

RICS new rules of measurement

Order of cost estimating and cost planning for building maintenance works

RICS

RICS new rules of measurement

NRM 3: Order of cost estimating and cost planning for building maintenance works

1st edition

RICS
the mark of property professionalism worldwide

Acknowledgments of Copyright

The project stages from the *RIBA Outline Plan of Work 2007* (Amended November 2008) are reproduced here in clause 1.2, with the permission of the Royal Institute of British Architects.

The RICS NRM 3 new rules of measurement for building maintenance works recommend the use of the 'Life Expectancy of Building Components' (2nd revised edition 2006), copyright of the Building Cost Information Service, and one of the tables and component life data and factors to be considered has been reproduced here in paragraph 5.4 with the permission of the BCIS.

The scope of cost categories and definitions for maintenance works and life cycle costing, included in Appendix F, are copyright of British Standards Institution, (from BS 8544 Table 2: Cost categories and definitions for maintenance and life cycle costing) are reproduced with the permission of the BSI.

The calculation template and rules of measurement in paragraph 5.5, for producing an annualised maintain cost plan form asset registers and applicable planned preventative maintenance task schedules (copyright of the Building & Engineering Services Association) are reproduced here with the permission of the Building & Engineering Services Association (formerly the HVCA).

These rules recommend the use of 'Economic life factors and methodology regarding economic service life data for the building engineering services', provided in CIBSE Guide M – Maintenance engineering and management), copyright of the Chartered Institution of Building Services Engineers, and some of the methodology has been reproduced here in paragraph 5.4 with the permission of the CIBSE.

RIBA & OGC Gateway process

In order to maintain consistency with NRM 1, the RIBA Plan of Work (2007) and the OGC Gateway have been used as the reference source in this document. In April 2013 the RIBA launched a new plan of work. In addition, the Construction Industry Council (CIC) are planning a Digital Plan of Work in 2014. RICS will continue to monitor the development in these areas, along with how the BS 1192 standards are applied for cost management and building information modelling. RICS will review and make any necessary amendments to the NRM suite of documents that will be necessary and appropriate. It is recommended that practitioners refer to a current and recognised industry plan of work when undertaking cost estimating and cost planning services.

Published by the Royal Institution of Chartered Surveyors (RICS)

Parliament Square

London

SW1P 3AD

UK

www.rics.org

No responsibility for loss or damage caused to any person acting or refraining from action as a result of the material included in this publication can be accepted by the author or RICS.

ISBN 978 1 78321 024 4

© Royal Institution of Chartered Surveyors (RICS) February 2014. Copyright in all or part of this publication rests with RICS. No part of this work may be reproduced or used in any form or by any means including graphic, electronic, or mechanical, including photocopying, recording, taping or Web distribution, without the written permission of the Royal Institution of Chartered Surveyors or in line with the rules of an existing license.

Typeset in Great Britain by Columns Design XML Ltd, Reading, Berks

Printed in Great Britain by Page Bros, Norwich

Contents

Foreword		vi
Acknowledgments		vii
Introduction		1
	Status of the RICS new rules of measurement	1
	The RICS new rules of measurement (NRM) suite of documents in context	2
	Identity	4
	Enquiries	4
Part 1: General		**7**
1.1	Introduction	7
1.2	Measurement in context with the RIBA Plan of Work and OGC Gateway Process	7
1.3	Purpose of NRM 3	9
1.4	Use of NRM 3	9
1.5	Structure of NRM 3	10
1.6	Symbols, abbreviations and definitions	11
Part 2: New rules of measurement for building maintenance works		**23**
2.1	Introduction	23
2.2	CROME	23
2.3	Scope and parameters of the renewal (R) and maintain M) work categories	24
2.4	Standardised building maintenance cost data structure (integrating construct (C) with the renewal (R) and maintain (M) works)	25
2.5	Process for order of cost estimating and cost planning of building maintenance works	25
2.6	Levels of measurement during the building's life cycle	26
2.7	Establishing the employer's maintenance requirements	27
2.8	Projects comprising multiple buildings, facilities and/or functional types	29
Part 3: Measurement rules for order of cost estimating (renewal and maintain)		**33**
3.1	Introduction	33
3.2	Purpose of an order of cost estimate	33
3.3	Information requirements for order of cost estimates	35
3.4	Constituents of an order of cost estimate	36
3.5	Measurement rules for order of cost estimates, using floor area and functional unit methods	37
3.6	Elemental method	39
3.7	Measurement rules for the elemental method of cost estimating building maintenance works	42
3.8	Unit rates and elemental unit rates (EURs) used to estimate the cost of renewal (R) and maintain (M) works	52
3.9	Updating unit rates and other costs to current estimate base date	52
3.10	Measurement rules for maintenance contractor's management and administration costs	53
3.11	Measurement rules for maintenance contractor's overheads and profit	54
3.12	Measurement rules for consultants' and specialists' fees	55
3.13	Measurement rules for other employer-definable maintenance-related costs	56
3.14	Measurement rules for risk	56
3.15	Measurement rules for inflation	59
3.16	Taxation allowances and other incentives	60
3.17	Value added tax (VAT) assessment	60
3.18	Other considerations	60
3.19	Present value, inflation and discounting methods	60

3.20	Reporting of order of cost estimates	62
Part 4: Measurement rules for cost planning of renewal (R) and maintain (M) works		**65**
4.1	Introduction	65
4.2	Purpose of maintenance cost planning	65
4.3	Constituents of a maintenance cost plan	67
4.4	Formal cost planning stages	69
4.5	Reviewing and approving maintenance cost plan	71
4.6	Cost control in procurement	71
4.7	Maintenance cost plans comprising multiple buildings and/or functional unit types	71
4.8	Information requirements for formal cost plans	71
4.9	Format, structure and content of formal cost plans	72
4.10	Measurement rules for maintenance cost planning	72
4.11	Calculating annualised costs for maintenance works	75
4.12	Unit rates used to cost renewal and maintain works	75
4.13	Updating unit rates and other costs to current estimate base date	75
4.14	Measurement rules for maintenance contractor's management and administration costs	76
4.15	Measurement rules for maintenance contractor's overheads and profit	77
4.16	Measurement rules for consultants' and specialists' fees	79
4.17	Measurement rules for other employer-definable maintenance-related costs	79
4.18	Measurement rules for risk	80
4.19	Measurement rules for inflation	81
4.20	VAT assessment	81
4.21	Other considerations	81
4.22	Present value, inflation and discounting methods	82
4.23	Reporting of maintenance cost plans	82
4.24	Analysis, collection and storage of maintenance cost data	83
Part 5: Calculation of annualised costs for renewal (R) and maintain (M) works		**87**
5.1	Introduction	87
5.2	Calculating annualised costs of renewal (R) work items from a capital building works cost plan	87
5.3	Reference service life, life factors and predicted life calculations	90
5.4	Calculating annualised costs of renewal (R) work items from as-built and/or asset registers and condition data	91
5.5	Calculating annualised costs of maintain (M) works from as-built and/or asset register and PPM task schedules	93
5.6	Creating a life cycle cost plan integrating construct (C) with the renewal (R) and maintain (M) works	97
5.7	Metrics used for life cycle cost analysis/benchmarking of maintenance	97
Part 6: Tabulated rules of measurement for elemental cost planning		**101**
6.1	Introduction	101
6.2	Use of tabulated rules of measurement for elemental cost planning	101
6.3	Works not covered by the rules of measurement for elemental cost planning	104
6.4	Method of codifying elemental cost plans	104
6.5	Method of codifying elemental cost plans for works packages	104
6.6	Alignment of NRM 3 to COBie II data structure and definitions for Building Information Modelling	105

Tables

Group element 0: Facilitating works 107
Group element 1: Substructure 118
Group element 2: Superstructure 139
Group element 3: Internal finishes 201
Group element 4: Fittings, furnishings and equipment 211
Group element 5: Services 224
Group element 6: Prefabricated buildings and building units 322
Group element 7: Work to existing buildings 323
Group element 8: External works 340
Group element 9: Maintenance contractor's management and administration costs 409
Group element 10: Maintenance contractor's overheads and profits 425
Group element 11: Consultants' and specialists' fees 426
Group element 12: Employer-definable maintenance-related costs 433
Group element 13: Risks 436
Group element 14: Inflation 444

Appendices

A Core definition of gross internal area (GIA) 445
B Core definition of net internal area (NIA) 451
C Commonly used functional units and functional units of measurement 457
D Special use definitions for shops 460
E Logic and levels for elemental cost planning of the construct (C), renewal (R) and maintain (M) works 464
F Maintenance cost categories and definitions 498
G Methods of economic evaluation and discounting equations (time value of money) 503
H Information requirements for formal cost plans, for the construction and maintenance works procurement and during the building's life cycle 509
I Report template for elemental cost plans for renewal (R) and Maintain (M) Works (condensed: based on level 1 codes) 526
J Report template for elemental cost plans for renewal (R) and Maintain (M) Works (expanded: based on level 2 codes) 528

Bibliography **532**

Index **533**

Foreword

Since 1922 the Standard Method of Measurement (SMM) has provided quantity surveyors and construction cost managers with rules of measurement for building construction works.

The Measurement Initiative Steering Group set up by the RICS Quantity Surveying and Construction Professional Group found that significant improvements were required to address the problems associated with the measurement of building construction works and future maintenance works, at all stages of the design and construction and in use stages of a building project. The lack of adequate measurement rules resulted the development of the RICS New Rules of Measurement (NRM): a suite of rules covering the design and construction, maintenance, life cycle major repairs and replacement (renewals) costs, i.e. throughout the whole life cycle cost management process. NRM is broken down into three volumes:

NRM 1: Order of cost estimating and cost planning for capital building works

NRM 2: Detailed measurement of building works

NRM 3: Order of cost estimating and cost planning for building maintenance works.

This volume provides a structured basis for measurement of building maintenance works, encompassing the annualised maintenance and life cycle major repairs and replacements of constructed assets and building components – which are carried out post construction procurement and throughout the in use phases of the constructed assets, or built environment.

The prime function of these rules is to provide consistent rules for the quantification and measurement of building maintenance work items – for the purposes of producing order of cost estimates, elemental cost plans and detailed asset specific work programmes, throughout the entire building life cycle.

The secondary function is to provide information and guidance on other areas of practice, such as:

(1) Input into life cycle cost plans (LCCP) in a structured way so that the same approach is adopted for all LCCP cash-flows and option appraisals. This in turn will facilitate meaningful comparison and more robust data analysis.
(2) Advising clients on the likely cash flow requirements for the purpose of annual budgeting (and initiating sinking funds) and informing forward maintenance and life cycle renewal plans.
(3) Informing the implementation of maintenance strategy and procurement stages and cost control of expenditure on maintenance works

The process of economic evaluation of the whole life cycle costing (WLCC) of all construction, operation and maintenance related costs during ownership is what is commonly referred to as life cycle costing. It provides a method for quantity surveyors/cost managers to assist building owners and project teams in selecting the optimum solution for their circumstances and helps inform the decision making process at various stages during the feasibility, design development and procurement and the in use phases of a building or facility.

This volume does not deal with operation or occupancy costs, or energy/carbon and environmental costs.

Although this volume does not address the measurement and description of capital building works, it does provide guidance on how to incorporate the relevant cost of capital building works into the generation of future life cycle major repairs and replacement forecasts and the annualised maintenance work programmes – and how this could be used as part of the wider life cycle cost plan (LCCP) process.

The rules of measurement for capital building works can be found in RICS NRM 1: Order of cost estimating and cost planning for capital building works. By using the rules for capital building works together with these rules for maintenance works, quantity surveyors/cost managers will be able to provide employers, design teams and building maintenance teams with sound guidance on the cost management of the building life cycle and thus give more robust information to inform the decision making process.

The RICS new rules of measurement are based on UK practice, but the requirements for a coordinated set of rules and underlying philosophy behind each part have worldwide application.

Acknowledgments

The development of RICS NRM 3: *Order of cost estimating and cost planning for building maintenance works* was facilitated by the RICS Quantity Surveying and Construction Professional Group under the direction of the Steering Group.

Lead author:

- Andrew Green, Faithful+Gould

Co-author:

- David Benge, Gleeds Cost Management Limited

Steering Group:

- Chair – Stuart Earl, Gleeds Cost Management Limited
- David Benge, Gleeds Cost Management Limited
- Alan Cripps, RICS
- John Davidson, Consultant
- Andrew Green, Faithful+Gould
- Adrian Green, Laing O'Rourke
- Joe Martin, Building Cost Information Service (BCIS)
- Alan Muse, RICS
- Sean Smylie, Shepherd Construction Ltd, and Contractors Legal Group UK, Contractors Group
- Roy Stratton, Countryside Properties

The substantial drafting of the RICS new rules of measurement; Order of cost estimating and cost planning for building maintenance works was undertaken by Andrew Green of Faithful+Gould, with significant technical input from David Benge (the lead author of NRM 1) to ensure alignment and consistency across the RICS NRM suite.

This volume has been drafted in the same style and format as the other RICS new rules of measurement suite of documents. With particular emphasis on creating an alignment between the NRM 3: *order of cost estimating and cost planning for building maintenance works* and NRM 1: *order or cost estimating and cost planning for capital building works*. Furthermore, in collaboration with the Building Cost Information Service (BCIS) significant work has been undertaken to create an elemental data structure common to cost estimating, cost planning, cost analyses and benchmarking of both capital and maintenance building works. This work resulted in the publication of the 4th edition of the BCIS Elemental Standard Form of Cost Analysis (2012) with the elemental cost data structure used to correlate fully with that within NRM 1 and NRM 3.

In the course of its preparation, this document underwent cross industry collaboration and consultation amongst practitioners, major portfolio estate management organisations, maintenance cost advisors, maintenance providers and trade associations, various professional bodies and with the British Standards Institution (BSI) via their technical working group members and industry subject matter experts.

The Steering Group express their special thanks to the Chartered Institution of Building Services Engineers (CIBSE) and the Building & Engineering Services Association (formerly HVCA) and their SFG20 technical standards committee, as well as various building maintenance contractor's cost managers for their co-operation and advice in the detailed consultations that have taken place.

The Steering Group also expresses its thanks to the QS surveying forum who have assisted in testing these rules and to the editors who have had the task of bringing together the final document.

Introduction

Status of the *RICS new rules of measurement*

These measurement rules have the status of guidance notes. Where recommendations are made for specific professional tasks, these are intended to represent 'best practices', i.e. recommendations which in the opinion of RICS meet a high standard of professional competence.

Although members are not required to follow the recommendations contained in the note, they should, however, note the following points.

When an allegation of professional negligence is made against a surveyor or maintenance cost advisor, the court or tribunal may take account of the contents of any relevant guidance notes published by RICS in deciding whether or not the surveyor, or maintenance cost advisor, had acted with reasonable competence.

In the opinion of RICS, a member conforming to the practices recommended in this note should have at least a partial defence to an allegation of negligence if they have followed those practices. However, members have the responsibility of deciding when it is inappropriate to follow the guidance.

It is for each individual surveyor, or maintenance cost advisor, to decide on the appropriate procedure to follow in any professional task. However, where members depart from the practice recommended in these rules, they should do so only for a good reason. In the event of a legal dispute, a court or tribunal may require them to explain why they decided not to adopt the recommended practice. Also, if they have not followed this guidance, and their actions are called into question in an RICS disciplinary case, they will be asked to explain the actions they did take and this may be taken into account by the Panel.

In addition, guidance notes are relevant to professional competence in that each member should be up to date and should have knowledge of guidance notes within a reasonable time of their coming into effect.

Document status defined

RICS produces a range of standards products. These have been defined in the table below. This document is a guidance note.

Type of document	Definition	Status
RICS practice statement	Document that provides members with mandatory requirements under Rule 4 of the Rules of Conduct for members	Mandatory
RICS code of practice	Standard approved by RICS, and endorsed by another professional body that provides users with recommendations for accepted good practice as followed by conscientious practitioners	Mandatory or recommended good practice (will be confirmed in the document itself)
RICS guidance note	**Document that provides users with recommendations for accepted good practice as followed by competent and conscientious practitioners**	**Recommended good practice**
RICS information paper Practice based information that provides users with the latest information and/or research	Information and/or explanatory commentary	

The RICS rules of measurement (NRM) suite of documents in context

The RICS new rules of measurement is a suite of documents issued by the RICS Quantity Surveying and Construction Professional Group. The rules have been written to provide a standard set of measurement rules that are understandable by all those involved in a construction and maintenance project.

The rules provide essential guidance to all those involved in, as well as those who wish to be better informed about, the cost management of construction projects and maintenance works. Although the RICS new rules of measurement are principally based on UK practice, the requirements for a coordinated set of rules and underlying philosophy behind each volume have worldwide application.

The suite of documents comprising the RICS new rules of measurement (NRM) consist of the following three volumes:

- NRM 1: Order of cost estimating and cost planning for capital building works
- NRM 2: Detailed measurement for building works
- NRM 3: Order of cost estimating and cost planning for building maintenance works

NRM 1: Order of cost estimating and cost planning for capital building works

This volume provides indispensable guidance on the quantification of building works for the purpose of preparing cost estimates and cost plans. Direction on how to quantify other items forming part of the cost of a construction project, but which are not reflected in the measurable building work items, is also provided – i.e. preliminaries, overheads and profit, project team and design team fees, risk allowances, inflation, and other development and project costs.

NRM 1 is the 'cornerstone' of good cost management of construction projects – enabling more effective and accurate cost advice to be given to clients and other project team members, as well as facilitating better cost control.

Although written primarily for the preparation of order of cost estimates and cost plans, the rules will be invaluable when preparing approximate estimates.

In addition, the rules can be used as a basis for capturing historical cost data in the form required for order of cost estimates and elemental cost plans, thereby completing the 'construction cost management cycle'.

NRM 2: Detailed measurement for building works

This volume provides fundamental guidance on the detailed measurement and description of building works for the purpose of obtaining a tender price. The rules address all aspects of bill of quantities (BQ) production, including setting out the information required from the employer and other construction consultants to enable a BQ to be prepared, as well as dealing with the quantification of non-measurable work items, contractor designed works and risks. Guidance is also provided on the content, structure and format of BQ, as well as the benefits of BQ.

Whilst written mainly for the preparation of bills of quantities and quantified schedules of works, the rules will be invaluable when designing and developing standard or bespoke schedules of rates.

These rules provide essential guidance to all those involved in the preparation of bills of quantities, as well as those who wish to be better informed about the purpose, use and benefits of bill of quantities.

NRM 3: Order of cost estimating and cost planning for building maintenance works

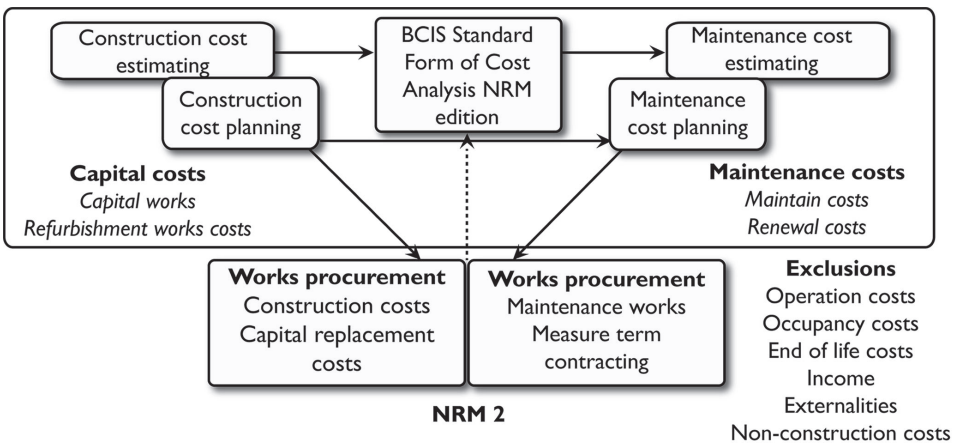
This volume provides essential guidance on the quantification and description of maintenance works for the purpose of preparing initial order of cost estimates during the preparation stages of a building project, elemental cost plans during the design development stages (pre-construction) and detailed asset-specific cost plan (post-construction) and throughout the in use phases of a building project or facility. The guidance provided by the rules also aids the procurement and cost control of maintenance works.

The rules follow the same framework and premise as NRM 1: Order of cost estimating and cost planning for capital building works. Consequently, they give direction on how to quantify and measure other items associated with maintenance works, but which are not reflected in the measurable maintenance work items – i.e. maintenance contractor's management and administration charges, overheads and profit, other maintenance-related costs, consultants' fees and risks in connection with maintenance works.

Unlike capital building works projects, maintenance works are required to be carried out from the day a building or asset is put to use until the end of its life. Accordingly, while the costs of a capital building works project are usually incurred by the building owner/developer over a relatively short-term, costs in connection with maintenance works are incurred throughout the life of the building – over the short, medium and long-term. Consequently, the rules provide guidance on the measurement and calculation of the time value of money (methods of economic evaluation, NPV and payback periods), guidance on using the measured data to inform life cycle cost plans and forward maintenance plans, as well as VAT, and taxation.

NRM 3: Order of cost estimating and cost planning for building maintenance works, together with NRM 1: Order of cost estimating and cost planning for capital building works, present the basis of life cycle cost management of capital building works and maintenance works – enabling more effective and accurate cost advice to be given to clients and other project team members, as well as facilitating better cost control.

Figure 0.1 below summarises the RICS NRM suite and how they inter-relate, as well as illustrating the link to the BCIS Standard Form of Cost Analysis.



Identity

The rules are called NRM 3: Order of cost estimating and cost planning and cost planning for building maintenance works.

Enquiries

Enquiries concerning the rules may be made in the first instance to Quantity Surveying and Construction Professional Group at RICS.

RICS QS & Construction Professional Group

The Royal Institution of Chartered Surveyors (RICS)

Parliament Square

London SW1P 3AD

United Kingdom

e: qsandc.professionalgroup@risc.org

Any suggestions for future revisions are welcomed and may be sent to the Quantity Surveying and Construction Professional Group at RICS.

Part 1: General

Part 1: General

1.1 Introduction

1.1.1 This part places the order of estimating and cost planning for maintenance works in context with the RIBA Plan of Work and OGC Gateway Process and explains the symbols, abbreviations and definitions used in the rules.

1.2 Measurement in context with the RIBA Plan of Work and OGC Gateway Process

1.2.1 Throughout this document, references are made to both the RIBA Plan of Work and the OGC Gateway Process and the RIBA Work Stages/OGC Gateways within.

1.2.2 The RIBA Plan of Work is a construction industry recognised framework that organises the process of managing and designing building projects, and administering building contracts, into a number of key Work Stages. The RIBA Plan of Work has 11 sequential steps but, despite its apparent linear nature, it should be recognised that the sequence or content of RIBA Work Stages may need to be varied or overlapped to suit the proposed procurement method. Consequently, when two or more Work Stages are combined, it is not always transparent when a building project is moving from one Stage to another. As such, it is an ideal tool to provide the basic outline of the building project life cycle process.

1.2.3 As an alternative to the RIBA Plan of Work, central and local government and the health and defence sectors have adopted the OGC Gateway Process as best practice for managing and designing building projects over their life cycle. The process examines programmes and projects at key decision points and looks ahead to provide assurance that the employer can progress to the next stage. Project reviews are carried out under OGC Gateway Reviews 1 to 5. Typically, a project will undergo three reviews before commitment to invest, and two looking at service implementation and confirmation of the operational benefits.

1.2.4 Both models are recognised frameworks for managing and designing the build as well as the post-construction, maintenance and renewal (or 'in use') stages, i.e. project life cycle cost management.

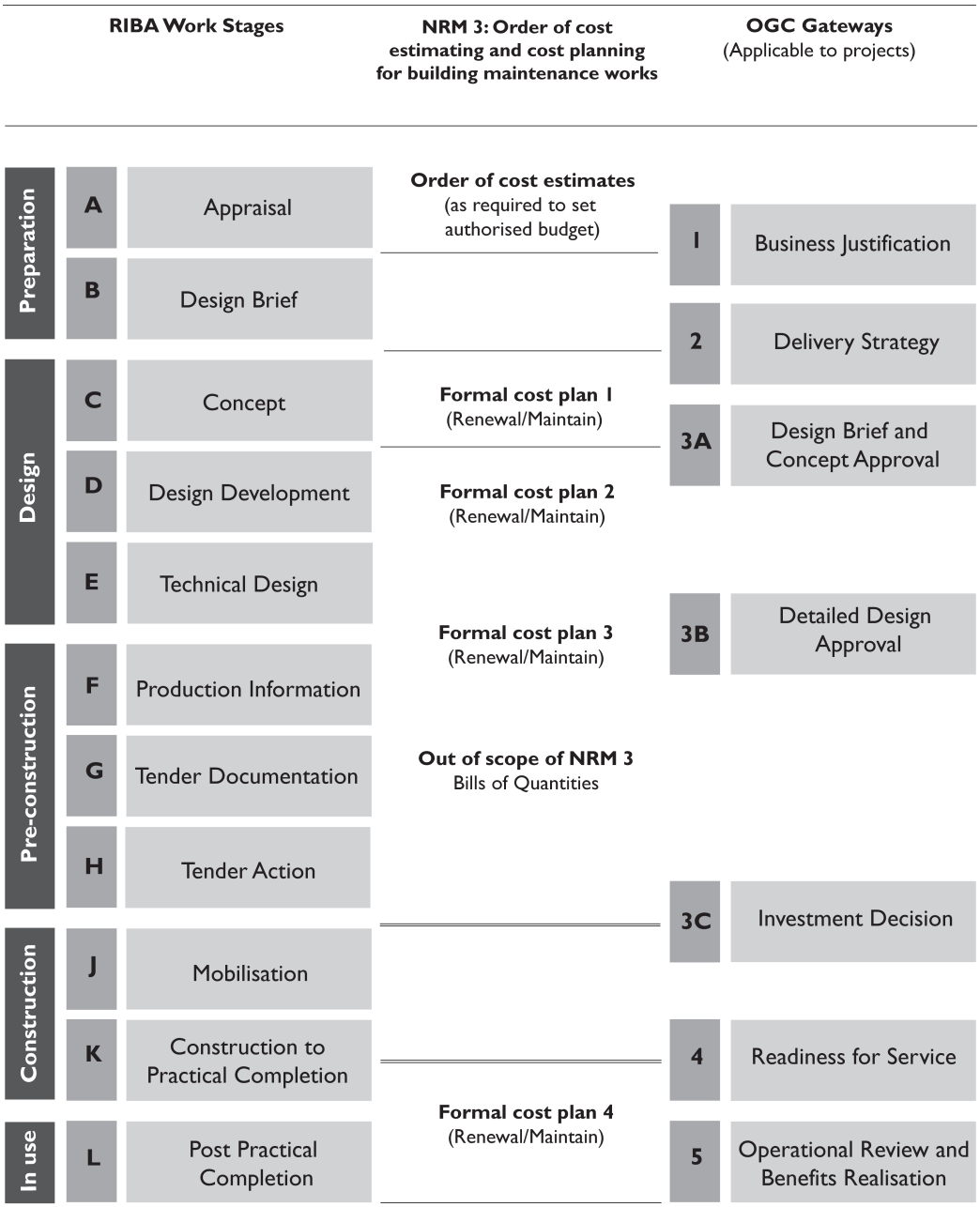
1.2.5 Cost estimates and cost plans will need to be prepared by the quantity surveyor/cost manager at various stages of the RIBA Plan of Work or at various points in the OGC Gateway Process, whichever management process is applicable. To address these requirements, RICS has developed a series of formal maintenance cost estimates and cost plans for use during construction procurement and maintenance cost planning, and during the in use phases of the building or constructed assets. These formal stages are shown in Figure 1.1 (see next page) in the context of the RIBA Work Stages and OGC Gateways. Notwithstanding this, some employers may require the preparation of cost plans at different RIBA Work Stages.

1.2.6 Figure 1.1 also shows the various points at which measurement is carried out by the quantity surveyor/cost manager to prepare annualised maintenance programmes of works (maintain), and/or quantified periodic life cycle major repairs and replacement schedules of works (renewals), in the context of the RIBA Work Stages and OGC Gateways.

1.2.7 The detailed rules of measurement for the build, or construction, order of cost estimates and elemental cost plans are defined in NRM 1. This volume links the construction cost data structure and rules of measurement with those in NRM 3 to align with the life cycle renewal (R) works and annualised maintenance (maintain – M) works and in this part, creating a totally integrated cost data structure for '**construct (C), renewal (R) and maintain (M)**'.

MAINTENANCE WORKS – Order of cost estimating and cost planning (pre-construction) and for the asset-specific cost planning of renewal (R) and maintain (M) works (post-construction) – i.e. life cycle costing of maintenance works.

Figure 1.1: Maintenance works – Order of cost estimating, elemental cost planning (pre- and post-construction) in context with the RIBA Plan of Work and OGC Gateways



Note: In order to maintain consistency with NRM 1, the RIBA Plan of Work (2007) has been used as a reference source in this document. In April 2013 the RIBA launched a new plan of work. In addition, the Construction Industry Council (CIC) are planning to launch a Digital Plan of Work in 2014. RICS will continue to monitor developments in these areas and review any necessary amendments to the NRM suite of documents that will be necessary and appropriate. It is recommended that practitioners refer to a current and recognised industry plan of work when undertaking their services.

1.3 Purpose of NRM 3

1.3.1 NRM 3 has been written to provide a standard set of measurement rules that are understandable by all those involved in budgeting, cost managing and procuring building maintenance works for discrete buildings (or part elements, systems or components), building portfolios, establishments or estates, including the employer; thereby aiding communication between the project and maintenance teams and the employer and the parties associated with the delivery of future maintenance works. In addition, NRM 3 should assist the quantity surveyor/cost manager, as well as the facilities manager, in providing effective and accurate cost advice to the employer and other project stakeholders throughout the life cycle cost planning and cost management process.

1.3.2 The document provides rules of measurement for the preparation of order of cost estimates and cost plans during construction procurement and post-practical completion (i.e. throughout the in use period of the building). Direction on how to describe and deal with costs and allowances forming part of the cost of maintaining a building or constructed asset or its parts, but which are not reflected in the measurable maintenance work items, is also provided.

1.3.3 The rules also provide a cost management framework that can be used to develop labour resource plans (including materials, consumables, plant and equipment) for annualised maintenance (maintain) works. They can also be used for predicting the intermittent or periodic forecast of life cycle major repairs and replacement (renewal) works, as appropriate for the defined period of analysis.

1.3.4 The rules do not explain in detail the estimating methods, cost planning techniques, procurement methods or maintenance contract strategies. Detailed advice on these subjects can be found in other RICS publications and external publications (see bibliography).

1.4 Use of NRM 3

1.4.1 NRM 3 provides a structured basis for measuring cyclical repairs and replacement (renewal) and annualised maintenance (maintain) of building components, which are to be carried out post-construction completion and throughout the in use phases of the constructed facility or built asset It also presents a consistent approach for dealing with other key cost components associated with the procurement of repair/replacement (renewal) and maintenance (maintain) works projects when preparing order of cost estimates, and elemental and component level based cost plans. The rules represent the essentials of good practice.

1.4.2 NRM 3 rules deal with measurement for the preparation of:

(1) order of cost estimates for repair/replacement (renewal – R) and annualised maintenance (maintain – M) works programme
(2) elemental cost plans for predicted life cycle repair/replacement (renewal – R) and annualised maintenance (maintain – M) works programme
(3) calculations of annualised costs for repair/replacement (renewal – R) works from capital building cost plans and asset registers/survey data
(4) cost reporting and analyses for repair/replacement (renewal – R) and maintenance (maintain – M) works.

In addition, the rules can be used to analyse actual maintenance costs in use, for use in estimating and cost planning of future repair/replacement (renewal) and maintenance (maintain) works projects – through cost-in-use studies, life cycle costs, building information modelling (BIM) and benchmark analyses.

1.4.3 Users of the rules are advised to adopt metric units as the standard system of measurement. Where the employer requires reference to imperial units, these may be provided as supplementary information (e.g. in parenthesis).

1.4.4 The British Standard BS 8888: 2011 Technical Product Specification (for defining, specifying and graphically representing products) recommends the inclusion of a comma rather than a point as a

decimal marker, and a space instead of a comma as a thousand separator. However, the traditional UK convention has been adopted in these rules (i.e. a point as a decimal marker and a comma as a thousand separator). Users should ensure that this does not conflict with employer requirements.

1.5 Structure of NRM 3

1.5.1 NRM 3 is divided into six parts with supporting appendices:

- **Part 1** places order of cost estimating and cost planning in context with the RIBA Plan of Work and the OGC Gateway Process; defines the purpose, use and structure of the rules and explains the symbols, abbreviations and definitions used in the rules.
- **Part 2** sets out the basis for NRM 3 by clarifying how maintenance costs relate to construction and life cycle costing; defines the scope and parameters for the renewal (R) and maintain (M) cost categories; explains the levels of measurement and process of cost estimating and cost planning; provides preparation rules for defining the brief and project particular requirements (depending on the stage in the building life cycle); explains the importance of developing a clear and comprehensive employer's maintenance brief and measurement rules; and discusses how to deal with projects comprising multiple buildings or facilities.
- **Part 3** describes the purpose and content of an order of cost estimate; defines its key constituents; explains how to prepare and report an order of cost estimate; and sets out the rules of measurement for the preparation of order of cost estimates using the floor area method, functional unit method and elemental method.
- **Part 4** describes the purpose and content of elemental cost planning used for building maintenance works; defines its key constituents; explains the rules for measurement for the preparation and reporting of formal cost plans for the renewal and maintain works.
- **Part 5** describes the measurement rules for the annualised costing of maintenance works; explains the calculation methods used for renewal (R) cost plans generated from capital building cost plans and the calculation methods for renewal (R) and maintain (M) from asset registers and condition surveys and the use of remaining life predicted data.
- **Part 6** comprises the tabulated rules of measurement and quantification of costs of renewal (R) and maintain (M) works; provides a standardised cost structure for renewal (R) and maintain (M) works integrating with the NRM 1 construct (C) cost data structure; discusses methods of codifying maintenance works cost plans; discusses methods of codifying cost plans for works packages; discusses methods of aligning NRM 3 to the COBie data structure and definitions for Building Information Modelling (BIM).

  The Appendices are listed below:

  Appendix A: Core definition of gross internal area (GIA)

  Appendix B: Core definition of net internal area (NIA)

  Appendix C: Commonly used functional units and functional units of measurement

  Appendix D: Special use definitions for shops

  Appendix E: Logic and levels for elemental cost planning of the construct (C), renewal (R) and maintain (M) works

  Appendix F: Maintenance cost categories and definitions

  Appendix G: Methods of economic evaluation and discounting equations (time value of money)

  Appendix H: Information requirements for formal cost plans for the construction and maintenance works procurement and during the building's life cycle

  Appendix I: Report template for elemental cost plans for renewal (R) and maintain (M) works (condensed: based on level 1 codes)

  Appendix J: Report template for elemental cost plan for renewal (R) and maintain (M) works (expanded: based on level 2 codes)

1.6 Symbols, abbreviations and definitions

The symbols, abbreviations and certain key words and phrases used in the rules are detailed below.

1.6.1 Symbols used for measurement

ha	hectare
hr	hour
kg	kilogramme
kN	kilonewton
kW	kilowatt
m	linear metre
m^2	square metre
m^3	cubic metre
mm	millimetre
min	minutes
nr	number
sys	system
t	tonne
wk	week

1.6.2 Abbreviations

BIM	Building Information Model or Modelling
Cost/ft^2 of GIA	Cost per square foot of gross internal area
Cost/m^2 of GIA	Cost per square metre of gross internal area
Cost/m^2 of GIA/pa	Cost per square metre of gross internal area per annum
Cost/task	Cost per task
Cost/element	Cost per element
Cost/year	Cost per year
Cost/function	Cost per function type
COBie	Construction Operations Building Information Exchange
CIBSE	Chartered Institution of Building Services Engineers
CRC	Carbon reduction commitment
CRV	Capitalised replacement value
B&ES	Building and Engineering Services Association (formerly known as the HVCA)
DCF	Discounted cash flow
DRC	Depreciated reinstatement cost
EUQ	Elemental unit quantity
EUR	Elemental unit rate
FCI	Function condition indexation
FMI	Function maintenance indexation
FMP	Forward maintenance plans (or programme)

FRI	Function re-investment indexation
GEA	Gross external area
GIA	Gross internal area
GIFA	Gross internal floor area
ICT	Information & communication technology
LCC	Life cycle cost or life cycle costing
LCR	Life cycle repairs/replacement (renewal)
NIA	Net internal area
NPC	Net present cost
NPV	Net present value
NRM	New rules of measurement
OGC	Office of Government Commerce
RCM	Reliability centred maintenance
PARL	Percentage asset remaining life
PIB	Planned inspection of buildings
PPM	Planned preventive maintenance
PV	Present value
RIBA	Royal Institute of British Architects
RICS	Royal Institution of Chartered Surveyors
RSL	Reference service life
SA	Site area
TPI	Tender price index
WLC	Whole life cost or costing

1.6.3 Definitions

Abnormal costs – the costs other than those typically encountered for the project funding route, including costs accruing due to circumstances outside the project manager's control. Examples of abnormal costs include those arising from issues such as: access constraints, legacy data issues, unforeseen events due to the nature of the assessment of works, statutory bodies and listed buildings.

Annual equivalent cost – the uniform annual amount equivalent to the project's real costs, taking into account the time value of money throughout the period of analysis.

Annualised maintenance cost – the yearly cost of maintaining the building or facility or asset, comprising preventative, reactive and proactive maintenance (see the definitions for these items).

Asset – the whole building, element, system, sub-element and/or a specific asset, or component or part thereof. Note – asset classifications can be at portfolio/estate level (e.g. offices or schools) down to specific maintainable assets (e.g. boilers). NRM 3 applies to all levels of building or constructed assets that are 'applicable' to maintenance and life cycle major repairs and replacement work.

Asset registers – a record of applicable maintainable assets, including information such as constructed specification, operational performance data, financial and technical details about each asset.

Authorised budget (or approved estimate) – see definition for Cost limit.

Base cost or benchmark cost – the cost of an existing or selected situation against which other options or a specific solution can be compared or benchmarked.

Base cost estimate – an evolving estimate of known factors without any allowances for risk and uncertainty, or element of inflation. The base cost estimate is the sum of the works cost estimate (including maintenance contractor's management, administration and overheads), profit and other project-specific costs, e.g. consultants' fees and employer-definable costs

Base date – the date at which the rates and prices included within the cost estimate or plans are based. See definition of Estimate base date.

Base rate – the interest rate selected as the basis of the discount rate. This could be the current bank rate or a client's opportunity cost of capital. The base rate is commonly adjusted by the inflation rate to give the discount rate.

Breakdown – a failure resulting in the non-availability of an item or asset.

Capital building works costs (capital costs) – the initial cost of construction of a building and associated external works.

Capital cost – the initial construction costs and the costs of initial adaptation, where these are treated as capital expenditure.

Coalface time – the actual time that is spent performing the defined maintenance activities. It does not include travel, arranging access or the erection or removal of any access equipment that may be required.

Condition survey – the collection of data about the condition of a building, captured at a facility, block, zone, floor, space and systems, asset or component level (in scope).

Cost control – the process of planning and controlling the costs of building(s) and maintenance works. Takes place throughout the complete duration of a project's construction life cycle.

Cost checks (cost checking) – these take place during all stages of a project's life cycle and are concerned with comparing current estimated costs against cost targets previously set for elements and sub-elements of the building-related maintenance works (in scope).

Cost limit (or authorised budget or approved estimate) – the maximum expenditure that the employer is prepared to a make in relation to the completed building or maintenance work.

Cost per functional unit (or functional unit cost) – the unit rate that, when multiplied by the number of functional units, gives the total base maintenance works estimate (i.e. works cost estimate less maintenance contractor's management and admin/overheads and profit). The total recommended cost limit (i.e. the cost limit including inflation) can be expressed as a cost per functional unit when reporting costs.

Cost plan – see definition for Elemental cost plan.

Cost plan for maintenance and renewal works – the critical breakdown of the cost limits for maintenance and renewal works into cost targets for each element of a built asset. It provides: a statement of how the available budgets are to be distributed among the elements; a frame of reference from which to ascertain the future maintenance and renewal requirements; a tool to inform the costs of future maintenance and renewal requirements; and a tool to inform design development and maintain cost control of future expenditure on maintenance and renewal works. It also provides a work breakdown structure and a cost breakdown structure that, by codifying, can be used to redistribute maintenance works into specific maintenance work packages for procurement (e.g. general mechanical and electrical building engineering services, lifts, catering equipment, refrigeration plant and systems, and landscape management). A maintenance and renewal works cost plan considers estimated maintenance and renewal costs over the life of the building, facility or asset.

Cost targets – the recommended total expenditure for an element. The cost target for each element is likely to be derived from a number of sub-elements and components.

Design life – the service life intended by the designer.

Director's adjustment – a reduction or addition to the tender price derived by the specific contractor's estimating team, offered by the director(s) of the maintenance contractor.

Discounting – the process of reducing the value of cost or benefits that occur later.

Discounted cash flow (DCF) – an analysis method of valuing projected asset life cycle costs using the concept of the time value of money (see definition).

Discount rate – the percentage rate required to calculate the Present value (see definition) of a future cash flow (i.e. used for bringing future costs to a comparable time base). For example, if investing at 3 per cent interest, then the present value is discounted by 3 per cent as it is worth less than future earnings due to interest. The discount rate is a factor or rate reflecting the time value of money that is used to convert cash flows occurring at different times to a common time base.

Disposal costs – the costs associated with the disposal of the asset at the end of its life cycle, including any asset transfer obligations.

Degradation – the process whereby an action on an item causes deterioration of one or more properties.

Durability – the ability of an item to perform a required function under given conditions of use and maintenance, until a limited state is reached. Note – a limited state of an item may be characterised by the end of its useful life, unsuitability for any economic or technological reasons.

Element – a major part of a group element. A separate cost target can be established for each element.

Elemental cost analysis (or cost analysis) – the full appraisal of costs involved in the maintaining and life cycle replacement of previously constructed buildings and is aimed mainly at providing reliable information, which will assist in accurately estimating cost of future buildings. It provides a product-based cost model and data on which initial elemental estimates and elemental cost plans can be based.

Elemental cost plan (or cost plan) – in the context of maintenance, this is the critical breakdown of the cost limits for the maintenance works into cost targets for each element of a built asset.

Elemental method – a budget setting technique that covers the major elements of a building and provides an 'order of cost estimate' based on an elemental breakdown of a building and maintenance project. The elemental method can also be used to develop an initial cost model as a prerequisite to developing an elemental cost plan. The method involves the use of Elemental unit quantities (EUQ) and Elemental unit rates (EUR) (see definitions).

Elemental unit quantity (EUQ) – the unit of measurement that relates solely to the quantity of the element or sub-element itself (e.g. the area of external walls, the area of windows and external doors, and the number of internal doors).

Elemental unit rate (EUR) – the total cost of an element divided by the elemental unit quantity (EUQ). EURs include the cost of all labour, materials, plant, subcontractor's costs, preliminaries, design fees, subcontractor's overheads and profit. EURs exclude maintenance contractor's preliminaries, overheads, profit and other allowances, such as project/design fees, risk allowances and inflation. These cost items are to be assessed separately.

Emergency maintenance – unplanned or unscheduled maintenance works that require immediate action to restore services, remove problems that could adversely interrupt user activities or to protect life and/or property (see definition for Unplanned maintenance).

Employer – the owner and/or the developer of the building or, in some cases, the ultimate user. The terms Senior Responsible Owner and Project Sponsor are used by central government and the defence sector, being the representatives empowered to manage the building project and make project-specific decisions. For these measurement rules, the term Employer shall also mean Senior Responsible Owner or Project Sponsor.

End of life cost – the net cost or fee of disposing of an asset at the end of its service life or period of interest, including: costs resulting from decommissioning, deconstruction and demolition of a building; recycling and making it environmentally safe; recovery and disposal of components and materials; and transport and regulatory costs.

Estimate base date – the date on which the cost limit (i.e. the sum of the works cost estimate, project/design team fees estimate, other related costs estimate and risk allowance estimate, excluding inflation) is established as the basis for calculating inflation, changes or other related variances.

Externalities – the quantifiable costs or benefits that specifically occur when the actions of organisations and individuals have an effect on people other than themselves, such as non-construction costs, income and wider social and business costs.

Facility – the built asset as a whole or part, including the site and building/structure and appropriate block, floors, space, zone, room, systems, assets, components, and sub-components.

Factor method – modification of reference service life (see definition) by factors to take account of specific in use conditions.

Forward maintenance plans (or programme) – a document setting out the specific maintenance activities (actions or tasks), resources and sequence of activities relevant for maintaining a building.

Function – the purpose or activity of users and other stakeholders for which an asset or facility is designed, used or required to be used.

Functional type – the prime use of a facility or part of a building.

Functional unit – a unit of measurement used to represent the prime use of a building or part of a building including all associated circulation spaces (e.g. per bed space, per house and per m^2 of retail area space).

Functional unit method – a rough budget setting technique that consists of selecting a suitable standard Functional unit to use for the project, and multiplying the projected number of units by the appropriate cost per functional unit.

Functional condition indexation (FCI) – the ratio of the functional cost estimate of predicted life cycle major repairs or replacements (identified by a condition and Remaining life assessment) to the Capitalised replacement value or rebuild costs, expressed over an agreed period of analysis (e.g. a banding of years such as 1, 2 to 3, 4 to 5, 6 to 10 or 11+).

Functional maintenance indexation (FMI) – the ratio of the functional unit cost estimate of annualised maintenance (i.e. planned, reactive and proactive maintenance) to the Capital replacement value (CRV) or rebuild costs, expressed over an agreed period of analysis (e.g. a banding of years such as 1, 2 to 3, 4 to 5, 6 to 10 or 11+).

Functional re-investment indexation (FRI) – the ratio of the functional cost of major repairs or replacements (identified by a condition and other form of asset assessment) to the Capital replacement value (CRV) or rebuild costs, expressed over an agreed period of analysis (e.g. a banding of years such as 1, 2 to 3, 4 to 5, 6 to 10 or 11+).

Gross external area (GEA) – the area of a building measured externally (i.e. to the external face of the perimeter walls). The rules of measurement for a GEA are defined in the RICS *Code of Measuring Practice*.

Gross internal floor area (GIFA) – is the area of a building measured to the internal face of the perimeter walls at each floor level. The rules of measurement of a GIFA are defined in the RICS *Code of Measuring Practice*. Also see Appendix A of NRM 3.

Group element – the main headings used to describe the facets of an elemental cost plan, i.e. substructure; superstructure; internal finishes; fittings, furnishings and equipment; and services.

Inspection (or Technical inspection) – the examination of an asset, product or building engineering services installation (including plant and equipment) and the determination of their conformity with specific requirements, on the basis of professional judgment.

Inflation – an allowance included in the order of cost estimate or elemental costs plans for fluctuations in the basic prices of labour, plant and equipment and materials.

Life cycle – the consecutive and interlinked stages of the object under construction.

Life cycle cost – the cost of an asset or its parts throughout its life cycle while fulfilling the performance requirements.

Life cycle costing – a methodology for the systematic economic evaluation of life cycle costs over a period of analysis, as defined in the agreed scope of assessment.

Maintenance contractor (or Prime Contractor) – the contractor responsible for the total maintenance and completion process. The term Prime contractor is often used to mean the Main contractor in central government and the defence sector.

Maintenance contractor's overheads and profit– the costs associated with head office administration proportioned to each building maintenance contract plus the its return on capital investment.

Maintenance contractor's management and administration– items that cannot be allocated to a specific element, sub-element or component. These include the costs associated with management and staff, site establishment, temporary services, security, safety and environmental protection, control and protection, commonly used plant and equipment, relevant temporary works, the maintenance of site records, completion and post-completion requirements, waste disposal, fees and charges, sites services and insurances, bonds, guarantees and warranties. These exclude costs associated with subcontractor's or work package contractor's management and administration costs.

Maintenance costs – the total of necessarily labour, materials, plant and equipment and other related costs incurred to retain a building or its part in a state in which it can perform its required functions.

Maintenance programme – a time-based plan allocating specific maintenance tasks of an item.

Minor replacement, repairs and maintenance cost – the cost of scheduled replacement, maintenance and minor repairs to components or parts together with associated making good and minor redecorations.

Net internal area (NIA) – the usable area within a building measured to the internal face of the perimeter walls at each floor level. The rules of measurement of NIAs are defined in the RICS *Code of Measuring Practice*. Also see Appendix B of NRM 3.

Net present cost (NPC) – the sum of the present values of all costs less the sum of the present value of all benefits.

Net present value (NPV) – the aggregated sum of the future income and expenditure discounted back to a common base date, usually the present day, at a given compound interest rate.

Normal working hours – normal working hours typically 8.30 to 5.30 Monday to Friday (excluding statutory holidays). Note. actual working hours may vary and should be stated in the assumptions.

Occupancy cost – the cost, relating to the occupation of the building, incurred by the occupant – such as rent, taxes, insurances on buildings and contents, depreciation and amortisation expenses.

OGC Gateway Process – a process that examines programmes and projects at key decision points in their lifecycle. It looks ahead to provide assurance that the Employer can progress to the next stage. Project reviews are carried under OGC Gateway reviews 1 to 5. Typically, a project will undergo three reviews before a commitment to invest, and two looking at service implementation and confirmation of the operational benefits. The process is best practice in central and local government, the health and the defence sector. The emphasis of the OGC Gateway Process is to examine the business case, which requires an assessment of the total development cost of the building project.

OGC Gateways – key decision points within the OGC Gateway Process.

Off-site maintenance – maintenance performed at a location different from where the item is used.

Optimisation – the lowest costs that provide the maximum benefit from an asset over the life cycle period defined, and with respect to specified criteria.

Other maintenance-related cost – a cost that is not necessarily directly associated with the cost of maintaining the building or constructed assets, but forms part of the total cost of the maintenance to the Employer.

Out of hours working (or out of normal hours working) – working outside of Normal working hours and includes an uplift to rates for the extra hours worked Monday to Friday and additional time at weekend and bank holidays. Premium rate uplifts to be stated as a multiplier of normal working hour rates (e.g. 1.5 times for extra weekday hours or 2 times for weekends and bank holidays).

Overheads and profit – see definition for Maintenance Contractor's overheads and profit.

Period of analysis – means the period of time over which life cycle costs or maintenance, or whole life cycle building and maintenance costs are analysed (in scope).

Planned (or scheduled) maintenance – the maintenance organised and carried out with forethought, control and the use of records to a predetermined plan. Note – planned preventative maintenance is always part of planned maintenance, whereas corrective maintenance may or may not be.

Post-tender estimate – a cost estimate carried out after the evaluation of tenders to corroborate the funds required by the Employer to complete the building maintenance contract.

Present value – the cost or benefit in the future discounted back to some base date, usually the present day, at a given compound interest rate. See definition for net present value.

Pre-tender estimate – a cost estimate prepared immediately before calling tenders for servicing, maintenance and life cycle replacement works.

Preventive maintenance – the planned and controlled programme of maintenance and inspection carried out at predetermined intervals (or corresponding to prescribed criteria) and intended to reduce the probability of failure or degradation of the functioning of an item. This includes inspections, adjustments, cleaning, lubrication and/or selective replacement of components (e.g. filters) and minor repairs, as well as performance testing and analysis intended to maximise the reliability, performance and life cycle of building systems, equipment, etc. Preventive maintenance consists of many checkpoint activities on items that, if disabled, may interfere with an essential installation operation, endanger life or property, or involve high costs or long lead times for replacement.

Price stability – the boundary between inflation and deflation.

Proactive maintenance – maintenance work that is undertaken to avoid failures or to identify defects that could lead to failure. They are the tasks to eliminate the root cause of the failure and include routine preventive and predictive maintenance activities and work tasks identified from them. This can include plant tours, targeted inspections and monitoring tasks.

Reactive – see definition of unscheduled or unplanned maintenance.

Reliability centred maintenance (RCM) – a process used to determine what must be done to ensure that any physical asset continues to do what its users want it to do in its present operating context.

Reference service life – the service life that is expected under a reference set of in use conditions and that may form the basis of estimating the service life. See definition for factor methods.

Remaining life – the period during which a building or component may reasonably be expected to continue to fulfil its present function provided it is given normal routine maintenance. Remaining life is the future expected life of an asset at a given point in time.

Repair – work that is performed to return equipment to service after a failure, or to make its operation more efficient. The restoration of an asset or a component to such a condition that it may be effectively utilised for its designed purpose by the overhaul, reprocessing or replacement of constituent parts or materials that have deteriorated by action of the elements or usage and have not been corrected by maintenance.

Residual risk (or retained risk) – the risks retained by the Employer.

RIBA Outline Plan of Work – summarises the deliverables required under each RIBA Work Stage.

RIBA Plan of Work – a model procedure dealing with basic steps in decision making for a capital building project. The RIBA Plan of Work sets out a logical structure for building projects, starting with the brief and ending with post-occupancy evaluation. The procedures identify the responsibilities of the design team at each stage of the design and contract administration process. Each step is referred to as a RIBA Work Stage. The full and correct title is The Architect's Plan of Work, published by RIBA, but it is commonly referred to in the building construction industry as the RIBA Plan of Work.

RIBA Work Stages – the stages into which the process of designing building projects and administering building contracts may be divided. Some variations of the RIBA Work Stages apply for design and build procurement.

Risk – the likelihood of an event or failure occurring and its consequences or impact

Risk allowance – the amount added to the base cost estimate for items that cannot be precisely predicted to arrive at the cost limit.

Risk register (or risk log) – a schedule of identified risks.

Risk value – an estimate of the cost of individual risks.

Scheduled maintenance – the preventive maintenance carried out in accordance with predetermined intervals, number of operations, hours run, including allowances for access.

Site area (external) – the total area of the site within the title boundaries (or the total area within the title boundaries defined by the employer as the site for the building or facilities) measured on a horizontal plane, excluding the area of the building footprint. It excludes any area used temporarily for building works that do not form part of the delivered programme of maintenance.

Subcontractor – a Contractor employed by the Maintenance contractor to undertake specific work within the building project. Also known as a specialist, works, trade, work package or a labour-only contractor

Subcontractor's management and administration – the management and administration that relate specifically to maintenance and replacement works carried out by subcontractors. Costs associated with these are to be included in the unit rates to sub-elements, components and individual assigned maintenance task schedules.

Sub-element – the part of an element. Similar to elements, a separate cost target can be established for each sub-element.

Sunk cost – the cost of goods and services already incurred and/or irrevocably committed.

Time value of money – the measurement of the difference between future monies and the present day value of monies.

Time-related charge – a charge for work, the cost of which is to be considered dependent on duration.

Tender inflation – means the allowance included in the order of estimate of a cost plan for fluctuations in the basic prices of labour, plant, equipment and materials during the period from the estimate base date to the date of tender return.

Treasury discount rate – the rate specified as the discount rate by the UK Government Treasury to be used as the discount rate for public sector whole life costing calculations (see the definitions for Discount rate).

TUPE Regulations – the Transfer of Undertakings (Protection of Employment) Regulations. These protects employees' terms and conditions of employment when a business is transferred from one owner to another.

Unit rate – the monetary rate applied to an element, sub-element or component per unit of measurement (e.g. cost per m, cost per m^2 or cost per m). The term also includes cost/m^2 of GIFA, or cost/m^2 per annum and cost per functional unit.

Unplanned (or unscheduled) maintenance – reactive and non-emergency work activities that occur in the current annual programme (i.e. maintenance carried out to no predetermined plan). Activities may range from unplanned/unscheduled maintenance of a nuisance nature requiring low levels of skill for correction, to non-emergency tasks involving a moderate to major repair or correction requiring skilled labour.

Utilities cost – the cost of different fuels, water and drainage charges identified separately and reported on an annual basis. Included in the net utilities cost is any income generated from selling energy back to the national grid or generated for other usages.

Whole life cost – all significant and relevant initial and future costs and benefits of a building facility or an asset, throughout its life cycle, while fulfilling the performance requirements.

Whole life costing – a methodology for the systematic economic evaluation used to establish the total cost of ownership, or the whole life costing of option appraisals. It is a structured approach addressing all costs in connection with a building or facility (including construction, maintenance, renewals, operation, occupancy, environmental and end of life). It can be used to produce expenditure profiles of a building or facility over its anticipated life span or defined period of analysis.

Works cost estimate – the combined total estimated cost of the maintenance works estimate, the maintenance contractor's management and administration, and overheads and profit, prepared using prices current at the time the estimate is prepared (or updated). It contains no allowance for other project-specific/employer-definable costs, risk allowances, inflation allowances and taxation.

Work order – a written or automated instruction detailing the work to be carried out and the methods to be used.

Work package contractor – a specialist contractor who undertakes particular identifiable aspects of maintenance or replacement work, e.g. maintenance of non-specialist mechanical and electrical engineering services; maintenance of specialist installations (such as building management systems and fuel installations); maintenance of building fabric, structure, finishes and fittings, furnishings and equipment; landscaping management and grounds maintenance works; or labour only. Depending on the contract strategy, works contractors can be employed directly by the Employer, or by the Maintenance Contractor.

Works package contractor's management and administration – the management and administration costs relating specifically to work that is to be carried out by a Works package contractor.

Part 2: New rules of measurement for building maintenance works

Part 2: New rules of measurement for building maintenance works

2.1 Introduction

2.1.1 Part 2 sets the basis for NRM 3 by clarifying how maintenance costs relate to construction and life cycle costing; defining the scope and parameters for renewal (R) and maintain (M) cost categories; explains the process of cost estimating and cost planning and the levels of measurement; and explains the importance of developing a clear and comprehensive employer's maintenance requirement and how the measurement rules are to be applied.

2.2 CROME

2.2.1 The acronym 'CROME' describes the key constituents of the building life cycle costs of a constructed asset and broadly categorises how they relate to the construction costs and to the other building maintenance costs (which are split into **renewal (R)** costs and **maintain (M)** costs) and to the other key aspects of life cycle costing:

C Construct costs

R Renewal costs

O Operation and occupancy costs

M Maintain costs

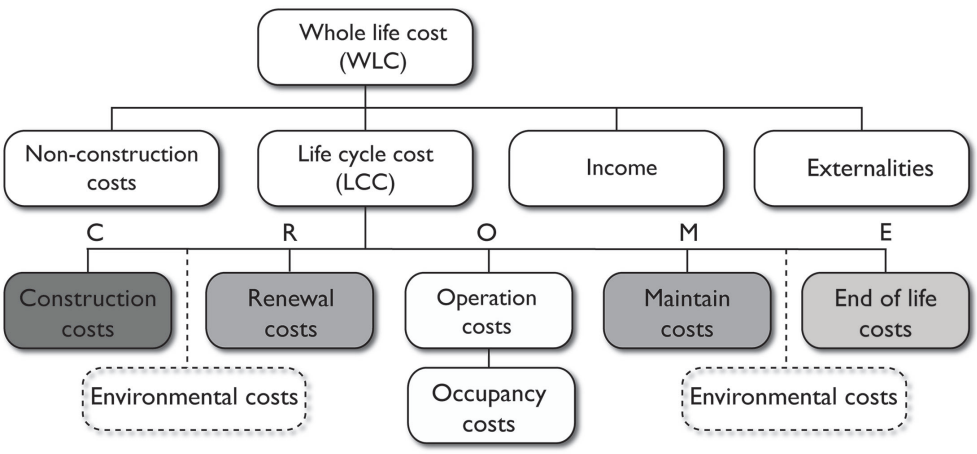
E Environmental and/or end of life costs.

2.2.2 NRM 3 deals with the renewal works (R) and maintain (M) aspects of the building and/or a constructed facility and/or asset systems or component parts. The rules also address other aspects of the life cycle costing, such as improvements and upgrades for environmental reasons, end of interest and/or end of life considerations, and other related obligations (E), which may be included as part of a specific project costing scope.

2.2.3 For NRM 3 the Construct (C) costs include subsequent refurbishment and adaptation works to the building or facility. The quantification of the initial construction or renovation of a building or assets, as well as the demolition of buildings and facilities (E), are dealt with under NRM 1.

2.2.4 Figure 2.1 below clarifies what are the key cost categories included in a 'life cycle costing' and those wider non-construction related costs, incomes and externalities, which together with life cycle costs, are referred to as whole life costs.

Figure 2.1: Key cost categories of life cycle costing and whole life costing

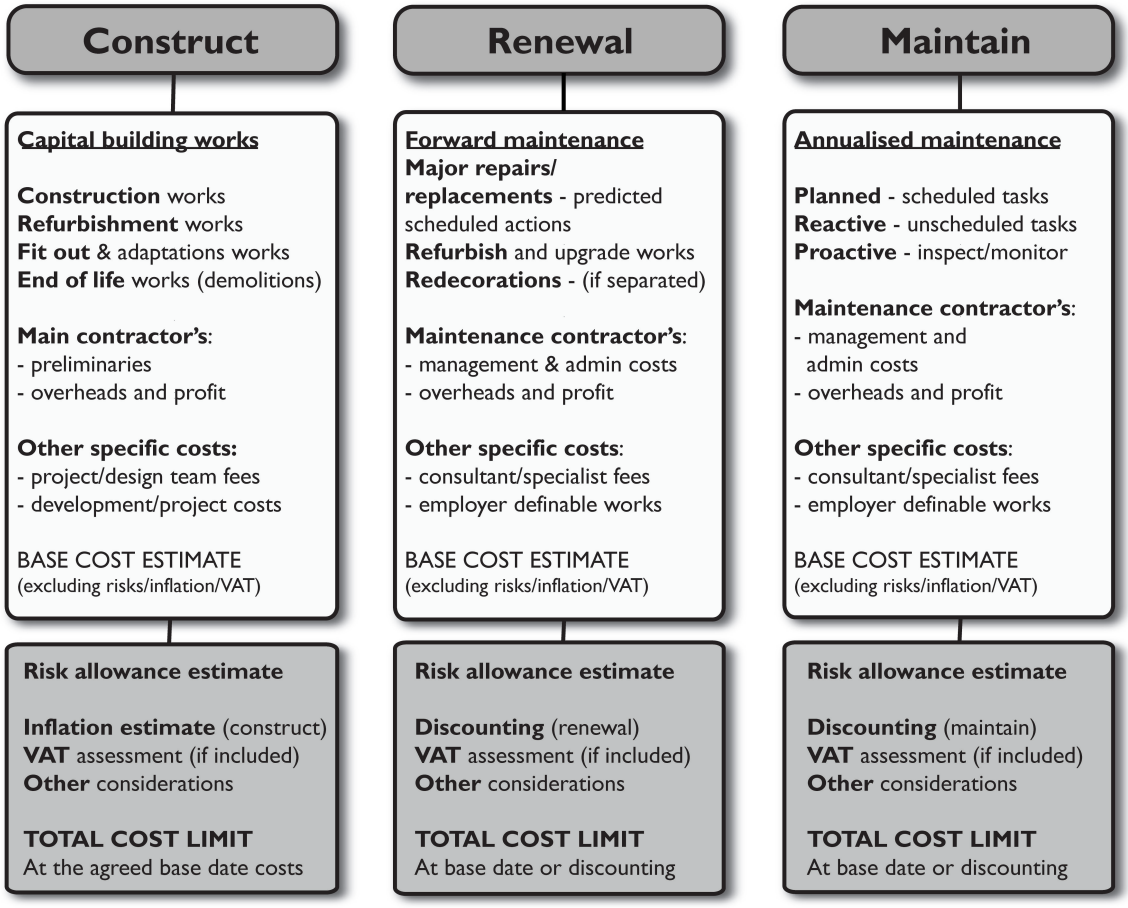


2.3 Scope and parameters of the renewal (R) and maintain (M) work categories

2.3.1 This paragraph broadly defines the scope and parameters of the cost categories for renewal (R) and maintain (M) works. Appendix F includes detailed definitions and guidance notes for each of the cost categories. Notwithstanding this, some of these aspects can be included in maintenance works, if required by the employer to be in the scope of works.

2.3.2 The scope of the key cost categories that constitute building maintenance works, split into renewal (R) and maintain (M) cost categories and how this aligns and relates to the construct (C) key cost categorises from NRM 1, is broadly summarised in Figure 2.2 below.

Figure 2.2: Scope of key cost categories of renewal (R) and maintain (M) and their relationship with construct (C)



Note: for asset-based cost planning (post-construction) during in use phases, include for the costs associated with quantification and verification of the asset maintenance registers identifying the maintain tasks and renewal actions required.

2.4 Standardised building maintenance cost data structure (integrating construct (C) with the renewal (R) and maintain (M) works)

2.4.1 Part 6 (Tabulated rules of measurement of elemental cost planning) of these rules includes a standardised cost data structure that links NRM 1, and a detailed 'inclusions' listing at the building or constructed (C) components level, to maintenance asset types specifically defined for applicable renewal (R) and maintain (M) works. It creates a fully integrated and standardised construction and maintenance works cost breakdown data structure (i.e. construct with renewal and maintain – aligned to the NRM 1 level 3 'inclusions' component list).

2.4.2 Wherever the detailed rules of measurement or units of measurement differ between the capital building works rules (NRM 1) and the maintenance and life cycle replacement works rules (NRM 3), then this has been highlighted **by exception** in Part 6 (Tabulated rules of measurement for elemental cost planning, group elements 0 to 14) of these rules.

2.4.3 The logic and levels for elemental cost planning published in Appendix E of NRM 1 has been developed to integrate the construct (C) levels 1 to 3 of the renewal (R) items and maintain (M) inclusions, as the table in Appendix E of NRM 3.

2.5 Process for order of cost estimating and cost planning of building maintenance works

2.5.1 The process of preparing both order of cost estimates and cost plans for building maintenance works is the same, and is as follows:

(1) define and agree the employer's brief for the maintenance works (or update the previous iteration of the brief)
(2) plan the procedure
(3) establish the rules of measurement to be applied for:
    (a) order of cost estimating of maintenance works (Part 3 of these rules)
    (b) cost planning of maintenance works (Part 4 of these rules)
    (c) annualised costing of maintenance works (Part 5 of these rules)
(4) compile the available information and record the data assumptions
(5) document all information and assumptions used in compiling the cost estimate or cost plan
(6) undertake the calculations, update unit rates and other costs; check and validate the results
(7) apply risk and sensitivity analysis (if required, in scope)
(8) carefully interpret and present the results
(9) report the results
(10) review the report with the employer and obtain agreement to the final outputs
(11) determine whether to do an analysis for comparative benchmarking purposes (if required)
(12) issue a final order of estimate or cost plan report, whichever is appropriate.

2.5.2 For the purposes of developing order of cost estimates and cost plans for building maintenance works, maintenance works are to be ascertained under separate cost categories, as follows:

(1) **Renewal (R) works costs** – which are sub-divided into the following sub-categories:
    (a) **major repairs/replacement costs** – including a predicted schedule of life cycle major repairs and replacement works and a provision for unscheduled renewal works
    (b) **refurbish and upgrade costs** – such as refurbishing heating systems; upgrading to modern day equivalents; and replacing for obsolescence, energy/carbon or performance reasons
    (c) **redecoration costs** (if separated out, in scope).

(2) **Maintain (M) works costs** – which are sub-divided into the following sub-categories:

(a) **planned preventative costs** – including annualised maintenance regimes, such as planned preventative maintenance works, minor repairs, consumables and equipment

(b) **reactive costs** – annualised unscheduled or responsive maintenance, including emergency/minor repairs and replacement items (within set renewal liability limits)

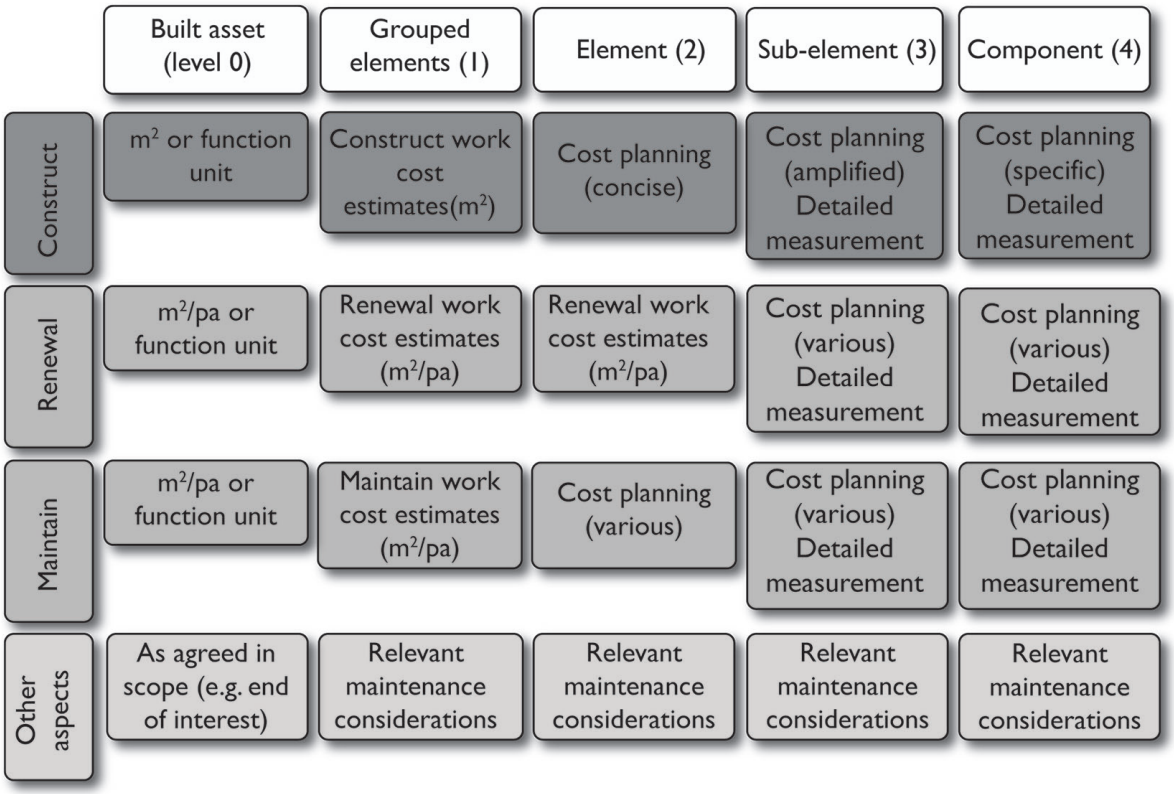
(c) **proactive costs** – such as planned inspections of buildings/components, audits, testing and monitoring regimes, and alternative maintenance regimes (e.g. condition based, asset criticality risk, or thermal imaging).

Note: see Appendix F for more detailed guidance on the scope and parameters for cost categories and definitions for renewal (R) and maintain (M) works, as well as how they relate to wider life cycle costing and whole life costing.

2.6 Levels of measurement during the building's life cycle

2.6.1 Producing order of cost estimates and cost planning construction and maintenance works are undertaken at various stages in the building's life cycle (see Figure 2.3). The level of information available and the type of cost estimate (i.e. whole building level or functional unit types; cost significant items; or elemental, sub-elemental down to detailed asset component level cost planning) will be based on the design and maintenance data, asset registers, condition and life data.

Figure 2.3: Levels of measurement undertaken during the building's life cycle



Note: Refer to Appendix E which clarifies the logic and levels for elemental cost planning of the construct (C), renewal (R) and maintain (M) works. Also see report templates in Appendices I and J.

2.7 Establishing the employer's maintenance requirements

2.7.1 An important step in the estimating and cost planning of building maintenance works is establishing the employer's requirements. Careful definition of the employer's maintenance requirements is therefore essential and usually takes the form of an employer's brief for maintenance works. The brief is an iterative document that will be reviewed and updated at each of the RIBA Work Stages or OGC Gateway, as applicable.

2.7.2 Development of the employer's brief for maintenance works is an exploratory process. Success presupposes effective collaborative working between the employer and relevant stakeholders (i.e. designers, maintenance contractors, suppliers' consultants, etc.).

2.7.3 Inexperienced employers should not be deterred by the detailed information requirements set down in these rules. This simply reflects the complexity of the maintenance process and the importance to the overall success of the defined maintenance programme of identifying all relevant maintenance requirements at the outset. Cost managers, in conjunction with the employer's other professional advisers, should be able to help the employer define their current and future maintenance requirements.

2.7.4 The employer's initial brief for maintenance works should concentrate on a clear statement of aims and their context, which is specific enough for action by the cost manager and other interested parties.

2.7.5 The employer's maintenance brief will need to be tailor-made to meet the employer's specific project requirements, e.g. Building information modelling (BIM). In some cases, the quantity surveyor/cost manager may need to propose the specific preparatory inputs for the maintenance cost estimating, elemental and/or asset-specific cost planning, particularly when the employer is unfamiliar with the new rules of measurement for building maintenance works.

2.7.6 Cost estimating and cost planning of building maintenance works is an iterative process, which will be based on more informed decisions as more detailed information becomes available.

2.7.7 To enable the preparation of an order of cost estimate or cost plan for a maintenance works project, the following information will be required to have been agreed with the employer and included in the employer's brief for maintenance works:

(1) scope of the maintenance:
   - (a) type of building(s) and/or other built asset(s) or facility and the functional usage
   - (b) occupancy details, i.e. tenure details, hours of operations, usage of space
   - (c) a statement of building(s) and/or other built asset(s) or facilities, in scope
   - (d) location
   - (e) purpose – the main reasons and aims of the maintenance programme (in general terms)

(2) scope of the works, in respect of:
   - (a) Renewal (R) works
   - (b) Maintain (M) works

(3) type of cost estimate or cost plan
(4) precise scope of costs to be included and excluded and how to express them
(5) time period of appraisal (or period of analysis)
(6) method of economic evaluation (NPV/payback period)
(7) discount rate to be applied, including confirmation that costs are to be discounted
(8) level of detail of the life cycle major renewal and maintenance works
(9) extent to which taxes are to be considered
(10) required format of cost reporting, analysis and presentation of the results.

2.7.8 In addition, the cost manager is to ascertain:
(1) if there is a base case, or project benchmark, to be used as a comparator
(2) the specific study inputs and rules of measurement to be applied.

2.7.9 Specific study inputs and rules of measurement comprise:
(1) estimate base date for the order of estimate or cost plan
(2) unit of time and costs
(3) levels of the construction (C), renewal (R) and maintain (M) works (BIM standards)
(4) costing methodology, including location factors and time adjustment indices and other rate and price adjustment factors (e.g. tender price indexation)
(5) the level at which the costs are to be reported and the required format
(6) a list of available information and record data sources and assumptions used for costing
(7) factoring methods used to prioritise/optimise renewal (R) and/or maintain (M) works
(8) degree of risks and uncertainty to be applied
(9) extent of sensitivity analysis to be applied (if required, in scope)
(10) inflation and taxation (see paragraphs 3.15 and 3.16 tax allowances and other incentives)
(11) establish the specific commercial considerations to be taken into account
(12) obtain from the project sponsor their formal sanction of the specific study inputs.

2.7.10 The estimate base date shall be stated (i.e. the point in time from which the maintenance costing period commences). All relevant costs used for the maintenance and life cycle repairs and replacement study shall be adjusted to the base date(s) for comparative prediction purposes, e.g. design date, construction base date, maintenance commencement base date and replacement period.

2.7.11 The unit of time shall be stated. The units of time are the increments to which the calculations refer, e.g. years, six-monthly intervals, months, weeks, days, etc. All factors in the calculations, e.g. interest rates, will relate to the stated unit of time.

2.7.12 The period of analysis for the renewal (R) and maintain (M) works (and wider life cycle costing elements study, if required) shall be stated. The period is the time from the agreed base date year to a given point in time in the future, and over which the calculations pertain.

2.7.13 The methods of economic evaluation (defined in more detail in Appendix G) that are most commonly used in the UK maintenance and construction industry are as follows:
(1) annual equivalent maintenance costs (AEC) – used for annualised maintenance works
(2) discounted cash flow (DCF) – used for calculating the Net Present Value (NPV) to predict life cycle replacement programmes
(3) discounted cash flow (DCF) – used for calculating the NPV for option appraisals, based on multiple scenarios
(4) present day value (PDV) for non-discounted cash flow – used for short-term scenarios
(5) payback period (PBP) – for assessing the period of time to recover the investment monies.

2.7.14 The level of the study may cover a single asset or multiple assets. Possible levels of study are:
(1) multiple assets or portfolio/estate level
(2) single asset or whole building level
(3) cluster level (multiple elements, e.g. all windows and doors)
(4) elemental level (e.g. a roof)
(5) system level (e.g. an air conditioning system)
(6) component or sub-component level (e.g. a boiler: oil fired type).

2.7.15 Costing must state whether the data used has been built up from first principles or whether comparative and benchmark data have been used, stating the source (e.g. client historic data, published data or other specific information sources, such as BCIS, B&ES SFG20, BRE and CIBSE).

2.7.16 Information and data should be recorded in the estimates and cost plans in a structured way, in accordance with the rules of measurement (in NRM 3 parts 3–6) for all the cash flow and option appraisals. This will enable a meaningful comparison and facilitate data sharing and analysis/benchmarking, as well as enabling BIM cost modelling and analysis.

2.7.17 Methods, techniques and the other criteria used for undertaking sensitivity and/or risk and impact-based analysis shall be stated on key cost significant elements, such as, discount rates, factoring component service life, critical maintenance schedules, labour rates and sub-contracted works.

2.7.18 Sources of design and reference service life (RSL) data for component replacement should be stated, together with confirmation of the predicted range of replacement life used and the associated basis for factoring these to relate to the specific project circumstances, e.g. 24/7 use of the facilities. See paragraph 5.3 for guidance on how to determine life expectancy.

2.7.19 Assumptions should be stated for:
(1) obsolescence and the asset residual values
(2) end of interest and/or end of contract obligations
(3) interest rates and discount rates to be applied (if required).
(4) Works in scope and out of scope (e.g. excludes ICT)

2.7.20 Iterations of the process may be required and the level of detail and form of cost estimating, cost planning and reporting will change over the period of construction procurement and during the in use phases.

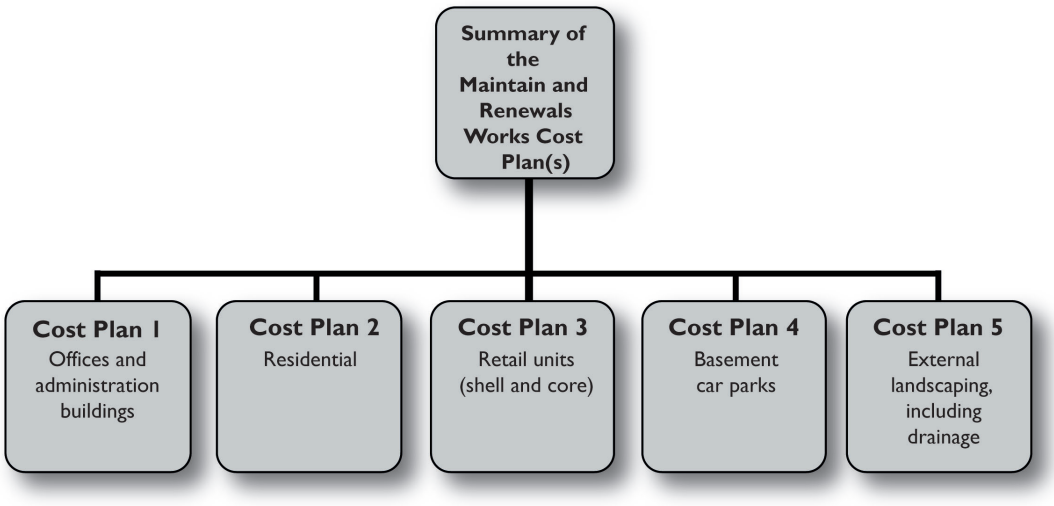
2.7.21 Certain factors may significantly affect the outcomes. It is therefore important to understand the implications of applying certain factors (such as the period of analysis, the discount rate to be used) and to make sure these are properly considered at the outset.

2.7.22 Appendix H provides details of the information required for formal cost plans 1 to 4.

2.8 Projects comprising multiple buildings, facilities and/or functional types

2.8.1 Where a building project or establishment comprises more than one type of building or facility, it is recommended that a separate cost plan is prepared for each building or facility; culminating in a 'summary cost plan' for the entire project (see Figure 2.4 below).

Figure 2.4: Part of a typical cost plan breakdown structure for an establishment comprising multiple components, or buildings and/or functional unit types



2.8.2 Appendix C lists the commonly used functional unit types (e.g. schools, railway stations, offices).

2.8.3 The functional unit method is used to calculate the total estimated cost for the maintenance works (i.e. the renewal (R) and maintain (M) works cost estimates). When used for maintenance cost planning, the functional unit method considers all of maintainable assets 'applicable' to the specific functional unit, or type of function being measured (e.g. office, house, shop, school, train station). It originates from design information, as-built data and/or an asset-specific maintenance register, based on an elemental, sub-element and component breakdown of the applicable maintenance items for each function unit being measured, which is then used to calculate the renewal (R) and maintain (M) work cost estimates.

Note: This method can be used to customise the functional maintenance standards to suit any organisation or end user's functional use of the built environment and specific circumstances.

2.8.4 It is recommended that specialist advice is sought on setting the maintenance strategy to ensure the appropriate service standards are applied to suit the various aspects of building maintenance works. Notwithstanding this, if required by the employer, then you should use industry accepted standards as the basis for cost estimating the maintenance works, such as the B&ES SFG20 maintenance task specification standards for building and engineering services.

Part 3: Measurement rules for order of cost estimating (renewal and maintain)

Part 3: Measurement rules for order of cost estimating (renewal and maintain)

3.1 Introduction

3.1.1 Part 3 describes the purpose and content of order of cost estimates, puts order of cost estimates in context with the RIBA Plan of Work and OGC Gateway Process, and sets out the rules of measurement for the preparation of order of cost estimates for maintenance works, split into renewal (R) and maintain (M) works, using the following methods:

(1) floor area method
(2) functional unit method (e.g. bed space, per house or per m^2 of retail area)
(3) elemental method.

3.1.2 The content and application of unit rates (i.e. cost/m^2 of GIA, functional unit rates and elemental unit rates) to measure quantities to generate the base cost of the building maintenance works is also described. Also covered is the method of dealing with cost allowances for maintenance contractor's management and administration and overheads and profit, project-specific costs, fees and other employer-definable maintenance costs, risk allowances, inflation and discounted values (if required), VAT.

3.1.3 The method of dealing with the time value of money, i.e. the concept of discounting current day values and future benefits to present day values, is broadly explained. **Note** – more detailed guidance on the methods of economic evaluation (e.g. NPV and payback periods), and various forms of discounting methods, is provided in Appendix G.

3.1.4 In addition, the basic information needed (from the employer, other project members and relevant maintenance providers) by the quantity surveyor/cost manager to complete order of cost estimating is outlined. The essential content of the quantity surveyor/cost manager's order of cost estimate report to the employer is also described.

3.1.5 The rules of measurement for elemental unit quantities used for the elemental method of estimating can also be used as a basis for measuring elemental unit quantities for the cost analysis of the building maintenance programmes of works.

3.2 Purpose of an order of cost estimate

3.2.1 Order of cost estimates for capital building works are produced as an intrinsic part of RIBA Work Stages A: Appraisal and B: Design Brief, or OGC Gateways 1 (Business Justification) and 2 (Delivery Strategy). At the same time, order of cost estimates for future building maintenance works (i.e. renewal (R) and maintain (M) works), should be prepared to predict the likely cost of such works over the life of the building or other constructed asset/facility. This permits life cycle costing of different development and/or design options to be compared at an early stage in the design development process.

3.2.2 **For new buildings or other built assets/function or facility:**

(1) Order of cost estimates are prepared to inform decision making at an early stage of design development, e.g. to review the cost-effectiveness of different buildings or other built assets, or to review design options over a defined period. Consequently, order of cost estimates are used to inform employer's initial developments or investment appraisals.
(2) In the context of new buildings or other built assets to be constructed, the requirements of RIBA Work Stages and OGC Gateways correspond equally to both capital building projects and building maintenance works. The requirements of RIBA Work Stages A and B described in the RIBA Plan of Work, are as follows:

(a) **RIBA Work Stage A: Appraisal**

'Identification of [employer's] needs and objectives, business case and possible constraints on development. Preparation of feasibility studies and assessment of options to enable the [employer] to decide whether to proceed.'

OGC Gateway 1 (Business Justification) can be compared with RIBA Work Stage A.

(b) **RIBA Work Stage B: Design Brief**

'Development of initial statement of requirements into the Design Brief by or on behalf of the [employer] confirming key requirements and constraints. Identification of procurement method, procedures, organisational structure and range of consultants and others to be engaged for the project.'

OGC Gateway 2 (Delivery Strategy) can be compared with RIBA Work Stage B.

Project stages from the RIBA Outline Plan of Work 2007, copyright Royal Institute of British Architects, are reproduced here with the permission of the RIBA.

(3) As part of RIBA Work Stages A and B or OGC Gateways 1 and 2, it may be necessary to estimate the cost of a number of alternative building types or development scenarios. Such alternative scenarios are known as option costs or option costings.

Note: orders of cost estimate for renewal (R) and maintain (M) work can also be carried out at other stages of the procurement process of a constructed building or post construction.

3.2.3 **For existing buildings, or other built assets:** Order of estimates are prepared to establish high-level budgets to inform the employer's Forward Maintenance Plan, or to aid the employer's building maintenance team to formulate a business case to obtain funding for the life cycle renewal and annualised maintenance programmes of works.

3.2.4 Although order of cost estimates for building maintenance costs are normally considered over a period of time (i.e. the defined life cycle of the building, or other built asset, or over an agreed timescale defined in the employer's brief) they can be prepared to inform a single annual maintenance programme.

3.2.5 Order of cost estimates are commonly presented in the form of an initial life cycle cost plan (LCCP). The LCCPs for capital building works may be used by the employer to inform a wider investment appraisal (or whole life cost plan). This may consider other costs (e.g. O – Operations and occupancy costs and E – Environmental and/or end of life costs, plus any other relevant non-construction costs and/or incomes and externalities, as agreed in scope).

3.2.6 For developing order of cost estimates, the costs in connection with building maintenance works the renewal (R) and maintain (M) works, are to be defined under two separate cost categories for renewal works and maintain works, as defined in paragraph 2.5.2.

3.2.7 A more detailed breakdown of the estimated costs will evolve through cost planning as the design of the building is developed. The rules for the cost planning of renewal (R) and maintain (M) works are in Part 4 (Measurement rules for cost planning of renewal (R) and maintain (M) works) of these rules.

3.2.8 For construction projects, order of cost estimates will be based on unit rates for renewal (R) and maintain (M) works (refer to 3.8) applicable to the method of measurement adopted (elemental functional unit method). Unit rates are essential to enable cost managers/estimators to do the life cycle costs during the appraisal and design briefing stages of a project.

3.3 Information requirements for order of cost estimates

3.3.1 To enable the preparation of an order of cost estimate, information will be required as follows (which is not exhaustive and is intended to provide guidance only):

For a new building, and/or refurbishments, or a constructed facility and/or function type:

(1) the building(s) description and the site location(s)
(2) a statement of building use and occupancy details (e.g. in use/sublet/vacate)
(3) a statement of floor area (GIA) of each building(s) or functional type(s)
(4) functional unit (e.g. bed spaces, office, etc) and schedule of accommodation
(5) net internal area (NIA) – if functional unit is to be expressed by NIA
(6) external site area (SA) – if grounds maintenance and external works are required
(7) access considerations and hours of operation, e.g. security available 24/7 for 365 days a year use (366 days in a leap year)
(8) building life (see appendix G) and/or period of interest in the facility or built asset
(9) period of analysis for the cost (i.e. 5 years, 10 years, 30 years or more)
(10) views of maintenance procurement strategies (in house and/or outsourced)
(11) discount rate – the annual percentage rate at which the present value of cost is assumed to fall away through time (see appendix G)
(12) budget/cash flow constraints – short-term and from a longer-term perspective
(13) requirements for refurbishments (i.e. known details of all outstanding maintenance necessary so the facility meets the defined asset performance/condition standard)
(14) particular requirements in respect of building services installations (e.g. carbon reduction commitments; availability and critical system specific requirements)
(15) salient project/design brief information (e.g. statement of quality, sustainability requirements and any specific 'fit-out' plans and responsibilities for reinstatement)
(16) requirements in respect of:
    (a) treatment of consultants' and specialists' fees
    (b) other employer-definable maintenance-related costs (e.g. IT systems)
    (c) risk allowances
    (d) treatment of VAT and other taxation/incentives
(17) other considerations (e.g. approach to deal with capital allowances and grants)

For existing buildings, or a constructed facility and/or functional type:

(1) all as for new buildings or refurbishments items 1 to 17 above, plus:
(2) age of the building (i.e. measured from the practical completion date of the building)
(3) last major refurbishment – and salient details to inform service life planning
(4) details of renewal works (actions arising from condition surveys and remaining-life assessments)
(5) period of analysis or facility life (or interest, defined in the brief).

3.3.2 For the purposes of an order of cost estimate, the costs of renewal (R) and maintain (M) works must be considered over a period of time (i.e. the life cycle of the building or facility, or agreed period of analysis defined in the brief). Therefore, an essential element of an order of cost estimate is defining the life cycle period to be adopted. An assessment must therefore be made of the life of the investment, i.e. 'the building life' as defined in Appendix G.

3.4 Constituents of an order of cost estimate

3.4.1 The key constituents of an order of estimate for building maintenance works are as follows:

Table 3.1: Constituents of an order of cost estimate

Constituent (Cost Centre)	£Y_1	£Y_2	£Y_3	…	£Y_n	Reference/Notes
	£k	£k	£k	£k	£k	
Renewal costs estimate (1)	£Y_1	£Y_2	£Y_3	…	£Y_n	See paragraphs 3.5 to 3.9
Maintain costs estimate (2)	£Y_1	£Y_2	£Y_3	…	£Y_n	See paragraphs 3.5 to 3.9
Sub-total (3) [(3) = (1) + (2)]	£Y_1	£Y_2	£Y_3	…	£Y_n	
Maintenance contractor's management and administration costs estimate (4)	£Y_1	£Y_2	£Y_3	…	£Y_n	See paragraph 3.10
Sub-total (5) [(5) = (3) + (4)]	£Y_1	£Y_2	£Y_3	…	£Y_n	
Maintenance contractor's overheads and profit estimate (6)	£Y_1	£Y_2	£Y_3	…	£Y_n	See paragraph 3.11
Maintenance cost estimate (7) [(7) = (5) + (6)]	£Y_1	£Y_2	£Y_3	…	£Y_n	
Consultants'/specialists' fees estimate (8)	£Y_1	£Y_2	£Y_3	…	£Y_n	See paragraph 3.12
Other employer-definable maintenance-related costs estimate (9)	£Y_1	£Y_2	£Y_3	…	£Y_n	See paragraph 3.13
Base cost estimate (10) [(10) = (7 + (8) + (9)]	£Y_1	£Y_2	£Y_3	…	£Y_n	
Risk allowances estimate (11)						
(a) Design installation risks (11a)	£Y_1	£Y_2	£Y_3	…	£Y_n	
(b) Maintenance risks (11b)	£Y_1	£Y_2	£Y_3	…	£Y_n	
(c) Employer change risks (11c)	£Y_1	£Y_2	£Y_3	…	£Y_n	
(d) Employer other risks (11d)	£Y_1	£Y_2	£Y_3	…	£Y_n	See paragraph 3.14
Risk allowance estimate (11) [(11) = (11a) + (11b) + (11c) + (11d) + (…)]	£Y_1	£Y_2	£Y_3	…	£Y_n	
Cost limit *(at current price levels)* (12) [(12) = (10) + (11)]	£Y_1	£Y_2	£Y_3	…	£Y_n	
Discount Factor (DF) (13)	DF^1	DF^2	DF^3	…	DF^n	See paragraph 3.19
Present Value (PV) (14) [(14) = (12) × (13)]	£Y_1	£Y_2	£Y_3	…	£Y_n	See paragraph 3.19

Constituent (Cost Centre)	£Y_1	£Y_2	£Y_3	…	£Y_n	Reference/Notes
	£k	£k	£k	£k	£k	
Net Present Value (NPV) ((Total) Cost limit) (15) [(15) = ∑(PV) (14)]	£Y_1	£Y_2	£Y_3	…	£Y_n	See paragraph 3.19

Notes:
VAT and other taxation incentives are excluded – see paragraph 3.16 to 3.17.
Other considerations (as defined in paragraph 3.18) are to be taken into account, if required.
£Y_1 = Year 1 costs
£Y_2 = Year 2 costs
£Y_3 = Year 3 costs
£Y_n = Final year costs in which either maintenance or renewal works are to be undertaken
DF^1 = Year 1 discount factor
DF^2 = Year 2 discount factor
DF^3 = Year 3 discount factor
DF^n = Discount factor for final year in which either maintenance or renewal works are to be undertaken

3.4.2 The base cost estimate is the total of the renewal costs estimate, the maintain cost estimate, maintenance contractor's management and administration costs estimate, maintenance contractor's and overheads and profit estimate, consultants' fees and the other employer-definable maintenance costs estimate. The base cost estimate is to contain no allowances for risk, inflation or VAT.

3.4.3 Allowances for risk and inflation (where applicable) are to be calculated separately and added to the base cost estimate to determine the cost limit for the maintenance works.

3.4.4 When required by the employer, the present value (PV) is calculated and the net present value (NPV) of maintenance works and the equivalent annual value are ascertained. This allows different development and maintenance scenarios to be compared on the same basis. The method of dealing with the time value of money is dealt with in paragraph 3.19.

3.5 Measurement rules for order of cost estimates, using floor area and functional unit methods

3.5.1 Quantities for the building maintenance work, for both renewal (R) and maintain (M) works, shall be determined by measuring the total GIFA of the building or built assets (using the floor area method) or by projecting the number of functional units (using the functional unit method). In certain circumstances, a combination of both the floor area method and functional unit method may need to be employed.

(1) **Floor area method:**

(a) For renewal (R) works:

The total GIFA of the building, or build assets is measured and multiplied by an appropriate cost/m^2 of GIFA. The equation for calculating the total estimated cost of future renewal (R) works is therefore:

$$R = a \times b$$

where:

a = GIFA

b = cost/m^2 of GIFA for renewal works

R = renewal cost estimate (i.e. total renewal cost estimate, annualised over the analysis period, in scope)

(b) For maintain (M) works:

The total gross internal floor area (GIFA) of the building or built assets is measured and multiplied by an appropriate cost/m^2 of GIFA. The equation for calculating the total estimated cost of maintain (M) works is therefore:

$$M = a \times b$$

where:

a = GIFA

b = cost/m^2 of GIFA for maintain (M) works

M = maintain cost estimate (i.e. total maintenance works costs, annualised over the analysis period, in scope)

(c) The GIFA is to be measured in accordance with the 'Core definition: gross internal area (GIA)' of the RICS *Code of Measuring Practice*, which is reproduced in Appendix A of these rules.

(d) Where measurement is for more than one building, the measurement for each building is to be shown separately.

(e) Where a single building comprises more than one user function (e.g. residential, retail and offices) then the GIFA of each function is to be calculated and quantified separately. The sum total of the GIFA for each separate function is to be equal to the GIFA for the whole building. To establish the GIFA of each separate building function, the centre line of the party wall shall be used to delineate the functions.

(f) Where the external works are to be measured separately (e.g. to capture the estimated costs of grounds maintenance works), the external site area (SA) is to be measured. The SA is the total area of the site within the site title boundaries (or the total area within the title boundaries defined by the employer as the site for the building), excluding the footprint of the building(s), measured on a horizontal plane.

(g) The estimated cost of annualised renewal (R) and maintain (M) works are to be calculated for each year of the building or asset life cycle, e.g. Year 0 (current year), Year 1, Year 2, Year 3… Year 25+.

(h) Unit rates (i.e. cost/m^2 of GIFA) used are to be current at the time the order of cost estimate prepared, irrespective of the year that the renewal (R) or maintain (M) works are to be undertaken.

(i) Given that costs in connection with renewal (R) and maintain (M) works will be expended in the future, the present value (PV) of the future cash flow, both the total (i.e. the net present value (NPV)) and the yearly present values (PVs) are to be calculated. The rules for ascertaining the annual PV and the NPV of a future cash flow are discussed in paragraph 3.19 of these rules.

(2) **Functional unit method:**

(a) Functional units are a unit of measurement used to represent the prime use of a building or part of a building. It is essential that the functional unit is clearly identified when measurements are expressed in this way. A list of commonly used functional units and functional units of measurement for buildings, or constructed facilities, is provided in Appendix C of these rules.

(b) A suitable functional unit of use for the building is to be selected (e.g. office, air-conditioned). The total number of functional units is determined and multiplied by an appropriate functional unit (or cost per functional unit).

(c) For renewal (R) works:

The equation for calculating the total estimated cost of renewal works is therefore:

$$R = a \times b$$

where:

a = number of functional units

b = cost per functional unit (or functional unit cost)

R = renewals cost estimate (i.e. total estimated cost of renewal works, annualised over the analysis period, in scope)

(d) For maintain (M) works:

The equation for calculating the total estimated cost of maintain (M) works is therefore:

$M = a \times b$

where:

a = number of functional units

b = cost per functional unit (or functional unit cost)

M = maintain cost estimate (i.e. total estimated cost of maintain works, annualised over the analysis period, in scope).

(e) Where measurement for the functional unit is to be 'net internal area' (NIA) it is to be measured in accordance with the 'Core definition: net internal area (NIA)' of the RICS *Code of Measuring Practice*, which is reproduced in Appendix B of these rules.

(f) Where measurement for the functional unit is to be expressed as 'retail area', the retail area of the shop is to be measured in accordance with the 'Special Use Definition: Shops' of the RICS *Code of Measuring Practice*, which is reproduced in Appendix D of these rules.

(g) A functional unit includes all circulation space.

(h) Where the external works are to be measured separately (e.g. to capture the estimated cost of ground maintenance works), the external site area (SA) is to be measured. The SA is the total area of the site within the title boundaries (or the total area within the site title boundaries defined by the employer as the site for the building), excluding the footprint of the building(s), measured on a horizontal plane.

(i) The estimated cost of renewal (R) and maintain (M) works are to be ascertained for each year of the building or built asset's life cycle, e.g. Year 0 (current year), Year 1, Year 2, Year 3… Year 25+.

(j) Unit rates (i.e. cost/m^2 of GIFA) used are to be current at the time the order of cost estimate prepared, irrespective of the year that the renewal and maintain works are to be undertaken.

(k) Given that costs in connection with renewal (R) and maintain (M) works will be expended in the future, the present value (PV) of the future cash flow, both the total (i.e. the net present value (NPV)) and the yearly present values (PVs) are to be calculated. For the rules for ascertaining the annual PV and the NPV of a future cash flow are discussed in paragraph 3.19 of these rules.

3.6 Elemental method

3.6.1 For new buildings and existing built assets, the elemental method is an alternative approach for calculating the total estimated cost of both capital building and maintenance works (i.e. the building and maintenance works estimate). The elemental method considers the major elements of the building maintenance works (in scope) and provides an order of estimate based on an elemental breakdown applicable to the building project and maintenance-related works agreed (in scope).

3.6.2 Typically, the group elements and elements used in the elemental method are the same as those used in the elemental cost planning process for capital building works. However, the choice and number of elements used to breakdown the maintenance cost estimate will be dependent on the 'applicable maintainable assets' in scope and also the information available.

3.6.3 The major elements commonly used when preparing order of estimates using the elemental method are listed in Table 3.2 below:

Table 3.2: Elemental structure for elemental method of cost estimating

Group element	Element
0 Facilitating works	0.0 Facilitating works
1 Structures	1.0 Substructures
2 Superstructures	2.1 Frame
	2.2 Upper floors
	2.3 Roof
	2.4 Stairs and ramps
	2.5 External walls
	2.6 Windows and external doors
	2.7 Internal walls and partitions
	2.8 Internal doors
3 Internal finishes	3.1 Wall finishes
	3.2 Floor finishes
	3.3 Ceiling finishes
4 Fittings, furnishings and equipment	4.1 Fittings, furnishings and equipment
5 Services	5.1 Sanitary installations
	5.2 Services equipment
	5.3 Disposal installations
	5.4 Water installations
	5.5 Heat source
	5.6 Space heating and air conditioning
	5.7 Ventilation
	5.8 Electrical installations
	5.9 Fuel installations
	5.10 Lift and conveyor installations/systems
	5.11 Fire and lightning protection
	5.12 Communication, security and control systems
	5.13 Special installations/systems
	5.14 Builder's work in connection with services
6 Prefabricated buildings and building units	*Not covered by NRM 3 rules*
7 Works to existing buildings	
8 External works	8.1 Site preparation works (N/A to NRM 3)
	8.2 Roads, paths and pavings
	8.3 Planting (i.e. grounds maintenance)
	8.4 Fencing, railings and walls
	8.5 External fittings
	8.6 External drainage
	8.7 External services

Note: See Appendix E, Logic and levels for elemental cost planning, which provides a detailed list of all group elements or systems, sub-elements and components used for elemental cost planning.

3.6.4 The method of measuring and unit of measurement for each of the elements are set out in paragraph 3.7 Table 3.3: Rules of measurement for elemental method of cost estimating of maintenance works (which is aligned with the NRM 1 elemental method of cost estimating).

3.6.5 If suitable information is available, then elemental unit quantities (EUQ) are measured for an element in accordance with the rules and priced with suitable elemental unit rates (EUR) to ascertain the cost target for an element. Where insufficient information is available for a particular element, the EUQ for the element is based on the GIFA. The equation for calculating the cost target for an element is therefore:

$$c = a \times b$$

where:

a = EUQ

b = EUR

c = cost target (for element)

3.6.6 For renewal (R) works:

The total estimated cost of renewal (R) works (i.e. the renewal cost estimate) is ascertained by adding together the cost target for each element. The equation for calculating the renewal (R) works estimate using the elemental method is therefore:

$$b = \sum (a0 + a1 + a2 + a3 + a4 + a5 + a6 + a7 + a8 + aX \text{ etc})$$

where:

a0, a1, a2, a3, etc = cost target for element

b = renewal cost estimate

3.6.7 For maintain (M) works:

The total estimated cost of maintain (M) works (i.e. the maintain cost estimate) is ascertained by adding together the cost target for each element. The equation for calculating the maintain (M) works estimate using the elemental method is therefore:

$$b = \sum (a0 + a1 + a2 + a3 + a4 + a5 + a6 + a7 + a8 + aX \text{ etc})$$

where:

a0, a1, a2, a3, etc = cost target for element

b = maintain cost estimate

3.6.8 Where measurement is to be based on the GIFA, the area is to be measured in accordance with the 'Core definition: gross internal floor area (GIFA)' of the RICS *Code of Measuring Practice*, which is reproduced in Appendix A of these rules.

3.6.9 Where a building and maintenance project comprises more than one building, the order of estimate for each building is to be shown separately. See paragraph 2.8.1: Projects comprising multiple building or facilities.

3.6.10 The elemental method can also be used to generate an initial cost model (or an outline elemental cost plan) at the commencement of RIBA Work Stage C: Concept, and/or OGC Gateway 3A: Design Brief and Concept Approval, whichever is applicable. This elemental breakdown provides a frame of reference from which formal cost plan can be developed – see Part 4 (Measurement rules of cost planning of renewal (R) and maintain (M) works) of these rules. The initial EUQs and EURs will eventually be superseded by more detailed measurement of elements, sub-elements, components and unit rates, once suitable design- and maintenance-related information has been prepared and the elemental cost plan evolves.

3.6.11 The measurement rules for the elemental method of estimating in Table 3.3 can also be used as a basis for measuring EUQs for the cost analysis and benchmark analysis of maintenance works. The content of each group element is defined in Part 6 (Tabulated rules of measurement for elemental cost planning) of these rules.

3.7 Measurement rules for the elemental method of cost estimating building maintenance works

3.7.1 Table 3.3 comprises the rules of measurement for EUQs that can be used to develop an order of cost estimating using the elemental method of estimating. The rules are tabulated.

3.7.2 The table comprises the rules of measurement for building maintenance works and renewal works cost estimating (i.e. for group elements 0 to 10). The table is structured as follows:

(1) the first column lists the group element
(2) the second column lists the element
(3) the third column lists the unit of measurement for group elements and elements, as appropriate
(4) the fourth column lists the rules of measuring elemental unit quantities (EUQs) for group elements and elements/sub-elements, as appropriate
(5) the last column contains further advice on measuring EUQs
(6) horizontal lines divide the tables to denote the end of group element or element
(7) the rules are written in the present tense.

3.7.3 The definitions of each group element and element used in the elemental method of cost estimating are the same as those defined for elemental cost plans in Part 6 (Tabulated rules of measurement for elemental cost planning) of these rules.

3.7.4 If suitable information is available, then EUQs are measured for a group element, element or sub-element, in accordance with the rules and priced with suitable EURs to ascertain the cost target for an element.

3.7.5 Where insufficient information is available for a particular element, the EUQ for that element is to be the GIFA.

3.7.6 The measurement rules for the elemental method of cost estimating in Table 3.3 can also be used as a basis for measuring EUQs for the purposes of preparing cost analysis and benchmark analysis of maintenance works and life cycle renewal works – associated directly with building construction projects. See paragraph 5.7.

3.7.7 Elemental unit rates or renewal (R) and maintain (M) works are an essential method of cost estimating and life cycle costing of construction projects. Unit cost information should be derived from detailed elemental cost analysis and benchmarking based on outturn unit costs (i.e. from building renewal (R) and maintain (M) costs during the in use phases (benchmark costs in use unit rates)).

Table 3.3: Rules of measurement for elemental method of cost estimating

Group element	Element	Unit	Measurement rules	Notes
0 Facilitating works[1]	1 Toxic/hazardous/ contaminated material treatment	m^2	The area measured is the site area (i.e. the total area of the site).	Costs to be separately shown for each type of toxic/hazardous/ contaminated material to be removed.
	2 Major demolition works		1 The area measured is the gross internal floor area (GIFA) of the building(s) demolished. 2 The area is measured in accordance with the rules of measurement for ascertaining GIFA.	Costs to be separately shown for each building demolished.
	3 Temporary support to adjacent structures		The area measured is the area of wall to be supported.	Costs to be separately shown for each structure to be supported.
	4 Specialist groundworks		The area measured is the site area (i.e. the total area of the site).	Costs to be separately shown for each element.
	5 Temporary diversion works			
	6 Extraordinary site investigation works			
1 Substructure[2]	1 Substructure	m^2	1 The area measured is the area of the lowest floor measured to the internal face of the external perimeter walls. 2 The area of the lowest floor shall be measured in accordance with the rules of measurement for ascertaining the gross internal floor area 3 Areas of basements to be shown separately. 4 The area of basements shall be measured in accordance with the rules of measurement for ascertaining GIFA.	

Group element	Element	Unit	Measurement rules	Notes
2 Superstructure	1 Frame[3]	m^2	1 The area measured is the area of the floors related to the frame. 2 The area of the frame shall be measured in accordance with the rules of measurement for ascertaining the gross internal floor area (GIFA).	For buildings with open ground floors and the like, exclude the area of the open ground floor (i.e. for a completely framed building this would equate to the GIFA).
	2 Upper floors[4]	m^2	1 The area measured is the total area of the upper floor(s). 2 The area of the upper floor(s) shall be measured in accordance with the rules of measurement for ascertaining the gross internal floor area (GIFA). 3 Sloping surfaces (such as galleries, tiered terraces and the like) are to be measured flat on plan. 4 Areas for balconies, galleries, tiered terraces, service floors, walkways, internal bridges, external links and roofs to internal buildings shall be shown separately.	Where balconies are included, the sum of the upper floors and lowest floor will exceed the GIFA.
	3 Roof[5]	m^2	1 The area measured is the area of the roof on plan. 2 The area measured is the area of the roof on plan measured to the inside face of the external walls.	
	4 Stairs and ramps[6]	nr	1 Enumerate, giving the total number of storey flights, i.e. the number of staircases or ramps multiplied by the number of floors served (excluding the lowest floor served in each case). 2 The total vertical rise of each staircase or ramp is to be stated, measured from the top of structural floor level	

Group element	Element	Unit	Measurement rules	Notes
	5 External walls[7]	m^2	The area measured is the area of the external wall, measured on the internal perimeter (i.e. the internal face) of the external wall, less the area of windows.	1 It is unlikely that the thickness of external wall construction will be known at the point of the RIBA Work Stages A (Appraisal) and B (Design Brief) or OGC Gateways 1 (Business Justification) and 2 (Delivery Strategy). 2 Costs to be separately shown for each type of external wall system.
	6 Windows and external doors	m^2	The area measured is the area of windows and external doors measured over frames.	Costs in connection with forming openings for windows and external doors to be included.
	7 Internal walls and partitions[8]	m^2	The area measured is the area of internal walls and partitions, measured on the centre line of the internal wall or partition. No deduction is made for door openings, screens and the like.	Costs to be separately shown for each type of internal wall or partition.
	8 Internal doors	nr	Enumerate, giving the total number of internal doors.	Irrespective of door type.
3 Internal finishes	1 Wall finishes	m^2	The area measured is the total area of wall finishes (i.e. the area of wall to which finishes are applied).	
	2 Floor finishes		The area measured is the total area of floor finishes (i.e. the area of floor to which finishes are applied).	
	3 Ceiling finishes		The area measured is the total area of ceiling finishes (i.e. the area of ceiling to which finishes are applied).	
4 Fittings, furnishings and equipment		m^2	1 The area measured is the gross internal floor area (GIFA). 2 The area is measured in accordance with the rules of measurement for ascertaining GIFA.	

Group element	Element	Unit	Measurement rules	Notes
5 Services	1 Sanitary installations	nr	1 Enumerate, giving the total number of appliances. 2 The total number of appliances enumerated is the total number of items listed below: (a) domestic sanitary appliances (b) specialist sanitary appliances (c) bathroom pods (d) toilet pods (e) shower room pods	
	2 Services equipment		1 Enumerate, giving the total number of items. 2 The total number of items enumerated is the total number of items listed below: (a) commercial catering equipment (b) sinks supplied as an integral part of catering equipment (c) food storage equipment (d) specialist equipment	
	3 Disposal installations		1 Enumerate, giving the total number of above-ground waste installations to sanitary appliances and services equipment, and entry chutes to refuse disposal installation. 2 The total number of items enumerated is the total number of items listed below (nr): (a) waste points to sanitary appliances (b) waste points to services equipment (c) waste points for laboratory and industrial liquid waste (d) entry points to rubbish chutes (e) entry points to chemical and industrial waste appliances	1 Do not separately enumerate ancillary fittings/items. Costs of ancillary fittings/items are to be included in the unit cost for the item. 2 Costs and measurements are to be separately shown for : (a) drainage to sanitary appliances (b) drainage to services equipment (e.g. sinks) (c) drainage for laboratory and industrial liquid waste (d) refuse disposal installations (e) chemical and industrial refuse disposal installations.

Group element	Element	Unit	Measurement rules	Notes
	4 Water installations	nr	1 Enumerate, giving the total number of draw-off points. 2 The total number of draw-off points enumerated is the total number of items listed below: (a) mains supply draw-off points (b) cold water draw-off points (c) hot water draw-off points (d) steam and condensate draw-off points	Costs to be separately shown for each: (a) mains supply draw-off point (b) cold water draw-off point (c) hot water draw-off point (d) steam and condensate draw-off point.
	5 Heat source	kW	State the total number of kilowatts (kW).	1 Costs to be separately shown for each heat source. 2 State the number and type of each heat source. 3 The rating in kilowatts (kW) are to be stated for each heat source.
	6 Space heating and air conditioning	m^2	1 The area measured is the area serviced by the system. 2 The area serviced is measured in accordance with the rules of measurement for ascertaining the gross internal floor area (GIFA). 3 Where more than one system is employed, the area measured for each system is the area serviced by the system. The area is measured in accordance with the rules of measurement for ascertaining GIFA.	Costs to be separately shown for each type of system.
	7 Ventilation			
	8 Electrical installations			
	9 Fuel installations			
	10 Lift and conveyor installations	nr	Enumerate, giving the total number of lift and conveyor installations.	Costs are to be separately shown for each type of lift and/or conveyor installation: (a) lifts (e.g. passenger, goods, fire fighting, etc); also state the number of levels served

Group element	Element	Unit	Measurement rules	Notes
				(b) enclosed hoists; also state the number of levels served (c) escalators; also state the number of levels served (nr), rise (m) and length of travel (m) (d) moving pavements; also state the length of travel (m) (e) powered stairlifts (f) conveyors (passenger or goods); also state the length of travel (m) (g) dock levellers and scissor lifts; also state the total rise (m) and designed load (kN) (h) cranes and unenclosed hoists; also state the total rise (m) and designed load (kN) (i) car lifts; also state the number of levels served (j) car stacking systems; also state the capacity (k) car/lorry turntables and the like (l) document handling systems (m) other lift and conveyor installations.

Group element	Element	Unit	Measurement rules	Notes
	11 Fire and lightning protection	m^2	1 The area measured is the area serviced by the system. 2 The area serviced is measured in accordance with the rules of measurement for ascertaining the gross internal floor area (GIFA). 3 Where more than one system is employed, the area measured for each system is the area serviced by the system. The area is measured in accordance with the rules of measurement for ascertaining GIFA.	Costs to be separately shown for each type of system.
	12 Communication, security and control systems			
	13 Specialist installations			
	14 Builder's work in connection with services		1 The area measured is the gross internal floor area (GIFA). 2 The area is measured in accordance with the rules of measurement for ascertaining GIFA.	
7 Work to existing buildings[10]	1 Minor demolition and alteration works	m^2	1 The area measured is the gross internal floor area (GIFA) of the building(s) demolished or altered. 2 The area is measured in accordance with the rules of measurement for ascertaining GIFA.	Costs to be separately shown for each building demolished or altered.
	2 Repairs to existing services			
	3 Damp-proof courses/fungus and beetle eradication	m^2	1 The area measured is the gross internal floor area (GIFA) of the room(s) treated. 2 The area of the rooms treated is measured in accordance with the rules of measurement for ascertaining GIFA.	
	4 Facade retention		The area measured is the area of facade to be retained.	
	5 Cleaning existing surfaces		The area measured is the surface area of the surface to be cleaned. No deduction for voids.	Costs to be separately shown for each type of surface.
	6 Renovation works		The area measured is the area to be renovated.	Costs to be separately shown for each type of surface to be renovated.

Group element	Element	Unit	Measurement rules	Notes
8 External works	1 Site preparation works[11]	m^2	The area measured is the site area (SA), less the footprint of the building (or buildings) measured on the horizontal plane.	Costs to be separately shown for each element.
	2 Roads, paths, pavings and surfacings			
	3 Soft landscapes, planting and irrigation systems			
	4 Fencing, railings and walls			
	5 External fixtures			
	6 External drainage			
	7 External services			
	8 Minor building works and ancillary buildings		1 The area measured is the gross internal floor area (GIFA) of the building(s). 2 The area is measured in accordance with the rules of measurement for ascertaining GIFA.	
9 Maintenance contractor's management and administration		%	The cost of the maintenance contractor's management and administration as a percentage of the total cost of facilitating works and building maintenance works.	
10 Maintenance contractor's overheads and profit			The cost of the maintenance contractor's overheads and profit as a percentage of the total cost of facilitating works, building maintenance works and costs of maintenance contractor's management and administration costs.	

Note: Group element 6: Prefabricated buildings and building units is excluded and not covered by NRM 3.

Notes:

(1) Facilitating works do not apply to maintenance works for permanent structures (e.g. major demolitions covered in NRM1).

(2) Substructure (foundations, basement walls and lowest floor slab) are not maintainable works. They will however require periodic inspection. Inspections are generally carried out for the building as a whole and an allowance should be made for proactive maintenance. For drainage under the building, and within the building footprint (e.g. gullies, ducts and manholes), maintenance work is measured in accordance with the tables in Part 6 of these rules. Where an estimate is for and existing building, remedial work resulting from a structural survey should be included under this element; where no structural survey data exists, an allowance may be made in group element 13: Risks.

(3) Frame structures are not maintainable works. Where an estimate is for an existing building, remedial work resulting from an inspection (i.e. a structural survey) is to be included under this element. Where no inspection data exists, it is recommended that a suitable allowance is made under group element 13: Risks.

(4) Upper floor structures – with the exception of drainage to balconies (outlets, gutters, downpipes, etc.), these are not included in maintenance works. Integral maintenance work to balcony drainage is measured in accordance with the tabulated rules of measurement in Part 6 of these rules. Where the estimate is for an existing building, remedial work resulting from an inspection is to be included under this element. Where no inspection data is available, it is recommended that a suitable allowance may be made in group element 13: Risks.

(5) Roof structures – Where the estimate is for an existing building, remedial work resulting from a structural survey should be included under this element. Where no inspection data is available, it is recommended that a suitable allowance may be made in group element 13: Risks. These rules apply to the maintenance of roof coverings, specialist roof systems, roof drainage, rooflights and roof features.

(6) Stair and ramp structures are not maintainable works. Where the estimate is for an existing building, remedial work resulting from an inspection should be included under this element. Where no inspection data is available, it is recommended that a suitable allowance may be made in group element 13: Risks. These rules apply to the maintenance of stair/ramp finishes and balustrades.

(7) External wall structures are not included in maintainable works, except where re-pointing, re-sealing, etc occurs within the study period. Where the estimate is for an existing building, remedial work resulting from a structural survey/inspection should be included under this element; Where no inspection data exists, it is recommended that a suitable allowance is made under group element 13: Risks. These rules apply to the maintenance of solar/rain screening and facade access cleaning systems.

(8) Internal walls and partition structure replacements are not maintainable work. Where an estimate is for an existing building, remedial work resulting from an inspection should be included under this element. Where no inspection data exists, it is recommended that a suitable allowance is made under group element 13: Risks. These rules apply to the maintenance of demountable partitions, moveable room dividers and cubicles.

(9) Where prefabricated units are incorporated into a building, the maintenance should be measured and priced in the appropriate element, e.g. sanitary fittings supplied in bathroom pods should be included in element 5.1 Sanitary installations.

(10) On refurbishment schemes or where parts of an existing building are incorporated into a new building, the maintenance should be measured and priced in the appropriate element.

(11) Site preparation works are a construction item and are excluded from maintenance works.

3.8 Unit rates and elemental unit rates (EURs) used to estimate the cost of renewal (R) and maintain (M) works

3.8.1 The unit rates used are to be current at the time the order of cost estimate is produced. That is, they must exclude any allowances for future inflation or deflation.

3.8.2 The unit rates applied to measured quantities are to be applicable to the method of measurement used, are as follows:

(1) rates based on cost/m^2 of GIFA are to be used for measured quantities determined using the floor area method

(2) a cost per functional unit is to be used for measured quantities calculated using the functional unit method

(3) appropriate elemental unit rates (EURs) are to be used where measured quantities are derived using the elemental method.

3.8.3 Both unit rates (i.e. cost/m^2 of GIFA or cost per functional unit (or functional unit cost)) and elemental unit rates (EURs) used to estimate the total cost renewal (R) and maintain (M) works are to include the cost of all materials (including consumables), labour and plant that are specifically required to renew and maintain the building component or element.

3.8.4 Unit rates and EURs are also to include allowances for any subcontractors' or suppliers' design fees, preliminaries and overheads and profit.

3.8.5 Unit rates and EURs are to exclude allowances for maintenance contractor's operating costs, maintenance contractor's overheads and profit and other allowances (such as consultants' fees, other related costs, risk allowances and inflation). These items are to be assessed separately and added to the estimated cost of renewal works and maintain works to give the maintenance cost estimate.

3.8.6 Costs per functional unit (or functional unit costs) include costs associated with all circulation space associated with the functional unit.

3.8.7 The cost/m^2 of GIFA, the cost per functional unit (or functional unit cost) and EURs can be derived from cost analyses or from benchmark analyses of previous maintenance programmes of a similar type. Where this is done, the unit rates should, if necessary, be adjusted to reflect changes in maintenance levels between the previous maintenance programmes and the proposed maintenance programmes. Time and regional variation of costs should also be considered.

3.8.8 When using unit rates from life cycle cost analyses and benchmark analyses, it is recommended that such rates are adjusted to reflect prices current at the time the order of cost estimate is prepared (i.e. adjusted to remove allowances included for inflation).

3.8.9 It is further recommended that cost analyses (and benchmark analyses) are based on the agreed contract sum (i.e. the original contract sum) not in the final contract sum (i.e. the agreed final account sum). The two main reasons for this are:

(1) the life cycle cost analyses (or benchmark analyses) would not be available until after the final account sum had been agreed, which could be three or four years after an analysis is undertaken at tender stage

(2) it is much more difficult to analyse both the original contract sum and variation account than to analyse the original contract sum alone.

3.9 Updating unit rates and other costs to current estimate base date

3.9.1 The estimate base date is to be established for an order of cost estimate. It is essential, therefore, that the unit rates used from cost analyses and benchmark analyses are updated to bring them into line with the estimate base date established for the order of cost estimate.

3.9.2 To do this, the unit rate is increased by the amount of inflation occurring during the period from the base date of cost data to the current estimate base date. The equation for calculating the updated unit rate is therefore:

$$Ra2 = Ra1 + (Ra1 \times p)$$

where:

Ra1 = unit rate at the base date of cost data

Ra2 = unit rate at the current estimate base date

p = percentage addition for inflation

The percentage addition for inflation can be computed using published indices (i.e. tender price indices, maintenance price indices or retail prices indices). Alternatively, the percentage addition can be derived from in-house sources of indices. Using the appropriate published indices, the equation for calculating the percentage addition/reduction for inflation/deflation is therefore:

$$p = \frac{(\text{Index 2} - \text{Index 1}) \times 100}{\text{Index 1}}$$

where:

Index 1 = index at the base date of cost data

Index 2 = index at the current estimate base date

p = percentage addition/reduction for inflation

Note: care should be taken not to update previous rates that were based on percentage additions (e.g. maintenance contractor's management and administration costs, maintenance contractor's overheads and profits, and consultants' fees). Such items will be systematically updated when the percentage addition is applied to the updated unit rates (and other rates).

3.10 Measurement rules for maintenance contractor's management and administration costs

3.10.1 Maintenance contractor's management and administration costs are to be added as a percentage to the total cost of maintenance works (i.e. to the maintenance works estimate). The percentage addition to be applied can be derived from a properly considered assessment of the cost analyses of previous maintenance programmes. The percentage can be ascertained by calculating the maintenance contractor's management and administration costs as a percentage of the total cost of all elements forming the maintenance works. Benchmark data from previously completed maintenance works contracts can also be used to assess the level of maintenance contractor's management and administration costs to be applied to new maintenance programmes.

3.10.2 The maintenance contractor's management and administration cost estimate is to be calculated by applying the selected percentage addition to the cost of the renewal (R) and maintain (M) works. The equation for calculating the total cost of maintenance contractor's management and administration costs is therefore:

$$c = (Rc + Mc) \times p$$

where:

Rc = renewal (R) works estimate (i.e. the total estimated cost of renewal (R) works)

Mc = maintain (M) works estimate (i.e. the total estimated cost of maintain (M) works)

p = percentage addition for maintenance contractor's management and administration costs

c = maintenance contractor's management and administration costs estimate (i.e. the total estimated cost of maintenance contractor's management and administration costs).

3.10.3 The maintenance contractor's management and administration cost estimate is added to the combined total of the renewal (R) and maintain (M) work estimates. The equation for calculating the sub-total is:

$$d = Rc + Mc + c$$

where:

Rc = renewal (R) works estimate (i.e. the total estimated cost of renewal (R) works)

Mc = maintain (M) works estimate (i.e. the total estimated cost of maintain (M) works)

c = maintenance contractor's management and administration costs estimate (i.e. the total estimated cost of maintenance contractor's management and administration costs)

d = sub-total, i.e. the total cost of renewal (R) and maintain (M) works excluding maintenance contractor's overheads and profit

3.10.4 If known during the early stages, costs relating to known site constraints (e.g. access, special security or operational conditions, sequencing of works, or other employer or site-specific non-standard requirements) are to be assessed and identified separately.

3.10.5 Allowances for subcontractors' and suppliers' management and administration costs, design fees, risk allowances, and overheads and profit are to be incorporated in the cost/m^2 of GIFA, cost per functional unit (or functional unit cost); or elemental unit rates (EURs) used to estimate the cost of maintenance works (i.e. to calculate the maintenance works estimate).

3.10.6 A list of typical items found within maintenance contractors' management and administration costs is provided in Part 6 (Tabulated rules of measurement for elemental cost planning, group element 9: Maintenance contractor's management and administration costs) of these rules.

Note: for the most part, management and administration costs are those relating to administering a maintenance contract and providing plant, site staff, facilities, and site-based services and other items not included in the rates for measured works. For the avoidance of doubt, or double accounting, specifically state what is included or excluded in the maintenance contractor's management and administration cost.

3.11 Measurement rules for maintenance contractor's overheads and profit

3.11.1 Maintenance contractor's overheads and profit is to be based on a percentage addition. The estimated cost of any maintenance contractor's overheads and profit is to be calculated by applying the selected percentage addition for overheads and profit to the combined total cost of the renewal (R) and maintain (M) works estimates and the maintenance contractor's management and administration cost estimate. The equation for calculating the total estimated cost of maintenance contractor's overheads and profit is therefore:

$$e = (Rc + Mc + c) \times p$$

where:

Rc = renewal (R) works estimate (i.e. the total estimated cost of renewal (R) works)

Mc = maintain (M) works estimate (i.e. the total estimated cost of maintain (M) works)

c = maintenance contractor's management and administration costs estimate (i.e. the total estimated cost of maintenance contractor's management and administration)

p = percentage for maintenance contractor's overheads and profit

e = maintenance contractor's overheads and profit estimate (i.e. the total estimated cost of the maintenance contractor's overheads and profit)

3.11.2 The percentage addition to be applied for maintenance contractor's overheads and profit is to be derived from a properly considered assessment of maintenance contractor's overheads and profit found from previous maintenance contracts or as submitted with a competitive tender for the maintenance works.

3.11.3 The maintenance contractor's overheads and profit estimate is to be added to the combined total of the renewal (R) and maintain (M) works estimates and the maintenance contractor's management and administration cost estimate. The equation for calculating the maintenance cost estimate is therefore:

$$m = Rc + Mc + c + e$$

where:

Rc = renewal (R) works estimate (i.e. the total estimated cost of renewal (R) works)

Mc = maintain (M) works estimate (i.e. the total estimated cost of maintain (M) works)

c = maintenance contractor's management and administration costs estimate (i.e. the total estimated cost of maintenance contractor's management and administration costs)

e = maintenance contractor's overheads and profit estimate (i.e. the total estimated cost of the maintenance contractor's overheads and profit)

m = maintenance cost estimate

3.11.4 A list of typical items to be found within maintenance contractor's overheads and profit is provided in Part 6 (Tabulated rules of measurement for elemental cost planning, group element 10: Maintenance contractor's overheads and profit) of these rules. These examples do not provide a definitive or exhaustive list of items, but are simply a guide.

3.12 Measurement rules for consultants' and specialists' fees

3.12.1 Consultants' and specialists' fees are to be included in order of cost estimates unless specifically excluded at the request of the employer. A list of typical consultants' and specialists' fees is provided in Part 6 (Tabulated rules of measurement for elemental cost planning, group element 11: Consultants' and specialists' fees) of these rules. These examples do not provide a definitive or exhaustive list of items, but are simply a guide.

3.12.2 It is recommended that a single allowance is made for consultants' and specialists' fees, including stating the specific purpose as it applies to the maintenance works in scope.

3.12.3 For order of cost estimates, it is recommended that consultants' fees be based on a percentage addition. These are to be calculated by applying a selected percentage addition to the total maintenance work cost estimate. The equation for calculating consultants' fees and other maintenance works costs is therefore:

$$f = (m \times p)$$

where:

m = maintenance cost estimate

p = percentage allowance for consultants' and specialists' fees

f = consultants' and specialists' fees estimate (i.e. total estimated cost of consultants' and specialists' fees)

3.12.4 The consultants' and specialists' fees estimate is added to the overall maintenance works estimate.

3.13 Measurement rules for other employer-definable maintenance-related costs

3.13.1 Other employer-definable maintenance-related costs are costs that are not necessarily directly associated with the building maintenance works, or consultants' fees/other associated costs, but form part of the cost of procuring and managing the maintenance works by the employer.

Note: examples are provided in Part 6 (Tabulated rules of measurement for elemental cost planning, group element 12: Employer-definable maintenance-related costs) of these rules. These examples do not provide a definitive or exhaustive list of items, but are simply a guide.

3.13.2 These costs are to be included in order of cost estimates unless specifically excluded at the request of the employer. Other employer-definable maintenance-related costs are to be added as a lump sum allowance.

3.13.3 The nature of other employer-definable maintenance-related costs and the extent of the lump sum allowance to be included in the order of cost estimate are to be ascertained in conjunction with the employer.

3.13.4 The total estimated cost of other employer-definable maintenance-related costs is added to the combined total of the maintenance works cost estimates and the consultants' fees/other associated costs estimate.

3.13.5 The combined total of the annual maintenance/renewals works estimate, the consultants' fees estimate and the other employer-definable maintenance-related costs estimate is the base cost estimate.

3.14 Measurement rules for risk

3.14.1 All building maintenance programmes involve risks; some obvious, some less so. The proper management of risk saves time and money. Risks can occur at any point in a building maintenance programme and it is essential that they are identified, assessed, monitored and controlled.

3.14.2 Risk exposure (i.e. the potential effect of risk) changes as the building programme progresses; continually managing the risks is therefore essential. As the maintenance programme evolves, more of the employer's maintenance requirements are defined, and a risk response can be decided.

For example:

(1) **Risk avoidance:** where risks have such serious consequences on the maintenance programme outcome that they are totally unacceptable. Risk avoidance measures may include a review of the employer's brief and a re-appraisal of the building maintenance programme, perhaps leading to a reduced or increased level of maintenance or early renewal works.

(2) **Risk reduction:** where the level of risk is unacceptable. Typical actions to reduce risk can take the form of the following:

  (a) redesign: combined with improved value engineering

  (b) more detailed design and related maintenance considerations, or site investigations: to improve the information on which cost estimates and programmes are based

  (c) different materials or engineering services: to avoid new technology or unproven systems and in order to assess the level of potential obsolescence

  (d) different approaches to maintenance and renewal works: to avoid inherently risky maintenance techniques

  (e) changing the contract strategy: to allocate risk between the contracting parties in a different way.

(3) **Risk transfer:** where accepting the risk would not give the employer best value for money. The object of transferring risk is to pass the responsibility to another party able to better control the risk. Whenever risk is transferred there is usually a premium to be paid (i.e. the

receiving party's valuation of the cost of the risk). To be worthwhile, risk transfer should give better overall value for money to the employer (i.e. the total cost of the risk to the employer is reduced by more than the cost of the risk premium). Risk transfer measures include taking out insurance cover where appropriate.

(4) **Risk sharing:** occurs when risk is not entirely transferred and the employer retains some element of risk.

(5) **Risk retention:** risks retained by the employer that are not necessarily controllable. This remaining risk is called the residual risk exposure.

3.14.3 Considering limited information is available about the building project's maintenance requirement at RIBA Preparation Work Stage A: Appraisal and B: Design Brief, and the OGC Gateways 1 (Business Justification) and 2 (Delivery Strategy), the risk allowance can be a significant percentage of the total estimated cost, whereas, after completion (when all accounts are settled) the requirement for a risk allowance will be zero. Proper risk identification, assessment, monitoring and control are therefore a prerequisite of realistic cost estimates and of minimising the consequential costs arising from the employer's residual risk exposure.

3.14.4 It is recommended that risk allowances are not a standard percentage, but a properly considered assessment of the risk, taking into account the completeness of the design and other uncertainties, such as the amount of site investigation done.

3.14.5 It is recommended that separate allowances are made for each of the following:

(1) **Design development and associated installation risks** – an allowance for use during the design process to provide for the risks associated with design development on the associated installation, plus changes in estimating data

(2) **Maintenance risks (unplanned/unscheduled)** – an allowance for use in the post-construction phase to provide for the risks associated with premature failure, resulting emergency or corrective maintenance/unplanned repairs and replacement works

(3) **Employer change risks** – an allowance for use during the design process and the construction process to provide for the risks of employer-driven changes (e.g. changes in scope of works or brief, changes in maintenance levels, changes in time)

(4) **Employer other risks** – an allowance for other employer risks (e.g. unconventional contracts and/or tender action, supplementary conditions of contract and special contract arrangements)

3.14.6 Lists of typical risks for each category of risk are at Part 6 (Tabulated rules of measurement for elemental cost planning, group element 13: Risks) of these rules. These examples do not provide a definitive or exhaustive list of items, but are simply a guide.

3.14.7 Risk allowances are to be included in the order of cost estimates. Even at the RIBA Preparation Work Stage A: Appraisal and B: Design Brief, and the OGC Gateways 1 (Business Justification) and 2 (Delivery Strategy), it is recommended that the size of the initial risk allowance is based on the results of a formal risk analysis. If the risk characteristics are not acceptable to the employer, it is advisable that the risk allowance is not determined until management action has been taken to review the employer's risk exposure and to identify suitable risk responses that will reduce this exposure to an acceptable level. It is recommended that a revised risk analysis is undertaken to determine the most likely out-turn cost and the risk allowance.

3.14.8 Throughout the RIBA Preparation Work Stage and the OGC Business Justification and Delivery Strategy Gateways of a building project, it is advisable that effort is concentrated on the main sources of risk. It may be beneficial, even at this stage of the project, to prepare a maintenance-specific risk register (incorporating the major risks identified) and a risk management strategy. It is recommended that risks are not excluded without due consideration. Take care not to allow the natural optimism that surrounds the early stages of a building project to influence the realism of judgments that are to be made.

3.14.9 The risks (which can influence the cost of maintenance, repairs and replacement works) change as the building project progresses through the subsequent RIBA Work Stages. It is recommended that

risk registers and risk estimates are reassessed at regular intervals throughout the various formal stages of cost planning, which follow once the cost limit has been authorised by the employer.

3.14.10 For order of cost estimates, risk allowances for the project development risks, unplanned/unscheduled maintenance risks and employer's risks based on the application of percentage additions – are to be calculated by multiplying the base cost estimate by the selected percentage additions. The equation for calculating the risk allowances for design development risk, construction risk and employer's risk are therefore:

for design development and associated installation risks: $R1 = a \times p1$

for maintenance risks (unplanned/unscheduled): $R2 = a \times p2$

for employer change risks: $R3 = a \times p3$

for employer other risks: $R4 = a \times p4$

where:

a = base cost estimate

p1 = percentage risk allowance for design development and associated installation risks

p2 = percentage risk allowance for maintenance risks (unplanned/unscheduled) risks.

p3 = percentage risk allowance for employer change risks

p4 = percentage risk allowance for employer other risks

R1 = risk allowance estimate for design development and associated installation risks (i.e. total estimated cost of risk allowance for design development and associated installation risks)

R2 = risk allowance estimate for maintenance risks (unplanned/unscheduled) risks (i.e. total estimated cost of risk allowance for maintenance risks (unplanned/unscheduled) risks)

R3 = risk allowance estimate for employer change risks (i.e. total estimated cost of risk allowance for employer change risks)

R4 = risk allowance estimate for employer other risks (i.e. total estimated cost of risk allowance for employer other risks)

3.14.11 The equation for calculating the total risk allowance estimate is therefore:

$RA = R1 + R2 + R3 + R4$

3.14.12 The risk allowance estimate is added to the base cost estimate. This gives the proposed cost limit (excluding inflation). The equation for calculating this is therefore:

$CL = a + b$

where:

a = base cost estimate

b = risk allowances estimate

CL = cost limit (excluding inflation)

3.15 Measurement rules for inflation

3.15.1 An order of cost estimate for maintenance works only should be prepared at current prices.

3.15.2 Where this estimate is for a tender, the prices should be adjusted in two stages:
(1) for tender inflation to the date of the tender for the maintenance work
(2) for cost inflation during the fixed price period. This would normally be done by adjusting the estimated annual expenditures for inflation. Where the contract provides for index linking the risk of any difference between the movement in the index and actual inflation should also be considered.

3.15.3 Where the estimate is prepared for use in a life cycle cost plan (LCCP), then it will need to be adjusted for future price changes (inflation) to the start date of the LCCP (year zero). Inflation during the period of the study will be covered by the discount rate in Net Present Value and discounting factor calculations.

3.15.4 The amount of tender inflation is ascertained by applying a single percentage rate for tender inflation to the cost limit (excluding inflation). The addition of tender inflation gives the projected cost limit (excluding construction inflation) for the building project. The equation for calculating the amount of tender inflation is therefore:

$$t = CL \times p$$

where:

CL = cost limit (excluding inflation)

p = percentage for tender inflation

t = tender inflation estimate

The percentage for tender inflation can be computed using published indices (i.e. maintenance price indices, tender price indices, building cost indices or retail price indices. Alternatively, the percentage addition can be derived from in-house sources of indices.

3.15.5 The tender inflation estimate is added to the cost limit (excluding inflation). This gives the proposed cost limit (including construction inflation). The equation for calculating the cost limit (including construction inflation) is therefore:

$$CL2 = CL1 + t$$

where:

CL1 = cost limit (excluding inflation)

CL2 = cost limit (including construction inflation)

t = tender inflation estimate

3.15.6 The amount of construction cost inflation during the period of study will be allowed for in the application of a discount rate (see paragraph 3.19).

3.15.7 Where an estimate is being prepared for a measured term contract, construction cost inflation is ascertained by applying a single percentage rate for construction inflation to the annual cost limit (excluding construction inflation) for each year of the contract. This should be shown separately for:

(a) those years covered by any fixed price provision in the contract, i.e. for inflation that will be allowed for by the contractor in their tender

(b) those years that will be adjusted by indexation.

3.15.8 The percentage for construction cost inflation can be computed using published indices and forecasts (i.e. maintenance cost/price indices, tender price indices, building cost indices or retail price indices). Alternatively, the percentage addition can be derived from in-house sources of indices.

3.15.9 It is recommended that potential cost increases/decreases caused by tendering conditions and the effects of changes in the market are also considered. These include price increases/decreases associated with particular materials or products or the impact of major projects sapping resources (home and abroad); particular specialist, works, trade, work package and labour-only subcontractors; or other countries buying major quantities of raw materials (e.g. China). However, it is recommended that such potential cost increases/decreases caused by tendering conditions and the effects of changes in the market should be initially dealt with under risk allowances.

3.16 Taxation allowances and other incentives

3.16.1 Taxation allowances, taxation relief and grants can provide valuable financial aid to an employer on certain types of building, as well as on maintenance and renewal programmes. However, due to the complexity of, and constantly changing, legislation, it is recommended that specialist advice is sought to maximise the availability and quantum of taxation allowances, taxation relief and grants. For that reason, unless specifically requested by the employer, it is recommended that these allowances should be excluded from order of cost estimates and therefore not covered by the scope of these rules.

3.16.2 The taxation allowances and incentives covered in these rules provide only broad guidance on how to deal with the effect of taxation allowances and incentives available for expenditure on capital building works and maintenance, repair and replacement works applicable in the UK during the life of an asset.

3.17 Value added tax (VAT) assessment

3.17.1 Value added tax (VAT) in relation to capital building works and maintenance, repair and replacement works, is a complex area. Therefore, for order of cost estimates it is recommended that VAT is excluded from cost plans.

3.17.2 It is recommended that specialist advice is sought on VAT matters to ensure that the correct rates are applied to the various aspects of the building maintenance works. Notwithstanding this, if required by the employer, provision for VAT assessment can be incorporated into the cost estimate or maintenance cost plans.

3.18 Other considerations

3.18.1 Other considerations that are not covered by the scope of these rules for maintenance works are:
(1) finance accounting (i.e. asset depreciation/write downs)
(2) service credits or non-performance rebates
(3) defects and warranty implications (these are contractual issues, not measurement).

3.18.2 Service credits or performance rebates may be applied during the execution of the maintenance, but are not applicable for order of cost estimates purposes.

3.19 Present value, inflation and discounting methods

3.19.1 The present value (PV) concept captures the time value of money by making adjustments through compounding and discounting cash flows to reflect the increase in costs due to inflation and the increased value of money when invested. The PV of a cash flow reflects, in today's terms, the value of future cash flows adjusted for the cost of capital. In essence, the time value of money reflects the fact that money in hand today is more valuable than an identical amount of money received in the future. Since money today can earn interest, all costs must be adjusted to reflect the inflation rate and then discounted to reflect the effect of interest rates on their PV.

3.19.2 Discounting is the procedure for presenting all costs and future benefits in one timeframe (i.e. on a common basis). The PV of an investment is calculated from the time series of projected cash flows using discount rates.

3.19.3 The discount rate is therefore based on assumptions about interest rates adjusted for assumptions about inflation.

An example calculation of a discount rate is as follows:

- Interest rate assumption = 4.0% per annum
- Inflation assumption = 2.5% per annum

$$\text{Discount rate} = \frac{1 + \text{Interest rate as a decimal}}{1 + \text{Interest rate as a decimal}} - 1$$

$$= \frac{1 + 0.04}{1 + 0.025} - 1 = 0.0146$$

$$= \frac{1.040}{1.025} - 1 = 0.0146$$

$$= 1.46\%$$

3.19.4 To estimate a net present value (NPV), future costs must be discounted. Discounting translates projected cash flows into PV terms using specified discount factors (or PV factors). The equation for calculating discount factors for each year of the building life is therefore:

$$DF = \frac{1 \ldots}{(1 + r)^n}$$

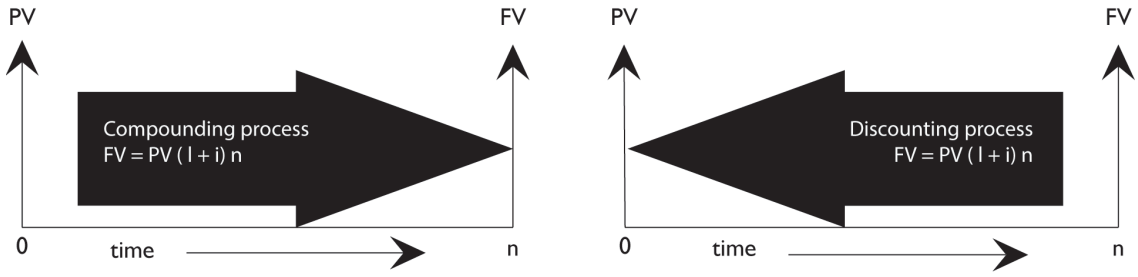
where:

DF = discount factor

r = discount rate as a factor of 1

n = number of years from the date of practical completion or handover of the building project, i.e. from the point at which the 'in use' phase commenced (i.e. 1, 2, 3 … 25, etc.)

Figure 3.1: Illustration of the compounding and discounting processes



Note: PV = present value; FV = future value; I = discount rate (as a factor of 1); N = number of years

3.19.5 See Appendix G for more detailed guidance on the methods of economic evaluation and discounting equations (time value of money).

3.20 Reporting of order of cost estimates

3.20.1 Costs are to be expressed as 'cost/m^2 of GIFA' per annum and/or functional unit cost (e.g. by bed space/per annum) or as a PV, an NPV, an Annual equivalent cost or a total cost over the period of analysis. The cost/m^2 of GIFA per annum is calculated by dividing the total cost by the number years of the analysis. See appendix G for the economic methods of calculating PV and NPV etc.

3.20.2 Where appropriate and/or required by an employer, costs may be expressed as a 'cost per functional unit' (or functional unit cost) as an alternative, or in addition, to the cost/m^2 of GIFA. The functional unit may be an employer-defined unit. It is essential, therefore, that the functional unit is clearly identified when costs are expressed in this way.

3.20.3 Order of cost estimates, as with all estimates, are a forecast out-turn cost, with stated allowances for consultants' fees, other maintenance-related project costs, risk allowances, inflation and VAT, as appropriate.

3.20.4 Items included or excluded from the estimated cost are to be clearly communicated to the employer when reporting the order of cost estimate.

3.20.5 Typical items to be included in order of cost estimates reports for maintenance works are:

(1) project title
(2) project description
(3) status of the cost plan(s), i.e. first or iteration version of the order of estimate
(4) a statement of cost (including cost limit)
(5) details of the information and specification on which the cost plan was prepared
(6) a statement of the floor areas
(7) basis of cost estimates (i.e. assumptions); and the period of analysis
(8) estimate base dates (i.e. to which inflation has been applied)
(9) cash flow forecasts, where appropriate for the life cycle renewal (R) and maintain (M) works
(10) method of economic evaluation (i.e. discounted, stating the rates applied)
(11) reasons for changes to the cost targets (explain the adjustments or transfers that have taken place against the previous cost estimates)
(12) estimated costs of, and a request for decisions on, any alternative proposals (i.e. summary of option costs)
(13) Inclusions and exclusions (i.e. a clear statement of what is included and excluded from the order of cost estimate).

3.20.6 At the outset, the scope of the project brief will define the project-specific reporting requirements and the format of cost reporting, analysis and presentation of the results.

3.20.7 Caution should be exercised when using benchmark data for order of estimates that have been derived from sources that did not use the new rules of measurement for building maintenance works. The level of cost certainty should be reflected in the risk allowances included.

3.20.8 The source of cost data used for order of cost estimating of construction projects should be stated (e.g. ideally from benchmark unit rates derived from maintenance costs in use). Over time more robust unit rates for renewal and maintain works will become available – derived from detailed analysis of actual costs of running built assets, which can then to used for order of cost estimating at various levels for feasibility stages of a construction project. (see 4.24.4 for more details of the level of analysis of maintenance cost data.)

Part 4: Measurement rules for cost planning of renewal (R) and maintain (M) works

Part 4: Measurement rules for cost planning of renewal (R) and maintain (M) works

4.1 Introduction

4.1.1 Part 4 of the rules describes the purpose, methods, content and types of elemental cost plans used for maintenance works (pre- and post-construction), as well as explaining the rules of measurement for the preparation of formal cost plans 1 to 4. The formal cost planning stages are put into context with the RIBA Plan of Work and the OGC Gateway Process.

4.1.2 The measurement rules for cost planning provide the basis for measuring quantities for the application of life cycle cost planning. Integrating the capital building works cost plans (C) with the renewal (R) and maintain (M) works cost plans, will enable the project team to evaluate the costs (on an elemental and whole building level) and inform value management and design and maintenance specification choices (i.e. option appraisals and trade-offs studies) to help determine the optimum life cycle solution.

4.1.3 The content and application of unit rates to measured quantities (to generate the base cost of the life cycle renewal (R) and maintain (M) works) is described. Also discussed is the method of dealing with cost allowances for maintenance contractor's management and administration charges, maintenance contractor's overheads and profit, project/design team fees, other maintenance-related costs, consultants' fees, risk allowances, inflation, discounting for the time value of money, VAT, taxation allowances and other incentives.

4.1.4 The method of dealing with the time value of money, i.e. discounting current day costs and future benefits to present day values, is explained.

4.1.5 In addition, the basic information requirements needed (from the employer and other project/maintenance team members) by the quantity surveyor/cost manager to complete a cost plan at each stage are outlined. The essential content of the quantity surveyor's/cost manager's cost reports to the employer is also described.

4.1.6 Guidance is also provided on rules for cost reporting and maintenance management, including the functional unit cost analysis and benchmarking of the annualised maintain (M) costs and the forecast renewal (R) programmes of works, including making provisions for unscheduled expenditure.

4.2 Purpose of maintenance cost planning

4.2.1 Maintenance works cost plans, as the cost plans for capital building works, are produced as an intrinsic part of RIBA Work Stages C: Concept, D: Design Development, E: Technical Design F: Production Information; and L: Post Practical Completion – or, when the OGC Gateway Process is used, Gateways 3A (Design Brief and Concept Approval), 3B (Detailed Design Approval). The requirements of RIBA Work Stages C, D, E F and L, as described in the RIBA Outline Plan of Work, are as follows:

(1) **RIBA Work Stage C: Concept**

'Implementation of Design Brief and preparation of additional data. Preparation of Concept Design, including outline proposals for the structural and building services systems with outline specifications and [formal cost plan 1]. Review of procurement route'

OGC Gateway 3A (Design Brief and Concept Approval) can be compared with RIBA Work Stage C.

(2) **RIBA Work Stage D: Design Development**

'Development of concept design to include structural and building services systems; updated outline specifications and cost plan. Completion of the project brief. Application for detailed planning permission.'

Note: application for detailed planning permission may be moved to suit project requirements.

(3) **RIBA Work Stage E: Technical Design**

'Preparation of technical design(s) and specifications, sufficient to co-ordinate components and elements of the project and information for statutory standards and construction safety.'

Note: information for statutory standards and construction safety may be moved to suit project requirements.

OGC Gateway 3B (Detailed Design Approval) can be compared with RIBA Work Stages D and E.

(4) **RIBA Work Stage F: Production Information**

'F1 Preparation of production information in sufficient detail to enable a tender or tenders to be obtained. Application for statutory approvals.

Note: application for statutory approvals may be moved to suit project requirements.

'F2 Preparation of further information for construction required under the building contract.'

Note: further information for construction may be moved to suit project requirements.

(5) **RIBA Work Stage L: Post Practical Completion**

'L1 – Administration of the building contract after practical completion and making final inspections'

'L2 – Assisting building user during the initial occupation period'

'L3 – Review of project performance in use'

OGC Gateway 4 (Readiness for Service) and 5 (Operations Review and Benefits realisation) can be compared with RIBA Work Stages L.

Project stages from the RIBA Outline Plan of Work 2007, copyright Royal Institute of British Architects, are reproduced here with the permission of the RIBA.

4.2.2 The fundamental purposes of maintenance cost planning during construction work stages are to:

(1) ensure that employers are provided with value for money – in terms of both capital costs and the annual maintain (M) costs, and life cycle renewal (R) costs – and any other costs agreed in scope (over the defined life cycle of the building project)
(2) make employers and designers aware of the cost consequences of their desired and alternative proposals
(3) provide advice to designers that enable them to arrive at practical, balanced and optimised designs within budget, based on maintenance plans that are sustainable and meet the employer's requirements in respect of future maintenance costs
(4) provide advice to maintenance teams to arrive at optimal plans within budget, which also meet the employer's requirements in respect of future maintenance and renewal costs
(5) keep predicted life cycle expenditure within the cost limit approved by the employer
(6) provide robust cost information on which the employer can make informed decisions.

4.2.3 The main purposes of formal cost plan 4 (post-construction completion works) are to:

(1) determine the target cost limit for the renewal (R) and maintain (M) programmes of works
(2) inform setting the annualised maintenance budgets v available funding constraints; and prioritisation of maintenance expenditure against competing risks and liabilities,
(3) provide the basis for procuring the maintenance work as a whole or in work packages
(4) provide robust cost information on which the employer can make informed decisions (e.g. whether to refurbish or disinvest in an asset or part thereof)
(5) inform what asset investments are funded or not funded – and then track and monitor the expenditure of sanctioned works, including revising the life cycle cost plan
(6) ensure the employer is provided with best value for money from maintenance spend.

4.2.4 Elemental cost planning is a budget distribution technique that is first implemented during the design stages of a building project. It involves a critical breakdown of the cost limit (i.e. the employer's authorised budget) for maintenance and repair/replacement works into cost targets for each element of the building(s). Cost targets are the recommended expenditure for each element (e.g. maintenance of roofs, internal finishes and services).

4.2.5 The elemental cost plan that results is a statement of how the project team proposes to distribute the available maintenance budget among the elements of the building and across the wider life cycle costs of renewal (R) and maintain (M) elements and other life cycle cost elements. It provides a frame of reference from which to develop the design and maintenance cost control. It also provides a work breakdown structure and a cost breakdown structure that, by codifying, can be used to redistribute works in elements to construction and building maintenance works packages for procurement.

4.2.6 Elemental maintenance cost planning is an iterative process, which is performed in steps of increasing detail as more design and production information becomes available.

4.2.7 Formal cost plan 4 is prepared at a point where the constructed asset or facility is practically completed, or during the in use phases of the built asset or facility.

4.2.8 There is no difference between a maintenance cost plan for a new or existing built asset (or facility) except that they are based on different data. Data for a newly built asset or facility is initially derived from the capital building works cost plan and completed using the as-built information (including asset schedules) provided by the construction contractor. Data for an existing built asset or facility is ascertained from record drawings, asset registers and the findings and recommendations obtained from inspections. It is an iterative process that is performed annually to reset the annual maximum expenditure that the employer is prepared to make for the total cost of maintenance.

4.3 Constituents of a maintenance cost plan

4.3.1 The key constituents of a maintenance cost plan are as follows:

Table 4.1: Constituents of a cost plan

Constituent (Cost Centre)	£Y_1	£Y_2	£Y_3	…	£Y_n	Reference/Notes
	£k	£k	£k	£k	£k	
Renewal (R) annualised costs:						
(1a) Facilitating works	£Y_1	£Y_2	£Y_3	…	£Y_n	
(1b) Substructure	£Y_1	£Y_2	£Y_3	…	£Y_n	
(1c) Superstructure	£Y_1	£Y_2	£Y_3	…	£Y_n	
(1d) Internal finishes	£Y_1	£Y_2	£Y_3	…	£Y_n	
(1e) Fittings, furniture and equipment	£Y_1	£Y_2	£Y_3	…	£Y_n	
(1f) Services	£Y_1	£Y_2	£Y_3	…	£Y_n	
(1g) Work to existing buildings	£Y_1	£Y_2	£Y_3	…	£Y_n	If not covered in 1e to 1f.
(1h) External works	£Y_1	£Y_2	£Y_3	…	£Y_n	
Total – Renewal costs estimate (1)						
[(1) = Σ (1a) + (1b) + (…) + (1h)]	£Y_1	£Y_2	£Y_3	…	£Y_n	See paragraphs 4.8 to 4.11

NRM 3: Order of cost estimating and cost planning for building maintenance works

Constituent (Cost Centre)	£Y_1	£Y_2	£Y_3	…	£Y_n	Reference/Notes
	£k	£k	£k	£k	£k	
Maintain (M) annualised costs:	£Y_1	£Y_2	£Y_3	…	£Y_n	
(2a) Facilitating works	£Y_1	£Y_2	£Y_3	…	£Y_n	
(2b) Substructure	£Y_1	£Y_2	£Y_3	…	£Y_n	
(2c) Superstructure	£Y_1	£Y_2	£Y_3	…	£Y_n	
(2d) Internal finishes	£Y_1	£Y_2	£Y_3	…	£Y_n	
(2e) Fittings, furniture and equipment	£Y_1	£Y_2	£Y_3	…	£Y_n	
(2f) Services	£Y_1	£Y_2	£Y_3	…	£Y_n	
(2g) Works to existing buildings (not covered in 2a–2f)	£Y_1	£Y_2	£Y_3	…	£Y_n	
(2h) External works	£Y_1	£Y_2	£Y_3	…	£Y_n	See paragraph 4.12
Total – Maintain costs estimate [2] [(2) = Σ (2a) + (2b) + (…) + (2h)]	£Y_1	£Y_2	£Y_3	…	£Y_n	See paragraphs 4.8 to 4.11 and 4.13
Sub-total [3] [(3) = (1) + (2)]	£Y_1	£Y_2	£Y_3	…	£Y_n	
Maintenance contractor's management & administration costs						
(4a) Renewal works	£Y_1	£Y_2	£Y_3	…	£Y_n	See paragraph 4.14.
(4b) Maintain works	£Y_1	£Y_2	£Y_3	…	£Y_n	See paragraph 4.14.
Maintenance contractor's management and administration costs estimate [4] [(4) = (4a) + (4b)]	£Y_1	£Y_2	£Y_3	…	£Y_n	
Sub-total [5] [(5) = (3) + (4)]	£Y_1	£Y_2	£Y_3	…	£Y_n	
Maintenance contractor's overheads and profit [6]	£Y_1	£Y_2	£Y_3	…	£Y_n	See paragraph 4.15
Maintenance cost estimate [7] Sub-total [7] [(7) = (5) + (6)]	£Y_1	£Y_2	£Y_3	…	£Y_n	
(8) Consultants'/specialists' fees estimate	£Y_1	£Y_2	£Y_3	…	£Y_n	See paragraph 4.16
(9) Employer-definable maintenance-related costs estimate	£Y_1	£Y_2	£Y_3	…	£Y_n	See paragraph 4.17
Base cost estimate [10] [(10) = (7 + (8) + (9)]	£Y_1	£Y_2	£Y_3	…	£Y_n	
Sub-total [10] [(10) = (7 + (8) + (9)]	£Y_1	£Y_2	£Y_3	…	£Y_n	
Risks						See paragraph 4.18
(11a) Design and installation risks	£Y_1	£Y_2	£Y_3		£Y_n	
(11b) Maintenance risks				…		
(11c) Employer change order risks	£Y_1	£Y_2	£Y_3	…	£Y_n	
(11d) Employer other risk	£Y_1	£Y_2	£Y_3	…	£Y_n	
Risk allowance estimate [11] [(11) = (11a) + (11b) + (11c) + (11d)]	£Y_1	£Y_2	£Y_3	…	£Y_n	
Cost limit *(at current price levels)* [12] [(12) = (10) + (11)]	£Y_1	£Y_2	£Y_3	…	£Y_n	

Constituent (Cost Centre)	£Y_1	£Y_2	£Y_3	…	£Y_n	Reference/Notes
	£k	£k	£k	£k	£k	
Discount Factor (13)	DF^1	DF^2	DF^3	…	DF^n	See paragraph 4.19
Present Value (14) [(14) = (12) × (13)]	£Y_1	£Y_2	£Y_3	…	£Y_n	See paragraph 4.19
Net Present Value (Total cost limit) (15) [(15) = Σ(PV) (14)]	£Y_1	£Y_2	£Y_3	…	£Y_n	See paragraph 4.19

Notes:
VAT and other taxation incentives are excluded (see paragraph 4.20).
Other considerations (as defined in paragraph 4.21) are to be taken into account, if required in scope.
£Y_1 = Year 1 costs
£Y_2 = Year 2 costs
£Y_3 = Year 3 costs
£Y_n = Final year costs in which either maintenance or replacement works are to be undertaken
DF^1 = Year 1 discount factor
DF^2 = Year 2 discount factor
DF^3 = Year 3 discount factor
DF^n = Discount factor for final year in which either maintenance or replacement works are to be undertaken

4.3.2 The base cost estimate is the total estimated cost of the maintenance works, maintenance contractor's management and administration costs, and maintenance contractor's overheads and profit. The base cost estimate is to contain no allowances for risk, inflation and taxation.

4.3.3 Allowances for risk and inflation are to be calculated separately and added to the base cost estimate to determine the cost limit for the maintenance works for the defined project life cycle.

4.4 Formal cost planning stages

4.4.1 There are a number of formal cost planning stages that are comparable with the RIBA Design and Pre-Construction Work Stages and OGC Gateways 3A (Design Brief and Concept Approval) and 3B (Detailed Design Approval) for a building project.

4.4.2 For most building projects, formal cost plans should be completed and submitted to the employer, or their appointed representative for approval, for each of the RIBA Work Stages or OGC Gateways – see Table 4.2 below.

Table 4.2: Formal cost planning stages for new and existing built assets and facilities

Formal cost plan	RIBA Work Stage
1	C: Concept
2	D: Design Development
3 and 4 (for new built asset or facility)	E to F: Technical Design and Production Information
4 (for existing built asset or facility)	K: Construction to Practical Completion
	L: Post Practical Completion
Formal cost plan	**OGC Gateway**
1	3A: Design Brief and Concept Approval
2 and 3	3B: Detailed Design Approval
4 (for new built asset or facility)	4: Readiness for Service
4 (for existing built asset or facility)	5: Operations Review and Benefits Realisation

4.4.3 **Formal cost plan 1 for a new built asset or facility** is prepared at a point where the scope of the work is fully defined and key criteria are specified, but no detailed design development or maintenance planning will have commenced.

4.4.4 **Formal cost plans 2 and 3 for a new built asset or facility** do not involve the preparation of a completely new cost plan; each is a progression of the previous cost plan. They are developed through the cost checking of the renewal (R) and maintain (M) works costs applicable to the building elements and components and cost targets, as more design and maintenance information and any further information about the elements and components become available.

4.4.5 **Formal cost plan 4 for a new built asset or facility** does not involve the preparation of a completely new cost plan; it is a progression of formal cost plan 3. It is developed through the cost checking of the renewal (R) and maintain (M) works costs applicable to the building elements and components and cost targets, at a point where the quality, operational and performance criteria has been fully defined and specified. It is normally based on the as-built information (including asset schedules) as this becomes available from the construction contractor.

4.4.6 **Formal cost plan 4 for an existing built asset or facility** is a newly developed cost plan. It is based on data derived from record drawings, asset registers and the findings and recommendations obtained from inspections (e.g. condition surveys, technical inspections and structural surveys).

4.4.7 Whether or not a formal cost plan is prepared at each RIBA Work Stage or OGC Gateway is dependent on the procurement strategy selected. For example, the preparation of an updated cost plan may not be required at Work Stage F: Production Information where a 'design and build' contract strategy is selected.

4.4.8 The cost targets within each formal cost plan approved by the employer will be used as the baseline for future cost comparisons. Each subsequent cost plan will require reconciliation with the preceding cost plan and explanations relating to any changes made. In view of this, it is essential that records of any transfers made to or from the risk allowances and any adjustments made to cost targets are maintained, so that explanations concerning changes can be provided to both the employer and the project team.

4.4.9 The employer is required to 'approve' the cost plan on completion of each RIBA Work Stage before authorising commencement of the next RIBA Work Stage.

4.4.10 Renewal (R) costs are normally reported at building elemental level, but the maintain (M) costs are normally reported at building level (in the absence of elemental 'maintain' benchmarks). Information may be a mix of typical benchmark costs (elemental unit rates) for key elements, comparable cost modelling or approximate estimates during the concept stage. As more detailed design information is produced then more detailed elemental cost estimates can be produced. However, the level of services information may not be sufficient to effectively cost plan the building services element to the applicable asset levels, during the pre-construction work stages.

4.4.11 Sub-elemental and component level cost planning at RIBA Work Stage D: Design Development stage is commonly used for life cycle cost planning, specification, choices of systems, elements or component levels during design development. Also for optimising the life cycle costing for the preferred options based on more detailed information. Costs to be included will depend on the purpose and scope of study agreed and the stage in the asset life cycle at which the study is carried out – and the availability and level of information required to undertake the study (see Appendix F).

4.4.12 To avoid unnecessary conflict, it is essential that employers and other project/design and maintenance team members are aware of what is included in each element of the cost plan.

4.4.13 While the process of establishing the life cycle costing of construction (C), renewal (R) and the maintain (M) works will be the same at each stage, the context in which it is being prepared will set the level of detail, the need for iterations and the need for component option appraisals. It will also set the type of report (i.e. specific outputs and formats to suit the client's defined required outputs) and the requirement to share data and assumptions with other interested parties.

4.5 Reviewing and approving maintenance cost plan

4.5.1 Prior to the employer authorising the commencement of the next RIBA Work Stage or OGC Gateway, the formal cost plan for the preceding RIBA Work Stage or OGC Gateway is to be reviewed by the employer and the project team to ensure that the:

(1) capital costs and the future renewal (R) and maintain (M) costs are affordable
(2) cost target for each aspect of maintenance is reasonable and up to date
(3) cost limit for the maintenance programme(s) has not been exceeded.

4.5.2 Following the review, the employer will sign off the cost plan and give any necessary instructions and/or authorise commencement of the next RIBA Work Stage or OGC Gateway.

4.6 Cost control in procurement

4.6.1 The cost plan becomes a fundamental cost control mechanism where a maintenance programme of works is procured via a number of different work packages. By using codified cost plans, the renewal (R) and maintain (M) tasks can be easily reordered into the required work packages. This will provide cost targets for each package, which in turn can be used to monitor and manage costs during the procurement of the maintenance programme(s).

4.6.2 The method of codifying and redistributing cost targets from elements to work packages is in paragraph 6.5 in Part 6 (Tabulated rules of measurement for elemental cost planning) of these rules.

4.7 Maintenance cost plans comprising multiple buildings and/or functional unit types

4.7.1 Where a building maintenance project, or programme of works, comprises more than one type of building or functional unit type, it is recommended that a separate cost plan is prepared for each building or functional unit type. This culminates in a 'summary cost plan' for the entire portfolio of buildings and/or estate and facilities, in scope – see Figure 2.4 in paragraph 2.8.1 of these rules.

4.7.2 When used for maintenance cost planning, the functional unit method, considers all maintainable assets 'applicable' to each of the specific functional unit or type of function being measured (e.g. office, house, shop, school, train station) that originates from an as-built or asset-specific maintenance based cost plan. It uses the elemental, sub-element and component breakdown of the applicable maintenance items for each function unit being measured, which is then used to calculate the applicable renewal (R) and maintain (M) work estimates and cost plans.

4.8 Information requirements for formal cost plans

4.8.1 The information required to prepare a formal cost plan for building maintenance works is contingent on whether or not it is a new, refurbished or existing building, or part thereof.

4.8.2 For new or refurbished building projects or facility/functional types:

The information base of building projects and the associated maintenance requirements will continue to expand during the RIBA Design and Pre-construction Work Stages and OGC Gateways 3A (Design Brief and Concept Approval) and 3B (Detailed Design Approval) as more project/design team, main contractor, specialist contractor and employer interaction takes place.

Note: a list of the key information required to enable preparation of formal cost plans for new and refurbished buildings or facility, is stated in Appendix H of these rules.

4.8.3 For an existing building or facility/functional type:

The information base will be as-built construction documents, as well as existing records, asset maintenance registers, condition surveys, asbestos registers, operating and maintenance manuals, and related inspection and audit documentation, and historical maintenance expenditure available.

Note: a list of the key information required to enable the preparation of formal cost plans for existing buildings, or construct assets, is provided in Appendix H of these rules.

4.9 Format, structure and content of formal cost plans

4.9.1 Examples of report templates showing the format, structure and content of elemental cost plans, based on level 1 and level 2 codes, are provided in Appendix I and J of these rules.

4.9.2 The quantities measured using the tabulated rules of measurement are used to inform life cycle cost plans for both renewal (R) and maintain (M) works, the results of which can be presented in terms of the estimated net present value (NPV).

4.10 Measurement rules for maintenance cost planning

4.10.1 Construct (C) capital building works are to be measured in accordance with the NRM 1 as detailed in Part 6 (Tabulated rules of measurement for elemental cost planning, group elements 0 to 8) of these rules.

Note: NRM 3 tabulated rules of measurement for building maintenance works have been aligned to the NRM 1 tabulated rules at the component 'inclusions' level, thereby creating a standardised cost breakdown data structure that integrates the construct (C) with renewal (R) and maintain (M) cost structures.

4.10.2 The rules of measurement for maintenance cost planning for renewal (R) and/or maintain (M) works, i.e. group elements 0 to 8 are detailed in Part 6 (Tabulated rules of measurement for elemental cost planning) of these rules.

4.10.3 Measurement for cost planning of building renewal (R) and maintain (M) works is an iterative and progressive process. Limited information will be known about the maintenance requirements of the building or facility at the start of the cost planning process; whereas detailed information about the individual components and sub-components (i.e. the assets) that will be incorporated into the building or facility will be known on design completion and post-practical completion (i.e. in use phases). Depending on the contract strategy used, design completion will occur either before the building project is procured (i.e. where the building is fully designed before a contractor is selected) or during the design and construction phase (i.e. where a design and build strategy is used, or where works are based on a performance specification and subject to contractor design). Consequently, measurement is to be carried out to increasing levels of detail as the design is developed.

4.10.4 The degree of detail to be measured for maintenance and renewal works should be related to the cost significance of the component (level 3) or sub-component (levels 4/5/6 as applicable). Where sufficient information is available, cost significant items are to be measured using approximate quantities. Composite items are measured by combining or grouping together work items with a common unit of measurement. Non-cost significant items (such as minor items and labours on cost significant items) are ignored in measurement, but are to be accounted for by increasing the applicable unit rate by an appropriate percentage.

4.10.5 Quantities shall be given to the nearest whole unit except that any quantity less than one whole unit shall be given as one unit. Quantities measured in tonnes shall be given to two decimal places.

4.10.6 For a new or refurbished building, or constructed asset, the method of measuring quantities for each formal cost plan shall be as follows:

(1) **Formal cost plan 1**

(a) this is the first formal cost plan. It coincides with the completion of the concept design at the point where the scope of works is fully defined and key criteria are specified but no detailed design has commenced

(b) cost plan 1 will provide the frame of reference for cost plan 2

(c) key information, such as the programme and procurement strategy, is required from the employer and other project/design and maintenance team members to enable preparation of formal cost plan 1

(d) for cost plan 1, a condensed list of elements is used, which will be developed into a full list of elements, sub-elements and components as more design and other information becomes available as the building project progresses

(e) quantities for renewal (R) and maintain (M) works shall be determined in accordance with Part 6 (Tabulated rules of measurement for elemental cost planning, group elements 0 to 8) of these rules

(f) where there is insufficient design information from which to quantify maintenance and replacement works (in accordance with the rules of measurement for elemental cost planning) then the quantity measured is to be the Glit is likely that a number of alternative concept designs will be considered at this stage.

(2) **Formal cost plan 2**

(a) this is the second formal cost plan, which coincides with the completion of the design development. Formal cost plan 2 is a progression of formal cost plan 1. It is developed by cost checking of cost-significant elements, as more detailed design information is made available from the design team

(b) cost plan 2 will provide the frame of reference for cost plan 3

(c) key information, such as programme and procurement strategy, is required from the employer and other project/design and maintenance team members to enable preparation of formal cost plan 2

(d) the cost checks are to be carried out against each pre-established cost target

(e) quantities for renewal (R) and maintain (M) works shall be determined in accordance with Part 6 (Tabulated rules of measurement for elemental cost planning, i.e. group elements 0 to 8) of these rules

(f) where insufficient design and maintenance information is available from which to quantify the maintenance works (in accordance with the rules of measurement for elemental cost planning) then the quantity measured is to be the GIFA.

(3) **Formal cost plan 3**

(a) this third formal cost plan stage is based on technical designs, specifications and detailed production information for construction. Formal cost plan 3 is a progression of formal cost plan 2

(b) cost plan 3 will provide the frame of reference for appraising tenders

(c) key information, such as programme and procurement strategy, is required from the employer and other project/design and maintenance team members to enable preparation of formal cost plan 3

(d) the cost checks are to be carried out against each pre-established cost target

(e) the rules for measuring, describing and quantifying renewal (R) and maintain (M) works shall be determined in accordance with Part 6 (Tabulated rules of measurement for elemental cost planning, i.e. group elements 0 to 8) of these rules

(f) where insufficient design and maintenance information is available from which to quantify maintenance works (in accordance with the rules of measurement for elemental cost planning) then the quantity measured is to be the GIFA.

(4) **Formal cost plan 4**

(a) this fourth formal cost plan stage is based on:

(i) for new built assets or facilities – data derived from the as-built information (including asset schedules) provided by the construction contractor, remaining-life data, specifications and other relevant information (as listed in appendix H of these rules)

(ii) for existing built assets or facilities – data derived from record drawings, asset registers and the findings and recommendations obtained from inspections (e.g. condition surveys, technical inspections and structural surveys), remaining-life data, specifications and other relevant information (as listed in appendix H of these rules)

(b) cost plan 4 will provide the frame of reference for annualised maintenance and forward renewal programmes of works

(c) cost plan 4 is not a one-off, but covers the iterative cost planning throughout the life of the building or constructed asset during the in use period (or the period of analysis)

(d) the cost checks are to be carried out against each pre-established cost target

(e) the rules for measuring, describing and quantifying renewal (R) and maintain (M) works shall be determined in accordance with Part 6 (Tabulated rules of measurement for elemental cost planning, i.e. group elements 0 to 8) of these rules

(f) where insufficient as-built maintenance information is available from which to quantify maintenance works (in accordance with the rules of measurement for elemental cost planning) then the quantity measured is to be the GIFA.

4.10.7 Maintenance contractor designed works:

(1) maintenance contractor designed works include any works that require the maintenance contractor to undertake their design, whether directly or via a work package subcontractor. Contractor designed work is sometimes referred to as the contractor designed portion

(2) elements, sub-elements and components for which the maintenance contractor is required to take responsibility for the design (such as replacement windows, roof trusses and/or mechanical and electrical engineering services) shall be identified and described separately in the cost plan as 'contractor designed works'

(3) the rules for dealing with contractor designed work, where design liability for the entire of the buildings life is to be transferred to the maintenance contractor, are covered in paragraph 3.12 (consultants' and specialist fees) of these rules.

4.11 Calculating annualised costs for maintenance works

4.11.1 The methods of calculating annualised costs for both renewal (R) and maintain (M) works are addressed in Part 5 (Calculation of annualised costs for renewal (R) and maintain (M) works) of these rules.

4.12 Unit rates used to cost renewal and maintain works

4.12.1 The unit rates, including elemental unit rates (EURs) and composite unit rates, used to estimate the total costs of building maintain (M) and renewal (R) works are to include the cost of all materials (including consumables and spares), labour, and plant and equipment that are specifically required to perform the maintenance work items. Costs are also to include any subcontractor's management and administration costs, sub-contractor's overheads and profit, consultants' design fees and risk allowances.

4.12.2 Unit rates used to estimate the cost of maintenance works (i.e. renewal (R) and maintain (M) works estimates) are to exclude maintenance contractor's management and administration, maintenance contractor's overheads and profit, and other allowances (such as project-specific costs/consultants' and specialists' fees, employer-definable maintenance-related costs, risk allowances and where applicable, inflation). These items are to be assessed separately and added to the building maintenance works estimate.

4.12.3 When using unit rates from cost analyses and benchmark analyses, care should be taken to ensure that such rates have been adjusted to reflect prices current at the time the cost plan is prepared (i.e. adjusted to remove allowances included for inflation). See paragraph 3.19 in these rules.

4.13 Updating unit rates and other costs to current estimate base date

4.13.1 The estimate base date is to be re-established for each formal cost plan. Therefore, it is essential that unit rates (and other rates) used in the preceding order of estimates and formal cost plans are updated to bring them into line with the estimate base date established for the next formal cost plan.

4.13.2 To do this, the unit rate (or other rate) is increased/decreased by the amount of inflation or deflation occurring during the period from the previous estimate base date to the current estimate base date. The equation for calculating the updated unit rate is therefore:

$$Ra2 = Ra1 + (Ra1 \times p)$$

where:

Ra1 = unit rate (or other rate) at previous estimate base date

Ra2 = unit rate (or other rate) at current estimate base date

p = percentage addition/reduction for inflation

The percentage addition/reduction for inflation or deflation (p) can be computed using published indices (i.e. tender price indices for maintenance works, the building maintenance cost profiles or retail prices indices. Alternatively, the percentage addition/reduction can be derived from in-house sources of indices. Using published indices, the equation for calculating the percentage addition/reduction for inflation/deflation is therefore:

$$p = \frac{(\text{Index 2} - \text{Index 1}) \times 100}{\text{Index 1}}$$

where:

Index 1 = index at base date of cost data

Index 2 = index at current estimate base date

p = percentage addition/reduction for inflation

Note: care should be taken not to update previous rates that were based on percentage additions/reductions (e.g. for maintenance contractor's management and administration costs, maintenance contractor's overheads and profits, and consultants' fees). Such items will be updated when the percentage addition/reduction is applied to the updated unit rates (and other rates). Similarly, updating percentages are not to be applied to items for which fixed costs have been agreed (e.g. consultants' fees where based on a fixed lump sum).

4.14 Measurement rules for maintenance contractor's management and administration costs

4.14.1 Maintenance contractor's management and administration cost estimates are a cost significant element in most maintenance works contracts. The cost checking of these charges is an iterative process that is repeated for each formal cost plan.

4.14.2 The methods of estimating the management and administration cost estimate will vary according to the RIBA Work Stage or OGC Gateway reached. To begin with, for formal cost plan 1 (prepared for RIBA Work Stage C: Concept or OGC Gateway 1: Business Justification), the estimated cost will be based on a percentage addition derived from a properly considered assessment of cost analyses of previous similar maintenance contracts. However, as more information becomes available, a more detailed approach to cost checking the cost target for maintenance contractor's management and administration costs is to be taken.

4.14.3 When preparing formal cost plans 2 and 3 (i.e. at RIBA Work Stages D, E, and F or at OGC Gateways 3A and 3B), to ensure that the previous cost target was sufficient, it is essential that thorough cost checks are carried out on cost significant items of maintenance contractor's management and administration costs. To facilitate the cost checking process, it is recommended that the checklist of charges included in these rules of measurement is used as an aide memoire

4.14.4 Where the estimated cost of maintenance contractor's management and administration charges, or any part of these charges, is to be based on a percentage addition, the estimated cost is to be calculated by applying the selected percentage addition for the charges to the cost of the building works estimate. The equation for calculating the total estimated cost of maintenance contractor's management and administration charges is therefore:

For Renewal (R) works:

$c2 = r \times p2$

where:

r = renewal works estimate (i.e. total estimated cost of forward renewal works)

p2 = percentage for maintenance contractor's management and administration costs

c2 = maintenance contractor's management and administration cost estimate (i.e. total estimated cost of maintenance contractor's management and administration costs)

For Maintain (M) works:

$c1 = m \times p1$

where:

m = maintenance works estimate (i.e. total estimated cost of maintenance works)

p1 = percentage for maintenance contractor's management and administration costs

c1 = maintenance contractor's management and administration cost estimate (i.e. total estimated cost of maintenance contractor's management and administration costs).

4.14.5 Alternatively, the estimated cost of all or part of the maintenance contractor's management and administration charges for either or both maintain (M) works and life cycle renewal (R) works can be assessed as a lump sum.

4.14.6 The maintenance contractor's management and administration charges estimate is added to the annualised maintenance works estimate or periodic renewal works estimate, as appropriate.

4.14.7 Allowance for subcontractor's management and administration charges is to be made in the unit rates applied to measured quantities.

4.14.8 It is recommended that the allowance for maintenance contractor's management and administration charges is treated as a separate cost target.

4.15 Measurement rules for maintenance contractor's overheads and profit

4.15.1 When preparing a cost estimate for maintenance contractor's overheads and profit, it can be either combined as a single cost centre or treated as two separate cost centres (i.e. one for overheads and the other for profit). Maintenance contractor's overheads and profit are to be based on a percentage addition. The estimated cost of any overheads and profit is to be calculated by applying the selected percentage addition to the combined total cost of the renewal (R) and maintain (M) works estimates and the maintenance contractor's management and administration charges estimate.

4.15.2 Where maintenance contractor's overheads and profit are to be combined as a single cost centre, the equation for calculating the total estimated cost of maintenance contractor's overheads and profit is:

$$e = (Rc + Mc + c) \times p$$

where:

Rc = renewal (R) works estimate (i.e. the total estimated cost of renewal (R) works)

Mc = maintain (M) works estimate (i.e. the total estimated cost of maintain (M) works)

c = maintenance contractor's management and administration costs estimate (i.e. the total estimated cost of maintenance contractor's management and administration costs)

p = percentage for maintenance contractor's overheads and profit

e = maintenance contractor's overheads and profit estimate (i.e. the total estimated cost of the maintenance contractor's overheads and profit)

4.15.3 The percentage addition to be applied for combined maintenance contractor's overheads and profit is to be derived from a properly considered assessment of maintenance contractor's overheads and profit found on previous maintenance projects.

4.15.4 The maintenance contractor's overheads and profit estimate is added to the combined total of the maintenance works estimate and the maintenance contractor's management and administration estimate. This gives the works cost estimate. The equation for calculating the works cost estimate is therefore:

$$d = a + b + c$$

where:

a = maintenance estimate (renewal and maintain)

b = maintenance contractor's management and administration charges estimate

c = maintenance contractor's overheads and profit estimate

d = maintenance works cost estimate

4.15.5 Where maintenance contractor's overheads and profit are to be treated as two separate cost centres, the equations for calculating the total estimated cost of maintenance contractor's overheads and profit are as follows:

(1) For maintenance contractor's overheads:

$$d = (a + b) \times c$$

where:

a = maintenance estimate (i.e. total estimated cost of maintenance works)

b = maintenance contractor's management and administration charges estimate (i.e. total estimated cost of maintenance contractor's management and administration charges)

c = percentage for maintenance contractor's overheads

d = maintenance contractor's overheads estimate (i.e. total estimated cost of maintenance contractor's overheads)

(2) For maintenance contractor's profit:

$$d = (a + b) \times c$$

where:

a = maintenance estimate (i.e. total estimated cost of maintenance works)

b = maintenance contractor's management and administration charges estimate (i.e. total estimated cost of maintenance contractor's management and administration charges)

c = percentage for maintenance contractor's profit

d = maintenance contractor's overheads estimate (i.e. total estimated cost of maintenance contractor's profit)

4.15.6 The percentage addition to be applied for maintenance contractor's overheads and maintenance contractor's profit are to be derived from a properly considered assessment of maintenance contractor's overheads and profit found on previous maintenance works contracts.

4.15.7 The separate maintenance contractor's overheads and profit estimates are added to the combined total of the renewal (R) works estimate, the maintain (M) works estimate and the maintenance contractor's management and administration charges estimate. This gives the maintenance cost estimate. The equation for calculating the maintenance cost estimate is therefore:

$$m = Rc + Mc + c + e$$

where:

Rc = renewal (R) works estimate (i.e. the total estimated cost of renewal (R) works)

Mc = maintain (M) works estimate (i.e. the total estimated cost of maintain (M) works)

c = maintenance contractor's management and administration costs estimate (i.e. the total estimated cost of maintenance contractor's management and administration costs)

e = maintenance contractor's overheads and profit estimate (i.e. the total estimated cost of the maintenance contractor's overheads and profit)

m = maintenance cost estimate

4.15.8 It is recommended that the allowances for maintenance contractor's overheads and profit are treated as either a single cost target or two separate cost targets.

4.16 Measurement rules for consultants' and specialists' fees

4.16.1 Consultants' and specialists' fees are associated with the maintenance works during the pre-construction work stages and for the employment of consultants, or specialist contractors, to advise on and manage the procurement and implementation of maintenance programmes of works or subcontracts, or to execute specialist maintenance works and/or inspections and audits.

4.16.2 A list of typical consultants' and specialists' fees is included in Part 6 (Tabulated rules of measurement for elemental cost planning, group element 11: Consultants' and specialists' fees) of these rules. The tables are intended for use by the quantity surveyor/cost manager to assist in the cost estimating and cost checking process. These examples do not provide a definitive or exhaustive list of items, but are simply a guide.

4.16.3 Consultants' and specialists' fees are to be included in cost plans unless specifically excluded at the request of the employer.

4.16.4 Calculation of the consultants' and specialists' fees estimate is as follows:

(1) the estimated cost of consultants' and specialists' fees is to be calculated by applying the selected percentage addition for these fees to the maintenance cost estimate (i.e. the combined total of the renewal (R) works estimate, the maintain (M) works estimate, the maintenance contractor's management and administration charges and the maintenance contractor's overheads and profit estimate). The equation for calculating the consultants' and specialists' fees is therefore:

$$c = m \times p$$

where:

m = maintenance cost estimate

p = percentage for consultants' and specialists' fees

c = consultants' and specialists' fees estimate (i.e. total estimated cost of consultants' specialists' fees)

(2) the percentage addition to be applied for consultants' and specialists' fees is to be derived from a properly considered assessment of these fees on similar previous maintenance projects

(3) where actual consultants' and specialists' fees are known (e.g. for the consultant creating the asset register), the actual fee is to be included in the cost plan. Any compensating adjustments are to be made to the applicable cost targets.

4.17 Measurement rules for other employer-definable maintenance-related costs

4.17.1 Other employer-definable maintenance-related costs are those not necessarily directly associated with the maintenance works costs or consultants' fees. They form part of the total cost of maintenance to the employer (e.g. training, insurances, statutory fees, fees in connection with party wall awards, decanting and relocation costs, move costs, procurement and mobilisation costs incurred by the employer and other project-specific items identified by the parties).

4.17.2 Other maintenance-related costs are to be included in the cost plan, unless specifically excluded at the request of the employer. Other maintenance-related costs are to be added as lump sum allowances. Examples are provided in Part 6 (Tabulated rules of measurement for elemental cost planning, group element 12: Employer definable maintenance-related costs) of these rules. These examples do not provide a definitive or exhaustive list of items, but are simply a guide.

4.17.3 The nature of other project-related maintenance costs, and the extent of the lump sum allowance to be included in the cost plan estimates, are to be ascertained in conjunction with the employer.

4.17.4 The total estimated cost of other project-related maintenance costs is added to the combined total of the maintenance works estimate and the agreed 'in scope' costs identified as other project related items of costs.

4.18 Measurement rules for risk

4.18.1 Risk allowances, based on the results of a formal risk analysis, are to be included in each formal cost plan. Risk allowances are to reflect the employer's risk exposure. In setting the amount of the risk allowances, the possible consequences of the employer's residual risk should be taken into account. The only satisfactory way to ensure that risk allowances provide for the risks to the project is to determine the size of the allowances from the results of a risk analysis. Risk allowances are not to be standard percentages, but a properly considered assessment of the risks, taking account of the completeness of the design and other uncertainties.

4.18.2 The need to undertake a formal risk analysis to identify the employer's risk exposure and to make considered risk allowances for risks is explained in section 'Measurement rules for risk', in Part 3 paragraph 3.14.

4.18.3 Risk registers and risk estimates are to be reassessed at regular intervals throughout the various RIBA Work Stages and OGC Gateways to ensure that estimates, formal cost plans and cash flows realistically reflect the potential impact of any residual risks.

4.18.4 Successive assessments are to show decreasing risk due to reduced uncertainty due to the increasing definition of the project itself and the decisions that are made as the project progresses. However, it should be noted that risk does not always decrease.

4.18.5 It is recommended that risk allowances are treated as four separate cost targets that are used to 'top up' other overspending cost targets as the project progresses. As an element overruns its cost target, a transfer is made from the appropriate risk allowance to allow for the increase. Similarly, if a cost target is likely to under run, the surplus is transferred into the appropriate risk allowance. The recommended cost targets are:

(1) design development and associated installation risks
(2) maintenance risks (unplanned/unscheduled) risks
(3) employer change risks
(4) employer other risks.

Note: see paragraph 3.14 (Risk allowances) in Part 3 (Measurement rules for order of cost estimating (renewal and maintain) of these rules for definitions of the above categories of risk allowance. Examples of risks are provided in Part 6: Tabulated rules of measurement for cost planning (Group element 13: Risks). These examples do not provide a definitive or exhaustive list of items, but are simply a guide.

4.18.6 Where any allowances for design development and associated installation risks, maintenance risks (unplanned/unscheduled), employer change risks and employer other risks are to be based on a percentage addition, the allowances are to be calculated by multiplying the base cost estimate by the selected percentage additions. The equations for calculating the allowances for these risks are therefore:

for design development and associated installation risks: $R1 = a \times p1$

for maintenance risks (unplanned/unscheduled) risks: $R2 = a \times p2$

for employer change risks: $R3 = a \times p3$

for employer other risks: $R4 = a \times p4$

where:

a = base cost estimate

p1 = percentage risk allowance for design development and associated installation risks.

p2 = percentage risk allowance for maintenance risks (unplanned/unscheduled) risks.

p3 = percentage risk allowance for employer change risks

p4 = percentage risk allowance for employer other risks

R1 = risk allowance estimate for design development and associated installation risks (i.e. total estimated cost of risk allowance for design development and associated installation risks)

R2 = risk allowance estimate for maintenance risks (unplanned/unscheduled) risks (i.e. total estimated cost of risk allowance for maintenance risks (unplanned/unscheduled) risks.)

R3 = risk allowance estimate for employer change risks (i.e. total estimated cost of risk allowance for employer change risks)

R4 = risk allowance estimate for employer other risks (i.e. total estimated cost of risk allowance for employer other risks).

4.18.7 The equation for calculating the total risk allowance estimate is therefore:

RA = R1 + R2 + R3 + R4

4.18.8 The risk allowance estimate is added to the base cost estimate. This gives the proposed cost limit (excluding inflation). The equation for calculating this is therefore:

CL = a + b

where:

a = base cost estimate

b = risk allowances estimate

CL = cost limit (excluding inflation)

4.19 Measurement rules for inflation

4.19.1 The rules for measuring the potential effects of inflation for cost planning are the same as those for order of cost estimating. See paragraph 3.15 (Measurement rules for Inflation) of these rules.

4.20 VAT assessment

4.20.1 In the UK, capital allowances are given against the net capital cost to the taxpayer. Therefore, as VAT is part of that capital cost, employers will incur differing overall capital expenditure for the same item depending on whether they can recover (fully or partially) the VAT.

4.20.2 VAT in relation to capital building works, and maintenance and replacement works is a complex area. Therefore, it is recommended that VAT is excluded from cost plans.

4.20.3 It is recommended that specialist advice is sought on VAT matters to ensure that the correct rates are applied to the various aspects of the building maintenance works. Notwithstanding this, if required by the employer, provision for VAT assessment can be incorporated into the cost plan.

4.21 Other considerations

4.21.1 Other considerations include:

(1) capital allowances for taxation purposes
(2) grants and energy tariffs and carbon reduction commitments
(3) defects and warranty liabilities
(4) availability and non-performance penalties.

Note: asset depreciation and write-downs are not covered by these rules.

4.21.2 Taxation allowances, taxation relief and grants can provide valuable financial aid to an employer on certain types of building, as well as on maintenance and replacement programmes. However, due to the complexity of, and constantly changing, legislation, it is recommended that specialist advice is sought to maximise the availability and quantum of taxation allowances, taxation relief and grants. For that reason, unless specifically requested by the employer, it is recommended that these allowances are excluded from cost plans.

4.21.3 **Grants** – these provide valuable, and possibly significant, financial aid to funding certain types of building maintenance works. It is recommended that specialist advice is sought to maximise the availability and quantum of the grants.

4.21.4 **Defects and warranty liabilities** – these are outside the scope of these rules.

4.21.5 **Availability and non-performance penalties** – these may be applied during the execution of the maintenance works and are often a contract condition, which entitles the employer to make deductions to payment to the maintenance contractor for not performing some of the contracted maintenance services. It is recommended that these are excluded from the order of estimates and elemental cost planning.

4.22 Present value, inflation and discounting methods

4.22.1 The rules for dealing with present value and discounting for cost planning are the same as those of order of cost estimating. See paragraph 3.19 (Present value, inflation and discounting) at Part 3 (Measurement rules for order of cost estimating (renewal and maintain)) of these rules.

4.23 Reporting of maintenance cost plans

4.23.1 Costs are to be expressed as 'cost/m^2 of GIFA/pa' and in 'functional unit cost/m^2/pa' (e.g. cost per primary school). See Appendix C for common functional types.

4.23.2 Where appropriate and/or required by an employer, costs may be expressed as cost/ft^2 of GIFA, or cost per functional unit (or functional unit cost), as an alternative, or in addition, to the cost/m^2 of GIFA. The functional unit may be an employer-defined unit. It is essential, therefore, that the functional unit is clearly identified when costs are expressed in this way. See Appendix C for types of functional units

4.23.3 Items included and excluded from the estimated cost are to be clearly communicated to the employer when reporting renewal (R) or maintain (M) and/or the combined maintenance cost plans (R&M).

4.23.4 Typical items to be included in maintenance cost plan reports are as follows:

(1) executive summary
(2) project title
(3) project description
(4) status of cost plan
(5) a statement of cost (including cost limit)
(6) details of the information and maintenance standards on which the cost plan was prepared; recording any key assumptions and exclusions (i.e. items out of scope)
(7) a statement of the floor areas
(8) the cost plan
(9) basis of cost estimates (i.e. assumptions)
(10) estimate base date (i.e. to which inflation/discounting, has been applied)
(11) reasons for changes to previous cost targets (explaining the transfers and adjustments that have taken place against the previous cost plan)
(12) value engineering option appraisals (e.g. lowest whole life costing, build specification v maintenance)
(13) estimated costs of, and a request for decisions on, any alternative proposals
(14) cash flow forecast, where appropriate

(15) inclusions and exclusions (i.e. a statement of what is included in and excluded from the order of cost estimate or elemental cost plans)
(16) others as relevant to renewal (R) or maintain (M) and/or the total combined maintenance cost plans (R&M) over the period of analysis
(17) risk and sensitivity analysis (optional)
(18) input into wider sustainability/environmental assessments (i.e. carbon reduction; BREEAM)
(19) input into wider life cycle costing or whole life cycle costing economic evaluations.

Note: see Appendix I and J that provides standard templates for cost reporting and analysis.

4.24 Analysis, collection and storage of maintenance cost data

4.24.1 NRM 3 can be used as a basis for measuring elemental and/or asset-specific cost planning of renewal (R) and maintain (M) works and also creating elemental unit rates (EUR) and elemental unit quantities (EUQ) for preparing detailed cost analysis of the maintenance works.

4.24.2 The cost data generated by the maintenance cost planning can be retrieved, analysed and stored and reprocessed in various ways (e.g. as distinct rates, detailed elemental cost analyses, elemental unit rates (EUR), cost/m^2 per annum of GIFA, and/or functional unit rates) for use in order of estimating and elemental cost plans. It can also be used for benchmarking purposes.

4.24.3 Asset-specific renewal (R) and maintain (M) post practical completion, make available the best sources of real-time cost data, which can be used by quantity surveyors/cost managers to provide evidence-based cost advice on the likely cost of future maintenance and life cycle repairs and replacement works. Moreover, they afford a complete cost model for the 'maintain and life cycle renewal' and/or the combined total maintenance costs.

4.24.4 There are four levels of analysis of maintenance costs information collected for renewal (R) and maintain (M) works as follows:

(i) Total building
(ii) Group element (concise)
(iii) Detailed element (detailed)
(iv) Sub element (amplified)

Total building analysis will provide the following: building (sum of elements 0 to 7); external works (element 8): maintenance admin, overhead/profit (sum of elements 9-10): consultant/specialist fees (11), employer definable maintenance related works (12); risks (13).

Group element analysis will provide concise maintenance costs for the following; facilitating works (0); substructures (1); superstructures (sum of elements 2); finishes (sum of elements 3); fittings, furnishings and equipment (sum of element 4); services (sums of element 5); works to existing building (sum of elements 7); external works (sum of elements 8); maintenance management and admin costs and overhead/profit (sum of elements 9 and 10); consultant/ specialist fees (sum of element 11); Employer definable maintenance related works (sum of element 12); risk (sum of element 13).

Detailed element analysis will collect and present the costs for each element separately. Sub element analysis will collect and present the costs for each sub element separately – for instance where there is more than one specification for a single sub element the costs should be shown separately.

Where the consultants and specialist fees and employer definable other maintenance related works costs are available they should be stated and not form part of the building cost analysis.

Ancillary information and the specification details should be provided with the level of detail cost analysis in accordance with the principles of cost analysis (as defined in the BCIS *Standard form of cost analysis*).

Part 5: Calculation of annualised costs for renewal (R) and maintain (M) works

Part 5: Calculation of annualised costs for renewal (R) and maintain (M) works

5.1 Introduction

5.1.1 This part of the rules describes a method of calculating annualised costs for renewal (R) and maintain (M) works. It also explains the methodology for generating life cycle cost plans and various metrics used for life cycle cost analysis and the benchmarking of maintenance works.

5.2 Calculating annualised costs of renewal (R) work items from a capital building works cost plan

5.2.1 The information and data required, and the method of calculating the cost per annum of renewal (R) works tasks, which is generated from a capital building work cost plan, is set out in Table 5.1 below.

Table 5.1: Data table for calculating the cost of renewal (R) works tasks

Cost Data Structure				Capital Building Works Cost Plan Data				Quantification of Renewal (R) Works						Event Cycle			Renewal (R) Costs				
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)	(v)
Group Element	Element	Sub-element	Component	Component Specification	Quantity	Unit of Measurement	Construction Unit Rate	In Renewal (R) Plan Scope	Renewal (R) Descriptor	Action Required	Scale of Renewal (R)	Renewal (R) Quantity	Renewal (R) Unit of Measurement	Reference Service Life (RSL)	Life Factor	Interval	Adjustment to Construction Unit Rate	Renewal Uplift	Renewal (R) Unit Rate	Cost Per Event	Total Renewal (R) Cost

Notes on Table 5.1

Columns (a) to (d): **Cost Data Structure**: these are used to define the group elements, elements, sub-elements and components are defined by and are taken directly from the NRM 1 cost data structure.

Columns (e) to (h): **Capital Building Works Cost Plan Data**: these are used to define the data relating to components extracted from the capital building works cost plan.

Columns (i) to (n): **Quantification of Renewal (R) Works**: these are used to define the elements, sub-elements and components subject to renewal (R) works and to define the nature and extent of renewal (R) works.

Columns (o) to (q): **Event Cycle**: these are used to define the interval at which renewal (R) works task are to be carried out.

Columns (r) to (v): **Renewal (R) Costs**: are used to specify the unit rate to be applied to the renewal (R) works task, the cost for each time the task is completed, and its total cost for the period of analysis.

Table 5.1 is to be completed as follows:

Cost Data Structure:	
Column (a): Group element:	Insert the group element descriptor.
Column (b): Element:	Insert the element descriptor.
Column (c): Sub-element:	Insert the sub-element descriptor.
Column (d): Component:	Insert the component descriptor.
	Note on columns (a) to (d): The descriptors, which are defined in NRM 1 and NRM 3, are extracted from the capital building works cost plan.
***Capital Building Works Cost Plan Data*:**	
Column (e): Component specification:	Insert the specification of the component.
Column (f): Quantity:	Insert the total quantity of the component in the building, or other built asset.
Column (g): Unit of measurement:	Insert the unit of measurement (i.e. nr, m, m^2, m^3 or item).
Column (h): Construction unit rate:	Insert the unit rate for building/installing the component (i.e. cost per nr, m, m^2, m or item).
	Note on columns (e) to (h): This information is to be extracted from the capital building works cost plan.
***Quantification of Renewal (R) Works*:**	
Column (i) In Renewal (R) plan scope:	State if the component from the capital building works cost plan is to be included in the scope of renewal (R) costs.
	Insert 'Yes' or 'No' as applicable.
Column (j): Renewal (R) descriptor:	Insert the renewal descriptor of the component that is to be renewed (R) as defined in Part 6 (Tabulated rules of measurement for elemental cost planning) of these rules.
Column (k): Action required:	Specify the nature of the works to be completed in connection with the renewal (R) works.
Column (l): Scale of renewal (R):	Specify the extent of renewal (R) works to be completed in connection with the component, in terms of a percentage (e.g. 10%, 15%, 20%, 25%, 50% or 100%). For example, internal doors replaced every X years and ironmongery renewed Y years.
	Note: The 'scale of renewal' is sometimes referred to as the 'limit of renewal'.
Column (m): Renewal (R) quantity:	Insert the renewal (R) quantity work to be undertaken. The calculation is: Renewal (R) Quantity = Quantity (column f) × Scale of renewal (R) (column l)
Column (n): Renewal (R) unit of measurement:	Insert the unit of measurement (i.e. nr, m, m^2, m or item).
Event Cycle:	
Column (o): Reference service life (RSL):	Assign a reference service life to the renewal (R) work item.

Note: Reference service life data can be derived from sources such as CIBSE *Guide M*, BCIS *Life Expectancy of Building Components* or client/consultant and other specific data sources.

Column (p): Life factor:	Insert life factor adjustments to the reference service life to take into account of any factors that may affect the frequency of renewal (R) (i.e. hours in use, material quality, environment, usage, location, etc). This can be expressed as a percentage or as a fraction as indicated in Table 5.2 below.
Column (q): Interval:	Insert the interval of renewal (R) for the component. The calculation for this is: Interval = RSL (column (o)) × Life Factor (column (p)) For example: RSL = 25 years Life factor = 80% (or 0.80) Interval = 20 years (25 years × 80%) Therefore, renewal (R) of the component is required in year 20 or at each 20 cycle (e.g. Year 20, Year 40, etc.).
Renewal (R) Costs:	
Column (r): Adjustment to construction unit rate:	Insert, as a percentage, the proportion of the construction unit rate that reflects the actual renewal (R) works undertaken. Example 1: A percentage split can be applied to the construction unit rate to reflect situations where a component is made up of various sub-components with different lives. For example, external doors may be split 80% door and frame, 15% ironmongery and 5% seals. Example 2: A percentage adjustment can be applied to the Construction unit rate in instances where the cost of renewal is less than construction. For example, the number of coats of paint for redecorations is likely to be less than that required at construction.
Column (s): Renewal uplift:	Insert the renewal uplift to the Construction unit rate in terms of a percentage. This uplift is to take into consideration the costs relating to the renewal process (e.g. access, removal of existing asset, disposal, making good, preparing to receive new, working within an existing building, subcontractor's preliminaries, subcontractor's overheads and profit).
Column (t): Renewal unit rate:	Insert the rate to be applied to each renewal (R) works task. The rate is generally calculated using the Construction unit rate. The calculation for this is: Renewal unit rate = Construction unit rate (column (h)) × Adjustment to construction unit rate (column r) × (1 + Renewal uplift (column s) **Note:** The Renewal (R) unit rate can also be generated using alternative rate built ups, such as those taken from schedule of rates, renewal quotations, etc.
Column (u): Cost per event:	Insert the cost per event. The calculation for this is: Cost per event = Renewal (R) quantity (column (m)) × Renewal (R) unit rate (column (t) **Note:** Any adjustment for inflation/indexation to the renewal (R) unit rate can be carried out here (see rules on inflation in paragraph 4.14).
Column (v): Total renewal (R) cost:	Insert the total renewal (R) cost for the period of analysis. The calculation for this is: Total renewal (R) cost = Cost per event (column (u) × Number of occurrences during the period of analysis.

5.3 Reference service life, life factors and predicted life calculations

5.3.1 Reference service life (RSL):

(1) the RSL is the service life that a building, other built asset, parts of a building, maintainable asset type or component would expect (or is predicted) to have in a certain (reference) set of in use conditions. The end of service occurs at the period after installation when a building or its part no longer meets performance requirements and when physical failure is possible and/or when it is no longer practical or economical to continue with corrective maintenance.

(2) sources of data for RSLs include:

(a) BCIS publication *BMI Life Expectancy of Building Components*

(b) Maintenance Engineering and Management CIBSE *Guide M*

(c) Building Research Establishment (BRE)

(d) component manufacturers' data sheets

(e) operating and maintenance manuals (project-specific data sheets).

5.3.2 Life factor:

(1) life factors are those used to predict the life expectancy of an element, component or a sub-component. There are a number of life factors used to define the life expectancy of an element, sub-element, or components. For example, quality of components, design level, work standard, indoor environment, exterior environment, in use condition and maintenance level.

(2) typical types of life factors are available from sources in the Bibliography. These are to be considered when assessing the life expectancy of elements, sub-element, or components which should be used to adjust the RSL to a predicted life expectancy that suits the project situation, using the life factoring method.

5.3.3 Predicted life expectancy of elements, components and sub-components

(1) Table 5.2 illustrates a method of collating life factor data and calculating the predicted life of elements, components or sub-components (e.g. a window).

Table 5.2: Example of a reference service life factor table for windows

Reference Service Life (RSL) of Windows from published source			
Factors	**References service life assumptions**	**Project conditions**	**Factors**
Quality of components	Average	High quality spec	1.1
Design level	Not known	Average	1
Work standard	Good practice	Good practice	1
Indoor environment	Not relevant	Not relevant	1
Exterior environment	UK average	West coast Scotland	0.8
In-use conditions	External envelope	External envelope	1
Maintenance level	Regular cleaning	No cleaning	0.8
Overall factor	1		0.704
References service life		Project life	
years	25	**years**	**18**

(2) by using the individual life factors from the table, the 'overall life factor' is calculated by cumulatively multiplying each individual life factor. The calculation for overall life factor is as follows:

$$OLF = LF1 \times LF2 \times LF3 \ldots \times LFn$$

where:

LF1 = first life factor
LF2 = second life factor
LF3 = third life factor
LFn = last life factor
OLF = overall life factor

(3) the predicted life is calculated by multiplying the overall life factor by the RSL. The calculation for predicted life is as follows:

$$PL = OLF \times RSL$$

where:

OLF = overall life factor
RSL = reference service life
PL = predicted life

Considering the data in Table 5.2 above, the predicted life is

$PL = 0.704 \times 25 = 17.6$ years (say 18 years)

5.4 Calculating annualised costs of renewal (R) work items from as-built and/or asset registers and condition data

5.4.1 The information and data required and the method of calculating renewal (R) works costs, ascertained from as-built or other record information (e.g. asset register, condition survey reports, technical inspection, PARL assessment or other as-built records), is set out in Table 5.3 below.

Table 5.3: Data table for calculating the cost of renewal (R) works tasks using as-built information (e.g. from an asset register and condition surveys/PARL assessments)

Cost Data Structure				Built Asset Data			Quantification of Renewal (R) Works								Event Cycle			Renewal (R) Costs		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)
Group Element	Element	Sub-element	Component	Component Specification	Quantity	Unit of Measurement	In Renewal (R) Plan Scope	Renewal (R) Descriptor	Condition Asset Rating	Action Required	Scale of Renewal (R)	Renewal (R) Quantity	Renewal (R) Unit of Measurement	Asset Remaining Life (PARL)	Reference Service Life (RSL)	Life Factor	Interval	Renewal (R) Unit Rate	Cost Per Event	Total Renewal (R) Cost

Notes on Table 5.3:

Columns (a) to (d): **Cost Data Structure**: these are used to define the group elements, elements, sub-elements and components defined by the NRM 1 cost data structure.

Columns (e) to (g): **Built Asset Data:** these are used to define the data relating to components extracted from the asset register, condition survey reports, inspections and other as-built records.

Columns (h) to (o): **Quantification of Renewal (R) Works:** these are used to define the elements, sub-elements and components subject to renewal (R) works, to specify the condition of the component and to define the nature and extent of renewal (R) works.

Columns (p) to (r): **Event Cycle:** these are used to define the interval at which the renewal (R) works task is to be carried out.

Columns (s) to (u): **Renewal (R) Costs:** these are used to specify the unit rate to be applied to the renewal (R) works task, the cost for each time the task is completed and its total cost for the period of analysis.

Table 5.3 is to be completed as follows:

Cost Data Structure:	
Column (a): Group element:	Insert the group element descriptor.
Column (b):Element:	Insert the element descriptor.
Column (c): Sub-element:	Insert the sub-element descriptor
Column (d): Component:	Insert the component descriptor.
	Note on columns (a) to (d): The descriptors, which are defined in NRM 1 and NRM 3, are extracted from the capital building works cost plan.
Built Asset Data:	
Column (e): Component specification:	Insert the specification of the component.
Column (f):Quantity:	Insert the total quantity of the component in the building, or other built asset.
Column (g): Unit of measurement:	Insert the unit of measurement (i.e. nr, m, m^2, m^3 or item).
	Note on columns (e) to (g): This information is to be extracted from the built asset data.
Quantification of Renewal (R) Works:	
Column (h) In Renewal (R) plan scope:	State if the component from the built asset is to be included in the scope of renewal (R) cost plan. Insert 'Yes' or 'No' as applicable.
Column (i): Renewal (R) descriptor:	Insert the renewal descriptor of the component that is to be renewed (R) as defined in Part 6 (Tabulated rules of measurement for elemental cost planning) of these rules.
Column (j): Condition asset rating:	Extract the condition asset rating for each of the components from the condition survey report.
Column (k): Action required:	Specify the nature of works to be completed in connection with the renewal (R) works.
Column (l): Scale of renewal (R):	Specify the extent of renewal (R) works to be completed in connection with the component, i.e. in terms of a percentage (e.g. 10%, 15%, 20%, 25%, 50% or 100%).
	Note: The 'scale of renewal' is sometimes referred to as the 'limit of renewal'.
Column (m): Renewal (R) quantity:	Insert the renewal (R) quantity work to be undertaken. The calculation for this is: Renewal (R) quantity = Quantity (column f) × Scale of renewal (R) (column l)
Column (n): Renewal (R) unit of measurement:	Insert the unit of measurement (i.e. nr, m, m^2, m^3 or item).
Column (o): Asset remaining life:	Extract the asset remaining life (1st intervention) for each of the components as determined from the condition survey report.
Event Cycle:	
Column (p): Reference service life (RSL):	Assign a reference service life to the renewal (R) works item.

Notes: Reference service life data can be derived from sources such as CIBSE *Guide M*, BCIS *Life Expectancy of Building Components* and/or client and consultant and product supplier's specific data.

Column (q): Life factor:	Insert life factor adjustments to the reference service life to take into account of any factors that may affect the frequency of renewal (R) (i.e. hours in use, material quality, environment, usage, location, etc). This can be expressed as a percentage or as a fraction.
Column (r): Interval:	Insert the interval of renewal (R) for the component. The calculation for this is: Interval = Reference service life (column (p)) × Life factor (column (q)) For example: RSL = 25 years Life factor = 80% (or 0.80) Interval = 20 years (25 years × 80%) Therefore, renewal (R) of the component is required in year 20 or at each 20 year cycle (e.g. Year 20, Year 40, etc).
Renewal (R) Costs:	
Column (s): Renewal (R) unit rate:	Insert the unit rate to be applied to each unit of renewal (R) works task. The unit rate is to be at current price levels. The Renewal (R) unit rate is generally based on specific estimates, quotations or the like, taking into account the cost of undertaking renewal works in an existing building, e.g. removal/stripping out, disposal, redesign work, making good, access requirements (including access scaffolding), management of costs and allowances for out of normal hours working.
Column (t): Cost per event:	Insert the cost per event. The calculation for this is: Cost per event = Renewal (R) quantity (column (m) × Renewal (R) unit rate (column (s)) **Note:** Any adjustment for inflation/indexation to the renewal (R) unit rate can be carried out here
Column (u): Total renewal (R) cost:	Insert the total renewal (R) cost for the period of analysis. The calculation for this is: Total renewal (R) cost = Cost per event (column t) at 1st intervention + Cost per event (column t) × Number of occurrences during the period of analysis.

5.5 Calculating annualised costs of maintain (M) works from as-built and/or asset register and PPM task schedules

5.5.1 The information and data required, and the method of calculating the maintain (M) works costs. ascertained from as-built or other record information (e.g. from an asset register, condition survey reports, technical inspection, inspection or other as-built records), is set out in Table 5.4.

Table 5.4 provides a structured basis for the measurement and quantification, task timing, task skilling and costing of maintain (M) works.

Note: see B&ES publications for specific guidance and access to the applicable maintenance task specifications for building and engineering services (SFG20 – the accepted industry standard).

Table 5.4: Data table for calculating the annualised cost of maintain (M) works tasks from asset registers and task schedules

Cost data structure			Built asset data			Quantification of maintain (M) works										Event cycle		Task skilling by trade	Annual labour hours calculated by trade									
																			Trade 1		Trade 2		Trade […]		Trade X	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	Normal hours (s)	Out of hours working (t)	Normal hours (u)	Out of hours working (v)	Normal hours (w)	Out of hours working (x)	Normal hours (y)	Out of hours working (z)
Group element	Element	Subelement	Maintain descriptor	Component specification	Quantity	Unit of measure	In maintain (M) plan scope	Action required	Maintain (M) quantity	Maintain (M) unit of measurement	Task time (industry standard PPM time)	Amended task time (PPM time)	Access adjustment factor	Out of normal hours working	Task frequency	Interval	Trade description	Trade 1 – PPM task time in hours [=((l – o) × j × q) or ((m – o) × j × q) + 60]	Trade 1 – out of normal hours working: PPM task time in hours [= (o × j × q) + 60]	Trade 2 – PPM task time in hours [= ((l – o) × j × q) or ((m – o) × j × q) + 60]	Trade 2 – out of normal hours working: PPM task time in hours [= (o × j × q) + 60]	Trade […] – PPM task time in hours [= ((l – o) × j × q) or (m – o) × j × q) + 60]	Trade […] – out of normal hours working: PPM task time in hours [= (o × j × q) + 60]	Trade X – PPM task time in hours [= ((l – o) × j × q) or ((m – o) × j × q) + 60]	Trade X – out of normal hours working: PPM task time in hours [= (o × j × q) + 60]
Net total annual labour hours by trade																									
Reactive hours annualised (if in scope)																									
Site adjustment / access factor (%)																									
Gross total labour hours by trade																									
Trade labour rate (Normal working hours or out of normal working hours as applicable)																									
Total annualised trade labour cost															£										
Annualised consumables / plant and equipment															£										
Total annualised maintain (M) cost															£										

Source: The calculation template and rules of measurement for producing and annualised maintain costs plan from asset registers and SFG20 PPM task schedules has been reproduced with the permission of B&ES (formerly the HVCA).

Notes on Table 5.4:

Columns (a) to (d): **Cost Data Structure**: these are used to define the group elements, elements, sub-elements and components defined by the NRM 1 and NRM 3 cost data structure.

Columns (e) to (g): **Built Asset Data**: these are used to define the data relating to components extracted from the asset register, condition survey reports, technical inspection, inspection and other as-built records.

Columns (h) to (o): **Quantification of Maintain (M) Works**: these are used to define the elements, sub-elements and components subject to maintain (M) works, to specify the nature of the works, and to define the extent of the works.

Columns (p) to (q): **Event Cycle**: these are used to define the frequency and interval at which the maintain (M) works task is to be carried out.

Column (r): **Task Skilling by Trade**: this is used to specify the trade that is to carry out the maintain (M) works task.

Columns (s) to (z): **Annual Labour Hours Calculated by Trade**: these calculate, by trade, the number of hours required to complete the works. Both work to be undertaken during normal working hours and out of normal working hours are addressed.

Table 5.4 is to be completed as follows:

Cost Data Structure:	
Column (a): Group element:	Insert the group element descriptor.
Column (b): Element:	Insert the element descriptor.
Column (c): Sub-element:	Insert the sub-element descriptor.
	Note on columns (a) to (d): The descriptors, which are defined in NRM 3, are compiled from the built-asset data.
Built Asset Data:	
Column (e): Component specification:	Insert the specification of the component
Column (f): Quantity:	Insert the total quantity of the component to be maintained.
	Note on column (f): Quantities shall be measured in accordance with the tabulated rules of measurement in NRM 1 or, where different rules of measurement apply, in accordance with the tabulated rules of measurement in NRM 3.
Column (g): Unit of measure	Insert the unit of measure (i.e. nr, m, m^2, m^3 or item).
	Note on columns (e) to (g): This information is to be extracted from the built asset data.
Quantification of Maintain (M) Works:	
Column (h): In Maintain (M) Plan Scope:	State if the component is to be included in the scope of the maintenance programme. Insert 'Yes or 'No as applicable
Column (i): Action required:	Input the task code(s) relating to the work(s) to be completed in connection with the maintain (M) works.
Column (j): Quantity – Maintain (M):	Insert the total quantity of the component to be maintained.

Notes on column (j):
(1) Quantities shall be measured in accordance with the tabulated rules of measurement in NRM 1 or, where different rules of measurement apply, in accordance with the tabulated rules of measurement in NRM 3.
(2) Where the quantities of components to be maintained have been derived from asset survey reports then the quantities can be directly inserted. Where these have not been included in the asset survey report, the quantity surveyor/cost manager will be required to ascertain the quantity from record drawings or physically measure the works.

Column (k): Unit of measurement: Maintain (M):	Insert the unit of measurement (i.e. nr, m, m^2, m^3 or item).
Column (l): Task time:	Insert the industry standard (coalface) task time required (in minutes).
Column (m): Amended task time:	Insert the amended task time (in minutes) should the industry standard task time not reflect the actual work required.
Column (n): Access adjustment factor:	This is an option to insert an access adjustment factor on an individual asset basis, rather than just a site-wide adjustment.
Column (o): Out of normal hours working:	Insert the number of minutes required to undertake the task outside of normal working hours.
Event cycle:	
Column (p): Task frequency:	Specify how often the maintain (M) task is required to be carried out (e.g. weekly, monthly, yearly). **Notes on column (p):** (1) Sources of data for frequencies include: (1) B&ES (SFG20 standard task schedules) (2) BCIS *Occupancy cost plans* (3) Specialist maintenance works contractors. (4) Component manufacturers' data sheets. (2) Where applicable, apply a percentage adjustment to the task frequency to take into account factors that affect the frequency of repair or replacement (such as hours run, material quality, environment, usage, location, etc).
Column (q): Interval:	Insert the task frequency by number of occurrences per year.
Task Skilling by Trade:	
Column (r): Trade description:	Insert the type of maintenance contractor that is to complete the maintain (M) task.
Annual Labour Hours Calculated by Trade:	
Column headed: Trade 1:	Insert the title of the trade required
Column (s): Normal working hours:	Insert the number of normal working hours relating to the trade.
Column (t): Out of normal hours working:	Insert the number of out of normal hours relating to the trade.
Results:	
***Net Total Annual Labour Hours by Trade*:**	Calculate the sum of the working hours (both normal and out of hours) for each trade
***Reactive Hours Annualised (if in scope)*:**	Insert the hours (annualised) for unscheduled maintenance work by trade (if in scope).
***Site Adjustment/Access Factor (%)*:**	Insert the project-specific allowances for site-wide adjustments, such as access.
***Gross Total Labour Hours by Trade*:**	Insert the gross total labour hours by trade: The calculation for this is: Gross Total Labour Hours by Trade = Net Total Annual Labour Hours by Trade + Reactive Hours Annualised × (1 + Site Adjustment/Access Factor (%))
***Trade Labour Rate*:**	Insert the estimated/agreed hourly labour rates (normal working hours and out of working hours for each trade).
***Total Annualised Trade Labour Cost*:**	Insert and summarise the total annualised trade labour cost for each trade. The calculation this is: Total Annualised Trade Labour Cost = Gross Total Labour Hours by Trade × Trade Labour Rate.
***Annualised Consumables/Plant and Equipment*:**	Insert and summarise the project-specific cost allowances for annualised consumables/plant and equipment.

Total Annualised Maintain (M) Costs:	Insert the total annualised maintain (M) cost for each trade. The calculation for this is: Total Annualised Maintain (M) Costs = Total Annualised Trade Labour Cost + Annualised Consumables/Plant and Equipment.

5.6 Creating a life cycle cost plan integrating construct (C) with the renewal (R) and maintain (M) works

5.6.1 The rules of measurement for cost planning of renewal (R) and maintain (M) works can be used as a basis for compiling life cycle cost plans (LCCPs), or used to inform a wider life cycle cost plan or whole life cost plan or other economic evaluation, for a complete building or element/asset, as appropriate.

5.6.2 Report templates based on level 1 and level 2 codes are provided at Appendices I and J of these rules.

5.7 Metrics used for life cycle cost analysis and unit rate benchmarking of maintenance

5.7.1 Life cycle costs can be measured and reported using a variety of metrics, for example:

(1) whole building or elemental unit rate examples:
   (a) cost/m^2/per annum of GIFA or NIA (as applicable)
   (b) functional unit cost – by function types (see Appendix C)
   (c) cost per unit/year (e.g. per bed, per hotel room, per pupil, etc).

(2) system or element/asset or component unit rate examples:
   (a) £/kW/year (boilers)
   (b) £/point/year (sanitary ware)
   (c) £/lift.

(3) function unit rate example:
   (a) cost per bed space (hotels, houses)
   (b) cost per pupil (schools)
   (c) cost per functional types (e.g. offices, retail, prisons, stations, and many others).

5.7.2 Cost indexation for benchmarking and comparison can be derived by expressing the ratios of the functional maintenance index (FMI) and functional condition index (FCI), versus the capital reinstatement value or rebuild costs.

$$\textbf{Functional maintenance index (FMI)} = \frac{\text{Total cost of annualised maintain (M) works}}{\text{Capital reinstatement value (or rebuild cost)}} = \frac{\text{FMI(\%)}}{(100)}$$

$$\textbf{Functional condition index (FCI)} = \frac{\text{Total cost of life cycle renewal (R) works}}{\text{Capital reinstatement value (or rebuild cost)}} = \frac{\text{FCI(\%)}}{(100)}$$

Note: the functional condition index (FCI) includes all identified actions from condition surveys (e.g. major repairs and replacements) and predicted life cycle remaining-life assessments, expressed over an agreed period of analysis. FCI indexation can be expressed in years, or in banding of years (e.g. years 5 to 10 totals) to profile the moving indexation over time that highlights the implications of the ageing of constructed assets.

Part 6: Tabulated rules of measurement for elemental cost planning

Part 6: Tabulated rules of measurement for elemental cost planning

6.1 Introduction

6.1.1 Part 6 of the rules comprises the rules of measurement for elemental cost planning of maintenance works. It explains the use of tabulated rules and describes how to codify elemental renewal (R) and maintain (M) cost plans. Advice is also given on how to reallocate costs from elements and sub-elements to work packages where building maintenance works are to be procured through use of discrete work packages and a combination of contract strategies.

6.1.2 The rules of measurement for elemental maintenance cost planning can also be used as a basis for measuring quantities for the application of whole life cycle costing.

6.2 Use of tabulated rules of measurement for elemental cost planning

6.2.1 The rules of measurement for elemental cost planning for maintenance works are set out in tables, which are provided for each of group element listed below. In addition, to compartmentalise the different aspects of maintenance work, each group element has been allocated to a high-level work breakdown structure classification:

Facilitating works	
Group element 0:	Facilitating works
Substructure	
Group element 1:	Substructure
Superstructure	
Group element 2:	Superstructure
Internal finishes	
Group element 3:	Internal finishes
Fittings, furnishings and equipment	
Group element 4:	Fittings, furnishings and equipment
Services	
Group element 5:	Services
Work to existing buildings	
Group element 7:	Work to existing buildings
External works	
Group element 8:	External works
Others	
Group element 9:	Maintenance contractor's management and administration costs
Group element 10:	Maintenance contractor's overheads and profit
Group element 11:	Consultants' and specialists' fees
Group element 12:	Employer-definable maintenance-related costs
Group element 13:	Risks
Group element 14:	Inflation

6.2.2 To provide a consistent work breakdown structure, cost breakdown structure, codification system and methodology for benchmarking, the group elements, elements, sub-elements and components are fully aligned with those defined in NRM 1. This common data structure system integrates the construction (C) components with the renewal (R) and the maintain (C) works.

6.2.3 **Facilitating works, building structure and fabric, building engineering services and external works**: The tables for group elements 0 to 8 inclusive, comprise the rules of measurement for Facilitating works (group element 0), Building structure and fabric (group elements 1 to 4, 6 and 7), Building services (group elements 5 and 6) and External works (group element 8). Each table is structured as follows:

(1) the group element is given in the first heading
(2) the element is given in the second heading
(3) the left hand column states the cost code (for the sub-element)
(4) the second column lists the sub-elements and contains the definition rules applicable to each sub-element
(5) the third and fourth columns list the components and the units of measurement for components respectively
(6) the fifth column describes the items included within each element and sub-element
(7) the sixth and seventh columns comprise the maintenance descriptors for renewal (R) and maintain (M) works
(8) the last column comprises the rules for measuring renewal (R) and maintain (M) works items
(9) horizontal lines divide the tables to denote the end of a sub-element
(10) the symbol '/' used between two or more units of measurement in the third column (unit of measurement) means 'or'
(11) the rules are written in the present tense.

6.2.4 The tabulated measurement rules are based on four principal levels. Levels 1 to 3 in the rules are the headings under which actual work items (i.e. group element, element and sub-element) are allocated. Levels 3, 4 and 5 are applicable construct (C) elements and components for renewal (R) or maintain (M) descriptors.

(1) **Level 1 – group element**: the primary classification used for grouping elements (i.e. headings)
(2) **Level 2 – element**: a key part of a group element
(3) **Level 3 – sub-element**: a part of an element. One or more sub-elements will constitute an element
(4) **Level 4 – component**: an item that forms part of a sub-element. One or more components will be measured to ascertain the cost of an element or sub-element
(5) **Levels 4 and 5 – maintenance descriptors**: for the applicable renewal (R) or maintain (M) work to be undertaken in connection with a sub-element component.

6.2.5 These levels provide the basis of a codified framework for elemental cost planning for maintenance works, which can be used both as a frame of reference for cost checking targets and the overall cost limit as more information about the built asset or facility becomes available. They provide both a work breakdown structure and a cost breakdown structure for the renewal (R) and maintain (M) works. The codification framework in NRM 3 is directly aligned to the NRM 1 codification framework.

6.2.6 **Maintenance contractor's management and administration costs**: The table for group element 9 comprises a list of typical items included in maintenance contractor's management and administration costs. The table is for use by the quantity surveyor/cost manager to assist in the cost estimating and cost checking process. These examples do not provide a definitive or exhaustive list of items, but are simply a guide. The table is structured as follows:

(1) the group element is given in the first heading
(2) the element is given in the second heading
(3) the sub-element is given in the third heading
(4) the first column states the cost code (for the sub-element)
(5) the second column lists sub-element
(6) the third column lists the components
(7) the fourth column lists the unit of measurement

(8) the fifth column lists the included items
(9) the sixth column lists the excluded items
(10) horizontal lines divide the tables to denote the end of sub-element or components.

6.2.7 **Maintenance contractor's overheads and profit:** The table for group element 10: Maintenance contractor's overheads and profit is structured as follows:
(1) the group element is given in the first heading
(2) the first column lists the elements
(3) the second column lists the included items for each element
(4) the third column lists the items excluded for each element
(5) where exclusions are stated, cross reference to the appropriate element are given
(6) horizontal lines divide the tables to denote the end of the element.

6.2.8 **Consultants' and specialists' fees**: The table for group element 11 comprises lists of typical consultants' and specialists' fees. The table is for us by the quantity surveyor/cost manager to assist in the cost estimating and cost checking process. These examples do not provide a definitive or exhaustive list of items, but are simply a guide. The table is structured as follows:
(1) the group element is given in the first heading
(2) the element is given in the second heading
(3) the first column (Component) comprises a list of typical project/design team fee headings
(4) the second column describes the appropriate unit of measurement for included items
(5) the third column the items included in each element and sub-element
(6) the fourth column describes the excluded items
(7) where exclusions are stated, cross references to the appropriate element are given
(8) horizontal lines divide the tables to denote the end of a component.

6.2.9 **Employer-definable maintenance-related costs**: The table for group element 12 comprises a tabulated list of typical employer-definable maintenance-related costs. These examples do not provide a definitive or exhaustive list of items, but are simply a guide. The table is structured as follows:
(1) the group element is given in the first heading
(2) the element is given in the second heading
(3) the first column (Component) comprises a list of typical employer definable maintenance cost headings
(4) the second column identifies the appropriate unit of measurement for included items
(5) the third column describes the items included in each element and sub-element
(6) the fourth column describes the excluded items
(7) where exclusions are stated, cross references to the appropriate element are given
(8) horizontal lines divide the tables to denote the end of a component.

6.2.10 **Risks**: Group element 13 lists typical risks. These examples do not provide a definitive or exhaustive list of items, but are simply a guide:
(1) the group element is given in the first heading
(2) the elements are listed as second level headings
(3) lists set out typical examples of causes of potential risk.

6.2.11 **Inflation**: Group element 14: Inflation is structured as follows:
(1) the group element is given in the first heading
(2) the element is given in both the second heading and the first column
(3) the second column describes the items included in each element
(4) the third column gives the unit of measurement
(5) the fourth column gives the items included in each element
(6) the fifth column gives the items excluded from each element
(7) where exclusions are stated, cross references to the appropriate element are given
(8) horizontal lines divide the tables to denote the end of an element.

6.3 Works not covered by the rules of measurement for elemental cost planning

6.3.1 Rules of measurement adopted for those components not covered by the rules of measurement for elemental cost planning shall be stated in the cost plan. Such rules shall, as far as possible, conform to those rules given in NRM 3 for similar components.

6.4 Method of codifying elemental cost plans

6.4.1 The logic and arrangement of levels to integrate the construction (C) cost codes with applicable renewal (R) and maintain (M) task codes is shown in Appendix E of these rules.

6.4.2 Codes for levels 1 to 3 are provided by NRM 3, while codes for level 4 (i.e. components) can be user defined. This is because of the considerable number of components that could be generated for any one sub-element. In view of this, it is recommended that each component measured is numbered sequentially within the sub-element. This will allow a unique level 4 code to be established for each component. The same applies to level 5.

For example:

- Level 1 Services: group element (5)
- Level 2 Heat source: element number (5)
- Level 3 Heat source: sub-element number (1)
- Level 4 Boiler (gas/oil): component number (1)
- Level 5 Boiler (specification – atmospheric; SFG20 code 05.12): (1)

For maintain (M) works, the B&ES standard list of SFG20 maintenance PPM task schedules has been aligned with the NRM 3 maintain (M) descriptors to provide a level 4 and 5 code for all maintainable assets (e.g. a biomass boiler is SFG20 code 05-38, an atmospheric gas-fired boiler is 05-12.

Based on this example, the code for maintenance undertaken to the burners of a biomass boiler would be: 5.5.1.1.1; and the code for carrying out the same task to a different boiler type would be 5.5.1.1.2.

For renewal (R) works, the industry published sources of reference service life data tables have been aligned with the NRM 3 maintenance renewal (R) descriptors, to create a standardised level 4 and 5 coding structure for the renewal of components and sub-components (5.5.1.1.1… and so on). For example, coding for two different boiler types:

- Level 4 Boiler (biomass) component number (1) – so the biomass boiler code is 5.5.1.1.1
- Level 4 Boiler (gas-fired) component number (2) – so the atmospheric boiler code is 5.5.1.2.1
- Level 5 Burner(gas-fired) sub-component number (4) – so the burner code is 5.5.1.2.4

6.4.3 It is essential, therefore, that each component is sequentially numbered under the sub-element. Additional code levels can be integrated as necessary to meet other user requirements. This will result in each component being given the applicable M and R standardised coding structure.

6.4.4 Alternatively, the user may adopt a unique code for level 4 and 5 components and sub-components, but if unique codes are used, it will make it be more difficult to do an effective and robust cost analysis.

6.5 Method of codifying elemental cost plans for works packages

6.5.1 Where the building maintenance works is to be procured through works packages due to the combination of contract strategies (e.g. a mix of operation and maintenance of plant and equipment contracts, measured term contracts, maintenance term contracts, specialist term

contracts and lump sum contracts) the works allocated to elements and sub-elements can be reallocated to the applicable work package. This can be achieved by simply introducing one or more numeric suffix to each item in the cost plan (see Figure 6.1 below).

6.5.2 Alternatively, one or more character(s) can be used as a suffix to identify a work package.

6.5.3 If elements need to be further broken down, additional levels of code may be introduced to meet user requirements.

Figure 6.1: Example of a works package codification framework

Work package	Suffix
Maintenance contractor's management and administration charges	/001
Building structure (steelwork, concrete, etc)	/002
Building fabric (roof coverings)	/003
Building fabric (masonry and brickwork)	/004
Curtain walling (system type)	/005
Windows and external/internal doors	/006
Internal finishes (walls, floors and ceilings)	/007
External finishes (walls, hard landscaping, etc)	/008
Fixtures, furnishings and equipment (FF&E)	/009
Mechanical, electrical and plumbing (including sanitary appliances, HVCA, etc)	/010
Fuel installations	/011
Lifts and conveyors	/012
Life safety systems (fire protection, alarms and lightning protection)	/013
Building management system (BMS)	/014
Communication and security control systems	/015
Specialist installations (water features, refrigeration, etc)	/016
Grounds maintenance (roads, paths, fencing and soft landscaping)	/017
Other – user defined (e.g. catering equipment)	/018
Maintenance contractor's overheads and profit	/019

6.6 Alignment of NRM 3 to COBie II data structure and definitions for Building Information Modelling

6.6.1 Data should be made interoperable, for example through the COBie data exchange format, in order to ensure that building maintenance cost data is accessible for life cycle costing of construction projects, and to ensure that output data from LCC of maintenance models is accessible to other interoperable models (for BIM cost modelling and setting up asset information systems to deliver maintenance programmes of works).

6.6.2 Where maintain and renewal works unit rates are use for order of estimates and cost planning during the design and construction phases, the output from the cost analysis of post construction maintenance works could be structured into a COBie format. This data can then be interoperable and enable the integration of LCC of construction and maintenance works.

6.6.3 The building information maintenance model (whether generated during pre construction or during the post construction, in use) should be provided in the same format and data referenced to physical assets or systems, types (specifications) and components – as well as linking to the building, blocks, zones, floors and spaces. (Note – Mapping of the NRM 1 data structure to COBie is included in BS 8544;2013; guide for life cycle costing of maintenance during the in use phases of building).

6.6.4 Figure 6.2 below shows that there is a close alignment of the COBie II data exchange format, used for building information modelling (BIM), with the NRM 3 data classifications for elemental cost planning The main differences are in spatial and physical classifications (which is outside the scope of these rules).

6.6.5 NRM 3 elemental cost data classification aligns with the COBie II data classifications, notwithstanding minor differences in definitions stated below:

- Element (or systems)
- Component (or sub element/systems)
- Specification (which COBie calls 'type')
- Tasks or actions required (which COBie calls 'job')
- Resources
- Spares (including materials and consumables)
- Other costs (user defined)

Figure 6.2: Definitions from COBie II data classifications – Source: PAS 1192 part 2

Sheet	Contents
Facility	Includes the Project, Site and Building/Structure
Floor	(Sectors) are the mandatory spatial structure
Space	The spatial locations where inspection, maintenance and operation jobs occur
Zone	The mandatory grouping of components as types or products, used to organise maintenance tasks
System	Additional functional groupings of Components
Component	The physical assets
Type	The mandatory grouping of Components as types or products, used to organise maintenance tasks
Job	The processes used to maintain and operate the assets
Spare	The physical objects
Resources	Support the processes

6.6.6 Figure 6.2 also highlights the importance of classifying the cost and asset information back to the relevant space, building, locational and functional data conventions, to create robust maintenance and renewal cost plans.

6.6.7 When the design and construction process requires a BIM model to be used, then it is essential to ensure the elemental cost plan is interoperable. Classifications of asset classes, or grouping of elemental or system types, may need to be applied to named objects to support BIM cost modelling option studies.

Note: more detailed guidance on BIM is provided in PAS 1192 part 2. How this relates to life cycle costing of maintenance in use is provided in BS 8544 and other published sources listed in the Bibliography.

Note: COBie is a standardised tabular representation of a facility and its constituents allowing the exchange of their detailed properties and impacts such as maintenance cost and carbon. COBie is a subset of IFC schema.

Group element 0: Facilitating works

Group element 0 comprises the following elements:

0.1 Toxic/hazardous/contaminated material treatment

0.2 Major demolition works

0.3 Temporary support to adjacent structures

0.4 Specialist groundworks

0.5 Temporary diversion works

0.6 Extraordinary site investigation works

Note: Works associated with general site preparation and groundworks, minor demolition works, and permanent roads, paths and pavings are included in group element 8: External works. The provision of temporary roads and services is included in group element 9: Main contractor's preliminaries.

Subcontractor on costs:	Where works are to be carried out by a subcontractor, an allowance is to be made within the unit rate applied to elements or components for subcontractor's preliminaries, design fees, risk, overheads and profit.
Not applicable:	In the following tabulated tables, 'N/A' means not applicable to renewal or maintain works. Specific items covered by NRM 1 and excluded from NRM 3.
Works (action required):	The work items, or actions required, within each section of the building element have been categorised into the following:
	Renewal (R): Replacement, Major repairs, Refurbishment, Upgrade work and Removals – and Redecorations (if measured separately)
	Maintain (M): Planned, Proactive and Reactive/Minor repair works
	Note: The required work actions included in the measurement rules are not an exhaustive list and are for guidance only.
Planned inspections:	**Note:** Facilitating works may arise as a consequence of planned inspections of the building and services, included in group elements 1 to 8.

Note: This group element of tabulated rules of measurement has been aligned with NRM 1 to create a standardised costs structure that links all construct (C) sub-element, components and inclusions with the 'applicable' renewal (R) and maintain (M) work items. Specific construction works that are not applicable (N/A) to maintenance works have been identified throughout.

Element 0.1: Toxic/hazardous/contaminated material treatment

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
0.1.1	**Toxic or hazardous material removal** **Definition:** Removal, employing special safety measures of toxic or hazardous material prior to demolition – for maintenance or renewal works.	1 Toxic or hazardous material removal: details to be stated.	item	1 Removal of toxic or hazardous building parts of building fabric (e.g. asbestos containing materials).	Toxic or hazardous material e.g. asbestos	Toxic or hazardous material – (THM)	<u>Renewal Actions</u> **Removal** – To include removal of affected area or item and safe disposal. <u>Maintain Actions</u> **Proactive** – Visual inspections and specialist surveys. **<u>Excluded</u>** – Asbestos survey fees and the like are to be included in group element 11: Consultants' and specialists' fees. **Note 1:** Control of toxic or hazardous materials regulations e.g. Control of asbestos regulations 2012 and the like. **Note 2:** Where no asbestos survey records exist an allowance should be made within the employer's requirements and in the maintenance contractor's risk allowance (if part of the contract). M1 – Cost-significant components are to be described and identified and itemised separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) as appropriate. M2 – Works undertaken by a specialist contractor are to be described and identified separately.
		2 Toxic or hazardous chemical removal: details to be stated.	item	2 Removal of toxic or hazardous insulating materials or components from existing services installations, including storage tanks and vessels.	Toxic or hazardous insulations	THM	
			item	3 Removal of toxic or hazardous chemicals from existing services installations, storage tanks and vessels.	Chemically hazardous material	THM	
			item	4 Safe disposal (included with items 1 to 3).	Safe disposal	N/A	
			item	5 Sundry items.	Sundry items (to be stated)	Sundry items (to be stated)	
			note	6 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	
0.1.2	**Contaminated land** **Definition:** Removal and/or treatment of contaminated ground material.	1 Contaminated ground material removal: details to be stated.	m^2/m^3	1 Contaminated ground material removal using 'dig and dump' strategy and safe disposal to licensed tip (tipping charge).	Contaminated land (not part of NRM 3)	Contaminated land not part of NRM 3)	Covered in NRM 1 for Contaminated land in group element 0: Facilitating works element 0.1.2.
		2 Contaminated ground material treatment: details to be stated.	m^2	2 Contaminated ground material treatment using in-situ methods.			

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
0.1.3	**Eradication of plant growth** **Definition:** Eradication of Japanese knotweed, giant hogweed or other invasive plants.	1 Eradication by 'dig and dump' strategy: details to be stated.	m^2/m^3	1 Eradication by 'dig and dump' strategy.	Eradication of plant growth	N/A	Applying herbicides taken with external works item 8.3.2.1. Renewal Actions **Eradication of plant growth** – By 'dig and dump' strategy. **Eradication by chemical treatment** – To be described. Maintain Actions N/A – Dealt with by renewal actions, unless there is maintenance provision for this included as part of the specified grounds maintenance contract work package. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The area measured is the area designated as infected by the plant growth (in m^2). M3 – Where the volume of the excavation and disposal of ground material is measured, the volume measured is the surface area of the infected plant growth multiplied by the depth of the dig (in m^3). M4 – Quantities given for disposal of contaminated ground material are the bulk before excavating. M5 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately.
		2 Eradication by chemical treatment: details to be stated.	nr/m^2	2 Eradication by chemical treatment.	Eradication by chemical treatment	N/A	
			note	3 Subcontractor on costs (where applicable).	Subcontractor on costs	N/A	

Element 0.2: Major demolition works

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
0.2.1	**Demolition works** **Definition:** Taking down to ground level and removing complete buildings/structures or parts of buildings /structures (including services, fittings and finishes).	1 Demolition works of entire buildings.	m^2	Major demolition works is not covered by NRM 3.	Excluded – from the maintenance works Note: the major demolition works are covered by construction works	Excluded – from the maintenance works Note: the major demolition works are covered by the construction works	Covered in NRM 1 for Major demolition works in group element; Facilitating works 0.2.1.
		2 Demolition of major parts of existing buildings.					
		3 Temporary propping to existing basement retaining walls.	nr				
		4 Extra over temporary propping for providing wailings.	m				
		5 Periodic technical inspections of temporary propping.	nr				
		6 Returning to site to reposition temporary props.					
		7 Removal of temporary props.					
		8 Removal of wailings.	m				
		9 Grubbing-up of anchor blocks/ foundations to temporary props and infilling voids.	nr				

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
0.2.2	**Soft strip works** **Definition:** Stripping out building components, services, fittings and finishes from a building as preparatory works to demolition or refurbishment.	Preparatory to demolition: extent of works to be stated. Preparatory to refurbishment: extent of works to be stated.	item/m^2	Soft strip works are not covered by NRM 3.	Excluded from the maintenance works (Demolition work included with the construction)	Excluded from the maintenance works (Demolition work included in with the construction)	Covered in NRM 1 for Major demolition works in group element 0: Facilitating works 0.2.1.

Element 0.3: Temporary support to adjacent structures

Sub-element		Component	Unit	Induced (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance work
					Renewal (R)	Maintain (M)	
0.3.1	**Temporary support to adjacent structures** **Definition:** Temporary or semi-permanent support for unstable structures (i.e. structures not to be demolished) adjacent to the building being built.	1 Support structures: details to be stated. 2 Taking down and repositioning support structures: details to be stated. 3 Periodic technical inspections of temporary support structures: details to be stated. 4 Removing support structures: details to be stated.	nr	Temporary support is not covered by NRM 3.	Excluded from the maintenance works (Demolition work included in with the construction works)	Excluded from the maintenance works (Demolition work included in with the construction works)	Covered in NRM 1 for Major demolition works in group element 0; Facilitating works 0.3.1.
Note: Works arising from party wall awards/agreements are to be described and identified separately (see group element 7: Work to existing buildings). **Excluded:** Facade retention works (included in element 7.4), temporary screens for alteration works (included in element 7.1: Minor demolition works and alteration works), supports to small openings or after removal of internal walls or the like (included in subelement 7.1.1: Minor demolition works and alterations works).							

Element 0.4: Specialist groundworks

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
0.4.1	**Site dewatering and pumping** **Definition:** Temporarily lowering the groundwater level to facilitate maintenance and renewal works.	1 Site dewatering and pumping: details to be stated.	item/m^2	1 Forming well points, including well pointing equipment and well point installation.	N/A	N/A	<u>Renewal Actions</u> Repairs to drainage to include clearing obstructions, flushing out and applicable removal, repairs and replacement work actions. Replace sump pumps at end of life. Running costs – site dewatering costs over service life period. <u>Maintain Actions</u> Planned maintenance to sumps and pumps (see the supplementary listing of pump types and related maintenance regimes included at the end of group element 5: Services). Running costs – off site water disposal charges and the like. <u>Unit of measurement</u> – The same as NRM 1 except for the pumps, which are to be enumerated (state type and capacity). M1 – Where components are to be itemised, the number of key elements comprising the component are to be identified, described and enumerated within the description of the component. M2 – The area measured is the area affected by the dewatering system employed. M3 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately. **Note:** Offsite disposal of site water by tankerage and by other means, is to be included in running costs.
			item/m^2	2 Filling (gravel or other filling).	N/A	N/A	
			item/nr	3 Drain tubes and ring mains (installing and removing).	Drain tubes and ring mains	N/A	
			nr	4 Sumps.	N/A	(include with pumps)	
			nr	5 Pumps and pumping, including standby pumps.	Pumps	Pumps	
			item	6 Off-site disposal of water.	Off site water disposal	N/A	
			item	7 Running costs.	Site dewatering	Site dewatering	
			inc	8 Attendance, including out of hours.	(included with items)	(included with items)	
			item	9 Sundry items associated with site dewatering.	Sundry items	N/A	
			note	10 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
0.4.2	**Soil stabilisation measures** **Definition:** Stabilisation or improvement of bearing capacity or slip resistance of existing ground to facilitate construction by injecting or otherwise introducing stabilising materials, by power vibrating, by soil nailing or by ground anchors.	1 Soil stabilisation measures: details to be stated.	m^2	Soil stabilisation measures are not covered by NRM 3.	Excluded from the maintenance works	Excluded from the maintenance works	Covered in NRM 1 for Major demolition works in group element; Facilitating works 0.4.2.
0.4.3	**Ground gas venting measures** **Definition:** Systems to prevent accumulation of radon or landfill gases.	1 Ground gas venting measures: details to be stated.	m^2	1 Ground gas venting measures, including: – gas-proof membranes – perforated collection pipes – proprietary gas dispersal fin layers. 2 Radon sumps. 3 Vent pipes, including vertical risers to vent at high level.	Ground gas venting measures	Ground gas venting measures	Renewal Actions Remedial actions to gas venting measures in order to keep operational are to be identified and described. Maintain Actions Planned and proactive monitoring regimes are to be stated. M1 – The area measured is the area affected by the gas venting measure. M2 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) and enumerated (nr) separately.
			item	2 Sundry items associated with ground gas venting measures (to be stated).	Sundry items (to be stated)	N/A	
			note	3 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Element 0.5: Temporary diversion works

Sub-element		Component	Unit	Induced (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance work
					Renewal (R)	Maintain (M)	
0.5.1	**Temporary diversion works** **Definition:** Temporary diversion of existing drainage systems, existing services installations and systems, rivers, streams and the like.	1 Temporary diversion of drains: details to be stated.	item	1 All works in connection with temporary diversion of drains.	Drains diversion – temporary works	N/A	<u>Renewal Actions</u> Temporary diversion works are to be itemised and described as applicable. <u>Maintain Actions</u> Not applicable M1 – Works are to be itemised and described. **Note:** Where insufficient information is available, such works are to be included in group element 13: Risks, as appropriate. **Note:** if statutory undertakers fees and charges required they are to be included in management and administration costs in group element 10.
			item	4 Statutory undertaker's fees and charges in connection with diversion works.	(Taken with group element 10)	N/A	
			item	5 Sundry items.	Sundry items	N/A	
			note	6 Subcontractor on costs (where applicable).	Subcontractor on costs	N/A	
		2 Temporary diversion of services: details to be stated.	item	2 All works in connection with temporary diversion of services (e.g. water, electricity, gas and communications).	Services diversion temporary works	N/A	
		3 Temporary diversion of waterways: details to be stated.	item	3 All works in connection with temporary diversion of rivers, streams and the like.	Waterways diversion – temporary works	N/A	

Element 0.6: Extraordinary site investigation works

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
0.6.1	**Archaeological investigations** **Definition:** Site-based archaeological investigation works.	1 Excavation works: details to be stated.	item	1 Physical archaeological investigation works.	Excluded (taken elsewhere)	Excluded (taken elsewhere)	Taken elsewhere (covered by other cost elements in group element 11: Consultant's and specialist's fees).
		2 Temporary screens and the like: details to be stated.	nr	2 Provision for temporary screens.			
		3 Attendance by archaeologist	per week	3 Attendance by archaeologists.			
0.6.2	**Reptile/wildlife mitigation measures** **Definition:** Relocation of reptiles/wildlife and provision of fences/ barriers to cordon off the working area.	1 Physical reptile/wildlife mitigation measures: details to be stated.	item	Reptile and wildlife mitigation measures are not covered by NRM 3.	Excluded from the maintenance works	Excluded from the maintenance works	Covered in NRM 1 as part of the capital building works in item 0.6.2.
		2 Temporary fences, barriers and the like: details to be stated.	nr/m				
		3 Attendance.	per week				

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
0.6.3	**Other extraordinary site investigation measures**	1 Physical site investigation work: details to be stated.	item	1 Physical works in connection with extraordinary site investigation works carried out by the main contractor.	Extraordinary site investigation measures	T/E	T/E – taken elsewhere. Refer to group element 11, consultants and specialist fees for site investigation works. Renewal works Physical works arising from extraordinary site measures. Maintain Actions Site investigation measures (e.g. tell tales for subsidence). M1 – Physical works arising from extraordinary site investigation measures are to be itemised and described, including provision of temporary screens and the like and applicable attendance on specialists. Excluded Specialist consultants' fees and charges in connection with ascertaining and carrying out extraordinary site investigation works (included in group element 11: Consultants' and specialists' fees or group element 12: Employer definable maintenance-related costs, as appropriate.
		2 Temporary screens, fences, barriers and the like: details to be stated.	nr/m	2 Provision of temporary screens, fences, barriers and the like to cordon off working area.	(Taken with group element 11)	N/A	
		3 Attendance.	per week	3 Attendance by specialists (where applicable).	(Taken with group element 12)	N/A	

Group element 1: Substructure

Group element 1 comprises the following elements:

1.1 Substructure

Notes: Where testing and commissioning of drainage installations is required to be measured under sub-element 1.1.3: Lowest floor construction, the terms shall include the following works:

1 Testing includes air tests, water tests and dyes required for testing

2 Temporary operation of drainage to employer's requirements

3 Setting all drainage installations to work after completion of commissioning.

Subcontractor on costs:	Where works are to be carried out by a subcontractor, an allowance is to be made within the unit rate applied to elements or components for subcontractor's preliminaries, design fees, risk, overheads and profit.
Not applicable:	In the following pages, 'N/A' means not applicable to renewal or maintain works. Specific items covered by NRM 1 and excluded from NRM 3.
Works (action required):	The work items, or actions required, within each section of the building element have been categorised into the following:
	Renewal (R): Replacement, Major repairs, Refurbishment, Upgrade work and Removals – and Redecorations (if measured separately)
	Maintain (M): Planned, Proactive and Reactive/Minor repair works
	Note: The required work actions included in the measurement rules are not an exhaustive list and are for guidance only.
Excluded:	Specific works which are normal construction works as defined in NRM1, are not covered by NRM 3 (as stated in the tables, e.g. foundations)
Planned inspections:	**Note:** The planned inspections of superstructures will identify if there are problems with substructures (e.g. subsidence) and may result in extra investigations (Note: taken elsewhere in group element 2 – refer to superstructures planned inspections).

Note: This group element of tabulated rules of measurement has been aligned with NRM 1 to create a standardised costs structure that links all construct (C) sub-element, components and inclusions with the 'applicable' renewal (R) and maintain (M) work items. Specific construction works that are not applicable (N/A) to maintenance works have been identified throughout.

Element 1.1: Substructure

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance Descriptor		Measurement Rules For Maintenance Works
					Renewal (R)	Maintain (M)	
1.1.1	**Standard foundations** **Definition:** Standard foundations up to and including the damp-proof course.	1 Strip foundations: details, including depth of foundation, to be stated (if known).	m	1 Wall and column foundations.	Standard foundations	Standard foundations	**Scope covered by NRM 3** This section of NRM 3 includes for isolated repair only to the standard foundations – (post construction works). Standard foundations full replacement excluded in NRM 3. For large-scale and cost-significant repairs it will be necessary to seek advice from a structural specialist. **Note** – Structural survey and inspection fees and the like are to be included in group element 11: Consultants' and specialists' fees. **N/A** – Not applicable to renewal and/or maintain work **Note**: Evidence of subsidence will become apparent above ground, hence monitoring and inspections taken with superstructure elements, not in substructures. **Renewal Actions** **Replacement** – Not applicable for maintenance works **Remedial works**– underpinning/damp proofing works **Major repairs** – To standard foundation systems arising from identified actions from visual inspections and specialist surveys/ investigations.
				2 Foundation walls to underside of damp-proof course (to both perimeter and internal load-bearing walls).	N/A	N/A	
				4 Trench and pit excavations, including earthwork support (including insertion and extraction of steel sheet piling, if used).	N/A	N/A	
				5 Excavating below groundwater level.	N/A	N/A	
				6 Breaking out surface materials (e.g. hard standings, pavements and the like). Note – Where no information relating to the ground conditions is available, an allowance is to be made within the construction risk allowance for the extra cost of removing unforeseen obstructions and dealing with unknown ground conditions.	N/A	N/A	
				7 Disposal of excavated material, including tipping charges and landfill tax (including inert, non-hazardous and hazardous material where not to be carried out as facilitating works). Note – Where no contamination/remediation strategy report exists, an allowance is to be made within the construction risk allowance for the extra cost of disposing of contaminated material.	N/A	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance Descriptor		Measurement Rules For Maintenance Works
					Renewal (R)	Maintain (M)	
				8 Disposal of surface water and groundwater, where dewatering techniques are not employed.	N/A	N/A	**Maintain Actions** **Planned** – N/A (inspections taken with superstructures) **Proactive** – Monitoring cracks (e.g. install tell tales) **Reactive** – N/A (physical investigation taken in element 11) M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The linear length of components is measured on the centre line of the component. M3 – The volume of disposal of contaminated material measured is the surface area of the contaminated material multiplied by the average depth of the contaminated material. M4 – Quantity given for disposal is the bulk before excavating and no allowance is made for subsequent variations to bulk or for extra space to accommodate earthwork support. M5 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element. M6 – Curved work is to be described and identified separately. M7 – Contractor-designed work is to be described and identified separately.
				9 Disposal of surface water and groundwater to receive foundations.	N/A	N/A	
				10 Blinding.	N/A	N/A	
				11 Concrete, reinforcement, formwork (temporary and permanent) and excavating and backfilling of working space required to facilitate placement of formwork.	N/A	N/A	
				12 Specialist concrete grades, including waterproof concrete and additives.	N/A	N/A	
				13 Brickwork and blockwork walling, including air/ventilation bricks and the like.	N/A	N/A	
				14 Forming cavities, including wall ties.	N/A	N/A	
				15 Filling cavities.	Cavity insulation	N/A	
				16 Thermal insulation to cavities.	Cavity insulation	N/A	
				17 Damp-proof courses – details to be stated.	Damp proofing	N/A	
				18 Service ducts and the like through foundation walls.	N/A	N/A	

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance Descriptor		Measurement Rules For Maintenance Works
				Renewal (R)	Maintain (M)	
		item	19 Sundry items – details to be stated.	Actions arising from structural surveys and inspections and monitoring regime.	N/A	
		Note	20 Subcontractor on costs (where applicable).	Subcontractor on costs	N/A	
	2 Isolated pad foundations: details, including size of and reinforcement rate (kg/m^3) to pile cap, to be stated (if known).	nr	3 Isolated pad foundations.	N/A	N/A	
	3 Extra for disposal of contaminated/ excavated material: details to be stated.	m^2	(Covered in item 7 included above).	N/A	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance Descriptor		Measurement Rules For Maintenance Works
					Renewal (R)	Maintain (M)	
1.1.2	**Specialist foundation systems** **Definition:** Load-bearing foundation piles and caissons. Inserting additional foundation support under and around existing foundations.	1 Piling mats/platforms: details, including thickness of mat/platform (mm), to be stated.	m^2	4 Piling mats and platforms (installing, moving, modifying and removing on completion).	N/A	N/A	**Scope covered by NRM 3** This section of NRM 3 only includes for isolated repair only to the specialist foundations – (post construction works). Specialist foundations full replacement excluded in NRM 3. For large-scale and cost-significant repairs it will be necessary to seek advice from a structural specialist. **Note** – Structural survey and inspection fees and the like are to be included in group element 11: Consultants' and specialists' fees. **Renewal Actions** **Replacement** – Not applicable to maintenance works **Major repairs** – To specialist foundation systems arising from identified actions from visual inspections and specialist surveys/ extra ordinary site investigations.
		2 Piling plant: details to be stated.	item	5 Piling rigs/other plant, including: bringing to and removing from site, maintenance, erection, dismantling and moving piling rigs to each pile position. **Note** – Where information about ground strata is unknown, an allowance is to be made within the construction risk allowance for breaking through obstructions.	N/A	N/A	
		3 Moving piling rig to pile position.	nr	(See item 5 included above).	N/A	N/A	
		4 Piles: details, including type, diameter (mm) and depth (m) of piles, to be stated.	nr	1 Piles, including: precast concrete reinforced piles, precast pre-stressed concrete piles, precast reinforced segmental concrete piles, bored cast-in-place concrete piles, driven cast-in-place concrete piles, steel-bearing piles, timber-bearing piles and mini piles.	N/A	N/A	
				10 Grouting.	N/A	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance Descriptor		Measurement Rules For Maintenance Works
					Renewal (R)	Maintain (M)	
				14 Trench and pit excavations for pile caps and ground beams, including earthwork support (including insertion and extraction of steel sheet piling, if used).	N/A	N/A	**Maintain Actions** **Planned** – N/A (inspections taken with superstructures) **Proactive** – not applicable to piling and associated works **Reactive** – N/A (physical investigations taken in element 11) M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The linear length of components is measured on the centre line of the component. M3 – The area measured for piling mats/platforms is the surface area of the piling mat/platform. M4 – The volume of disposal of excavated material arising from piling is the cross-sectional area of the pile multiplied by the depth of the pile. M5 – Quantity given for disposal is the bulk before excavating and no allowance is made for subsequent variations to bulk. M6 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately. M7 – Curved work is to be described and identified separately. M8 – Work to existing buildings is to be described and identified separately. M9 – Contractor-designed work is to be described and identified separately.
				17 Consolidating and compacting formation level to receive pile caps and ground beams.	N/A	N/A	
				18 Blinding.	N/A	N/A	
				19 Protection boarding to underside of pile caps and ground beams (e.g. to provide heave protection).	N/A	N/A	
				20 Concrete, reinforcement, formwork (temporary and permanent) and excavating and backfilling of working space required to facilitate placement of formwork.	N/A	N/A	
				21 Specialist concrete grades, including waterproof concrete and additives.	N/A	N/A	
			item	22 Sundry items – details to be stated.	Actions arising from structural surveys and inspections and monitoring regime.	N/A	
			note	23 Subcontractor on costs (where applicable)	N/A	N/A	
		5 Extra for pile casings or linings: details, including material, length (m), diameter (mm) and if permanent or temporary, to be stated.	nr	(Covered with item included in component 4: Piles).	N/A	N/A	
		6 Caissons: details, including type, diameter (mm) and depth (m) of caisson, to be stated.		2 Permanent caissons.	N/A	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance Descriptor		Measurement Rules For Maintenance Works
					Renewal (R)	Maintain (M)	
		7 Disposal of excavated material arising from piling.	m^3	6 Disposal of excavated material arising from piling, including tipping charges and landfill tax. Note – Where no contamination/remediation strategy report exists, an allowance is to be made within the construction risk allowance for the extra cost of disposing of contaminated material.	N/A	N/A	
				7 Disposal of surface water and groundwater, where dewatering techniques are not employed.	N/A	N/A	
				15 Disposal of excavated material, including tipping charges and landfill tax. (See Note above about disposal of contaminated material).	N/A	N/A	
				16 Disposal of surface water and groundwater, where dewatering techniques not employed.	N/A	N/A	
		8 Extra for breaking through obstructions.	nr/m^3	(Covered with item 14 included above).	N/A	N/A	
		9 Cutting off tops of concrete piles and preparing pile heads.	nr	8 Cutting off excess lengths of piles.	N/A	N/A	
				9 Cutting out concrete to tops of piles and preparing pile heads and reinforcement for capping.	N/A	N/A	
		10 Pile tests: details, including type of test, pile type, diameter of pile and number of piles, to be stated.	item	11 Pile tests (e.g. load tests and integrity tests).	N/A	N/A	
		11 Vibro-compacted columns: details, including size (mm) and length (m) of column, to be stated.	nr	3 Vibro-compacted columns.	N/A	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance Descriptor		Measurement Rules For Maintenance Works
					Renewal (R)	Maintain (M)	
		12 Pile caps: details, including size of and reinforcement rate (kg/m^3) to pile cap, to be stated.	m	12 Pile caps.	N/A	N/A	<u>Maintain Actions</u> **Note:** Monitoring subsidence to include fixing 'tell tales' on cracks in the structures in excess of 5mm
		13 Ground beams: details, including size of and reinforcement rate (kg/m^3) to pile cap, to be stated.		13 Ground beams.	N/A	N/A	
		14 Underpinning: details to be stated.	m	(See items 1–21 included above).	Underpinning works	Monitoring subsidence	
1.1.3	**Lowest floor construction** **Definition:** The entire lowest floor assembly below the underside of screed or lowest floor slab.	1 Lowest floor construction: details to be stated. **Note** – Reinforcement rate (kg/m^3 or kg/m^2, as appropriate) for concrete slabs and beds to be stated.	m^2	1 Lowest floor assemblies, such as: – ground slabs/beds – basement slabs/beds – raft foundations – suspended floors serving as lowest floor level systems, i.e. where void between ground slab/bed under and lowest floor slab (including, suspended timber floor construction and precast/composite decking systems).	N/A	N/A	<u>Scope covered by NRM 3</u> This section of NRM 3 includes for isolated repair only to the lower floor construction – (post construction works). Full replacement of the lower floors is excluded in NRM 3. For large-scale and cost-significant repairs it will be necessary to seek advice from a structural specialist. **Note** – Structural survey and inspection fees and the like are to be included in group element 11: Consultants' and specialists' fees. <u>Renewal Actions</u> **Replacement** – Not applicable to maintenance works. **Major repairs** – To lowest floor construction arising from identified actions from visual inspections and specialist surveys/extra ordinary site investigations.
				2 Thickening to slabs/beds for load-bearing walls, machine bases and the like.	N/A	N/A	
				4 Inclined and stepped slabs/beds.	N/A	N/A	
				9 Surface area excavations (i.e. to remove topsoil and to reduce levels), including earthwork support.	N/A	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance Descriptor		Measurement Rules For Maintenance Works
					Renewal (R)	Maintain (M)	
				11 Disposal of excavated material, including tipping charges and landfill tax (including inert, non-hazardous and hazardous material where not to be carried out as facilitating works). **Note** – Where no contamination/remediation strategy report exists, an allowance is to be made within the construction risk allowance for the extra cost of disposing of contaminated material.	N/A	N/A	Maintain Actions **Planned** – N/A (inspections taken with superstructures) **Proactive** – Monitoring damp and inspection of manholes **Reactive** – N/A (physical investigations taken with element 11) Excludes – extra ordinary site investigations included in group element 0; facilitating works covers the physical works needed to identify the extent of subsidence, damp proofing problems, drainage leakages and the like N/A – Not applicable to renewal and/or maintain work. M1 – The area measured is the area of the floor construction measured to the internal face of the external perimeter walls. M2 – The area of the floor construction shall be measured in accordance with the rules of measurement for ascertaining the gross internal floor area (GIFA). M3 – Where more than one type of floor construction is employed, the area measured for each floor construction is the area covered by that floor construction. M4 – The length of retaining walls at changes in level is their extreme length, over all obstructions. The height measured is the distance from top of the slab to the underside of the attached slab. M5 – The area measured for forming swimming pool tanks and the like is the area of the swimming pool (or other similar facility) on plan, measured to the internal face of the swimming pool walls.
				12 Disposal of surface water and groundwater, where dewatering techniques are not employed.	N/A	N/A	
				13 Consolidating and compacting formation level to receive floor construction.	N/A	N/A	
				14 Concrete, reinforcement, formwork (temporary and permanent) and working space for formwork.	N/A	N/A	
				15 Specialist concrete grades, such as waterproof concrete.	N/A	N/A	
				16 Filling to make up levels.	N/A	N/A	
				17 Blinding beds.	N/A	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance Descriptor		Measurement Rules For Maintenance Works
					Renewal (R)	Maintain (M)	
				18 Protection boarding to underside of floor/base slabs (e.g. to provide heave protection).	N/A	N/A	M6 – The area measured for forming lift pits and the like is the area of the lift pit on plan, measured to the internal face of the lift pit.
				19 Damp-proof membranes, including gas-proof membranes serving as a damp-proof membrane.	(T/E)	N/A	M7 – The length of linear components measured is their extreme length, over all obstructions.
				20 Service ducts and the like below the lowest floor construction.	N/A	N/A	M8 – The length of below-ground drainage pipelines measured is their extreme length, over all fittings, branches and the like.
				21 Fixing devices cast into concrete (i.e. dowels, anchor bolts, anchor boxes, anchor fixing slots and the like).	N/A	N/A	M9 – Where components are to be enumerated, the number of components is to be stated.
				23 Worked finishes (i.e. in-situ surface treatments), including the application of surface hardeners and power-floated finishes.	N/A	N/A	M10 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately.
				24 Structural screeds, including reinforcement.	N/A	N/A	M11 – Curved work is to be described and identified separately.
				25 Suspended timber floors, including floor boards, joists, joist struts, plates and the like. Including supporting masonry/concrete walls under (i.e. load-bearing sleeper walls).	N/A	N/A	M12 – The percentage additions for testing and commissioning are to be applied to the total cost of the items comprising the drainage installation. A single combined percentage addition can be applied to cover the costs of both testing and commissioning.
				26 Precast/composite decking systems, including concrete components, in-situ concrete, site-fixed formwork and reinforcement, filler units, fixing slips, metal clips and other fixings, joints (including grouting joints), worked finishes and performance tests.	N/A	N/A	M13 – Contractor-designed work is to be described and identified separately. (TE) – Taken elsewhere. Refer to group element 7.3 for works to existing damp proof courses.
				31 Trenches for pipework, including excavation, earthwork support, backfilling and disposal of surplus material.	N/A	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance Descriptor		Measurement Rules For Maintenance Works
					Renewal (R)	Maintain (M)	
				32 Granular beds and surrounds, concrete beds, cradles, haunchings and surrounds, and foamed concrete backfill.	N/A	N/A	
				33 Venting below building (e.g. radon sumps under ground slab/bed).	N/A	N/A	
				34 Special filling material beneath base slab/bed.	N/A	N/A	
			item	35 Sundry items – details to be stated.	Actions arising from structural survey, inspections and monitoring regimes	Planned inspection	
			note	37 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	
		2 Extra over lowest floor construction for forming ramps and the like: details to be stated.	m^2	5 Ramps in slabs.	N/A	N/A	
		3 Extra over lowest floor construction for forming of lift pits and the like: details, including the number and size (m) of lift pits, to be stated.	nr	3 Sumps, pits, chambers and the like integral to the lowest floor construction.	N/A	N/A	
				7 Lift pits and the like below the lowest floor, including waterproofing.	N/A	N/A	
				10 Pit excavations, including earthwork support.	N/A	N/A	
		4 Extra over lowest floor construction for forming swimming pool tanks and the like: details, including the size (m), to be stated.		8 Swimming pool tanks, including boom pits, and the like, including waterproofing.	Swimming pool tanking – (details to be stated)	N/A	

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance Descriptor		Measurement Rules For Maintenance Works
				Renewal (R)	Maintain (M)	
	5 Retaining walls at changes in level: details, including thickness (mm), height (m) and reinforcement rate (kg/m^3), to be stated.	m	6 Retaining walls at changes in level.	Lowest floor construction	N/A	
	6 Designed joints: details, including height (mm), to be stated.		22 Design joints, including at intersection of base slab/bed and external perimeter wall, to provide bays and the like.	Designed joints to floor slabs	N/A	
	7 Drainage below ground: details, including average depth of trench (m), type and nominal size of pipe (mm), and materials for beds and haunchings/surrounds, to be stated.		27 Drainage below or within lowest floor assembly, including pipework, pipework ancillaries (e.g. gullies, gratings, rodding and access points) and fittings to pipework (to first manhole beyond the external enclosing walls).	N/A (as inaccessible)	N/A	
	8 Gullies, floor outlets and the like: details to be stated.	nr	29 Floor outlets. 30 Prefabricated floor channels and gratings in ground floor construction.	Gullies, floor outlets Prefabricated floor channels	Gullies, floor outlets Prefabricated floor channels	
	9 Internal manholes, catch-pits, petrol interceptors or the like: details to be stated		28 Internal manholes and the like, including channels, benching, step irons, access covers and other accessories.	Internal manholes	Internal manholes	
	10 Testing of drainage installations.	%	36 Testing and commissioning of drainage installations.	N/A	N/A	
	11 Commissioning of drainage installations.		(Covered by item 36 above).	T/E	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance Descriptor		Measurement Rules For Maintenance Works
					Renewal (R)	Maintain (M)	
1.1.4	**Basement excavation** **Definition:** Bulk excavation required for construction of floors below ground level.	1 Basement excavation: details, including average depth of excavation, to be stated.	m^3	1 Bulk excavation to form basements and the like.	N/A	N/A	N/A – Not applicable to renewal and/or maintain work.
				4 Excavating below groundwater level.	N/A	N/A	
				6 Disposal of surface water and groundwater, where dewatering techniques are not employed.	N/A	N/A	
				7 Consolidating and compacting formation level to receive base slab/bed construction.	N/A	N/A	
			item	8 Sundry items – details to be stated.	N/A	N/A	
			note	9 Subcontractor on costs (where applicable).	N/A	N/A	
		2 Disposal of excavated material: details to be stated.	m^3	5 Disposal of excavated material, including tipping charges and landfill tax (including inert, non-hazardous and hazardous material where not to be carried out as facilitating works). **Note** – Where no information relating to the ground conditions is available, an allowance is to be made within the construction risk allowance for the extra cost of removing unforeseen obstructions and dealing with unknown ground conditions. **Note** – Where no contamination/remediation strategy report exists, an allowance is to be made within the construction risk allowance for the extra cost of disposing of contaminated material.	N/A	N/A	
		3 Extra for disposal of contaminated excavated material: details to be stated.		See item 5 above.	N/A	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance Descriptor		Measurement Rules For Maintenance Works
					Renewal (R)	Maintain (M)	
		4 Earthwork support: details to be stated.	m^2	2 Temporary or permanent support to the bulk excavation (e.g. earthwork support, caissons, steel sheet piling and the like), including insertion and extraction of temporary steel sheet piling and caissons.	N/A	N/A	
		5 Additional excavation: details to be stated.	m^3	3 Additional excavation required to facilitate construction of basement retaining walls (e.g. where open excavation method is employed), including excavating, back filling (e.g. with selected excavated material or granular material) and disposal of surplus excavated material.	N/A	N/A	
1.1.5	**Basement retaining walls** **Definition:** External basement retaining walls in contact with earthwork up to and including the damp-proof course.	**Basement retaining walls:** 1 Basement retaining wall: details to be stated. **Note** – Reinforcement rate (kg/m^3) and formwork finish for in-situ concrete walls to be stated.	m/m^2	1 Concrete retaining walls, including concrete, reinforcement, and formwork and excavating and backfilling working space required to facilitate construction of retaining walls. 2 Specialist concrete grades, such as waterproof concrete. 3 Trench excavations for bases/toes to basement retaining walls which commence below the level from which the construction of the basement base slab is to commence. 4 Disposal of excavated material, including tipping charges and landfill tax (including inert, non-hazardous and hazardous material where not to be carried out as facilitating works).	Basement retaining walls N/A N/A	N/A N/A N/A N/A	<u>Scope covered by NRM 3</u> This section of NRM 3 only includes for isolated repair. Basement retaining wall full replacement excluded in NRM 3. For large-scale and cost-significant repairs it will be necessary to seek advice from a structural specialist. **Note** – Structural survey and inspection fees and the like are to be included in group element 11: Consultants' and specialists' fees. <u>Renewal Actions</u> **Replacement** – Not applicable to maintenance works. **Major repairs** – To basement retaining walls arising from identified actions from visual inspections and specialist surveys/investigations.

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance Descriptor		Measurement Rules For Maintenance Works
					Renewal (R)	Maintain (M)	
				Note – Where no contamination/remediation strategy report exists, an allowance is to be made within the construction risk allowance for the extra cost of disposing of contaminated material.	N/A	N/A	<u>Maintain Actions</u> **Planned** – N/A (inspections taken with superstructures) **Proactive** – Monitoring of movement and water ingress. **Reactive** – Minor isolated repairs to basement retaining walls. M1 – Where the area of the basement retaining wall is to be measured, the area measured is the surface area of the exposed face of the retaining wall. M2 – The height of the basement retaining wall shall be measured from the top of the base slab/bed or the top of the basement retaining wall base/toe to the level at which the basement retaining wall connects with the external wall above ground (i.e. at the level at which the external wall changes from being a retaining wall to a non-retaining wall). M3 – Where the length of the basement retaining wall is to be measured, the length of the basement wall shall be measured on the centre line. M4 – Where more than one type of retaining wall construction is employed, each type of retaining wall construction is to be stated separately.
				5 Fixings cast into/fixed to concrete retaining walls to retain masonry walls (e.g. brickwork, blockwork and stonework) facing wall.	N/A	N/A	
				6 Masonry walls (e.g. brickwork, blockwork and stonework) forming an integral part of the basement retaining wall construction, including where used for the purpose of concealment (external and internal skins), including reinforcement and design joints.	N/A	N/A	
				7 Waterproof tanking to walls.	Waterproof tanking	N/A	
				8 Applied protection to external tanking (e.g. protection boards) – details to be stated.	Protective external tanking	N/A	
				9 Thermal insulation, damp-proof membranes, vapour barriers and the like.	Damp proofing and vapour barriers	N/A	
				10 Groundwater pressure relief drains to basements and retaining walls connected to the drainage system (i.e. fin drains, filter drains and blanket drains).To Soil connection.	N/A (inaccessible)	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance Descriptor		Measurement Rules For Maintenance Works
					Renewal (R)	Maintain (M)	
			item	11 Sundry items – planned inspections of basement retaining walls.	Actions arising from planned inspections	Planned inspections	M5 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately. M6 – Curved work is to be described and identified separately. M7 – Work within existing buildings is to be described and identified separately. M8 – Contractor-designed work is to be described and identified separately. This section of NRM 3 only includes for isolated repair. Embedded basement retaining wall full replacement is excluded. For large-scale and cost-significant repairs it will be necessary to seek advice from a structural specialist. **Note** – Structural survey and inspection fees and the like are to be included in group element 11: Consultants' and specialists' fees.
			note	12 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance Descriptor		Measurement Rules For Maintenance Works
					Renewal (R)	Maintain (M)	
		Embedded basement retaining walls: 2 Piling mats/platforms: details, including thickness of mat/platform (mm), to be stated.	m^2	6 Piling mats and platforms (installing, moving and removing on completion).	Embedded basement retaining walls	N/A	Scope covered by NRM 3 This section of NRM 3 only includes for isolated repair. Embedded basement retaining wall full replacement is excluded. For large-scale and cost-significant repairs it will be necessary to seek advice from a structural specialist. **Note** – Structural survey and inspection fees and the like are to be included in group element 11: Consultants' and specialists' fees.
			item	20 Sundry items – details to be stated	Sundry items	Sundry items	
			note	21 Subcontractor on costs (where applicable)	Subcontractor on costs	Subcontractor on costs	
		3 Piling plant: details to be stated.	item	7 Pile rigs/other plant, including bringing to and removing from site, maintenance, erection, dismantling and moving piling rigs to each pile position.	N/A	N/A	
		4 Moving piling rig to pile position.	nr	See item 7 included above.	N/A	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance Descriptor		Measurement Rules For Maintenance Works
					Renewal (R)	Maintain (M)	
		5 Guide walls: details to be stated.	m	See items 1 and 3 included below.	N/A	N/A	<u>Renewal Actions</u> **Replacement** – not applicable to maintenance works. **Major repairs** – To embedded basement retaining walls arising from identified actions from visual inspections and specialist surveys/investigations. <u>Maintain Actions</u> **Planned** – N/A (inspections taken with superstructures) **Proactive** – Monitoring subsidence and water ingress **Reactive** – Minor isolated repairs to embedded basement retaining walls. <u>N/A</u> – Not applicable to renewal and/or maintain work. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The area measured for piling mats/platforms is the surface area of the piling mat/platform. M3 – Secant piles and the like are to be enumerated. M4 – The linear length of guide walls and contiguous bored pile walls is measured on the centre line of the guide wall or contiguous bored pile wall, as applicable. M5 – The area measured for steel sheet piling is the total surface area of specified sheet pile length.
		6 Piles: details, including type, diameter (mm), depth (m), total length (m) and embedded length (m) of piles of piles, to be stated.	nr	1 Pile walls (i.e. contiguous bored pile walls, hard/hard secant pile walls, and hard/soft secant pile walls), including guide walls, trimming and cleaning faces, cutting out concrete to tops of piles and preparing pile heads and reinforcement for capping, and disposal of excavated material arising from piling. **Note** – Where no contamination/remediation strategy report exists, an allowance should be made within the construction risk allowance for the extra cost of disposing of contaminated material.	N/A	N/A	
		7 Contiguous bored pile walls: details, including diameter (mm), depth (m), total length (m) and embedded length (m) of piles of piles, to be stated.	m	See item 1 included above.	N/A	N/A	
		8 Disposal of excavated material arising from piling.	m^3	See item 1 above and item 3 included below.	N/A	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance Descriptor		Measurement Rules For Maintenance Works
					Renewal (R)	Maintain (M)	
		9 Cutting off tops of concrete piles.	nr/m	See item 1 included above.	N/A	N/A	M7 – The volume of disposal of excavated material arising from the piling measured is the cross-sectional area of the pile multiplied by the depth of the pile. M8 – Quantity given for disposal is the bulk before excavating and no allowance is made for subsequent variations to bulk. M9 – The area measured for trimming and cleaning faces of walls is the surface area of the exposed piled or diaphragm wall. M10 – The linear length of capping beams is measured on the centre line of the capping beam. M11 – The area measured for each basement retaining wall component is the area of the component, measured on the centre line of the component. M12 – The area measured for concrete applied by spray or gun is the surface area of the surface to which it is to be applied. M13 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately. M14 – Curved work is to be described and identified separately. M15 – Work within existing buildings is to be described and identified separately. M16 – Contractor-designed work is to be described and identified separately. M6 – The area measured for diaphragm walls is the area of the diaphragm wall, measured on the centre line of the diaphragm wall.
		10 Steel sheet piling: details, including total area (m^2) and total driven area (m^2) to be stated.	m^2	2 Steel sheet piling, including extensions and cutting off surplus lengths.	N/A	N/A	
		11 Cutting off surplus lengths of steel sheet piling.	nr	See item 2 included above.	N/A	N/A	
		12 Pile tests: details to be stated.	item	8 Pile tests (e.g. load tests and integrity tests).	N/A	N/A	
		13 Diaphragm walls: details, including depth of excavation (m), thickness (mm) of wall reinforcement rate (kg/m^3), to be stated.	m^2	3 Diaphragm walls, including excavating and disposal of excavated material, support fluid to uphold faces of excavation, concrete, reinforcement, formwork, joints and waterproof joints, guide walls, and trimming and cleaning faces. (See Note above about disposal of contaminated material.)	N/A	N/A	
		14 Ground anchors: details, including type, to be stated.	nr	4 Ground anchors.	N/A	N/A	
		15 Trimming and cleaning faces of piled and diaphragm walls.	m^2	See items 1 and 3 included above.	N/A	N/A	
		16 Temporary works: details to be stated.	item	13 Temporary works (e.g. props and wailings to support contiguous bored piled walls) and removal, including any necessary temporary anchors, foundations and the like.	N/A	N/A	
		17 Removal of temporary works: details to be stated.		See item 13 included above.	N/A	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance Descriptor		Measurement Rules For Maintenance Works
					Renewal (R)	Maintain (M)	
		18 Capping beams: details, including beam size (mm) and reinforcement rate (kg/m^3), to be stated.	m	5 Capping beams, including concrete, reinforcement and formwork.	N/A	N/A	
		19 Basement retaining wall components: details to be stated. **Note** – Reinforcement rate (kg/m^3) and formwork finish for in-situ concrete walls to be stated.	m^2	9 Instrumentation and monitoring.	N/A	Instrumentation and monitoring	
				10 Groundwater pressure relief drains to basements and retaining walls connected to the drainage system (i.e. fin drains, filter drains and blanket drains).To soil connection.	N/A	N/A	
				11 Concrete walls forming an integral part of the embedded basement wall construction, including reinforcement, tying to piled wall formwork.	N/A	N/A	
				12 Specialist concrete grades, such as waterproof concrete.	N/A	N/A	
				14 Fixings cast into/fixed to concrete retaining walls to retain masonry walls (e.g. brickwork, blockwork and stonework) facing wall.	N/A	N/A	
				15 Masonry walls/facings (e.g. brickwork, blockwork and stonework) forming an integral part of the embedded basement retaining wall.	N/A	N/A	
				16 Waterproof tanking to walls.	Waterproof tanking	N/A	
				17 Applied protection to external tanking (e.g. protection boards).	External tanking	N/A	
				18 Thermal insulation, damp-proof membranes, vapour barriers and the like.	Damp proofing and the like	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance Descriptor		Measurement Rules For Maintenance Works
					Renewal (R)	Maintain (M)	
		20 Concrete applied by spray or gun: details, including thickness (mm), to be stated.		19 Concrete applied by spray or gun, including reinforcement, formwork and design joints.	N/A	N/A	

Group element 2: Superstructure

Group element 2 comprises the following elements:

2.1 Frame

2.2 Upper floors

2.3 Roof

2.4 Stairs and ramps

2.5 External walls

2.6 Windows and external doors

2.7 Internal walls and partitions

2.8 Internal doors

Note 1 – Works requiring temporary services, security, safety and environmental protection (e.g. scaffolding internally), control and protection, mechanical plant, etc (to facilitate the measured work item) are included in group element 9: Maintenance contractor's management and administration costs.

Subcontractor on costs: Where works are to be carried out by a subcontractor, an allowance is to be made within the unit rate applied to elements or components for subcontractor's preliminaries, design fees, risk, overheads and profit.

Testing and commissioning: Where testing and commissioning of drainage installations is required to be measured under sub-element 2.2.3: Drainage to balconies, the terms shall include the following works:

(1) Testing includes:

(a) plugging outlets and carrying out water tests
(b) water required for testing

(2) Commissioning and setting to works includes:

(a) commissioning, including preliminary checks, setting systems and installations to work and regulation thereof, and commissioning records
(b) temporary operation of drainage to employer's requirements
(c) setting all drainage installations to work after completion of commissioning

Not applicable:	In the following pages 'N/A' means not applicable to renewal or maintain works.
	The work items, or actions required, within each section of the building superstructure elements have been categorised into the following:
Works (action required):	**Renewal (R)** – Replacement, Major repairs, Refurbishment, Upgrade work and Removals – plus Redecoration works (if measured separately)
	Maintain (M) – Planned, Proactive and Reactive/Minor Repair works
	Note – The required work actions included in the measurement rules are not an exhaustive list and is for guidance only
Planned inspections:	The planned inspections of the superstructures elements, includes for identifying problems with substructures (e.g. foundations subsidence).

Note: This group element of tabulated rules of measurement has been aligned with NRM 1 to create a standardised costs structure that links all construct (C) sub-element, components and inclusions with the 'applicable' renewal (R) and maintain (M) work items. Specific construction works that are not applicable (N/A) to maintenance works have been identified throughout.

Element 2.1: Frame

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
2.1.1	**Steel frames** **Definition:** Structural steelwork in frames, including all fittings, fixings and components.	1 Structural steel frame including fittings and fixings: details, including size of column grid (m), to be stated.	t/(item)	1 Structural steel frame, including all components (e.g. columns, beams, composite columns and beams, lattice beams, braces, struts and the like).	Frame – Steel (SF)	Frame – Steel (SF)	**Scope covered by NRM 3** This section of NRM 3 only includes for isolated repairs. Steel frames full replacement excluded in NRM 3. For large-scale and cost-significant repairs it will be necessary to seek advice from a structural specialist. **Note** – Structural survey and inspection fees and the like are to be included in group element 11: Consultants' and specialists' fees. (SF) – included as part of the steel frame **Renewal Actions** **Replacement** – Not applicable to maintenance works. **Major repairs** – To steel frames arising from identified actions from visual inspections and specialist surveys/investigations (e.g. repairing connections and fixings). **Fire-protective painting** – In situ re-coating or painting as appropriate (details to be stated) by specialist contractor. **Maintain Actions** **Planned** – Inspections of frames (non invasive)
				2 Fittings and fixings.	(SF)	(SF)	
				3 Roof trusses, where an integral part of the frame and cannot be separated from the frame.	(SF)	(SF)	
				4 Floor and roof members or decks forming an integral part of the frame, which cannot be separated from the frame.	(SF)	(SF)	
				5 Fabrication, trial erection and permanent erection on-site (including holding-down bolts, assemblies, grouting under base plates and the like).	(SF)	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
		2 Fire protection to steel frame: details to be stated.	item	6 Factory applied coatings, including fire-protective coatings and paint systems.	Fire protective coating	N/A	**Proactive** – (taken with group element 0 or 11 surveys) **Reactive** – Minor isolated repairs to steel frames. N/A – Not applicable to renewal and/or maintain work. M1 – Works identified by a structural survey or specialist inspection are to be described and itemised separately. M2 – Cost-significant components are to be described and identified separately. Such components are to be measured by the total mass in tonne (t) by area (m^2), linear measurement (m) or enumerated (nr) and the number and sizing of each component is to be stated, as appropriate. M3 – Planned inspection of frames is to be itemised.
		3 Factory applied paint systems: details to be stated.			Fire protective coating	N/A	
			item	7 Sundry items – planned inspection of frames.	Actions arising from planned inspections.	Planned inspection	
			note	8 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
2.1.2	**Space frames/decks** **Definition:** Space frames/decks, including structural support framework, and including all components.	1 Space frame/deck, including structural support framework, fittings and fixings: details to be stated.	m^2/(item)	1 Space frames/decks, including fittings and fixings.	Frame – Space deck (SDF)	Frame – Space desk (SDF)	<u>Scope covered by NRM 3</u> This section of NRM 3 only includes for isolated repairs. Steel frames full replacement excluded in NRM 3. For large-scale and cost-significant repairs it will be necessary to seek advice from a structural specialist. **Note** – Structural survey and inspection fees and the like are to be included in group element 11: Consultants' and specialists' fees. (SF) – included as part of the steel frame <u>Renewal Actions</u> **Replacement** – Not applicable to maintenance works. **Major repairs** – To steel frames arising from identified actions from visual inspections and specialist surveys/investigations (e.g. repairing connections and fixings). **Fire-protective painting** – In situ re-coating or painting as appropriate (details to be stated) by specialist contractor.
				2 Structural support framework.	(SDF)	(SDF)	
				3 Fittings and fixings.	(SDF)	(SDF)	
				4 Fabrication, trial erection and permanent erection on-site (including holding-down bolts, assemblies, grouting under base plates and the like).	N/A	N/A	
			item	6 Sundry items – planned inspection of frames	Actions arising from planned inspections.	Planned inspection	
			note	7 Subcontractor on costs (where applicable)	Subcontractor on costs	Subcontractor on costs	
		2 Fire protection to steel frame: details to be stated.	item	5 Factory applied coatings, including fire-protective coatings and paint systems.	Fire protective coating	N/A	
		3 Factory applied paint systems: details to be stated.			Fire protective coating	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
							Maintain Actions **Planned** – Inspections of frames (non invasive) **Proactive** – (taken with group element 0 or 11 surveys) **Reactive** – Minor isolated repairs to steel frames. N/A – Not applicable to renewal and/or maintain work. M1 – Works identified by a structural survey or specialist inspection are to be described and itemised separately. M2 – Cost-significant components are to be described and identified separately. Such components are to be measured by the total mass in tonne (t) by area (m^2), linear measurement (m) or enumerated (nr) and the number and sizing of each component is to be stated, as appropriate. M3 Planned inspection of frames is to be itemised
2.1.3	**Concrete casings to steel frames** **Definition**: Protective casings to columns and beams for structural or protective purposes, including fire protection.	1 Column casings: details, including number of columns (nr), columns size and type of formwork finish, to be stated.	m/(item)	1 Concrete. 2 Specialist concrete grades and additives.	Frame concrete casings (CC) N/A	Frame concrete casings (CC) N/A	Scope covered by NRM 3 This section of NRM 3 only includes for isolated repairs. Steel frames full replacement excluded in NRM 3. For large-scale and cost-significant repairs it will be necessary to seek advice from a structural specialist. **Note** – Structural survey and inspection fees and the like are to be included in group element 11: Consultants' and specialists' fees. (SF) – included as part of the steel frame

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
				3 Formwork. 4 Special formed finishes to in-situ concrete.	N/A (CC)	N/A (CC)	<u>Renewal Actions</u> **Replacement** – Not applicable to maintenance works. **Major repairs** – To steel frames arising from identified actions from visual inspections and specialist surveys/investigations (e.g. repairing connections and fixings). **Fire-protective painting** – In situ re-coating or painting as appropriate (details to be stated) by specialist contractor. <u>Maintain Actions</u> **Planned** – Inspections of frames (non invasive) **Proactive** – (taken with group element 0 or 11 surveys) **Reactive** – Minor isolated repairs to steel frames. <u>N/A</u> – Not applicable to renewal and/or maintain work. M1 – Works identified by a structural survey or specialist inspection are to be described and itemised separately. M2 – Cost-significant components are to be described and identified separately. Such components are to be measured by the total mass in tonne (t) by area (m^2), linear measurement (m) or enumerated (nr) and the number and sizing of each component is to be stated, as appropriate. M3 Planned inspection of frames is to be itemised
			item	5 Sundry items – planned inspection of frames.	Actions arising from planned inspections	Planned inspection	
			note	6 Subcontractor on costs.	Subcontractor on costs	Subcontractor on costs	
		2 Beam casings: details, including number of beams (nr), beam size and type of formwork finish, to be stated.	m/item	(Included in items 1 to 6 above).	Concrete casings	Concrete casings	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
2.1.4	**Concrete frames** **Definition:** Concrete columns and beams.	1 Columns: details, including number (nr) of columns, column size (mm), concrete grade, reinforcement rate (kg/m^3) and type of formwork finish, to be stated.	m/(item)	2 Columns, blade columns and the like.	Frame – Concrete (FC)	Frame – Concrete (FC)	<u>Scope covered by NRM 3</u> This section of NRM 3 only includes for isolated repairs. Steel frames full replacement excluded in NRM 3. For large-scale and cost-significant repairs it will be necessary to seek advice from a structural specialist. **Note** – Structural survey and inspection fees and the like are to be included in group element 11: Consultants' and specialists' fees. (FC) – included as part of the frame – concrete. (item) – unit of measurement for maintain <u>Renewal Actions</u> **Replacement** – Not applicable to maintenance works. **Major repairs** – To concrete frames arising from identified actions from visual inspections and specialist surveys/investigations (e.g. repairing connections and fixings). **Fire-protective painting** – In situ re-coating or painting as appropriate (details to be stated) by specialist contractor. <u>Maintain Actions</u> **Planned** – Inspections of frames (non invasive) **Proactive** – (taken with group element 0 or 11 surveys) **Reactive** – Minor isolated repairs to steel frames. <u>N/A</u> – Not applicable to renewal and/or maintain work. M1 – Works identified by a structural survey or specialist inspection are to be described and itemised separately.
				4 Concrete.	(FC)	(FC)	
				5 Specialist concrete grades and additives.	N/A	N/A	
				6 Reinforcement, including starter bars, punching shear reinforcement and the like.	N/A	N/A	
				7 Reinforcement for precast, prestressed and post-tensioned concrete, including stressing cables, applying stressing and the like.	N/A	N/A	
				8 Formwork.	N/A	N/A	
				10 Worked finishes (i.e. in-situ surface treatments), including the application of surface hardeners.	N/A	N/A	
				11 Special formed finishes to in-situ concrete.	N/A	N/A	
				12 Grouting-up of frame components.	(FC)	(FC)	
				13 Forming openings for doors, windows, screens and the like.	N/A	N/A	
			item	14 Sundry items – planned inspection of frames.	Actions arising from planned inspections	Planned inspection	
			note	15 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
		2 Beams: details, including number of beams (nr), beam size (mm), reinforcement rate (kg/m^3) and type of formwork finish, to be stated	m/(item)	1 Beams.	Frame – Concrete	Frame – Concrete	M2 – Cost-significant components are to be described and identified separately. Such components are to be measured by the total mass in tonne (t) by area (m^2), linear measurement (m) or enumerated (nr) and the number and sizing of each component is to be stated, as appropriate. M3 – Planned inspection of frames is to be itemised.
		3 Walls: details, including thickness of wall (mm), concrete grade, reinforcement rate (kg/m^3) and type of formwork finish, to be stated.	m/(item)	3 Walls and core walls forming an integral part of the structural assembly.	Frame – Concrete	Frame – Concrete	
		4 Extra over walls for forming openings in walls for doors, windows, screens and the like: details, including thickness of wall (mm), overall size of opening (m) and type of formwork finish, to be stated.	nr/(item)	(Not applicable to building maintenance works).	N/A	N/A	
		5 Designed joints: details to be stated.	m/(item)	9 Designed joints (e.g. to walls).	Designed joints	Frame – Concrete	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
2.1.5	**Timber frames** **Definition:** Timber frame systems, including all components.	1 Timber frames: details to be stated.	m^2/(item)	1 Complete timber frame systems, including all components and fixings.	Frame – Timber (TF)	Frame – Timber (TF)	<u>Scope covered by NRM 3</u> This section of NRM 3 only includes for isolated repairs. Components full replacement is excluded from NRM 3. **Note 1** – For large-scale and cost-significant major repairs and replacement works it will be necessary to seek advice from a structural specialist. **Note 2** – Structural survey and inspection fees and the like are to be included in group element 11: Consultants' and specialists' fees. TF – To be included as part of timber frames. <u>N/A</u> – Not applicable to renewal and/or maintain work. (item) – unit of measurement for maintain <u>Renewal Actions</u> **Replacement** – partial replacement of timber frames **Major repairs** – describe identified actions from inspections and specialist surveys/extra investigations to timber frames. <u>Maintain Actions</u> **Planned** – inspections of timber frames (non invasive) **Proactive** – timber treatment (localised or extensive) **Reactive** – Minor repairs to timber frames and the like
				2 Panel systems, such as off-site manufactured timber frames.	(TF)	(TF)	
				3 Laminated timber structures and the like.	(TF)	(TF)	
				4 Roof trusses, where an integral part of the frame and cannot be separated from the frame.	(TF)	(TF)	
				5 Floor, roof and structural wall members, including wall linings and floor boarding, forming an integral part of the frame, which cannot be separated from the frame.	(TF)	(TF)	
				6 Specialist subcontractor/supplier design of timber frame.	(TF)	(TF)	
				7 Trial erection and permanent erection on-site of timber frame (when required).	(TF)	(TF)	
				8 Treatments to timber.	Timber Treatment	(TF)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
				9 Site-applied fire-retarding paint.	Protective coating	N/A	M1 – Works identified by a structural survey or specialist inspection are to be described and itemised separately. M2 – Area measured to include the area of the upper floors. The area is measured using the rules of measurement for ascertaining the gross internal floor area (GIFA). M3 – Area measured to include area of roof where roof structure (including roof trusses) is an integral part of the frame. M4 – Details of floor roof (including trussed roofs) and wall members or decks, which cannot be separated from the frame, are to be stated. M5 – Cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) and the number and sizing of each component is to be stated, as appropriate. M6 – Planned inspections to be itemised
			item	10 sundry items – planned inspection of frames.	Actions arising from planned inspections	Planned inspection	
			note	11 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
2.1.6	**Specialist frames** **Definition:** Specialist structural frame systems, including all components.	1 Specialist frames: details to be stated.	m^2/(item)	1 Portal frames and similar individual structural units (e.g. steel, concrete, timber or other material).	Frames – Specialist (SF)	Frames – Specialist (SF)	**Scope covered by NRM 3** This section of NRM 3 only includes for isolated repairs. Components full replacement excluded from NRM 3. For large-scale and cost-significant repairs it will be necessary to seek advice from a structural specialist. **Note** – Structural survey and inspection fees and the like are to be included in group element 11: Consultants' and specialists' fees. SF – To be included as part of specialist frames. (item) – unit of measurement for maintain **Renewal Actions** **Replacement** – not applicable for maintenance works **Major repairs** – To specialist frames arising from identified actions from visual inspections and specialist surveys/investigations. **Maintain Actions** **Planned** –inspections to frames (non invasive) **Proactive** – protective treatment (localised or extensive) **Reactive** – Minor isolated repairs (details to be stated). M1 – Works identified by a structural survey or specialist inspection are to be described and itemised separately. M2 – The area measured is the area of the upper floors. The area is measured using the rules of measurement for ascertaining the gross internal floor area (GIFA). M3 – Cost-significant components are to be described and identified separately. Such components are to be measured by linear measurement (m) or enumerated (nr) and the number and sizing of each component is to be stated, as appropriate. M4 – Planned inspections are to be itemised.
				2 Specialist, proprietary and modular lightweight steel-frame systems.	(SF)	(SF)	
				3 Cellular construction, such as tunnel (slip) form.	(SF)	(SF)	
				4 Components, fittings and fixings.	(SF)	(SF)	
				5 Roof trusses, where an integral part of the frame and cannot be separated from the frame.	(SF)	(SF)	
				6 Floor and roof members or decks forming an integral part of the frame, which cannot be separated from the frame.	(SF)	(SF)	
				7 Fabrication, trial erection and permanent erection on-site (including holding-down bolts, assemblies, grouting under base plates and the like).	N/A	N/A	
				8 Factory applied coatings, including fire-protective coatings and paint systems.	Protective treatment	(SF)	
			item	9 Sundry items – planned inspection of frames	Actions arising from planned inspections	Planned inspection	
			note	10 Subcontractors on costs (where applicable).	Subcontractor on cost	Subcontractor on cost	

Element 2.2 Upper floors

Note: Where testing and commissioning of drainage installations is required to be measured under sub-element 2.2.3: Drainage to balconies, the terms shall include the following works:

Subcontractor on costs: Where works are to be carried out by a subcontractor, an allowance is to be made within the unit rate applied to elements or components for subcontractor's preliminaries, design fees, risk, overheads and profit.

Testing and commissioning: Where testing and commissioning of drainage installations is required to be measured under sub-element 2.2.3: Drainage to balconies, the terms shall include the following works:

(1) Testing includes:

(a) plugging outlets and carrying out water tests

(b) water required for testing

(2) Commissioning includes:

(a) commissioning, including preliminary checks, setting systems and installations to work and regulation thereof, and commissioning records

(b) temporary operation of drainage to employer's requirements

Not applicable: In the following pages 'N/A' means not applicable to renewal or maintain works.

Works (action required): The work items, or actions required, within each section of the building superstructure elements have been categorised into the following:

Renewal (R) – Replacement, Major repairs, Refurbishment, Upgrade work and Removals – plus Redecoration works (if measured separately)

Maintain (M) – Planned, Proactive and Reactive/Minor Repair works

Note – The required work actions included in the measurement rules are not an exhaustive list and is for guidance only

Planned inspections: The planned inspections of the superstructures elements, includes for identifying problems with substructures (e.g. foundations subsidence).

Note: This group element of tabulated rules of measurement has been aligned with NRM 1 to create a standardised costs structure that links all construct (C) sub-element, components and inclusions with the 'applicable' renewal (R) and maintain (M) work items. Specific construction works that are not applicable (N/A) to maintenance works have been identified throughout.

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
2.2.1	**Floors** **Definitions**: – reinforced and post-tensioned concrete – floor decks consisting of proprietary precast units, a combination of in-situ concrete with filler units of other material – structural timber floor construction, including floor boards – structural screeds.	**Concrete floors:** 1 Suspended floor slabs: details, including thickness (mm), concrete strength (N/mm^2), reinforcement rate (kg/m^3) and type of formwork finish, to be stated.	m^2/(item)	1 Concrete suspended floors, including: – upper floors – podium slabs forming roofs to basements – transfer structures – balconies (internal and external) that are an integral part of the suspended floor construction – mezzanine floors – service floors and the like – galleries, tiered terraces and the like – walkways, internal bridges and the like – external corridors/bridges forming links between buildings, including supporting frames – roofs to internal buildings, where an integral part of the upper floor construction.	Upper floor – Concrete (CUF)	Upper floor – Concrete (CUF)	<u>Scope covered by NRM 3</u> This section of NRM 3 only includes for isolated repairs. Components full replacement is excluded from NRM 3. For large-scale and cost-significant repairs it will be necessary to seek advice from a structural specialist. **Note** – Structural survey and inspection fees and the like are to be included in group element 11: Consultants' and specialists' fees. CUF – To be included as part of concrete upper floors. (item) – unit of measurement for maintain. <u>Renewal Actions</u> **Replacement** – not applicable for maintenance works **Major repairs** – Identified actions from the inspections and specialist surveys/investigations to floors. <u>Maintain Actions</u> **Planned** – inspections of upper floors (non invasive) **Proactive** – (taken with group element 11 – surveys) **Reactive** – Minor repairs to upper floors (details to be stated). M1 – Works relating to a structural survey or specialist inspection are to be described and itemised separately. M2 – The area measured is the area of the upper floors. The area is measured using the rules of measurement for ascertaining the gross internal floor area (GIFA). No deduction is to be made for beams, which form part of the upper floor. M3 – Where more than one floor construction type is employed, the areas measured for each floor construction type shall equal the total area of the upper floors.
				2 Reinforced concrete floors, including solid, waffle and trough slabs. Including all concrete, reinforcement (including punching shear reinforcement) and formwork (to soffits, edges and openings).	(CUF)	(CUF)	
				3 Post-tensioned concrete floors, including concrete, reinforcement, (i.e. stressing cables), formwork, applying stressing and grouting-up) and formwork.	(CUF)	(CUF)	
			item	7 Sundry items – planned inspection of floors	Actions arising from planned inspections	Planned inspection	
			note	8 Subcontractor on costs (where applicable)	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
		2 Edge form work: details of formwork to be stated.	m	5 Permanent formwork, including profiled sheet-metal decking.	N/A	N/A	M4 – Areas for balconies, galleries, tiered terraces, service floors, walkways, internal bridges, external links and roofs to internal buildings shall be shown separately. M5 – Sloping surfaces to be measured flat on plan. M6 – The length of linear components measured is their extreme length. M7 – Curved work is to be described and identified separately. M8 Planned inspections of upper floors to be itemised
		3 Designed joints: details to be stated.	m	6 Designed joints.	Designed joints	(CUF)	
		4 Surface treatment: details to be stated.	m^2	Worked finishes (i.e. in-situ surface treatments), including tamped finish, power-float finish and the application of surface hardeners.	N/A	N/A	
		Precast/composite decking systems: 5 Suspended floor slab: details, including type, thickness (mm), span (m) and loading (kN/m^2), to be stated.	m^2/(item)	1 Suspended floors, including: – upper floors – podium slabs forming roofs to basements – balconies (internal and external) that are an integral part of the suspended floor construction – mezzanine floors – service floors and the like – galleries, tiered terraces and the like – walkways, internal bridges and the like – external corridors/bridges forming links between buildings, including supporting frames – roofs to internal buildings, where an integral part of the upper floor construction.	Upper floor – precast concrete (PCDS)	Upper floor – Precast concrete (PCDS)	Scope covered by NRM 3 This section of NRM 3 only includes for isolated repairs. Components full replacement is excluded from NRM 3 For large-scale and cost-significant repairs, it will be necessary to seek advice from a structural specialist. **Note** – Structural survey and inspection fees and the like are to be included in group element 11: Consultants' and specialists' fees. PCDS – To be included as part of precast concrete decking systems. Renewal Actions Replacement – not applicable to maintenance works. **Major repairs** – Identified actions from inspections and specialist surveys/investigations to floors. Maintain Actions **Planned** – inspections to upper floors (non invasive)

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
				2 Solid, hollow, tee or other section precast and prestressed concrete plank and slab decks.	(PCDS)	(PCDS)	**Proactive** – (taken with group element 11 – surveys) **Reactive** – Minor repairs to upper floors (details to be stated). N/A – Not applicable to renewal and/or maintain work. M1 – Works relating to a structural survey or specialist inspection are to be described and itemised separately. M2 – The area measured is the area of the upper floors. The area is measured using the rules of measurement for ascertaining the gross internal floor area (GIFA). No deduction is to be made for beams, which form part of the upper floor. M3 – Where more than one floor construction type is employed, the areas measured for each floor construction type shall equal the total area of the upper floors. M4 – Areas for balconies, galleries, tiered terraces, service floors, walkways, internal bridges, external links and roofs to internal buildings shall be shown separately. M5 – Sloping surfaces to be measured flat on plan. M6 – Planned inspections to upper floors to be itemised.
				3 Composite decks of precast and prestressed concrete beams with filler blocks of precast concrete, in-situ concrete and other materials.	(PCDS)	(PCDS)	
				4 Composite decks of in-situ concrete on precast or prestressed concrete planks.	(PCDS)	(PCDS)	
				5 Hollow tile decks of in-situ concrete with filler blocks of clay, precast concrete or other material.	(PCDS)	(PCDS)	
				6 Precast and prestressed concrete components.	(PCDS)	(PCDS)	
				7 In situ concrete.	N/A	N/A	
				8 Site-fixed formwork and reinforcement.	N/A	N/A	
				9 Filler units.	N/A	N/A	
				10 Fixing slips, metal clips and other fixings.	N/A	N/A	
				11 Joints, including grouting joints.	Re-grouting joints	(PCDS)	
				12 Worked finishes (i.e. in-situ surface treatments), including the application of surface hardeners.	N/A	N/A	
				13 Performance tests.	N/A	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
			item	14 Sundry items – planned inspection of floors	Actions arising from planned inspections	Planned inspection	
			note	15 Subcontractor on costs (where applicable)	Subcontractor on costs	Subcontractor on costs	
		6 Timber floors: details to be stated.	m^2/(item)	1 Timber suspended floors, including: – upper floors – balconies (internal and external) that are an integral part of the suspended floor construction – mezzanine floors, service floors and the like – galleries, tiered terraces and the like – walkways, internal bridges and the like – external corridors/bridges forming links between buildings, including supporting frames – roofs to internal buildings, where an integral part of the upper floor construction.	Upper floors – Timber (TUF)	Upper floors –timber (TUF)	Scope covered by NRM 3 This section of NRM 3 only includes for isolated repairs. Components full replacement is excluded from NRM 3 – unless included in scope of the maintenance refurbishment For large-scale and cost-significant repairs it will be necessary to seek advice from a structural specialist. **Note** – Structural survey and inspection fees and the like are to be included in group element 11: Consultants' and specialists' fees. TUF – to be included as part of timber upper floors. SS – to be included as part of structural screeds. (item) – unit of measurement for maintain. Renewal Actions **Replacement** – replacement of timber floors agreed in scope **Major repairs** – Identified actions from inspections and specialist surveys/investigations to timber floors. Timber treatment – Eradication of infested timbers.
				2 Structural floor members, including joists, struts, trimmers, plates and the like.	(TUF)	(TUF)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
				3 Carpenter's metalwork, including strutting, joist hangers, straps, bolts and the like.	(TUF)	(TUF)	Maintain Actions **Planned** – As the scoping note statement above. **Proactive** – Visual inspections or structural surveys of floors. **Reactive** – Minor repairs to upper floors. N/A – Not applicable to renewal and/or maintain work. (item) – unit of measurement for maintain. M1 – Works relating to a structural survey or specialist inspection are to be described and itemised separately. M2 – The area measured is the area of the upper floors. The area is measured using the rules of measurement for ascertaining the gross internal floor area (GIFA). No deduction is to be made for beams, which form part of the upper floor. M3 – Where more than one floor construction type is employed, the areas measured for each floor construction type shall equal the total area of the upper floors.
				4 Floor surface where construction does not provide a platform (e.g. floor boarding to joisted floors).	(TUF)	(TUF)	
				5 Thermal insulation.	N/A (not accessible)	N/A (not accessible)	
			item	6 Sundry items – planned inspection of floors.	Action arising from planned inspections	Planned inspection	
			note	7 Subcontractor on costs (where applicable)	Subcontractor on costs	Subcontractor on costs	
		7 Structural screeds: details, including thickness (mm), reinforcement rate (kg/m^3) and surface treatments, to be stated.	m^2/(item)	1 Screed.	Structural screeds (SS)	Structural screeds (SS)	
				2 Reinforcement.	N/A	N/A	
				3 Worked finishes.	N/A	N/A	
				4 Surface treatments (e.g. surface hardeners and non-slip inserts).	(SS)	(SS)	
			item	5 Sundry items – planned inspection of floors.	Action arising from planned inspections	Planned inspection	
			note	6 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
2.2.2	**Balconies** **Definition:** Internal and external balconies that are not an integral part of the upper floor construction.	1 Balconies: details, including floor area (m^2), to be stated.	nr/(item)	1 Purpose-made balconies, which are not an integral part of the upper floor construction, comprising bolt-on frame, decking, soffit panels, integral drainage/drainage trays and balustrades/handrails.	Balconies – purpose made	Balconies – purpose made	<u>Renewal Actions</u> **Replacement** – To include removal of existing, preparation and replacement of balconies, as appropriate. **Major repairs** – To include preparation, repair and making good of balconies, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishment of balconies, as appropriate. <u>Maintain Actions</u> **Planned** – included as a proactive tasks. **Proactive** – Visual inspections of balconies (non invasive) **Reactive** – Minor repairs to balconies (details to be stated). (item) – unit of measurement for maintain. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Contractor-designed work is to be described and identified separately. M3 Planned inspections of balconies to be numerated (nr)
				2 Protective coatings and paint systems.	Protective coating	N/A	
				3 Surface treatments (e.g. surface hardeners and non-slip inserts).	N/A	N/A	
				4 Fittings and fixings.	N/A	N/A	
			nr	5 Sundry items – planned inspection of balconies.	Action arising from planned inspections	Planned inspection	
			note	6 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
2.2.3	**Drainage to balconies** **Definition:** Piped internal or external disposal systems for taking rainwater from balconies to the first underground drain connection or gully.	1 Rainwater downpipes: details to be stated.	m/(nr)	1 Rainwater downpipes including bends, swan necks and rainwater shoes and the like.	Downpipes	Downpipes	<u>Renewal Actions</u> **Replacement** – To include removal of existing, preparation and replacement of drainage to balconies, as appropriate. **Major repairs** – To include preparation, repair and making good of drainage to balconies, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishment of drainage to balconies, as appropriate. (nr) – unit of measurement for maintain. <u>Maintain Actions</u> **Planned** – PPM on drainage downpipes/outlets to balconies. **Proactive** – visual inspections of drainage to balconies. **Reactive** – Minor repairs to drainage/outlets to balconies M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The length of linear components measured is their extreme length, over all fittings, branches and the like. M3 – Contractor-designed work is to be described and identified separately.
		2 Floor outlets: details to be stated.	nr	2 Floor outlets.	Floor outlets	Floor outlets	
		3 Testing of installations.	%	3 Testing and commissioning of above-ground surface water drainage systems. 5 Testing and commissioning, and Set to work.	(included in Drainage)	(included in Drainage)	
		4 Commissioning of installations.	item	4 Sundry items – planned inspection of balconies.	Action arising from planned inspections	Planned inspection	
			note	6 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Element 2.3: Roof

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
2.3.1	**Roof structure** **Definition**: All components of the roof structure.	1 Roof structure – pitched roofs: details, including design loads (kN/m^2), spans (m) and angle of pitch (°), to be stated. 2 Extra over roof structure – pitched roofs for forming dormer.	m^2/(item)	1 Roof decks and slabs.	Roof structure – pitched (RSP)	Roof structure – pitched (RSP)	**Specification** – To be described for each item 1–18, in order to apply the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the component included in scope. **Note** – full replacement of roof structures included in NRM 3. **Excluded** – Providing temporary roofs and access scaffold included in group element 9: maintenance contractor's admin costs). **Note** – Structural survey and inspection fees and the like are to be included in group element 11: Consultants' and specialists' fees. RSP and RSF – Included as part of roof structures – pitched and roof structures – flat) (item) – unit of measurement for renewal works **Renewal Actions** **Replacement** – partial or full replacement of roof structures. **Major repairs** – Works only arising from identified actions from inspections and specialist surveys/investigations to roof structure. **Maintain Actions** **Planned** – Periodic timber treatment (arising from surveys) **Proactive** – Inspections of roof structure (non invasive) **Reactive** – Minor repairs to the roof structure (localised) M1 – Works arising from a structural survey or specialist inspection are to be described and itemised separately.
				2 Trusses, purlins, rafters, binders, hangers, hip and valley rafters, ridge boards, wall plates, firings, ceiling joists and the like.	(RSP)	(RSP)	
				3 Dormer trusses.	(RSP)	(RSP)	
				5 Specialist-designed roof trusses.	(RSP)	(RSP)	
				6 Roof boarding	(RSP)	(RSP)	
				7 Beams	(RSP)	(RSP)	
				8 Carpenter's metalwork (details to be stated).	(RSP)	(RSP)	
				9 Eaves and verge structures	(RSP)	(RSP)	
				10 Gable ends and internal walls above wall plate level.	(RSP)	(RSP)	
				11 Concrete (temporary or permanent).	(RSP) and roof structure flat (RSF)	(RSP & RSF)	
				12 Precast/composite decking systems.	(RSP and RSF)	(RSP & RSF)	
				13 Basement roofs.	(RSP and RSF)	(RSP & RSF)	
				14 Roofs to internal buildings.	(RSP)	(RSP)	
				15 Beams in unframed buildings.	(RSP)	(RSP)	
				16 Structural screeds to roofs.	(RSP)	(RSP)	
				17 Permanent formwork.	N/A	N/A	
				18 Thermal insulation laid in roof space (e.g. lagging).	Thermal insulation	Thermal insulation	
			item	19 Sundry items – planned inspection of roofs.	Action arising from planned inspections	Planned inspection	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
			note	20 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	M2 – The area measured for pitched roofs is the area of the roof on plan, to the extremities of the eaves. M3 – Flat roofs (without parapet walls) – the area measured is the area of the roof on plan, to the extremities of the eaves and valleys. M4 – Flat roofs (with parapets walls) – the area measured is the area within the parapet walls measured to the internal face of the parapet walls to the roof. **Note** – roof housings (e.g. lift motor and plant rooms) shall be broken down into the appropriate constituent components and measured in accordance with the measurement of the applicable components. M5 – Contractor-designed work is to be described and identified separately. M6 – Planned inspections of roofs is to be itemised.
		3 Prefabricated dormers: details to be stated.	nr	20 Prefabricate dormers.	N/A	N/A	
		4 Roof structure – flat roofs: details, including design loads (kN/m^2) and spans (m), to be stated.	m^2/(item)	(See items 1, 2, 5 to 16, and 18 to 20 included above).	Roof structure – Flat	Roof structure – Flat	
2.3.2	**Roof coverings** **Definition**: Protective cladding, coverings and coatings to roofs.	1 Roof coverings, non-structural screeds, thermal insulation and surface treatments: details to be stated.	m^2/(nr)	1 Roof cladding/coverings (e.g. tiling, slating, sheet coverings and thatching), including battening, underlay, vapour control layers, hip, valley, eaves and verge treatment, flashings, edge trims and other components required for the applicable cladding/covering system.	Roof covering – (RC) (state type and related specification)	Roof covering – (RC) (state type and related specification)	Specification – To be described for each item 1–10 in order to apply the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope. (nr) – unit of measurement for maintain.

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
		2 Extra over roof coverings for coverings to dormers, including cladding to dormer cheeks.	m^2/(nr)	2 Mastic asphalt roofing, liquid applied roof coatings and built up felt roof coverings: including underlay, vapour control layers, flashings, edge trims, skirtings, upstands and other boundary works required for the applicable roof covering system.	Roof covering – mastic asphalt	Roof covering – mastic asphalt	**Renewal Actions** **Replacement** – To include removal of existing, preparation and replacement of roof coverings (specific areas or in full). **Major repairs** – To include preparation, repair and making good of roof coverings, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishment of roof coverings, as appropriate. **Maintain Actions** **Planned** – PPM on applicable motorised photovoltaic solar and thermal devices. **Proactive** – inspections of roof coverings (non invasive) **Reactive** – Minor repairs to roof coverings. **N/A** – Not applicable to renewal and/or maintain work. M1 – The area to be measured for roof coverings and the like is the surface area of the roof covering to the extremities of the eaves or to the internal face of the parapet wall, whichever is applicable, excluding the area of roof lights, skylights and openings. No deduction is made for voids less than 1.00m^2. M2 – The area to be measured for dormer coverings is the surface area of the dormer roof coverings to the extremities of the eaves. No deduction is made for voids less than 1.00m^2. M3 – Where more than one type of roof covering system is employed, the area measured for each system is the area covered by the system.
			m^2/(nr)	3 Photovoltaic devices.	Photovoltaic device	Photovoltaic device	
			nr	4 Roof ventilation tiles.	(RC)	N/A	
			m^2/(nr)	5 Non-structural screed.	(RC)	N/A	
			m^2/(nr)	6 Thermal insulation to roofs, including insulation overlays for inverted roofs.	Thermal insulation (to pitched roof areas)	Thermal insulation (to pitched roof areas)	
			m^2/(nr)	7 Surface treatments to roof coverings (e.g. solar reflective painting, chippings, etc).	Surface treatment (state type)	Surface treatment (state type)	
			m^2/(nr)	8 Paving tiles, paving slabs and the like to form service walkways, roof terraces and the like on roof surfaces.	Roof paving	Roof paving	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
			m^2/(nr)	9 Green roofs and roof gardens, including protection layer, drainage layer, filter membranes and growing medium.	Green roofs/gardens	Green roofs/gardens	M4 – The length of linear components measured is their extreme length. M5 – Curved work is to be described and identified separately. M6 – Contractor-designed work is to be described and identified separately. M7 – Planned inspections of roof coverings are to be itemised
			m^2/(nr)	10 Planting to green roofs/roof garden.	Roof planting	Roof planting	
			item	11 Sundry items – planned inspection of roofs.	Actions arising from planned inspections	Planned inspection	
			note	12 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	
		3 Eaves and verge treatment to pitched roofs: details to be stated.	m	(Items are included in items 1 and 2 above).	(RC)	N/A	
		4 Edge treatment to flat roofs: details to be stated.			(RC)	N/A	
		5 Flashings: details to be stated.			Flashings	Roof covering	
2.3.3	**Specialist roof systems** **Definition:** Glazed roofing systems.	Specialist roof systems: details to be stated.	m^2/(nr)	1 Patent glazing.	Patent glazing	Specialist roof system (SRS)	**Specification** – To be described for each item 1–4 in order to apply the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope SRS – To be included as part of specialist roof systems. (nr) – unit of measurement for maintain Renewal Actions **Replacement** – To include removal of existing, preparation and replacement of specialist roof systems, as appropriate. **Major repairs** – To include preparation, repair and making good of specialist roof systems, as appropriate.
			m^2/(nr)	2 Glazed roofing systems.	Glazed roofing system	(SRS)	
			m^2/(nr)	3 Perspex roofing systems.	Perspex roofing systems	(SRS)	
			m^2/m	4 Roof components, including flashings, cover strips, integral drainage channels, perimeter treatments and the like.	Roof components – details to be stated	(SRS)	
			item	5 Sundry items – planned inspections of roofs.	Actions arising from planned inspections	Planned inspection	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
			note	6 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	**Refurbish** – To include removal of existing, preparation and refurbishment of specialist roof systems, as appropriate. Maintain Actions **Planned** – To roof system manufacturer's requirements. **Proactive** – Visual inspections of specialist roof systems. **Reactive** – Minor repairs to roof systems. M1 – The area measured is the area of the glazed roof on plan. M2 – Curved work is to be described and identified separately. M3 – Contractor-designed work is to be described and identified separately. M4 Planned inspections of roofs, is to be itemised.
2.3.4	**Roof drainage** **Definition:** Piped internal or external disposal for taking rainwater from roofs and the like to the first underground drain connection or gully.	1 Gutters: details to be stated.	m/(nr)	1 Gutters (other than those forming an integral part of a cladding or curtain walling system), including fittings, gutter outlets, balloons and gratings to outlet and the like.	Gutters	Gutters	Specification – To be described for each item 1–5 in order to apply the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope. (nr) – unit of measurement for maintain. Renewal Actions **Replacement** – To include removal of existing, preparation and replacement of roof drainage, as appropriate.
			nr	3 Syphonic roof drainage pipework systems.	Syphonic roof drainage	Syphonic roof drainage	
			nr	4 Rainwater heads, including gratings.	Rainwater heads	Rainwater heads	
			m	5 Painting and anti-corrosion treatments to gutters and rainwater downpipes.	Redecoration	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
			item	7 Sundry items – planned inspection of roofs.	Actions arising from planned inspections	Planned inspections	**Major repairs** – To include preparation, repair and making good of roof drainage, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishment of roof drainage, as appropriate. **Redecorations** – To gutters and downpipes, as appropriate. Maintain Actions **Planned** – PPM on applicable motorised roof systems and drainage channels. **Proactive** – Visual inspections of roof drainage. **Reactive** – Minor repairs to roof drainage. M1 – The length of linear components measured is their extreme length, over all fittings, branches and the like. M2 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately. M3 – Curved work is to be described and identified separately. M4 – Contractor-designed work is to be described and identified separately. M5 – Planned inspections of roofs, is to be itemised
			note	8 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	
		2 Rainwater pipes: details to be stated.	m/(nr)	2 Rainwater downpipes, including bends, swan necks and rainwater shoes.	Downpipes	Downpipes	
		3 Testing of installations.	%	6 Testing and commissioning.	Included in items 1–5 (Setting to work)	Included in item 1–5 (Setting to work)	
		4 Commissioning of installations.					

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
2.3.5	**Roof lights, skylights and openings** **Definition:** Roof lights, skylights and openings to roof (type and size to be stated).	1 Roof lights skylights and openings: type and size to be stated.	nr/m^2	1 Roof lights, skylights and the like.	Skylights	Skylights	<u>Specification</u> – To be described for each item 1–8 in order to apply the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope. RLSO – To be included as part of roof lights <u>Renewal Actions</u> **Replacement** – To include removal of existing, preparation and replacement of roof lights, skylights and openings, as appropriate. **Major repairs** – To include preparation, repair and making good of roof lights, skylights and openings, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishment of roof lights, skylights and openings, as appropriate. **Redecoration** – To roof lights and skylights, as appropriate. <u>Maintain Actions</u> **Planned** – PPM on the motorised roof lights and openings. **Proactive** – Inspections of roof lights, skylights and openings. **Reactive** – Minor repairs to roof lights, skylights and openings. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The area measured is the area of rooflights, skylights and openings. M3 – Curved work is to be described and identified separately.
			nr	2 Opening gear, frames, kerbs and glazing.	Opening gear	(inc. skylights)	
			nr	3 Sun pipes/tubes.	Sun pipes/tubes	(inc. skylights)	
			nr/m^2	4 Pavement lights.	Pavement lights	Pavement lights	
			nr	5 Roof hatches.	Roof hatches	Roof hatches	
			nr	6 Access hatches to roof spaces.	Access hatches	Access hatches	
			nr	7 Smoke vents.	Smoke vents	Smoke vents	
			nr	8 Roof vents and roof cowls.	Roof vents	(include in roof covering)	
			item	9 Sundry items – planned inspections of roofs.	Actions arising from planned inspections	Planned inspection	
			note	10 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
							M4 – Contractor-designed work is to be described and identified separately. M5 – Cost-significant components are to be described and identified separately. Such components are to be measured by linear measurement (m) or enumerated (nr) and the number and sizing of each component is to be stated, as appropriate. M6 – Planned inspections are to be itemised.
2.3.6	**Roof features** **Definition:** Roof features not forming part of the roof structure.	1 Roof features: details to be stated.	nr/(item)	1 Turrets.	Turret	Roof features (RF)	Specification – To be described for each item 1–10, in order to apply the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope. RF – To be included as part of roof features. (item) – unit of measurement for maintain Renewal Actions **Replacement** – To include removal of existing, preparation and replacement of roof features and openings, as appropriate. **Major repairs** – To include preparation, repair and making good of roof features, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishment of roof features, as appropriate. **Redecoration** – To roof features, as appropriate.
				2 Wind vanes.	Wind vanes	(RF)	
				3 Spires.	Spires	(RF)	
				4 False chimneys.	False chimney	(RF)	
				5 Enclosures designed solely to conceal plant, rooflines, and the like (complete structure, including wall louvres).	Roof enclosure	(RF)	
				6 Fall arrest systems.	Fall arrest system	(RF)	
				7 Access systems for cleaning roof.	Roof access system	(RF)	
				8 Roof edge protection (permanent).	Roof edge protection	(RF)	

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
				Renewal (R)	Maintain (M)	
			9 Balustrades, handrails to roof edges and walkways. 10 Service walkways within roof voids.	Roof balustrades Roof service walkways	(RF) (RF)	**Maintain Actions** **Planned** – PPM on applicable roof features. Proactive – Visual inspections of roof features. **Reactive** – Minor repairs to roof features. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Contractor-designed work is to be described and identified separately. M3 – Cost-significant components are to be described and identified separately. Such components are to be measured by linear measurement (m) or enumerated (nr) and the number and sizing of each component is to be stated, as appropriate.
		item	11 Sundry items – planned inspection of roofs	Actions arising from planned inspections	Planned inspection	
		note	12 Subcontractor on costs (where applicable)	Subcontractor on costs	Subcontractor on costs	

Element 2.4: Stairs and ramps

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
2.4.1	**Stair/ramp structures** **Definition:** Construction of staircases, ramps and landings.	1 Stair structure: details, including vertical rise of staircase, to be stated.	nr/(item)	1 Staircases, including spiral staircases and the like.	Staircases (SC) structures	Stair/ramps (SR) structures	<u>Specification</u> – To be described for each item 1–6 to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. SC – To be included as part of staircases. SR – To be included as part of stair/ramp structures. (item) – unit of measurement for maintain. <u>Renewal Actions</u> **Replacement** – Removal of existing structure and replace with equivalent stair/ramp structures and landings. **Major repairs** – Arising from identified actions from inspections and specialist surveys/investigations. **Refurbish** – N/A **Redecoration** – Of stair/ramp structures, as appropriate. <u>Maintain Actions</u> **Planned** – Normally covered by visual inspections. **Proactive** – Visual inspections of stair/ramp structures. **Reactive** – Minor repairs to stair/ramp structures. M1 – Number of storey flights (i.e. the number of staircases or ramps multiplied by the number of floors served (excluding the lowest floor served in each case). M2 – The vertical rise of stairs or ramps is the distance measured from top of structural floor level to top of structural floor level. M3 – Curved work is to be described and identified separately.
				3 Landings between floor levels.	(SC)	(SR)	
				4 Fire escape staircases.	(SC)	(SR)	
				5 In-situ and precast concrete stair/ramps structures including concrete, reinforcement, formwork, worked finishes and grouting (of precast units).	Steps	(SR)	
				6 Staircases fabricated from steel, timber or other material, including off-site applied coatings and paint systems.	(SC) state type	(SR)	
		2 Ramp structures: details, including vertical rise of ramp, to be stated.	nr/(item)	2 Access ramps	Ramps	(SR)	
			item	7 Sundry items – planned inspection of stairs and ramps.	Actions arising from planned inspections	Planned inspection	
			note	8 Subcontractor on costs.	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
							M4 – Contractor-designed work is to be described and identified separately. M5 – Planned inspections to stairs and ramps are to be itemised – stating the number of stairs and ramps
2.4.2	**Stair/ramp finishes** **Definition:** Finishes to stairs, ramps and landings.	Stair finishes: details, including vertical rise of staircase, to be stated.	nr/(item)	1 Finishes to treads and risers.	Stair finishes (SF)	Stair finishes (SF)	**Specification** – To be described for each item 1–4 in order to apply the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope (item) – unit of measurement for maintain Renewal Actions **Replacement** – To include removal of existing, preparation and replacement of stair/ramp finishes, as appropriate. **Major repairs** – To include preparation, repair and making good of stair/ramp finishes, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishment of stair/ramp finishes, as appropriate. **Redecoration** – To stair/ramp finishes, as appropriate. Maintain Actions **Planned** – Normally covered by visual inspections. **Proactive** – Visual inspections of stair/ramp finishes. **Reactive** – Minor repairs to stair/ramp finishes. M1 – Number of storey flights (i.e. the number of staircases or ramps multiplied by the number of floors served (excluding the lowest floor served in each case).
				2 Finishes to landings between floor levels.	(SF)	(SF)	
				4 Finishes to strings.	(SF)	(SF)	
				5 Finishes to the soffits of staircase.	(SF)	(SF)	
			item	5 Sundry items – planned inspection of stairs and ramp finishes.	Actions arising from planned inspections	Planned inspection	
			note	6 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
		2 Ramp finishes: details, including vertical rise of ramp, to be stated.	nr/(item)	3 Finishes to ramp surfaces.	Ramp finishes	Ramp finishes	M2 – The vertical rise of stairs or ramps is the distance measured from top of structural floor level to top of next structural floor level. M3 – Curved work is to be described and identified separately. M4 – Contractor-designed work is to be described and identified separately. M5 – Planned inspection to stairs and ramps to be itemised
2.4.3	**Stair/ramp balustrades and handrails** **Definition:** Balustrades and handrails to stairs, ramps and landings.	1 Wall handrails: details, including vertical rise of staircase or ramp, to be stated.	nr/(item)	1 Balustrades and handrails to stairs.	Balustrades and handrails (SRBH)	Stair/ramp balustrades and handrails (SRBH)	Specification – To be described for each item 1–4 in order to apply the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope SRBH – To be included as part of stair/ramps balustrades and handrails. (item) – unit of measurement for maintain Renewal Actions **Replacement** – To include removal of existing, preparation and replacement of stair/ramp balustrades and handrails, as appropriate. **Major repairs** – To include preparation, repair and making good of stair/ramp balustrades and handrails, as appropriate. **Refurbishment** – To include removal of existing, preparation and refurbishment of stair/ramp balustrades and handrails, as appropriate. **Redecoration** – To stair/ramp balustrades and handrails, as appropriate. Maintain Actions **Planned** – Normally covered by visual inspection.
		2 Combined balustrades and handrails: details, including vertical rise of staircase or ramp, to be stated.		2 Balustrades and handrails to landings between floor levels.	(SRBH)	(SRBH)	
				3 Balustrades and handrails to landings.	(SRBH)	(SRBH)	
				4 Applied coatings and paint systems.	Decoration	N/A	
			item	1 Sundry items – planned inspection of stairs and ramp balustrades and railings.	Actions arising from planned inspections	Planned inspection	
			note	2 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
				Renewal (R)	Maintain (M)	
						Proactive – Visual inspections of stair/ramp balustrades and handrails. **Reactive** – Minor repairs to stair/ramp balustrades and handrails. M1 – Number of storey flights (i.e. the number of staircases or ramps multiplied by the number of floors served (excluding the lowest floor served in each case). M2 – The vertical rise of stairs or ramps is the distance measured from top of structural floor level to top of structural floor level. M3 – Curved work is to be described and identified separately. M4 – Contractor-designed work is to be described and identified separately. M5 Planned inspection to stairs and ramps to be itemised.

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
2.4.4	**Ladders/chutes/slides** **Definition:** Access and escape ladders and the like.	1 Ladders: details to be stated.	nr	1 Fire escape ladders.	Ladders, chutes and slides (LCS)	Ladders, chutes and slides (LCS)	<u>Specification</u> – To be described for each item 1–4 in order to apply the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope LCS – To be included as part of ladders/chutes/slides. <u>Renewal Actions</u> **Replacement** – To include removal of existing, preparation and replacement of ladders/chutes/slides, as appropriate. **Major repairs** – To include preparation, repair and making good of ladders/chutes/slides, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishment of ladders/chutes/slides, as appropriate. **Decorations** – detail the specifications as appropriate <u>Maintain Actions</u> **Planned** – Safety checks on ladders/chutes/slides. **Proactive** – Visual inspections of ladders/chutes/slides. **Reactive** – Minor repairs to ladders/chutes/slides M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Contractor-designed work is to be described and identified separately. M3 – Planned inspections to be itemised.
				2 Access ladders.	(LCS)	(LCS)	
				3 Loft ladders, including hatch doors where an integral part of the loft ladder.	(LCS)	(LCS)	
				4 Applied coatings and paint systems.	Decoration	N/A	
			item	5 Sundry items – planned inspection of ladders, chutes and slides.	Actions arising from planned inspections	Planned inspection	
			note	6 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	
		2 Chutes: details to be stated.	nr	7 Fire escape chutes/slides.	Fire escape chute/slides	(LCS)	
		3 Slides: details to be stated.					

Element 2.5: External walls

Note: Where testing and commissioning is required to be measured under sub-elements 2.5.5: Subsidiary walls, balustrades, handrails, railings and proprietary balconies, and 2.5.6: Facade access/cleaning systems, the terms shall include the following works:

Subcontractor on costs: Where works are to be carried out by a subcontractor, an allowance is to be made within the unit rate applied to elements or components for subcontractor's preliminaries, design fees, risk, overheads and profit.

Testing and commissioning: Where testing and commissioning of drainage installations is required to be measured under sub-element 2.2.3: Drainage to balconies, the terms shall include the following works:

(1) Testing includes:

(a) Testing equipment and consumables
(b) Calibration
(c) Site installation tests, including water tests for drainage installations
(d) Static testing, including testing records
(e) Performance testing, including performance test records
(f) Fuels and water required for testing

(2) Commissioning includes:

(a) commissioning, including preliminary checks, setting systems and installations to work and regulation thereof, and commissioning records
(b) Temporary operation of equipment to employer's requirements
(c) Fuels and water required for commissioning

(3) Setting all drainage installations and mechanical and electrical services and installations to work after completion of commissioning (initial operation)

Not applicable: In the following pages 'N/A' means not applicable to renewal or maintain works.

Works (action required): The work items, or actions required, within each section of the building superstructure elements have been categorised into the following:

Renewal (R) – Replacement, Major repairs, Refurbishment, Upgrade work and Removals – plus Redecoration works (if measured separately)

Maintain (M) – Planned, Proactive and Reactive/Minor Repair works

Note – The required work actions included in the measurement rules are not an exhaustive list and is for guidance only

Planned inspections: The planned inspections of the superstructures elements, includes for identifying problems with substructures (e.g. foundations subsidence).

Note: This group element of tabulated rules of measurement has been aligned with NRM 1 to create a standardised costs structure that links all construct (C) sub-element, components and inclusions with the 'applicable' renewal (R) and maintain (M) work items. Specific construction works that are not applicable (N/A) to maintenance works have been identified throughout.

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
2.5.1	**External enclosing walls above ground-floor level** **Definition:** External enclosing walls above ground floor level.	1 External walls: details, to be stated. **Note:** Reinforcement rate (kg/m^3) and formwork finish for in-situ concrete walls to be stated.	m^2/(nr)	1 External enclosing walls (i.e. both internal and external skins).	External walls (EW)	External walls (EW)	<u>Specification</u> – To be described for each item 1–27, in order to apply the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope. EW – To be included as part of external enclosing walls. (nr) – unit of measurement for maintain. <u>Renewal Actions</u> **Replacement** – To include removal of existing, preparation and replacement of external enclosing walls above ground, as appropriate. **Major repairs** – To include preparation, repair and making good of external enclosing walls above ground, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishment of external enclosing walls above ground, as appropriate. **Redecoration** – To external wall, to be described and identified separately, as appropriate. <u>Maintain Actions</u> **Planned** – PPM on applicable motorised opening vents, integral blinds and photovoltaic glazing. **Proactive** – Visual inspections of external enclosing walls above ground. **Reactive** – Minor repairs to external enclosing walls above ground. M1 – The area measured is the area of the external wall, measured on the centre line of the external wall. No deductions for windows or external doors.
				2 Underside of returns in external walls.	N/A	N/A	
				3 Parapet walls, including copings and cappings, to roofs formed as part of the external walls.	Parapet walls	(EW)	
				4 Gable walls formed as part of the wall construction.	(EW)	(EW)	
				5 Chimneys – formed as part of external walls.	Chimneys	Chimneys	
				6 Columns and beams in unframed structures.	(EW)	(EW)	
				7 Curtain walling (designed and fixed as an integrated assembly – complete with opening lights, doors, ventilators, and the like).	Curtain walling	Curtain walling	
				8 Structural glazing assemblies and the like (i.e. glazing that forms an integral part of a cladding system).	(EW)	(EW)	
				9 Profiled sheet cladding systems, including cladding rails and the like.	(EW)	(EW)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
				11 Opening vents and panels to curtain walling system, or structural glazing assemblies or profiled sheet cladding systems.	Opening vents	(EW)	M2 – Where more than one type of external wall system is employed, the area measured for each external wall system is measured separately. M3 – Where more than one external wall system is employed, the combined area of each external wall system shall equal the total area of all external wall systems. M4 – The area measured for external wall finishes is the surface area of the external wall component to which the finish is to be applied. M5 – Other cost-significant sub-components, such as decorative masonry or brickwork bands/panels, cover strips and window boards forming an integral part of internal skins/backing walls to curtain walling systems, cladding systems and the like, are to be measured by area (m^2), linear measurement (m) or enumerated (nr) and identified separately. M6 – The length of linear components measured is their extreme length, over all obstructions. M7 – Descriptions shall include the amount of any PC Sum included in the unit rates applied to the item. M8 – Curved work is to be described and identified separately. M9 – Contractor-designed work is to be described and identified separately. M10 – Planned inspections to external walls are to be itemised. **Note** – Faceted cladding, or similar external wall constructions, is to be measured flat on elevation, with no allowance for forming facets. The unit rate applied is to allow for the nature of the walling system.
				12 Integral blinds to windows curtain walling system or structural glazing assemblies.	Integral blind	(EW)	
				14 Rigid sheet cladding systems, including support framework.	(EW)	(EW)	
				16 Panelled walling systems, including panels to a frame structure.	(EW)	(EW)	
				17 Internal skins/backing walls to curtain walling systems, cladding systems, walling systems and the like, including window boards, cover strips and the like.	(EW)	(EW)	
				18 Concrete walls including reinforcement and formwork.	(EW)	(EW)	
				19 Masonry walls (i.e. brickwork, blockwork and stonework), including forming cavities, wall ties, thermal insulation and the like.	(EW)	(EW)	
				21 Lightweight steel-frame systems, including cladding and insulation.	(EW)	(EW)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
				22 Thermal insulation, membranes and the like.	(EW)	(EW)	
				23 Timber and plastic cladding systems (e.g. weatherboarding).	(EW)	(EW)	
				24 Insulating render systems.	(EW)	(EW)	
				25 Finishes applied to external wall (e.g. paint systems, coating systems, ceramic/stone cladding, tiling and other materials).	External decoration	N/A	
				26 Finishes to underside of returns in external walls.	N/A	N/A	
				27 Planted 'green' walls, including protection layer, drainage layer, filter membranes and growing medium.	Green walls	N/A	
				28 Forming openings in external walls for external windows and external doors, including lintels/beams, head courses, damp-proof courses, cavity trays, closing cavities and all other work to soffits, sills and reveals of openings.	N/A	N/A	
			item	29 Sundry items – planned inspection of external walls.	Actions arising from planned inspections	Planned inspection	
			note	30 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	
		2 Extra over external walls for plinths, cornices, ornamental bands and the like: details to be stated.	m^2	20 Plinths, cornices, ornamental bands and quoins which are formed with a different material from general wall.	(EW)	(EW)	
		3 Extra over external walls for quoins: details to be stated.	m	Included in 20 above.	(EW)	(EW)	

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
				Renewal (R)	Maintain (M)	
	4 Extra over external walls for forming openings for windows: details, including overall size of opening (mm), to be stated.	nr	N/A	N/A	N/A	
	5 Extra over external walls for forming openings for external doors: details, including overall size of opening (mm), to be stated.		N/A	N/A	N/A	
	6 Extra over cladding or curtain walling system for integral photovoltaic panels: details including overall size of opening (mm), to be stated.		10 Photovoltaic glazing or cladding panels where an integral part of a curtain walling system, or structural glazing assemblies or profiled sheet cladding systems.	Photovoltaic glazing	(T/E) – with curtain walling	
	7 Extra over cladding or curtain walling system for integral opening vents and panels: details, including overall size of opening (mm), to be stated.	nr/m^2	N/A	N/A	N/A	
	8 Projecting fins to cladding or curtain walling system: details, including overall size of panel (mm), to be stated.	nr	15 Projecting fins to cladding systems, including any applied artwork.	(EW)	(EW)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
		9 Extra over projecting fins for applied artwork: details to be stated.	item	N/A	N/A	N/A	
		10 Safety barriers, handrails or combined balusters and handrails to facetted glazing or cladding systems: details to be stated.	nr/m	13 Safety barriers, handrails or combined balusters and handrails to facetted glazing or cladding systems.	Safety barriers and the like	Safety barriers and the like	
		11 Finishes applied to external walls: details to be stated.	m^2	25 Finishes applied to external walls (e.g. paint systems, coating systems, ceramic/stone cladding, tiling and other materials).	(EW)	(EW)	
2.5.2	**External enclosing walls below ground-level** **Definition:** External enclosing walls below ground-floor level that are not formed by retaining walls.	1 External walls: details, including reinforcement rate (kg/m^3) and formwork finish for in-situ concrete walls, to be stated.	m^2/(nr)	1 External basement walls below ground-floor level not in contact with earthwork or part of an embedded retaining wall construction (i.e. not retaining walls). 2 External enclosing walls (i.e. both internal and external skins). 3 Underside of returns in external walls. 4 Parapet walls, including copings and cappings, to roofs formed as part of external walls. 5 Gable walls formed as part of wall construction. 6 Chimneys forming part of external walls. 7 Columns and beams in unframed structures.	External basement walls (EBW) (EBW) N/A Parapet walls (EBW) Chimneys (EBW)	External basement walls (EBW) (EBW) N/A (EBW) (EBW) (EBW) (EBW)	Specification – To be described for each item 1–24, in order to apply the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the component. EBW – To be included as part of external enclosing walls. (nr) – unit of measurement for maintain. Renewal Actions **Replacement** – To include removal of existing, preparation and replacement of external enclosing walls below ground, as appropriate. **Major repairs** – To include preparation, repair and making good of external enclosing walls below ground, as appropriate. Refurbish – To include removal of existing, preparation and refurbishment of external enclosing walls below ground, as appropriate. Maintain Actions **Planned** – Normally covered by visual tours/surveys.

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
				8 Curtain walling (designed and fixed as an integrated assembly – complete with opening lights, doors, ventilators, and the like).	Curtain walling	(EBW)	**Proactive** – Visual inspections of external enclosing walls below ground. **Reactive** – Minor repairs to external enclosing walls below ground. M1 – The area measured is the area of the external wall, measured on the centre line of the external wall. No deductions for windows or external doors. M2 – Where more than one type of external wall system is employed, the area measured for each external wall system is measured separately. M3 – Where more than one external wall system is employed, the combined area of each external wall system shall equal the total area of all external wall systems. M4 – The area measured for external wall finishes is the surface area of the external wall component to which the finish is to be applied. M5 – Other cost-significant sub-components, such as cover strips and window boards forming an integral part of internal skins/backing walls to curtain walling systems, cladding systems and the like, are to be measured by area (m^2), linear measurement (m) or enumerated (nr) and identified separately. M6 – The length of linear components measured is their extreme length, over all obstructions. M7 – Curved work is to be described and identified separately. M8 – Contractor-designed work is to be described and identified separately.
				9 Structural glazing assemblies and the like (i.e. glazing that forms an integral part of a cladding system).	Structural glazing	(EBW)	
				10 Profiled sheet cladding systems, including cladding rails and the like.	(EBW)	(EBW)	
				11 Photovoltaic glazing or cladding panels where an integral part of a curtain walling system, or structural glazing assemblies or profiled sheet cladding systems.	(T/E) – with curtain walling	N/A	
				12 Rigid sheet cladding systems, including support framework.	(EBW)	(EBW)	
				13 Panelled walling systems, including panels to a frame structure.	(EBW)	(EBW)	
				14 Internal skins/backing walls to curtain walling systems, cladding systems, walling systems and the like, including window boards, cover strips and the like.	(EBW)	(EBW)	
				15 Concrete walls, including reinforcement and formwork.	(EBW)	(EBW)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
				16 Masonry walls (i.e. brickwork, blockwork and stonework), including forming cavities, wall ties, thermal insulation and the like.	(EBW)	(EBW)	
				18 Lightweight steel-frame systems, including cladding and insulation.	(EBW)	(EBW)	
				19 Thermal insulation, membranes, and the like.	(EBW)	(EBW)	
				20 Timber and plastic cladding systems (e.g. weatherboarding).	(EBW)	(EBW)	
				21 Insulating render systems.	(EBW)	(EBW)	
				23 Finishes to underside of returns in external walls.	N/A	N/A	
				25 Forming openings in external walls for external windows and external doors, including lintels/beams, head courses, damp-proof courses, cavity trays, closing cavities and all other work to soffits, sills and reveals of openings.	N/A	N/A	
			m^2/(nr)	24 Planted 'green' walls, including protection layer, drainage layer, filter membranes and growing medium.	N/A	N/A	
			item	26 Sundry items – planned inspections of external walls.	Actions arising from planned inspections	Planned inspection	
			note	27 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	
		2 Extra over external walls for plinths, cornices, ornamental bands and the like: details to be stated.	m	17 Plinths, cornices, ornamental bands and quoins that are formed with a different material from general wall.	(EBW)	(EBW)	
		3 Extra over external walls for quoins: details to be stated.					

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
				Renewal (R)	Maintain (M)	
	4 Extra over external walls for forming openings for windows: details, including overall size of opening (mm), to be stated.	nr		(EBW)	N/A	
	5 Extra over external walls for forming openings for external doors: details, including overall size of opening (mm), to be stated.	nr		(EBW)	N/A	
	6 Finishes to external walls: details to be stated.	m^2/ (nr)	22 Finishes applied to external wall (e.g. paint systems, coating systems, ceramic/stone cladding, tiling and other materials.	External decoration	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
2.5.3	**Solar/rain screening** **Definition:** Cladding systems and the like attached to the exterior of the building to protect the external walls.	1 Vertical solar/rain screening: details, including projection (mm), to be stated.	m^2/(nr)	1 Vertical and horizontal exterior over cladding systems, including support systems.	Solar/rain screening	Solar/rain screening	<u>Specification</u> – To be described for each item 1 and 4, in order to apply the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope. (nr) – unit of measurement for maintain. <u>Renewal Actions</u> **Replacement** – To include removal of existing, preparation and replacement of solar/rain screening, as appropriate. **Major repairs** – To include preparation, repair and making good of solar/rain screening, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishment of solar/rain screening, as appropriate. <u>Maintain Actions</u> **Planned** – PPM on amotorised solar/rain screen cladding. **Proactive** – Visual inspections of solar/rain screening. **Reactive** – Minor repairs to solar/rain screening. M1 – The area measured is the area of the over cladding system. M2 – Where more than one type of over cladding system is employed, the area for each over cladding system is measured. M3 – The length of linear components measured is their extreme length, over all obstructions. M4 – Curved work is to be described and identified separately. M5 – Contractor-designed work is to be described and identified separately. M6 – Planned inspections to be itemised
			item	2 Sundry items – planned inspection of external walls	Actions arising from planned inspections	Planned inspection	
			note	3 Subcontractor on costs (where applicable)	Subcontractor on costs	Subcontractor on costs	
		2 Horizontal solar/rain screening: details to be stated.	m^2/(nr)	4 Brise soleil and the like, including supporting system.	Brise soleil system	Solar/rain screening	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
2.5.4	**External soffits** **Definition:** External false ceilings and demountable suspended ceilings that form an integral part of a building envelope.	1 External soffit: details to be stated.	m^2/(nr)	1 In-situ/board ceilings – including soffit linings and battens, fixed direct to underside of upper floor construction.	External soffits (ESF)	External soffits (ESF)	**Specification** – To be described for each item 1–8 in order to apply the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope. ESF – To be included as part of external soffits. (nr) – unit of measurement for maintain. **Renewal Actions** **Replacement** – To include removal of existing, preparation and replacement of external soffits, as appropriate. **Major repairs** – To include preparation, repair and making good of external soffits, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishment of external soffits, as appropriate. **Maintain Actions** **Planned** – Normally covered by visual checks/surveys. **Proactive** – Visual inspections of external soffits, cornices, covings and access hatches. **Reactive** – Minor repairs to external soffits, cornices, covings and access hatches.
				2 Demountable suspended ceiling systems, including suspension systems.	(ESF)	(ESF)	
				3 Insulation fixed direct to underside of upper floor construction or laid on soffit construction/soffit.	(ESF)	(ESF)	
				4 In-situ coatings applied to false ceilings (e.g. plaster skim coats, render, roughcast and specialist coatings).	(ESF)	(ESF)	
			item	9 Sundry items – planned inspection of external walls.	Action arising from planned inspections	Planned inspection	
			note	10 Subcontractor on costs (where applicable)	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
		2 Cornices, covings and the like: details to be stated.	m/(nr)	6 Cornices, covings and the like.	(ESF)	(ESF)	M1 – The area measured for each type of external soffit is the surface area of the soffit to which the finish is to be applied. M2 – The area measured for each type of finish applied to external soffits is the surface area of the soffit to which the finish is to be applied. M3 – The length of linear components measured is their extreme length, over all obstructions. M4 – Other cost-significant components are to be described and measured by area (m^2), linear measurement (m) or enumerated (nr) separately, as appropriate. M5 – Curved work is to be described and identified separately. M6 – Contractor-designed work is to be described and identified separately. M7 – Planned inspection of external walls to be itemised.
		3 Shadow gaps and the like: details to be stated.		7 Shadow gaps and the like, including painting.	(ESF)	(ESF)	
		4 Access hatches and the like: details to be stated.	nr	8 Access hatches and the like in external soffit construction.	Access hatches	(ESF)	
		5 Finishes applied to external soffits: details to be stated.	m^2	5 Painting and decorating to false ceilings.	External decoration	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
2.5.5	**Subsidiary walls, balustrades and proprietary balconies** **Definition:** Subsidiary components that form an integral part of the building envelope.	1 Walls: details to be stated.	m/(nr)	1 Low-level or dwarf walls, balustrades, handrails and railings to external walkways and balconies built off the upper floor construction, which form an integral part of the building envelope (e.g. to provide walkway between external enclosing wall and edge of upper floor construction), including walls forming planters. 8 All work, materials, components and the like required to construct subsidiary components.	Subsidiary walls (SW) Subsidiary components	Subsidiary walls (SW) (SW)	<u>Specification</u> – To be described for each item 1–8, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. SW – To be included as part of subsidiary walls. (nr) – unit of measurement for maintain. <u>Renewal Actions</u> **Replacement** – To include removal of existing, preparation and replacement of subsidiary walls, balustrades and proprietary balconies, as appropriate. **Major repairs** – To include preparation, repair and making good of subsidiary walls, balustrades and proprietary balconies, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishment of external soffits , as appropriate. **Redecoration** – To subsidiary walls, balustrades and the like, to be described, as appropriate. <u>Maintain Actions</u> **Planned** – Normally covered by visual checks/surveys. **Proactive** – Visual inspections of subsidiary walls, balustrades and proprietary balconies. **Reactive** – Minor repairs to subsidiary walls, balustrades and proprietary balconies. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The length of linear components measured is their extreme length, over all obstructions.
		2 Walls forming planters: details to be stated.	m/(nr)	2 Walls forming planters, including protection layer, drainage layer, filter membranes and growing medium.	Formed planters	(SW)	
		3 Combined balustrades and handrails: details to be stated.		4 Combined balustrades and handrails.	Balustrades and handrails	Balustrades and handrails	
		4 Wall-mounted handrails: details to be stated.		3 Wall handrails.	Wall handrails	Wall handrails	
		5 Parapet railings: details to be stated.		5 Railings and barriers to tops of parapet walls.	Railings to parapet	Railings to parapet	
		6 Proprietary bolt-on balconies: details to be stated.		6 Proprietary bolt-on balconies (e.g. 'Juliet' balconies).	Juliet balconies	Juliet balconies	
		7 Rainwater pipes: details to be stated.		7 Surface water drainage from external walkways and the like attached to building to first underground drain connection or gully, including floor outlets.	Downpipes	Downpipes	
		8 Floor outlets: details to be stated.			Floor outlets	Floor outlets	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
		9 Testing of rainwater drainage installation.	%	9 Testing and commissioning of above-ground surface water drainage systems.	Included with items (Set to work).	Included with items (Set to work).	M3 – Where more than one type of component is employed, each component is measured. M4 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately. M5 – Work to existing buildings is to be described and identified separately. M6 – Curved work is to be described and identified separately. M7 – The percentage additions for testing and commissioning are to be applied to the total cost of the items comprising the rainwater drainage installation. A single combined percentage addition can be applied to cover the costs of both testing and commissioning. M8 – Contractor-designed work is to be described and identified separately. M9 – Planned inspections to external walls to be itemised.
		10 Commissioning of rainwater drainage installation.					
			item	10 Sundry items – planned inspection of external walls.	Actions arising from planned inspections	Planned inspection	
			note	11 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
2.5.6	**Facade access/cleaning systems** **Definition:** Systems for accessing and cleaning facades.	1 Facade cleaning systems: details to be stated	nr	1 Window and facade cleaning trolley/cradles (including twin track, manual and automatic systems).	Window/facade cleaning cradles	Window/facade cleaning cradles	**Specification** – To be described for each item 1–5, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. Renewal Actions **Replacement** – To include removal of existing, preparation and replacement of facade access/cleaning systems, as appropriate. **Major repairs** – To include preparation, repair and making good of facade access/cleaning systems, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishment of facade access/cleaning systems, as appropriate. Maintain Actions **Planned** – Normally covered by visual checks/surveys. **Proactive** – Visual inspections of facade access/cleaning systems. Reactive – Minor repairs to facade access/cleaning systems M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Contractor-designed work is to be described and identified separately.
				2 Combined facade and roof cleaning system.	Combined facade/roof cleaning system	Combined facade/roof cleaning system	
				3 Building maintenance units.	Building maintenance units	Building maintenance units	
				4 Other facade access systems.	Other facade access system	Other facade access system	
				5 Builder's work in connection with facade access/cleaning systems.	Included with all above items	N/A	
			item	1 Sundry items – planned inspection of facade/access cleaning systems.	Actions arising from planned inspections	Planned inspection	
			note	2 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	
		2 Testing of installations.	%	6 Testing and commissioning of facade access/cleaning systems.	Included in item (Set to work)	Included in item (Set to work)	
		3 Commissioning installations.					

Element 2.6: Windows and external doors

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
2.6.1	**External windows** Windows and openings in external walls for ventilation and light.	1 Windows: details, including overall size of opening (mm), to be stated.	m^2/(nr)	1 Windows, including opening lights, fixed lights, frames, linings, window boards, cover trims, ironmongery and glazing.	External windows (EW)	External windows (EW)	<u>Specification</u> – To be described for each item 1–14, in order to apply the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope. EW – included as part of external windows (nr) – unit of measurement for maintain <u>Renewal Actions</u> **Replacement** – To include removal of existing, preparation and replacement of external windows (nr), or areas (m^2). **Major repairs** – To include preparation, repair and making good of external windows (nr) as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishing the external windows, (nr) as appropriate. **Redecoration** – To external windows and the like, to be described and identified with the renewal actions, or stated separately if part of decoration regime. (nr) – unit of measurement for renewal <u>Maintain Actions</u> **Planned** – PPM on motorised solar/rain screening, photovoltaic glazing, canopies roller shutters and integral blinds. Proactive – Visual inspections of external windows. Reactive – Minor repairs to external windows M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Where the area of the component is to be measured, the area measured is the area of the component measured over frames.
				2 Windows to dormers.	(EW)	(EW)	
				8 Solar/rain screen over cladding systems to window.	Solar/rain screening	Solar/rain screening	
				9 Photovoltaic glazing where an integral part of window system.	Photovoltaic glazing	(EW)	
				10 Canopies and the like providing protection to windows and shop fronts, including any associated surface water drainage	Canopies	Canopies	
				11 Protective film applied to windows.	Protective film	(EW)	
				13 Window boards, trims and the like, including those that are not an integral part of the window.	(EW)	(EW)	
				14 Painting and decorating.	External decoration	N/A	
		2 Louvres: details, including overall size of opening (mm), to be stated.	m^2/(nr)	3 Louvered windows and panels.	Louvered windows	(EW)	
		3 Shop fronts: details, including overall size of opening (mm), to be stated.	m^2	4 External shop fronts – including temporary shop fronts	Shop front	(EW)	
		4 Roller shutters, sliding shutters, grilles and the like to window openings: details, including overall size of opening (mm), to be stated.	nr	5 Roller shutters, sliding shutters, grilles and the like providing security or protection to windows and shop fronts.	Roller/sliding door	Roller/sliding door	
				6 Fly screens and storm windows.	Screen/Shutters	Screens/shutters (SS)	
				7 Integral blinds to windows.	Integral blinds	(SS)	

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
				Renewal (R)	Maintain (M)	
			12 External blinds, shutters and the like.	Blinds and shutters	Blinds and shutters	M3 – Where more than one type of component is employed, each component is measured. M4 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately. M5 – Curved work is to be described and identified separately. M6 – Contractor-designed work is to be described and identified separately. M7 – Planned inspection of external windows to be itemised.
		item/(nr)	15 Sundry items – planned inspection of external windows	Actions arising from planned inspections	Planned inspection	
		item/(nr)	16 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
2.6.2	**External doors** **Definition:** Doors and openings in external enclosing walls.	1 External doors: details, including type, number of door leaves (nr), size of each door leaf (mm) and overall size of opening (mm), to be stated.	nr	1 Entrance doors, door frames, door linings, door sets: including solid, glazed and partially glazed doors, louvre doors, and the like (proprietary and purpose-made).	External doors (ED)	External doors (ED)	**Specification** – To be described for each item 1–19, in order to apply the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope ED – included as part of external doors **Renewal Actions** **Replacement** – To include removal of existing, preparation and replacement of external doors, as appropriate. **Major repairs** – To include preparation, repair and making good of external doors, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishing the external doors, as appropriate. Redecoration – To external doors and the like, to be described and identified with the renewal works, or stated separately if part of a decoration programme of works. **Maintain Actions** **Planned** – PPM on applicable motorised doors, blinds and screens. **Proactive** – Visual inspections of external doors. **Reactive** – Minor repairs to external doors. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Where the area of component is to be measured, the area measured is the area of the component measured over frames. M3 – The length of linear components measured is their extreme length. M4 – Where more than one type of component is employed, each component is measured.
				2 Entrance screens and doors, including frames.	(ED)	(ED)	
				4 Patio doors.	(ED)	(ED)	
				8 Manual and automatic doors.	Automatic door (manual with ED)	Automatic door (manual with ED)	
				11 Fanlights, sidelights/side panels – integral to the door.	(ED)	(ED)	
				13 Ironmongery, including door closers, panic locks and the like.	(ED)	(ED)	
				14 Glazed vision panels.	(ED)	(ED)	
				15 Painting and decorating.	External decorations	N/A	
				16 Fly screens and storm doors.	Screens and storm doors	Screens and storm doors	
				17 Integral blinds to doors.	Integral blinlds	(ED)	
				18 Solar/rain screen over cladding to doors.	Solar/rain screening	Solar/rain screening	
			item	20 Sundry items – planned inspections of external doors	Actions arising from planned inspections	Planned inspection	
			note	21 Subcontractor on costs (where applicable)	Subcontractor on costs	Subcontractor on costs	
		2 Revolving doors: details, including overall size of opening (mm), to be stated.	nr	3 Revolving doors.	Revolving doors	Revolving doors	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
		3 Shop front doors: details, including type, number of door leaves (nr), size of each door leaf (mm) and overall size of opening (mm), to be stated.	nr	7 External shop front doors.	External shop front doors	External shop front door	M5 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately.
		4 Roller shutters, sliding shutters, grilles and the like to door openings: details, including overall size of opening (mm), to be stated.		6 Rolling and sliding shutters, including integral access doors.	Roller/sliding shutter	Roller/sliding shutter	
		5 Garage doors: details, including overall size of opening (mm), to be stated.		5 Garage doors.	Garage doors	Garage doors	
		6 Canopies: details to be stated.		9 Canopies and the like, providing protection to external doors, including any associated surface water drainage. 19 Canopies and the like providing protection to doors.	Canopies	Canopies	
		7 Grilles: details, including overall size of opening (mm), to be stated.		10 Grilles (fixed and folding) and the like providing security or protection to doors.	Grilles (fixed and folding)	Grilles (fixed and folding)	
		8 Architraves: details to be stated.		12 Architraves (included with items).	(ED)	(ED)	

Element 2.7: Internal walls and partitions

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
2.7.1	**Walls and partitions** **Definition:** Internal walls and fixed partitions.	1 Internal walls: details, including thickness, to be stated.	m^2	1 Internal walls, including full height and low level walls.	Walls and partitions (WAL)	Walls and partitions (WAL)	<u>Specification</u> – To be described for each item 1–17, in order to apply the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the component. **WAL** – included with walls and partitions (item) – unit of measurement for maintain <u>Renewal Actions</u> **Replacement** – To include removal of existing, preparation and replacement of walls and partitions, as appropriate. **Major repairs** – To include preparation, repair and making good of walls and partitions, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishing of walls and partitions, as appropriate. **Redecoration** – To walls and partitions, is to be described and identified with the renewal works, as appropriate. <u>Maintain Actions</u> **Planned** – PPM on the applicable motorised blinds. **Proactive** – Visual inspections of walls and partitions. **Reactive** – Minor repairs to walls and partitions. M1 – The area measured is the area of internal walls and partitions, measured on the centre line of the internal wall or partition. No deduction is made for door openings, screens or the like.
				3 Internal shop fronts and the like, including temporary shop fronts.	Shop fronts	(WAL)	
				4 Columns and beams that are not an integral part of a frame structure.	(WAL)	N/A	
				5 Internal walls in roof formed as part of the wall construction.	(WAL)	(WAL)	
				6 Walls forming chimneys, stairwells and lift shafts.	(WAL)	(WAL)	
				7 Walls forming cubicles.	(WAL)	(WAL)	
				8 Walls forming planters, including protection layer, drainage layer, filter membranes and growing medium.	Planters	(WAL)	
				9 Borrowed lights, glazed screens and the like that are an integral part of internal walls and partitions.	Borrowed lights/screens and the like	Borrowed lights and screens	
				10 Concrete walls, including reinforcement and formwork that are not an integral part of the structural frame.	(WAL)	(WAL)	
				11 Masonry walls (i.e. brickwork, blockwork and stonework), including floor and head support systems.	(WAL)	(WAL)	
				15 Thermal insulation and membranes.	(WAL)	(WAL)	
				16 Cappings to low-level internal walls, including timber, stone, tiles and other materials.	(WAL)	(WAL)	
				17 Blinds, where an integral part of a proprietary partitioning system.	Integral blind in partitions	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
				18 Forming openings for internal doors and the like in internal walls, including work to soffit and reveals of openings.	N/A	N/A	M2 – Where more than one type of component is employed, each component is measured. M3 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately. M4 – Curved work is to be described and identified separately. M5 – Contractor-designed work is to be described and identified separately. M6 – Planned inspections of internal walls to be itemised.
				19 Forming openings for internal doors and the like in internal fixed partitions, including work to soffit and reveals of openings.	N/A	N/A	
			item	20 Sundry items – planned inspection of internal walls and partitions	Actions arising from planned inspections	Planned inspection	
			note	21 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	
		2 Extra over internal walls for forming openings in walls for internal doors and the like: details, including overall size of opening (mm), to be stated.	nr/(item)	Included in works.	(WAL)	N/A	
		3 Fixed partitions: details, including thickness (mm), to be stated.	m^2/(item)	Fixed partitions, including demountable partition systems.	Fixed partitions	(WAL)	
				Timber stud partitions, including cavity insulation, board linings, filling lining joints.	(WAL)	(WAL)	
				Metal stud partitioning systems, including cavity insulation, board linings, filling lining joints.	(WAL)	(WAL)	
				Glazed partitioning.	(WAL)	(WAL)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
		4 Extra over fixed partitions for forming openings in partitions for internal doors and the like: details, including overall size of opening (mm), to be stated.	nr	N/A	N/A	N/A	
2.7.2	**Balustrades and handrails** **Definition:** Internal balustrades, handrails and other fixed non-storey height divisions.	1 Combined balustrades and handrails: details to be stated.	m	1 Balustrades and handrails to interior atriums, access walkways, galleries and the like, including off-site and on-site applied coating and paint systems.	Balustrades and handrails	Balustrades and handrails	**Specification** – To be described for each item 1, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. (item) – unit of measurement for maintain **Renewal Actions** **Replacement** – To include removal of existing, preparation and replacement of balustrades and handrails, as appropriate. **Major repairs** – To include preparation, repair and making good of balustrades and handrails, as appropriate.
			item	2 Sundry items – planned inspection on balustrades and handrails.	Actions arising from planned inspections	Planned inspection	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
			note	3 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	**Refurbish** – To include removal of existing, preparation and refurbishing the balustrades and handrails, as appropriate. **Redecoration** – To balustrades and handrails to be described and identified with the renewal works items. Maintain Actions **Planned** – Normally covered by visual surveys. **Proactive** – Visual inspections of balustrades and handrails. **Reactive** – Minor repairs to balustrades and handrails. M1 – The length of linear components measured is their extreme length. M2 – Where more than one type of component is employed, each component is measured. M3 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately. M4 – Curved work is to be described and identified separately. M5 – Contractor-designed work is to be described and identified separately. M6 – Planned inspection of balustrades/handrails to be itemised.

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
2.7.3	**Moveable room dividers** **Definition**: Moveable partitions intended to divide rooms into smaller spaces.	1 Moveable room dividers and partitions: details, including height (m), to be stated.	m	1 Moveable room dividers and partitions, including frames, linings, ironmongery, architraves, cover trims and the like (proprietary and purpose made).	Moveable room dividers	Moveable room dividers	<u>Specification</u> – To be described for each item 1–2, in order to apply the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope (item) – unit of measurement for maintain <u>Renewal Actions</u> **Replacement** – To include removal of existing, preparation and replacement of moveable room dividers, as appropriate. **Major repairs** – To include preparation, repair and making good of moveable room dividers, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishing the moveable room dividers, as appropriate. **Redecoration** – To moveable room dividers is to described and identified with the renewal work items. Maintain Actions **Planned** – PPM on applicable motorised room dividers. **Proactive** – Visual inspections of moveable room dividers. Reactive – Minor repairs to moveable room dividers. M1 – The length of linear components measured is their extreme length. M2 – Where more than one type of component is employed, each component is measured. M3 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately.
				2 Off-site and on-site applied coating and paint systems.	Internal decoration	N/A	
			item	3 Sundry items – planned inspection of internal walls and partitions.	Actions arising from planned inspections	Planned inspection	
			note	4 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
							M4 – Curved work is to be described and identified separately. M5 – Contractor-designed work is to be described and identified separately. M6 Planned inspection of internal walls to be itemised.
2.7.4	**Cubicles** **Definition:** Proprietary pre-finished panels, assembled to form cubicles, complete with doors.	1 Cubicles: details to be stated.	nr/m/m^2/ (item)	1 Proprietary pre-finished panel cubicles (e.g. toilet and changing) and the like, including doors, trims, cover strips, ironmongery and fittings forming an integral part of the cubicle.	Cubicles	Cubicles	**Specification** – To be described for each item 1, in order to apply the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope. (item) – unit of measurement for maintain Renewal Actions **Replacement** – To include removal of existing, preparation and replacement of cubicles, as appropriate. **Major repairs** – To include preparation, repair and making good of cubicles, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishing the cubicles, as appropriate. **Redecoration** – To cubicles to be described and identified with the renewal work items, as appropriate. Maintain Actions **Planned** – Normally covered by visual checks/surveys. **Proactive** – Visual inspections of cubicles. **Reactive** – Minor repairs to cubicles. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The length of linear components measured is their extreme length. M3 – The area measured is the area of moveable room dividers and partitions.
			item	Sundry items – planned inspections of cubicles	Actions arising from planned inspections	Planned inspection	
			note	Subcontractor on costs (where applicable)	Subcontractor on costs	Subcontractor on costs	
		2 Fixed partitions: details, including thickness (mm), to be stated.	nr/m/m^2/ (item)	Included in items 1 to 3 above.	As items 1–3 above	As items 1–3 above	

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
				Renewal (R)	Maintain (M)	
						M4 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately. M5 – Curved work is to be described and identified separately. M6 – Contractor-designed work is to be described and identified separately. M7 – Planned inspections of internal walls are to be itemised

Element 2.8: Internal doors

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
2.8.1	**Internal doors** **Definition:** Doors, hatches, shutters and grilles and other openings in internal walls and partitions.	1 Internal doors: details, including type, number of door leaves (nr), size of each door leaf (mm), and overall size of opening (mm), to be stated.	nr	1 Doors, including standard doors, purpose-made doors, full-height doors and fire-resisting doors.	Internal doors – standard or purpose made	Internal doors – standard or purpose made	<u>Specification</u> – To be described for each item 1–10, in order to apply the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope. IDR – To be included as part of internal doors. N/A – Not applicable to renewal and/or maintain work. <u>Renewal Actions</u> **Replacement** – To include removal of existing, preparation and replacement of internal doors, as appropriate (e.g. doors, frames, linings and stops and replace with new – including redecorating new internal doors and the like). **Major repairs** – To include preparation, repair make good of internal doors, as appropriate (e.g. re-glazing panels). **Refurbish** – To include removal of existing, preparation and refurbishing the internal doors, as appropriate. **Redecoration** – To be described and identified with the renewal work items, as appropriate. <u>Maintain Actions</u> **Planned** – PPM on applicable motorised doors, hatches, shutters and grilles and the like; including security checks. **Proactive** – Visual inspections of internal doors and the like, including protective measures (e.g. fix extra security and kick plates). **Reactive** – Minor repairs to internal doors (e.g. overhaul ironmongery, ease/adjust doors, replacing glazing).
				2 Frames, linings, architraves, stops and the like.	Frames, linings and architraves, stops	IDR	
				5 Glazed vision panels and the like.	Glazed vision panel	IDR	
				6 Sliding and folding doors in fixed partitions.	Sliding/folding doors	Sliding/folding doors	
				7 Hatches, including doors, frames, linings, architraves, stops and the like.	Hatches	Hatches	
			nr (prs)	8 Ironmongery.	Ironmongery	Ironmongery	
			nr	10 Painting and decorations.	Internal decoration	N/A	
		2 Fire-resisting doors: details, including type, number of door leaves (nr), fire rating (hours), size of each door leaf (mm), and overall size of opening (mm), to be stated.	nr	1A – Fire resisting doors (See door description included in item 1 above).	Doors – fire resisting	Doors – fire resisting	
		3 Door sets: details, including type, number of door leaves (nr), size of each door leaf (mm), and overall size of opening (mm), to be stated.		3 Door sets.	Door sets	(IDR)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
		4 Composite door and sidelights/over panel units: details, including type, number of door leaves (nr), size of each door leaf (mm), and overall size of opening (mm), to be stated.	nr	4 Fanlights, over panels and sidelights and the like that are integral to the door set.	Composite door and fanlights	(IDR)	M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Where more than one type of component is employed, each component is measured. M3 – Cost-significant sub-components are to be described and measured linear (m) or enumerated (nr) separately, as appropriate. M4 – The length of linear components measured is their extreme length. M5 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately. M6 – Contractor-designed work is to be described and identified separately. M7 – Planned inspection of internal doors to be itemised
		5 Roller shutters, sliding shutters, grilles and the like: details, including overall size of opening (mm), to be stated.		8 Internal roller shutters, sliding shutters, grilles and the like, including frames, linings, architraves, stops and the like.	Roller/sliding door	Roller/sliding door	
		6 Architraves: details to be stated.	m	Included in items 1 to 8 above.	(IDR)	(IDR)	
			item	11 Sundry items – planned inspection of internal doors	Actions arising from planned inspections	Planned inspection	
			note	12 Subcontractor on costs (where applicable)	Subcontractor on costs	Subcontractor on costs	

Group element 3: Internal finishes

Group element 3 comprises the following elements:

3.1 Wall finishes

3.2 Floor finishes

3.3 Ceiling finishes

Note: Works requiring temporary services, security, safety and environmental protection (e.g. internal scaffolding) control, mechanical plant, etc. (to facilitate the measured work item) are included in group element 9: Maintenance contractor's management and administration costs.

Subcontractor on costs	Where works are to be carried out by a subcontractor, an allowance is to be made within the unit rate applied to elements or components for subcontractor's preliminaries, design fees, risk, overheads and profit
Not applicable	In the following pages 'N/A' means not applicable to renewal and/or maintain works
Works (action required)	The work items, or actions required, within each section of the building element have been categorised into the following: **Renewal (R)** – Replacement, Major repairs, Refurbishment, Upgrade work and Removals – plus Redecoration works (if measured separately) **Maintain (M)** – Planned, Proactive and Reactive/Minor Repair works **Note** – The required work actions included in the measurement rules are not an exhaustive list and is for guidance only
Planned inspections	Non-invasive planned inspections are included in the internal finishes section – which are normally undertaken as part of the maintain (M) regime. Actions arising from the planned inspections are dealt with normally as renewal (R) works – when they not covered by the maintenance minor repairs provisions.

Note: This group element of tabulated rules of measurement has been aligned with NRM 1 to create a standardised costs structure that links all construct (C) sub-element, components and inclusions with the 'applicable' renewal (R) and maintain (M) work items. Specific construction works that are not applicable (N/A) to maintenance works have been identified throughout.

Element 3.1: Wall finishes

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
3.1.1	**Wall finishes** **Definition:** Applied finishes to internal wall surfaces, including specialist wall finishes for sports, public amenities and the like.	1 Finishes to walls and columns: details to be stated.	m^2	1 In-situ coatings applied to walls (e.g. plaster, render and roughcast).	Wall finishes – (WF) In-situ	Walls finishes (WF)	Specification – to be stated, in order to apply the appropriate reference service life (RSL) as appropriate to included item. WF – included as part of the wall finishes. Renewal Actions **Replacement** – To include removal of existing, preparation and replacement of wall finishes, as appropriate. **Major repairs** – To include preparation, repair and making good of wall finishes, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishing the wall finishes, as appropriate, with modern equivalent components. Maintain Actions **Planned** – Normally covered by visual surveys. **Proactive** – Visual inspections of wall finishes. **Reactive** – Isolated patch repairs to wall finishes. M1 – Where components are to be enumerated, the number of components is to be stated.
				2 Sprayed monolithic coatings to columns and walls (i.e. to provide fire protection, thermal insulation, condensation control and acoustic control).	WF – sprayed coating	(WF)	
				3 Plasterboard or other sheet linings, including fixing systems, joint reinforcing scrim, plaster skim coats and the like.	WF – plasterboard	(WF)	
				4 Ceramic wall tiling.	WF – ceramic tiling	(WF)	
				5 Decorative sheet coverings, including lining paper, decorative paper, vinyl and plastic wall covering, and textile wall covering.	WF – decorative sheet covering	(WF)	
				6 Painting and decorating.	WF – decorations	N/A	
				9 Insulation that provides a wall finish.	WF – insulation board	(WF)	
				10 Applied finishes to columns.	WF – applied finishes	(WF)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
				11 Wall finishes to staircase areas/stairwells.	WF – to staircases /stairwell	(WF)	M2 – The area measured for each type of wall finish is the surface area of the wall to which the finish is to be applied. No deduction is made for voids (e.g. door openings, screens and the like). M3 – The length of linear components measured is the extreme length over all obstructions. M4 – Painting and decorating of walls to individual rooms within residential units, hotel rooms, student accommodation units and the like may be enumerated (nr). The type of residential unit or room and size (by number of bedrooms) of unit is to be stated. M5 – Other cost-significant components are to be described and measured by area (m^2), linear measurement (m) or enumerated (nr) separately, as appropriate. M6 – Curved work is to be described and identified separately. M7 – Planned inspection of wall finishes to be itemised.
				12 Specialist wall finishes.	WF – specialist	(WF)	
			item	13 Sundry items – planned inspections of wall finishes	Actions arising from planned inspections	Planned inspection	
			note	14 Subcontractor on costs.	Subcontractor on costs	Subcontractor on costs	
		2 Picture rails, dado rails and the like: details to be stated.	m	7 Picture rails, dado rails and the like.	Picture and dado rails	(WF)	
		3 Proprietary impact and bumper guards, protection strips, corner protectors and the like: details to be stated.	nr/m	8 Proprietary impact and bumper guards, protection strips, corner protectors and the like.	Wall protection	(WF)	

Element 3.2: Floor finishes

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
3.2.1	**Finishes to floors** **Definition:** Applied finishes to floor surfaces, including specialist floors to sports facilities, public amenities and the like.	1 Finishes to floors: details to be stated.	m^2/(item)	1 Non-structural screeds, including under-screed damp-proof membranes.	Floor finishes (FF) screed	Floor finishes (FF)	**Specification** – to be stated, in order to apply the appropriate reference service life (RSL) to the included items in scope. **FF** – included as part of floor finishes. (item) – unit of measurement for maintain **Renewal Actions** **Replacement** – To include removal of existing, preparation and replacement of floor finishes, as appropriate. **Major repairs** – To include preparation, repair and making good of floor finishes, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishing the floor finishes, as appropriate, with modern equivalent components. **Maintain Actions** **Planned** – Normally covered by surveys. **Proactive** – Visual inspections of floor finishes. **Reactive** – Isolated repairs to specialist flooring systems. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The length of linear components measured is the extreme length over all obstructions.
				2 Latex screeds (i.e. levelling screeds).	FF – screed	(FF)	
				3 Chemical surface hardeners and sealers applied to screeds.	FF – surface hardener	(FF)	
				4 Floating floors.	FF – floating floor	(FF)	
				5 Resin-bonded resilient layers.	FF – resin	(FF)	
				6 In-situ floor finishes (e.g. granolithic and terrazzo).	FF – in-situ	(FF)	
				7 Tiled floor finishes (e.g. stone, quarry, ceramic and mosaic tiles).	FF – hard tile	(FF)	
				8 Woodblock flooring, composition block flooring, parquet flooring and the like.	FF – wood block	(FF)	
				9 Proprietary thin-tiled and strip flooring, blockwood flooring and the like.	FF – proprietary types	(FF)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
				10 Floor painting and sealing.	FF – painted floors	(FF)	M3 – The area measured for each type of floor finish is the surface area of the floor to which the finish is to be applied. M4 – The area measured for finishings to swimming pool tanks is the area of the swimming pool on plan, measured to the internal face of the swimming pool walls. M5 – Other cost-significant components are to be described and measured by area (m^2), linear measurement (m) or enumerated (nr) separately, as appropriate. M6 – Curved work is to be described and identified separately. M7 – Planned inspection of floor finishes to be itemised.
				11 Edge-fixed carpeting, including underlay, rods, grippers, edgings, and cover and threshold strips.	FF – carpets	(FF)	
				12 Fixed-flexible and semi-flexible tile and sheet coverings (e.g. carpet, vinyl, rubber, PVC, thermoplastic, cork, linoleum and antistatic flooring).	FF – tile/sheet	(FF)	
		2 Specialist flooring systems: details to be stated.	m^2	13 Timber-sprung floors to sports halls, squash courts and the like.	Timber-sprung floors	(FF)	
				14 Specialist floor covering systems.	Specialist floor covering systems	(FF)	
				16 Floor finishes to internal and external balconies.	Floor finishes to balconies	(FF)	
			item	20 Sundry items – planned inspection of floor finishes.	Actions arising from planned inspections	Planned inspection	
			note	21 Subcontractor on costs.	Subcontractor on costs	Subcontractor on costs	
		3 Skirtings and the like: details to be state.	m	17 Skirtings.	Skirtings (unless part of floor finishes)	(FF)	
		4 Mat wells and mats: details to be stated.	nr	18 Mat wells and mats.	Entrance matting	(FF)	
		5 Finishes to swimming pool tanks, including tank linings: details to be stated.	m^2	15 Finishes to swimming pool tanks, including tank linings.	Finishes to swimming pools	(FF)	
		6 Line markings: details to be stated.	m	19 Line markings, numerals, letters, symbols and the like (e.g. surface markings to denote car park spaces in basement car park).	Line markings	(FF)	
		7 Numeral and symbols: details to be stated.	nr				

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
3.2.2	**Raised access floors** **Definition:** Platform floors or dry construction, raised above the structural floor to create space for the distribution of services.	1 Raised access floor systems: details to be stated.	m^2	1 Proprietary raised access floor systems, including adjustable pedestals/supports, floor panels, ventilation and access panels, cavity fire barriers, air plenum barriers, outlet boxes and trunking, skirtings/edge trims that form part of the proprietary system, risers and nosings at changes of level, adhesives, bearing pads and shims.	Raised access floor system	Raised access floor system	**Refurbish** – To include removal of existing, preparation and refurbishing the floor finishes, as appropriate, with modern equivalent components. **Redecoration** – To be described and identified with the renewal work items, as appropriate, and/or measured separately if part of decoration programme of works. Maintain Actions **Planned** – Normally covered by surveys. **Proactive** – Visual inspections of floor finishes. **Reactive** – Isolated repairs to specialist flooring systems M1 – The area measured for each type of raised access floor system is the surface area of the floor to which the finish is to be applied. M2 – The length of linear components measured is their extreme length, over all obstructions. M3 – Curved work is to be described and identified separately. M4 – Planned inspections of floor finishes to be itemised Renewal Actions **Replacement** – To include removal of existing, preparation and replacement of floor finishes, as appropriate. **Major repairs** – To include preparation, repair and making good of floor finishes, as appropriate.
				2 Floor coverings/finishes (where factory-bonded or mechanically fixed on-site).	Floor coverings – to access floor systems	Floor finishes – to access floor systems	
		2 Skirtings and the like: details to be stated.	m	(Included in item 1 above).	Raised access floor system	Raised access floor system	
			item	3 Sundry items – planned inspections of access flooring systems.	Actions arising from planned inspections	Planned inspection	
			note	4 Subcontractor on costs.	Subcontractor on costs	Subcontractor on costs	

Element 3.3: Ceiling finishes

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
3.3.1	**Finishes to ceilings** **Definition:** Applied finishes to ceiling surfaces, including specialist ceiling finishes to sports facilities, public amenities and the like.	1 Finishes to ceilings: details to be stated.	m^2/(item)	1 Linings to ceilings (e.g. dry-lined plasterboard ceilings, pre-finished sheets, timber boarding and the like).	Ceiling finishes (state type of linings) (CF)	Ceiling finishes (CF)	**Specification** – to be stated in order to apply the appropriate reference service life (RSL to the components included **CF** – included as part of the ceiling finishes (item) – unit of measurement for maintain **Renewal Actions** **Replacement** – To include removal of existing, preparation and replacement of ceiling finishes, as appropriate. **Major repairs** – To include preparation, repair and making good of ceiling finishes, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishing the ceiling finishes, as appropriate. **Redecoration** – To ceiling finishes is to be described and identified with the renewal work item, or separately if part of redecoration programme of works. **Maintain Actions** **Planned** – Normally covered by visual checks. **Proactive** – Visual inspections of ceiling finishes. **Reactive** – Isolated patch repairs, as appropriate. M1 – The area measured for each type of ceiling finish is the surface area of the ceiling/soffit to which the finish is to be applied. M2 – The length of linear components measured is the extreme length over all obstructions.
				2 Linings to sides and soffits of beams, bulkheads and the like.	CF – linings	(CF)	
				3 In-situ coatings applied to ceilings (e.g. plaster skim coat, render, roughcast and specialist coatings).	CF – plaster in-situ	(CF)	
				4 Sprayed monolithic coatings to beams and ceilings (i.e. to provide fire protection, thermal insulation, condensation control and acoustic control).	CF – sprayed coating	(CF)	
				5 Painting and decorating to ceilings.	CF – decorations	(CF)	
				7 Specialist ceiling finishes.	CF – specialist	(CF)	
		2 Cornices, covings and the like: details to be stated.	m^2/(item)	6 Cornices, covings and the like.	Cornices and covings	(CF)	
			item	8 Sundry items – planned inspection of ceiling finishes.	Actions arising from planned inspections	Planned inspection	

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
		note	9 Subcontractor on costs.	Subcontractor on costs	Subcontractor on costs	M3 – Other cost-significant components are to be described and measured by area (m^2), linear measurement (m) or enumerated (nr) separately, as appropriate. M4 – Painting and decorating of ceilings to individual rooms is to be enumerated (nr). The type of room and size (by area dimensions) of unit is to be stated. M5 – Curved work is to be described and identified separately. M6 – Contractor-design work is to be described and identified separately. M7 – Planned inspections to ceiling finishes to be itemised.

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
3.3.2	**False ceilings** **Definition:** False ceilings comprising soffit linings on battens and the like fixed direct to underside of slabs, not demountable, including specialist false ceilings to sports facilities, public amenities, and the like.	1 False ceilings: details to be stated.	m^2/(item)	1 In-situ/board ceilings, including soffit linings, battens, support framework or suspension system, fixed direct to underside of upper floor construction.	False ceilings (FCF)	False ceilings (FCF)	**Specification** to be stated in order to appropriate apply the reference service life (RSL) to the included components. **FCF** – included as part of the false ceiling finishes (item) – unit of measurement for maintain **Renewal Actions** **Replacement** – To include removal of existing, preparation and replacement of ceiling finishes, as appropriate. **Maintain Actions** **Planned** – Normally covered by visual checks. **Proactive** – Visual inspections of ceiling finishes. **Reactive** – Isolated patch repairs, as appropriate. M1 – The area measured for each type of false ceiling is the surface area of the ceiling/soffit to which the finish is to be applied. M2 – The length of linear components measured is the extreme length over all obstructions. M3 – Other cost-significant components are to be described and measured by area (m^2), linear measurement (m) or enumerated (nr) separately, as appropriate. M4 – Painting and decorating of ceilings to individual rooms to be enumerated (nr). The type of room and size (by area dimensions) of unit is to be stated.
				2 Insulation fixed direct to underside of upper floor construction or laid on false ceiling.	FCF – insulation	(FCF)	
				3 In-situ coatings applied to false ceilings (e.g. plaster skim coats, render, roughcast and specialist coatings).	FCF – in-situ coatings	(FCF)	
				4 Painting and decorating to false ceilings.	FCF – decorations	(FCF)	
				6 Shadow gaps and the like, including painting.	FCF – shadow gaps	(FCF)	
			item	8 Sundry items – planned inspection of ceiling finishes.	Actions arising from planned inspections	Planned inspection	
			note	9 Subcontractor on costs.	Subcontractor on costs	Subcontractor on costs	
		2 Cornices, covings and the like: details to be stated.	m/(item)	5 Cornices, covings and the like.	Cornices and covings	(FCF)	
		3 Access hatches and the like: details to be stated.	nr/(item)	7 Access hatches and the like in false ceilings.	Access hatches	(FCF)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
3.3.3	**Demountable suspended ceilings** **Definition:** False ceilings of dry construction comprising a membrane of tiles, panels and trays supported by exposed or concealed suspended grids. Including specialist false ceilings to sports facilities, public amenities and the like.	1 Demountable suspended ceilings: details to be stated.	m^2/(item)	1 Proprietary suspended ceiling systems, including suspension systems.	Demountable suspended ceiling (DSC)	Demountable suspended ceiling (DSC)	**Major repairs** – To include preparation, repair and making good of demountable suspended ceiling, as appropriate. **Proactive** – Visual inspections of demountable suspended ceilings. Specification – to be stated, in order to apply the appropriate reference service life to the components included in scope. (item) – unit of measurement for maintain Renewal Actions **Replacement** – To include removal of existing, preparation and replacement of demountable suspended ceiling, as appropriate. **Reactive** – Isolated patch repairs, as appropriate.
				2 Integrated ceiling systems, including suspension systems.	DSC – state type	(DSC)	
				3 Acoustic suspended ceiling systems, including suspension systems.	DSC – acoustic type	(DSC)	
				4 Specialist suspended ceiling systems, including suspension systems.	DSC – specialist	(DSC)	
				5 Insulation fixed direct to underside of upper floor construction or laid on suspended ceiling system.	N/A – Included in suspended ceilings if replaced	N/A	
		2 Shadow gaps and the like: details to be stated	m/(item)	6 Shadow gaps and the like, including painting.	N/A	N/A	
		3 Access hatches and the like: details to be stated.	nr/(item)	7 Access hatches in suspended ceilings and the like.	Access hatches	(DSC)	
			item	8 Sundry items – planned inspection of ceiling finishes.	Actions arising from planned inspections	Planned inspection	
			note	9 Subcontractor on costs.	Subcontractor on costs	Subcontractor on costs	

Group element 4: Fittings, furnishings and equipment

Group element 4 comprises the following elements:

4.1 Fittings, furnishings and equipment

Note 1: Works requiring temporary services, security, safety and environmental, control and protection (e.g. internal scaffolding), mechanical plant, etc. (to facilitate the measured work item) are included in group element 9: Maintenance contractor's management and administration costs.

Subcontractor on costs:	Where works are to be carried out by a subcontractor, an allowance is to be made within the unit rate applied to elements or components for subcontractor's preliminaries, design fees, risk, overheads and profit.
Descriptors:	Maintain and renewal works descriptors – for applicable included components in the tabulated tables
Not applicable:	In the following tabulated tables, 'N/A' means not applicable to renewal or maintain works.
Works (action required):	The work items, or actions required, within each section of the building element have been categorised into the following: **Renewal (R):** Replacement, major repairs, refurbishment, upgrade work and removals **Maintain (M):** Planned, proactive and reactive/minor repair works **Note:** The required work actions included in the measurement rules is not an exhaustive list and is for guidance only.
Planned inspections	Non-invasive planned inspections are included in the FF&E section which are normally undertaken as part of the maintain (M) regime. Actions arising from the planned inspections are dealt with normally as renewal (R) works when they not covered by the maintenance minor repairs provisions

Note: This group element of tabulated rules of measurement has been aligned with NRM 1 to create a standardised costs structure that links all construct (C) sub-element, components and inclusions with the 'applicable' renewal (R) and maintain (M) work items. Specific construction works that are not applicable (N/A) to maintenance works have been identified throughout.

Element 4.1: Fittings, furnishings and equipment

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
4.1.1	**General fittings, furnishings and equipment** **Definition:** Furnishings, fittings and equipment fixed to the building fabric or provided loose within the building.	1 Fittings: details to be stated.	nr	1 Counters, desks, benches and worktops.	Counter, desks, benches and worktops	General fittings, furnishings and equipment (FFE)	**Specification** – To be described for each item 1–21, in order to apply the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope. FFE – included in fittings, furnishings and equipment. **Renewal Actions** **Replacement** – To include removal of existing, preparation and replacement of general fittings, furnishings and equipment, as appropriate. **Major repairs** – To include preparation, repair and making good of general fittings, furnishings and equipment, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishing of general fittings, furnishings and equipment, as appropriate. **Maintain Actions** **Planned** – Normally covered by visual checks. **Proactive** – Visual inspection of general fittings, furnishings and equipment.
				2 Mirrors, which are not an integral part of wall finishes, furnishings, fittings and equipment.	Mirrors	(FFE)	
				3 Curtains, curtain track rails, pelmets and the like.	Curtains and rails	(FFE)	
				5 Fireplace surrounds and hearths.	Fireplace and hearths	(FFE)	
				8 Storage racks, shelves, shelving support systems and the like.	Storage racks and shelving	(FFE)	
				10 Fitted seating, upholstery.	Fitted seating	(FFE)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
				12 Bathroom furniture, including vanity units, cupboards and the like.	Bathroom furniture	(FFE)	**Reactive** – Minor repairs identified by inspections or arising from reactive requests. N/A – Not applicable to renewal and/or maintain work. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Descriptions shall include the amount of any PC sum included in the unit rates applied to the item. M3 – Contractor-designed work is to be described and identified separately. M4 – Planned inspections of FF&E are to be itemised.
				21 Other general purpose fittings and furnishings.	Other general FFE	(FFE)	
				22 Delivery, unpacking, sorting, checking all components, assembling, fixing in position (including all bolts and other fixing devices).	(*included with all above items)	N/A	
		2 Furnishings: details to be stated.		4 Blinds and blind boxes, which are not an integral part of the window system.	Blinds	(FFE)	
				6 Wall hangings.	Wall hangings	(FFE)	
				7 Loose carpets.	Loose carpets	(FFE)	
				9 Tables and chairs.	Table /chairs	(FFE)	
				11 Bedroom furniture, including beds, divans, wardrobes, dressers, vanity units, cupboards, cabinets, drawer units and the like.	Bedroom furniture	(FFE)	
				13 Lockers, hat and coat rails and the like.	Lockers, hat/coat rails	(FFE)	
		3 Equipment: details to be stated.		14 Hand-held firefighting equipment, including fire extinguishers, fire blankets and the like (including backboards, fixings and the like).	Firefighting equipment – state type	Firefighting equipment – state type	
				15 Bins, wheelie bins, continental bins and the like.	Bins	N/A	
				16 Safes, including building into structure.	Safes (if in scope)	N/A	
				17 Vacuum cleaners and cleaning equipment.	Cleaning equipment	N/A	
				18 Televisions, hi-fis and computers.	Televisions and the like	N/A	
				19 Vending machines.	Vending machines	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
				20 Telephone booths and enclosures (internal).	Telephone booths	(FFE)	
			item	23 Sundry items – planned inspections of FF&E.	Actions arising from planned inspections	Planned inspection	
			note	24 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	
4.1.2	**Domestic kitchen fittings and equipment** **Definition:** Domestic kitchen units and equipment of all kinds.	1 Kitchen units: details to be stated.	nr	1 Kitchen units, including base units, drawer units, worktops, cupboards and the like.	Domestic kitchen units (DKU)	Domestic kitchen units	**Specification** – To be described for each item 1–9 in order to apply the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope. **Renewal Actions** **Replacement** – To include removal of existing, preparation and replacement of domestic kitchen fittings and equipment, as appropriate. **Major repairs** – To include preparation, repair and making good of domestic kitchen fittings and equipment, as appropriate **Refurbish** – To include removal of existing, preparation and refurbishing of domestic kitchen fittings and equipment, as appropriate. **Maintain Actions** **Planned** – Applicable kitchen appliance checks and health and safety assessments and the like. **Proactive** – Visual inspection of domestic kitchen fittings and equipment. **Reactive** – Minor repairs identified by inspections or reactive requests.
				2 Sinks, taps, waste fittings and waste disposal units where supplied as part of the kitchen fitting installation.	Sinks, taps and the like	Sinks, taps and the like	
				8 Kitchen equipment suites (i.e. comprising any combination of kitchen appliances items 3 to 7).	(Covered in 4.1.2..3 to 7)	T/E	
				9 Other kitchen fittings and equipment.	Other kitchen fittings and equipment	Other kitchen fittings and equipment	
				10 Delivery, unpacking, sorting, checking all components, assembling and fixing into position (including all bolts and other fixing devices).	(included with all above items)	N/A	

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
	2 Kitchen appliances: details to be stated.	nr	3 Ovens, cookers, hobs, grill, microwaves and the like. 4 Refrigerators, freezers and the like. 5 Dishwashers. 6 Clothes washing machines, clothes dryers, ironing cabinets and the like.	Catering equipment Refrigerators/freezers Dishwashers White goods	Catering equipment Refrigeration Dishwashers White goods	N/A – Not applicable to renewal and/or maintain work. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Descriptions shall include the amount of any PC Sum included in the unit rates applied to the item M3 – Contractor-designed work is to be described and identified separately. M4 – Planned inspections of FF&E are to be itemised.
	3 Waste bins, towel rails, storage racks and other accessories: details to be stated.	item	7 Waste bins, towel rails, storage rails and other accessories. 11 Sundry items – planned inspection of domestic kitchen fittings and equipment	Waste bins, towel rails and the like Actions arising from planned inspections	N/A Planned inspection	
		note	12 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on cost	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
4.1.3	**Special-purpose fittings, furnishings and equipment** **Definition:** Fittings, furnishings and non-mechanical or non-electrical equipment fixed to the building fabric or provided loose within the building. 'Special' in the sense that they are designed for the particular purpose(s) of the building and are likely to be obtained from a specialist supplier or specialist contractor for use within the building.	1 Fittings: details to be stated. 2 Furnishings: details to be stated. 3 Equipment: details to be stated.	nr/(item)	1 Furnishings, fittings and non-mechanical or non-electrical equipment designed specifically for a particular type of building, such as: – agricultural, fishing and forestry buildings – communications, power supply, mineral supply and water supply buildings – defence, police, prison and fire service buildings – educational buildings, including workbenches, blackboards and gymnasia equipment – entertainment buildings, community centres and clubs, including bars – factories, industrial buildings for food, drink, chemicals, engineering, textiles and the like – hospitals, dentist, medical, welfare and animal welfare buildings	Special-purpose fittings, furnishings and equipment (SFFE) **Note** – state specific FFE types for each particular building function	Special-purpose fittings, furnishings and equipment (SFFE)	Specification – To be described for each item 1–2 in order to apply the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope SFFE – included in special purpose fittings, furnishings and equipment. **Note 1** – details to be stated to define the special purpose fittings, furnishings and equipment as applicable for specific types of buildings or functions (e.g. laboratory equipment). (item) – unit of measurement for maintain Renewal Actions **Replacement** – To include removal of existing, preparation and replacement of special-purpose fittings, furnishings and equipment, as appropriate.

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
				– laundry – rail, road, water and air transport buildings and terminals – record offices, museums, galleries and zoos – religious and funerary buildings, including seating – restaurants, snack bars and public houses, and libraries – scientific research buildings, including laboratory workbenches – shops, showrooms, stores and shopping centres – special residential buildings, hotels and elderly care homes – sports buildings, swimming pools, marinas and stadia – warehouses.			**Major repairs** – To include preparation, repair and making good of special-purpose fittings, furnishings and equipment, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishing of special-purpose fittings, furnishings and equipment, as appropriate. **Redecoration** – To be described and identified with the renewal work item, as appropriate. Maintain Actions **Planned** – In accordance with special-purpose fittings, furnishings or equipment manufacturer's recommendations. **Proactive** – Visual inspection of special-purpose fittings, furnishings and equipment. **Reactive** – Minor repairs identified by visual checks or arising from reactive requests. N/A – Not applicable to renewal and/or maintain work. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Descriptions shall include the amount of any PC Sum included in the unit rates applied to the item. M3 – Contractor-designed work is to be described and identified separately. M4 – Planned inspection of specialist FF&E to be itemised.
				2 Other special-purpose fittings, furnishings and equipment.	Other SFFE – state types	(SFFE)	
				3 Delivery, unpacking, sorting assembling and fixing into position (including all bolts and other fixing devices).	Included with all above items	N/A	
			item	4 Sundry items – planned inspections of SFF&E.	Actions arising from planned inspections	Planned inspection	
			note	5 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
4.1.4	**Signs/notices** **Definition:** Directories, notice boards, letters, signs, plaques, symbols and emblems of all kinds for identification and directional purposes within or attached to the building.	1 Component: details to be stated.	nr/(item)	1 Directional signboards.	Directional signboards	Signs and notices (SN)	<u>Component Specifications</u> – To be described for each item 1–7, in order to apply the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the component included. **SN –** included in signs and notices. (item) – unit of measurement for maintain <u>Renewal Actions</u> **Replacement** – To include removal of existing, preparation and replacement of signs/notices, as appropriate. **Major repairs** – To include preparation, repair and making good of signs/notices, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishing of signs/notices, as appropriate. <u>Maintain Actions</u> **Planned** – Normally covered by safety checks. **Proactive** – Visual inspection of signs/notices. **Reactive** – Minor repairs identified by inspections or reactive requests. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Descriptions shall include the amount of any PC Sum included in the unit rates applied to the item. M3 – Contractor-designed work is to be described and identified separately.
				2 Notice boards, white boards and the like.	Notice/white boards	(SN)	
				3 Sign writing.	Sign writing	(SN)	
				4 Shop front lettering, emblems and symbols.	Shop front lettering	(SN)	
				5 Door or floor numbering or lettering.	Door/floor numbering	(SN)	
				6 Nameplates, plaques and identification symbols.	Nameplates, plaques and the like	(SN)	
				7 Lettering emblems and other identification/directional symbols carved into stone.	Lettering emblems	(SN)	
				8 Delivery unpacking, sorting, checking all components, assembling and fixing into position (including all bolts and other fixing devices).	(Included with all above items)	N/A	
			item	9 Sundry items – planned inspection of S&Ns.	Actions arising from planned inspections	Planned inspection	M4 – Planned inspection of signs and notices to be itemised N/A – Not applicable to renewal and/or maintain work.

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
			note	10 Work undertaken by subcontractor; on costs (where applicable)	Subcontractor on costs	Subcontractor on costs	
4.1.5	**Works of art** **Definition:** Objects d'art and other ornamental and decorative features within or attached to the building.	1 Objects d'art and other ornamental features: details to be stated.	nr	1 Objects d'art and other ornamental features.	Excluded from NRM 3	Excluded from NRM 3	<u>Excluded</u> – Objects d'art and other ornamental features (as not normally a maintained or renewal work item). <u>Renewal actions</u> N/A – works if art are excluded from NRM 3 as they are not normally part of building maintenance works. <u>Maintain Actions</u> N/A – Not normally maintenance works M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Descriptions shall include the amount of any PC Sum included in the unit rates applied to the item. M3 – Contractor-designed work is to be described and identified separately. M4 – Planned inspections of fish tanks to be itemised.
				3 Fish tanks, including fish tanks set into internal walls and partitions.	Fish tanks	fish tanks	
				4 Delivery unpacking, sorting, checking all components, assembling and fixing into position (including all bolts and other fixing devices).	Included with all above items	N/A	
		2 Decorative features and panels: details to be stated.	nr	2 Decorative features, including panels.	Decorative features	N/A	
			item	5 Sundry items – planned inspections of fish tanks.	Actions arising from planned inspections	Planned inspection	
			note	6 Work undertaken by subcontractors: on costs (where applicable).	Subcontractor on costs	Subcontractor on cost	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
4.1.6	**Non-mechanical and non-electrical equipment** **Definition:** Non-mechanical and non-electrical equipment for use within or to enter the building.	1 Equipment: details to be stated.	nr/(item)	1 Removable disabled access equipment.	Disabled access equipment	Disabled access equipment	**Specification** – To be described for each item 1–3 in order to apply the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the component included in scope. **Note** – Other non-mechanical and non-electrical equipment – types to be stated. (item) – unit of measurement for maintain **Renewal Actions** **Replacement** – To include removal of existing, preparation and replacement of non-mechanical and electrical equipment, as appropriate. **Major repairs** – To include preparation, repair and making good of non-mechanical and electrical equipment, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishing of non-mechanical and electrical equipment, as appropriate. **Maintain Actions** **Planned** – PPM on applicable non-mechanical and electrical equipment. **Proactive** – Visual inspection of non-mechanical and electrical equipment. **Reactive** – Minor repairs identified by inspections or reactive requests. M1 – Where components are to be enumerated, the number of components is to be stated.
				3 Other non-mechanical and non-electrical equipment.	Non-mechanical /electrical equipment	Non- mechanical /electrical equipment	
				4 Delivery unpacking, sorting, checking all components, assembling and fixing into position (including all bolts and other fixing devices).	Included with all above items	N/A	
			item	5 Sundry items – planned inspection of equipment.	Actions arising from planned inspections	Planned inspection	
			note	6 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on cost	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
		2 Removable ladders and the like: details to be stated	nr	2 Removable ladders and the like.	Ladders and the like	Ladders and the like	M2 – Descriptions shall include the amount of any PC Sum included in the unit rates applied to the item. M3 – Contractor-designed work is to be described and identified separately. M4 – Planned inspections of equipment to be itemised. N/A – Not applicable to renewal and/or maintain work.
4.1.7	**Internal planting** **Definition:** Natural and artificial planting in internal environments, including containers.	1 Plant and shrub beds: details to be stated.	nr/m^2	2 Planting container-grown plants. 3 Planting shrubs. 5 Plant to containers, which are an integral part of the building fabric, including drainage layers, separation layers, capillary matting and wicks, compost, hydro-culture supporting medium and nutrients. 7 Watering, feeding and maintenance during the defects liability period (or period for rectifying defects, or the maintenance period, as appropriate).	Internal planting (IP) IP –shrubs IP – plant containers N/A	Internal planting (IP) (IP) (IP) Plant maintenance	**Note**– may be part of a soft landscaping work package IP – included as part of internal planting. Renewal Actions **Replacement** – To include removal of existing, preparation and replacement of internal planting, as appropriate. **Major repairs** – Not applicable to internal planting. Maintain Actions **Planting** – Covered by internal planting regime. **Proactive** – Visual inspection of internal planting. **Reactive** – Minor repairs identified by inspections or reactive requests.

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
				8 Replacement planting.	IP – replacement plants	N/A	M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The area measured is the surface area of planting. M3 – Where measured linear, the length measured is the extreme length, over all obstructions. M4 – Other cost-significant components are to be described and measured by area (m^2), linear measurement (m) or enumerated (nr) separately, as appropriate. M5 – Descriptions shall include the amount of any PC Sum included in the unit rates applied to the item. M6 – Contractor-designed work is to be described and identified separately. M7 – Planned inspection of planting to be itemised N/A – Not applicable to renewal and/or maintain work.
				9 Artificial plants, preserved plants and the like, including fixing medium and covering medium for artificial plants.	IP – artificial plants	N/A	
			item	10 Sundry items – planned inspection of planting.	Actions arising from planned inspections	Planned inspection	
			note	11 Work undertaken by subcontractors; on costs.	Subcontractor on costs	Subcontractor on cost	
		2 Plant containers: details to be stated.	nr	1 Internal prefabricated plant and tree containers, including drainage layers, separation layers, capillary matting and wicks, compost, hydro-culture supporting medium and nutrients.	Plant containers	(IP)	
		3 Trees: details to be stated		4 Planting trees.	Trees	(IP)	
		4 Tree planters: details to be stated.		6 Planting containers and the like to roof gardens, including planting.	Tree planting containers to roof gardens	(IP)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
4.1.8	**Bird and vermin control** **Definition:** Installations and equipment to repel or trap or otherwise control birds or vermin, which may be a nuisance or danger to health	1 Wires, nets, traps and the like: details to be stated.	nr	1 Wires, nets, traps and the like.	Bird and vermin control	Bird and vermin control	Component Specifications – To be described for each item 1–3, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. Renewal Actions **Replacement** – To include removal of existing, preparation and replacement of bird and vermin control, as appropriate. **Major repairs** – To include preparation, repair and making good of bird and vermin control, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishing of bird and vermin control, as appropriate. Maintain Actions **Planned** – Normally covered by pest control programme of works, as appropriate. **Proactive** – Visual inspection of bird and vermin control. **Reactive** – Minor repairs identified by inspections or reactive requests. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The area measured is the surface area to which the coating is to be applied. M3 – Other cost-significant components are to be described and measured by area (m^2), linear measurement (m) or enumerated (nr) separately, as appropriate. M4 – Contractor-designed work is to be described and identified separately. M5 – Planned inspection of bird and vermin control to be itemised.
		2 Electronic and sonic systems: details to be stated.	nr	2 Electronic and sonic systems.	Bird and vermin control	Bird and vermin control	
		3 Bird repellent coatings: details to be stated.	m^2	3 Bird repellent coatings and the like.	Bird repellent coatings	Bird repellent coatings	
			item	4 Sundry items – planned inspection of bird control.	Actions arising from planned inspections	Planned inspection	
			note	5 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Group element 5: Services

Group element 5 comprises the following elements:

5.1 Sanitary installations

5.2 Services equipment

5.3 Disposal installations

5.4 Water installations

5.5 Heat source

5.6 Space heating and air conditioning

5.7 Ventilation systems

5.8 Electrical installations

5.9 Fuel installations

5.10 Lift and conveyor installations

5.11 Fire and lightning protection

5.12 Communications, security and control systems

5.13 Specialist installations

5.14 Builder's work in connection with services

Subcontractor on costs	Where works are to be carried out by a subcontractor, an allowance is to be made within the unit rate applied to elements or components for subcontractor's preliminaries, design fees, risk, overheads and profit
Testing and commissioning	Where testing and commissioning is required to be measured under elements 5.1–5.13, the terms shall include the following works: (1) Testing includes: (a) testing, equipment and consumables (b) calibration (c) site installation tests (d) static testing, including testing records (e) performance testing, including performance test records (f) fuels required for testing (2) Commissioning includes: (a) commissioning, including preliminary checks, setting systems and installations to work and regulation thereof, and commissioning records (b) temporary operation of equipment to employer's requirements (c) fuels required for commissioning (3) Setting all mechanical and electrical services and installations to work after completion of testing and commissioning (following repairs, replacement and fitting new works).
Not applicable	In the following pages 'N/A' means not applicable to renewal and/or maintain works
Works (action required)	The work items, or actions required, within each section of the building element have been categorised into the following: **Renewal (R)** – Replacement, Major repairs, Refurbishment, Upgrade work and Removals – plus Redecoration works (if measured separately) **Maintain (M)** – Planned, Proactive and Reactive/Minor Repair works **Note** – The required work actions included in the measurement rules are not an exhaustive list and is for guidance only
Planned inspections	Non-invasive planned inspections are included in the services section – which are normally undertaken as part of the maintain (M) regime. Actions arising from servicing and planned inspections from the planned inspections are dealt with normally as renewal (R) works – when they not covered by the maintenance minor repairs provisions.

Note: This group element of tabulated rules of measurement has been aligned with NRM 1 to create a standardised costs structure that links all construct (C) sub-element, components and inclusions with the 'applicable' renewal (R) and maintain (M) work items. Specific construction works that are not applicable (N/A) to maintenance works have been identified throughout.

Element 5.1: Sanitary installations

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.1.1	**Sanitary appliances** **Definition:** Appliances for health, hygiene and personal washing, together with their accessories.	1 Sanitary appliance: details to be stated.	nr	1 WC pans and cisterns, WC suites, slop hoppers, urinals and cisterns.	WC and cisterns, urinals and the like	Sanitary appliances	Component Specifications – To be described for each item 1–13 to determine the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope. Excluded – Showers including drench showers. Jacuzzi baths are covered in specialist installations in 5.13.3.3. N/A – Not applicable to renewal and/or maintain work. SA – included in sanitary appliances **Note:** state the types of taps and valves etc., as the supplementary list at the end of this group element. Renewal Actions **Replacement** – Remove sanitary appliances and replace with new modern equivalent in position; including taps, wastes, plugs, etc. **Major repairs** – Overhauling sanitary appliances, cleaning, carrying out repairs on the appropriate component or sub-component parts. **Removal** – Remove sanitary appliances, seal off services. **Note:** sanitary appliances are part of SFG20 48-05 task schedule(which also includes disposal and plumbing task activities).
			nr	2 Sinks, including sinks not supplied as part of the kitchen fitting installation and catering sinks not supplied as part of the catering equipment installation.	Sinks	Sanitary appliances	
			nr	3 Wash basins, hand rinse basins, wash fountains.	Wash hand basins	Sanitary appliances	
			nr	4 Bidets.	Bidets	Sanitary appliances	
			nr	5 Baths, including bath panels and trims.	Bath	Sanitary appliances	
			nr	6 Shower trays.	Shower tray	Showers	
			nr	7 Shower unit, including shower head and hose.	Shower unit	Showers	
			nr	8 Shower booster pumps.	Shower booster pump	Shower booster pump	
			nr	9 Shower valves.	Shower valve	Shower valve	
			nr	10 Drinking fountains.	Drinking fountains	Drinking fountains	
			nr	11 Taps and waste fittings.	Tap and outlet fittings	Tap and outlet fittings	
			nr	12 Water-saving devices.	Water-saving devices	Water-saving devices	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			nr	13 Automated controls and sensors.	Control and sensors	Controls and sensors	**Maintain Actions** **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable sanitary appliances items **Proactive** – Visual inspection of sanitary appliances. **Reactive** – Response to call outs and carry out unscheduled minor repairs. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Contractor-designed work is to be described and identified separately. M3 – The percentage additions for testing and commissioning are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of testing, commissioning and setting to work. M4 – Planned inspections of sanitary appliances to be itemised.
			N/A	14 Final connections to sanitary appliances, including: stop cocks and stop taps, and final pipeline connection from stop cocks and stop taps to taps.	N/A	N/A	
			item	15 Sundry items – planned inspection of sanitary appliances.	Actions arising from servicing and planned inspections	Planned inspection	
		2 Testing of installations	%	16 Testing and commissioning.	Setting to work	Setting to work	
		3 Commissioning of installations					
			note	17 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.1.2	**Sanitary ancillaries** **Definition:** Bathroom, toilet and shower ancillaries.	1 Fittings: details to be stated.	nr/(item)	1 Shower cubicles, including shower curtains and rails.	Shower cubicles	(PI)	Component Specifications – To be described for each item 1–9, to determine the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope.
			nr/(item)	2 Bath/shower curtain rails, screens and the like.	Curtain rail/screens	(PI)	Included **Item 6** – Paper towel dispensers need to be identified as electrical or manual. Manual dispensers are covered by visual inspection.
			nr/(item)	3 Grab/support rails.	Grab/support rails	(PI)	**Excluded** – Heated towel rails are covered in section 5.6.1. (item) – unit of measurement for maintain
			nr/(item)	4 Towel rails and holders (not connected to a heating or hot water supply installation).	Towel rails	(PI)	Renewal Actions **Replacement** – Remove sanitary fittings and replace with new modern equivalent in position (including taps, wastes, plugs etc.).
			nr	5 Hand dryers, including final connection to services.	Hand dryers	Hand dryers	**Major repairs** – Overhaul sanitary fittings, cleaning, carrying out repairs on the appropriate component or sub-component parts. **Refurbish** – Existing sanitary ancillaries, as appropriate.
			nr	6 Paper towel dispensers, toilet paper holders, waste bins, soap dispensers and holders.	Paper towel dispensers	Paper towel dispensers	**Removal** – Remove sanitary fittings/ancillaries and make good. Maintain Actions **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.
			nr	7 Sanitary incinerators (i.e. sanitary towel disposal).	Sanitary incinerators	Sanitary incinerators	**Planned** – PPM on applicable sanitary ancillaries **Proactive** – Visual inspection of sanitary ancillaries; various.
			nr	8 Sanitary macerators.	Macerators	Macerators	**Reactive** – Response and carry out unscheduled minor repairs. (PI) – Included with planned visual inspections of sanitary ancillaries.

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			nr	9 Other sanitary fittings (to be stated).	Other sanitary fittings	Other sanitary fittings	M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Contractor-designed work is to be described and identified separately. M3 – The percentage additions for testing and commissioning are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of testing, commissioning and setting to work. M4 – Planned inspection of SA to be itemised.
			item	10 Sundry items – planned inspection of sanitary ancillaries.	Actions arising from servicing and planned inspections (include with item)	Planned inspection (PI)	
			note	11 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	
			%	12 Testing and commissioning/set to works.	(Include in item)	(Include in item)	

Element 5.2: Services equipment

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.2.1	**Services equipment** **Definition:** Services equipment designed for use on a communal or commercial scale.	1 Services equipment: details to be stated.	nr	1 Catering equipment – designed for use in provision of food and drink on a communal or commercial scale.	Catering equipment	Catering equipment (CE)	**Component Specifications** – To be described for each item 1–4, to determine the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope. CE – To be included as part of catering equipment. **Renewal Actions** **Replacement** – Remove services equipment and replace with new modern equivalent in position (including taps, wastes, plugs and adjusting supply and waste pipe work and the like) and making good. **Major repairs** – Overhaul services equipment cleaning, carrying repairs on the appropriate component or sub-component parts. **Refurbish** – overhaul and refurbish component parts. **Removal** – Remove sanitary equipment and make good. **Maintain actions** **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.
			nr	2 Sinks – supplied as an integral part of catering equipment.	Sinks – (part of CE)	(CE)	
			nr	3 Food storage equipment.	Food storage equipment	Food storage equipment	
			nr	4 Other free-standing/fixed mechanical and electrical equipment in: – hospitals, dentist, medical, welfare and animal welfare buildings – entertainment buildings, community centres and clubs – sports buildings, swimming pools, marinas and stadia – religious and funerary buildings – educational buildings – scientific research buildings – rail, road, water and air transport buildings and terminals – special residential buildings, hotels and elderly care homes – agricultural, fishing and forestry buildings	Other service equipment (to be stated)	Other service equipment (to be stated)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
				– communications, power, mineral and water supply buildings – laundry (including ironing machines, steam presses, tumble driers, washer extractors and washing machines – factories and industrial buildings for food, drink, chemicals, engineering, textiles and the like – shops, showrooms, stores, shopping centres and warehouses – defence, police, prison and fire service buildings – restaurants, snack bars and public houses – libraries, record offices, museums, galleries and zoos.			**Planned** – PPM on applicable services equipment **Proactive** – Visual inspection of services equipment; various. **Reactive** – Response and carry out unscheduled minor repairs. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Contractor-designed work is to be described and identified separately. M3 – The percentage additions for testing and commissioning are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of testing, commissioning and setting to work. M4 – Other free-standing service equipment – applicable to the facility type is to be identified and described separately, as appropriate. M5 – Planned inspections of Service equipment to be itemised.
			item	5 Sundry items – planned inspection of service equipment	Actions arising from servicing and planned inspections	Planned inspection	
		2 Testing of installations.	%	6 Testing and commissioning/set to works	(include in item)	(include in item)	
		3 Commissioning of installations.					
			note	7 Subcontractor on costs (where applicable)	Subcontractor on costs	Subcontractor on costs	

Element 5.3 Disposal installations

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.3.1	**Foul drainage above-ground** **Definition:** Piped foul water drainage systems from sanitary appliances, sinks and kitchen appliances to the first underground drain connection.	1 Drainage to sanitary appliances: details to be stated.	nr	1 Waste pipes and fittings.	Foul drainage (FD)	Foul drainage (FD)	Component Specifications – To be described for each item 1–7, to determine the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope. (FD) – included in foul drainage. **Note:** state types of pumps and valves, etc. as the supplementary listing at the end of the Services group element. Renewal actions **Replacement** – Remove soil and vent pipe work (including all fittings and connections) and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, stating size, type and materials used. **Minor new works** – To be described and identified separately. Maintain Actions **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable Foul drainage above-ground components **Proactive** – Visual inspection of Foul drainage above-ground **Reactive** – Response and carry out unscheduled minor repairs.
		2 Drainage to services equipment: details to be stated.	nr	2 Discharge stacks and waste pipes.	(FD)	(FD)	
			nr	3 Ventilating stacks and pipes.	(FD)	(FD)	
			nr	4 Traps, access points, rodding eyes, collars and the like.	Traps, access points and the like	(FD)	
			nr	5 Prefabricated pipeline assemblies.	Pipeline assemblies	(FD)	
			nr	6 Prefabricated floor channels and gratings, and drains in upper floor construction.	Floor channels/gratings	Floor channels/gratings	
			nr	7 Sump pumps – type to be stated.	Sump pumps	Sump pumps	
			item	8 Sundry items – planned inspection of disposal installations.	Actions arising from servicing and planned inspections	Planned inspection	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
		3 Testing of installations.	%	9 Testing and commissioning/set to works.	(include in items above)	(FD)	M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Contractor-designed work is to be described and identified separately. M3 – The percentage additions for testing and commissioning are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of testing, commissioning and setting to work. M4 – Planned inspections of disposal systems to be itemised.
		4 Commissioning of installations.					
			note	10 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	
5.3.2	**Chemical, toxic and industrial liquid waste drainage** **Definition:** Separate piped waste disposal systems where the waste needs special treatment or separate storage before disposal from appliance or equipment to external face of the external wall to the building.	1 Drainage to appliance or equipment: details to be stated.	nr	1 Distribution pipelines and fittings, including glass drainage.	Pipework systems	Pipework systems	Component Specifications – To be described for each item 1–15, in order to determine the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope. **Note:** state the types of pumps, valves and controls, as the supplementary listing at the end of the Services group element. N/A – Not applicable to renewal and/or maintain work. Renewal Actions **Replacement** – Remove CTIL waste drainage, including all fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, stating size, type and materials used. **Minor new works** – To be described and identified separately.
			nr	2 Traps, access points, rodding eyes, collars and the like.	Traps, access points and rodding eyes	Traps, access points and rodding eyes	
			nr	3 Gullies.	Gullies	Gullies	
			N/A	4 Connections to tanks and the like.	Connections to tanks	N/A	
			nr	5 Storage tanks and vessels.	Storage tanks and vessels	Storage tanks and vessels	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			nr	6 Settlement tanks.	Settlement tanks	Settlement tanks	**Maintain Actions** **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable disposal components. **Proactive** – Visual inspection of CTIL installations; various. **Reactive** – Response and carry out unscheduled minor repairs. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Contractor-designed work is to be described and identified separately. M3 – The percentage additions for testing and commissioning are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of testing, commissioning and setting to work. M4 – Planned inspections are to be itemised.
			nr	7 Effluent treatment plant.	Effluent treatment plant	Effluent treatment plant	
			nr	8 Dosing equipment.	Dosing equipment	Dosing equipment	
			nr	9 Sterilisation equipment.	Sterilisation equipment	Sterilisation equipment	
			nr	10 Supports integral to the storage tanks and vessels, settlement tanks, and the like.	Supports to storage tanks and vessels,	N/A	
			nr	11 Thermal insulation.	Thermal insulation	Thermal insulation	
			N/A	12 Connections to equipment.	(include in item)	N/A	
			nr	13 Control components located externally.	Control components located externally	Controls	
			nr	14 Monitoring equipment located externally.	Monitoring equipment located externally	Monitoring equipment located externally	
			nr	15 Painting, anti-corrosion treatments and coating systems to drainage pipelines.	Painting/anti-corrosion treatments	Painting/anti-corrosion treatments	
			item	16 Sundry items – planned inspection of CTLWD.	Actions arising from servicing and planned inspections	Planned inspection	
		2 Testing of installations.	%	17 Testing and commissioning; setting to work.	(include in item)	(include in item)	
		3 Commissioning of installations.					
			note	18 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.3.3	**Refuse disposal** **Definition:** Refuse chutes, incineration plant and the like.	1 Refuse disposal installations: details to be stated.	nr	1 Refuse input devices.	Refuse input devices	Refuse collection and disposal equipment (RCDE)	<u>Component Specifications</u> – To be described for each item 1–8, to determine the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope. (RCDE) – included in refuse collection and disposal equipment <u>Renewal Actions</u> **Replacement** – Remove refuse disposal, including all fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, stating size, stating type and materials. **Minor new works** – To be described and identified separately. <u>Maintain Actions</u> **Note** – Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable disposal components **Proactive** – Visual inspection of disposal installation; various. **Reactive** – Response and carry out unscheduled minor repairs.
			nr	2 Refuse chutes and ducts.	Refuse chutes and ducts	(RCDE)	
			nr	3 Plant for the compacting/macerating of refuse ready for collection.	Plant for compacting/ macerating of refuse	(RCDE)	
			nr	4 Refuse collection equipment, including bins and continental bins.	Refuse collection equipment	(RCDE)	
			nr	5 Incineration plant and ancillaries, including refuse and waste handling equipment, afterburners, proprietary metal chimney and flues, and ash-handling equipment.	Incineration plant	Incineration plant	
			nr	6 Paper shredders.	Paper shredders	(RCDE)	

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewals (R)	Maintain (M)	
		nr	7 Safety devices.	Safety devices	Safety devices	M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Contractor-designed work is to be described and identified separately. M3 – The percentage additions for testing and commissioning are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of testing, commissioning and setting to work. M4 – Planned inspection to be itemised.
		nr	8 Painting/anti-corrosive treatments.	Painting/anti-corrosion treatment	N/A	
		N/A	9 Final connection to services.	Final connections	N/A	
		item	10 Sundry items – planned inspection of refuse disposal installations.	Actions arising from servicing and planned inspections	Planned inspection	
	2 Testing of installations.	%	11 Testing and commissioning; reset to works.	(include in item)	(include in item)	
	3 Commissioning of installations.					
		note	12 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Element 5.4: Water installations

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.4.1	**Mains water supply** **Definition:** Piped water supply systems from point of entry into building to appliance or equipment.	1 Mains water supply: details, including the number of draw off points (nr) to be stated.	nr/m²	1 Pipelines and pipeline fittings.	Pipework systems	Pipework systems	Component Specifications – To be described for each item 1–7, to determine the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope. **Note:** state specific types of pumps and valves as the supplementary listing at the end of this group element. N/A – Not applicable to renewal and/or maintain work. **Included** – Rising mains may require a booster pump, pumps to be measured under the sundry items. Renewal Actions **Replacement** – Remove installations, including all fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, stating size, stating type and materials. **Minor new works** – To be described and identified separately. **Proactive** – Visual inspection of water installations. **Reactive** – Response and carry out unscheduled minor repairs. Maintain Actions **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on the applicable water installations.
			nr	2 Valves – type to be stated.	Valves	Valves	
			nr	3 Water meters (internal).	Water meters, internal	Meters	
			nr	4 Rising main to storage tanks.	Rising main to storage tanks	(Included in pipework systems)	
			nr	5 Water meters, where not provided as part of water mains supply and installation by the statutory undertaker.	Water meters	N/A	
			nr/m²	6 Trace heating.	Trace heating	Trace heating	
			nr/m²	7 Thermal insulation.	Thermal insulation	Thermal insulation	
			item	8 Sundry items – planned inspection of mains water supply.	Actions arising from servicing and planned inspections	Planned inspection	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
		2 Testing of installations.	%	9 Testing and commissioning; set to works.	(include in item)	(include in item)	M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Where more than one system is employed, the area served by each system is to be measured separately. Areas are to be measured using rules of measurement for ascertaining the GIFA. M3 – Installations to residential units, hotel rooms, student accommodation units and the like may be enumerated (nr). The type of residential unit or room and size (by number of bedrooms) of unit is to be stated. M4 – Contractor-designed work is to be described and identified separately. M5 – The percentage additions for testing/set to work are to be applied to total the costs of the items comprising the sub-elements. A single combined percentage addition can be applied to cover the costs of testing, commissioning and setting to work. M6 – Planned inspections of water systems to be itemised.
		3 Commissioning of installations.					
			note	10 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.4.2	**Cold water distribution** **Definition:** Piped water supply systems to distribute cold water from point of storage to user point. Internal rainwater harvesting systems and piped water supply systems to distribute cold water from point of storage, including storage tanks, to user point.	1 Cold water distribution: details, including the number of draw off points (nr), to be stated.	nr/m^2	1 Cold water distribution pipelines to sanitary appliances, sinks, equipment and the like, including fittings.	Cold water distribution pipelines	Pipework systems	**Component Specifications** – To be described for each item 1–13, to determine the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope. **Note:** state specific types of pumps and valves, etc. as the supplementary listing at the end of this group element. **Renewal Actions** **Replacement** – Remove installation, including all fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. **Minor new works** – To be described and identified separately. **Maintain Actions** **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable water installation components. **Proactive** – Visual inspection of water installations. **Reactive** – Response and carry out unscheduled minor repairs.
			nr	2 Valves.	Valves	Valves	
			nr	3 Water-saving devices.	Water-saving devices	Water-saving devices	
			nr	4 Taps, where not part of a sanitary appliance or services equipment.	Taps	Taps	
			nr	5 Pumps – type to be stated.	Pumps	Pumps	
			nr	6 Pressurisation expansion units (expansion vessels).	Pressurisation expansion units	Pressurisation expansion units	
			nr	7 Pressure booster sets.	Pressure booster sets	Pressure booster sets	
		2 Storage tanks: details, including type, material and capacity, to be stated.	nr	8 Water storage tanks and cisterns (details of tank size and capacity (litres) to be stated).	Cold water storage tanks and cisterns	Cold water storage tanks and cisterns	
			nr/m^2	9 Trace heating.	Trace heating	Trace heating	
			nr	10 Instrumentation and control components to cold water distribution systems.	Instrumentation and control	Instrumentation and controls	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			nr/m^2	11 Thermal insulation.	Thermal insulation	Thermal insulation	M1–M5 measurement rules are the same as item 5.4.1. **Note:** Sprinkler booster sets are covered in sections 5.11.1 and 5.11.2. **Note:** Water meters and cistermisers are components that are normally included as sub-components for maintain works.
		3 Rainwater harvesting systems: details to be stated.	nr	12 Rainwater harvesting systems (internal), including collection pipelines.	Rainwater harvesting systems	Rainwater harvesting systems	
		3A Grey water collection pipe systems: details to be stated.	nr	13 Grey water collection pipe systems (internal), including collection pipelines.	Grey water collection systems	Grey water collection systems	
			item	14 Sundry items – planned inspection of cold water distribution system.	Actions arising from servicing and planned inspections	Planned inspection	
		4 Testing of installations.	%	15 Testing and commissioning/set to works.	(included in item)	(included in item)	
		5 Commissioning of installations.					
			note	16 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.4.3	**Hot water distribution** **Definition:** Piped water systems to distribute hot water to sanitary appliances, sinks, equipment and other appliances and to distribute mixed water to water heaters and equipment.	1 Hot water distribution: details, including the number of draw off points (nr), to be stated.	nr/m^2	1 Hot water distribution pipelines to sanitary appliances, sinks, equipment and the like, including fittings.	Hot water distribution pipelines	Hot water systems (vented or unvented)	Component Specifications – To be described for each item 1–14, to determine the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope. **Note** – State specific types of pumps, taps and valves, etc. as the supplementary listing at the end of this group element. Included Trace heating to include frost protection. Water softeners should state relevant type. Renewal Actions **Replacement** – Remove installation, including all fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. **Minor new works** – To be described and identified separately. Maintain Actions **Note 1** – Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Note 2** – Hot water storage vessels and expansion vessels include expansion vessels and combination units and load levellers.
			nr	2 Valves – type to be stated.	Valves	Valves	
			nr	3 Water-saving devices.	Water-saving devices	Water-saving devices	
			nr	4 Taps, where not part of a sanitary appliance or services equipment (see the supplementary listing).	Taps	Taps	
			nr	5 Pumps – type to be stated.	Pumps	Pumps	
			nr	6 Heat exchangers – state type.	Heat exchangers	Heat exchangers	
			nr	7 Storage cylinders and calorifiers.	Storage cylinders and calorifiers	Storage cylinders and calorifiers	
			nr/m^2	8 Trace heating – pipework.	Trace heating	Trace heating	
			nr	9 Hot water storage vessels and expansion vessels (including domestic hot water system calorifiers).	Hot water storage vessels	Hot water storage vessels	
			nr	10 Immersion heaters – state type.	Immersion heaters	Immersion heaters	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			nr	11 Insulated combination units with their own feed and expansion tank.	Insulated combination units	Expansion tank	**Planned** – PPM on applicable water system components. **Proactive** – Visual inspection of water installations. **Reactive** – Response and carry out unscheduled minor repairs. **Unit of measurement** – The same as NRM 1 rules, except where specific variances are included in unit column (m^2 and nr). M1–M5 measurement rules are the same as per item 5.4.1.
			nr	12 Water softeners, including ion exchange plant (commercial and domestic), magnetic water conditioners and reverse osmosis plant.	Water softeners: treatment	Water softeners	
			nr	13 Instrumentation and control components to hot water distribution systems.	Instrumentation and controls	Instrumentation and controls	
			nr/m^2	14 Thermal insulation.	Thermal insulation	Thermal insulation	
			item	15 Sundry items – planned inspection of hot water distribution systems.	Actions arising from servicing and planned inspections	Planned inspection	
		2 Testing of installations.	%	16 Testing and commissioning; set to works.	(include in item)	(include in item)	
		3 Commissioning of installations.					
			note	17 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.4.4	**Local hot water distribution** **Definition:** Systems where hot water is generated in the vicinity of the appliance being served.	1 Water heaters: details to be stated.	nr	1 Instantaneous water heaters (including shower heaters) and storage water heaters, including flue pipes and terminals.	Instantaneous water heaters	Instantaneous water heaters	Component Specifications – To be described for items 1 and 2, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. Renewal Actions **Replacement** – Remove installation, including all fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. **Minor new works** – To be described and identified separately.
			nr	2 Wall- or floor-mounted, under-sink multipoint and over-sink units.	Under-sink multipoint and over-sink units	Under-sink, multipoint and over-sink units	
			item	3 Sundry items – planned inspection of local hot water distribution systems.	Actions arising from servicing and planned inspections	Planned inspection	
		2 Testing of installations.	%	4 Testing and commissioning; set to works.	(include in item)	(Include in item)	
		3 Commissioning of installations.					

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			note	5 Work undertaken by subcontractors; on costs.	Subcontractor on costs	Subcontractor on costs	Maintain Actions **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable water system components **Proactive** – Visual inspection of water installations;. **Reactive** – Response and carry out unscheduled minor repairs. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Contractor-designed work is to be described and identified separately. M3 – The percentage additions for testing and commissioning are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of testing, commissioning and setting to work. M4 Planned inspections to be itemised.
5.4.5	**Steam and condensate distribution**	1 Steam and condensate distribution: details, including number of draw off points (nr), to be stated.	nr/m^2	1 Steam distribution pipelines to, and condensate return pipelines from, services equipment, including fittings.	Steam distribution pipelines system	Steam services pipework systems	Component Specifications – To be described for each applicable item 1–11, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component.

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
	Definition: Steam distribution and condensate return pipelines to and from services equipment within the building.		nr	2 Valve, strainers pressure-reducing sets and the like.	Valve, strainers, pressure reducing sets	Valves	**Note** – state specific types of pump sets, taps and valves as the supplementary listing at the end of this group element. Renewal Actions **Replacement** – Remove installation, including all fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. **Minor new works** – To be described and identified separately. Maintain Actions **Note** – Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable water system components **Proactive** – Visual inspection of water installations; various. **Reactive** – Response and carry out unscheduled minor repairs. M1–M5 measurement rules, all the same as 5.4.1. **Included** – Hot wells and Safety Valves under sundry items. **Note:** Item 1 – Steam distribution pipelines includes the traps. Item 8 – Heat exchangers are also included in to 5.4.3 Item 9 – Storage cylinders/calorifiers also included in 5.4.3.
			nr	3 Steam-reduction stations.	Steam reduction stations	Steam reduction stations	
			nr	4 Condensate receivers and storage tanks.	Condensate receivers and storage tanks	Condensate receivers	
			nr	5 Condensate pump sets.	Condensate pump sets	Condensate pump sets	
			nr	6 Steam connection outlets.	Steam connection outlets	Steam connection outlets	
			nr	7 Taps (where not part of services equipment).	Taps	Taps	
			N/A	8 Heat exchangers.	Heat exchangers	Heat exchangers	
			N/A	9 Storage cylinders and calorifiers (heated by steam).	Storage cylinders and calorifiers	Storage cylinders and calorifiers	
			nr	10 Instrumentation and control components to steam and condensate systems.	Instrumentation and controls	Instrumentation and controls	
			nr/m^2	11 Thermal insulation.	Thermal insulation	Thermal insulation	
			item	12 Sundry items – planned inspection of system.	Actions arising from servicing and planned inspections	Planned inspection	
		2 Testing of installations.	%	13 Testing and commissioning; set to works	(include in item)	(include in item)	
		3 Commissioning of installations.					
			note	14 Subcontractor on costs (where applicable)	Subcontractor on costs	Subcontractor on costs	

Element 5.5: Heat source

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.5.1	**Heat source** **Definition:** A heat source supplying heat to one or more heating systems.	1 Heat source: details, including output of heat source (kW), to be stated.	nr	1 Biomass fuel boiler plant and ancillary items.	Boiler – biomass	Boiler – biomass	**Component Specifications** – To be described for each applicable item s1 to 10 and 12 to 19, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the components. For example: Boiler gas/oil – Gas fired boiler MTHW up to 120°C or LTHW up to 95°C. **Note 1:** See the list of standard boiler types (included in the B&ES SFG20 core library of maintenance schedules) **Note 2:** State the specific types of pumps, valves and controls, see the supplementary listing at the end of this group element. Item 11 – Step down calorifiers is also included by either Storage Vessel or Exchanger in section 5.4.3. Item 20 – Forced draft extract is a duplication of item 17.
			nr	2 Gas-/oil-fired boiler plant and ancillary items, including burners, blow down facilities and pressurisation plant.	Boiler – gas/oil	Boiler – gas/oil	
			nr	2a Boilers – steam (not included in NRM 1).	Boiler – steam	Boiler – steam	
			nr	3 Coal-fired boiler plant and ancillary items, including burners, blow down facilities, coal distribution equipment, ash handling and storage equipment, grit arrestors and pressurisation plant.	Boiler – coal fired	Boiler – coal fired	
			nr	4 Electric boiler plant and ancillaries, including blow down facilities and pressurisation plant.	Boiler – electric	Boiler – electric	
			nr	5 Packaged steam generators and ancillaries, including blow down facilities and pressurisation plant.	Packaged steam generators	Packaged steam generators	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			nr	6 Wood pellet boiler plant and ancillary items.	Boiler – wood pellet	Boiler – wood pellet	**Renewal Actions** **Replacement** – Remove heat source, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. **Minor new works** – To be described and identified separately. **Maintain Actions** **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable heat source types, as per applicable items 1–19. **Proactive** – Visual inspection of heat source items; various. **Reactive** – Response and carry out unscheduled minor repairs. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Contractor-designed work is to be described and identified separately. M3 – The percentage additions for testing and setting to work are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of testing, commissioning and setting to work.
			nr	7 Central (combined) heat and power (CHP) boiler plant.	Central (combined) heat and power (CHP) boiler plant	Central (combined) heat and power (CHP) boiler plant	
			nr	8 Heat pumps, including domestic air-to-water heat pumps – type to be stated (see the supplementary listing).	Heat pumps	Heat pumps	
			nr	9 Ground source heating (GSH), including boreholes and all ancillary components (including closed-loop and open-loop systems).	Ground source heating	Ground source heating	
			nr	10 Water or steam mains, pumps, valves and other equipment from district heating systems.	Pumps, valves	Pumps, valves	
			nr	11 Step down/non-storage calorifiers connected to external heat source.	Step down/non-storage calorifiers	Non-storage calorifiers	
			nr	12 Building-mounted solar thermal panels.	Solar thermal panels	Solar thermal panels	
			nr	13 Other heat sources (e.g. air source heating)	Other heat sources	Other heat sources	
			nr	14 Water tanks (i.e. header tanks), including cold water distribution to heat source.	Water tanks	Tanks	
			nr	15 Vibration isolation mountings.	Vibration isolation mountings	N/A	
			nr	16 Instrumentation and control components to heat source.	Instrumentation and controls	Instrumentation and controls	
			nr	17 Forced draft fans.	Forced draft fans	Fans	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			nr	18 Gantries.	Gantries	Gantries	
			nr	19 Chimneys and flues (where not part of the building).	Chimneys and flues	Flues	
			nr	20 Forced draft extract.	(Covered in item 17)	(Covered in item 17)	
			item	21 Sundry items – planned procedures for the system.	Actions arising from servicing and planned inspections	Planned procedures	
		2 Testing of installations.	%	22 Testing and commissioning; set to works.	(include in item)	(include in item)	
		3 Commissioning of installations.					
			note	23 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Element 5.6: Space heating and air conditioning

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.6.1	**Central heating** **Definition:** Systems where heating is generated at a central point and distributed to the spaces and/or locations being treated.	1 Central heating systems: details to be stated.	m^2/(nr)	1 Heating systems from, including everything within, the plant room specifically related to the heating system, excluding the heat source (including domestic heating and hot water systems).	Central heating system	Central heating system	Component Specifications – To be described for each item 1–23, to determine the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope.
			m^2/(nr)	2 Heat distribution pipelines from heat source to heat emitter or other equipment.	Pipework systems	Pipework systems	**Note:** state specific types of pumps, valves, ductwork etc as the supplementary listing at the end of this group element.
			m^2/(nr)	3 Heating emission units, such as: – heat emitters – skirting heaters (e.g. natural convectors and perimeter skirting heaters) – radiant strip heater systems – radiator systems – natural convectors – fan convectors – unit heaters – radiators – convector heaters – continuous convectors.	Heat emission units	Heat emission units	Item 12: Distribution pipelines and fittings, and item 16: AHU, are excluded as these items are covered by section 5.7.1. CS – included in convection systems. (nr) – unit of measurement for maintain systems. Renewal Actions **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. **Minor new works** – To be described and identified separately. Maintain Actions **Note 1:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable central heating systems.
			m^2/(nr)	4 In-screed embedded pipelines (i.e. under-floor heating).	Under-flooring heating	Under-floor heating	
			m^2/(nr)	5 Heated ceiling panels.	Heated ceiling panels	Heat emitters	
			$m^{2/(nr)}$	6 Warm-air heating.	Warm-air heating	Heat emitters	
			m^2/(nr)	7 Convection systems.	Convection systems	Heat emitters	
			m^2/(nr)	8 Fan-assisted convection systems, including under-floor systems.	Convection systems	Heat emitters	
			m^2/(nr)	9 Cable-heating systems.	Cable-heating systems	Cable-heating systems	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			m^2/(nr)	10 Plenum air-heating system.	Plenum air-heating system	Plenum air-heating system	**Proactive** – Visual inspection of central heating systems; various. **Reactive** – Response and carry out unscheduled minor repairs. M1 – The area measured is the area served by the system (i.e. the area of the rooms and circulation spaces that is served by the system, which is not necessarily the total gross internal floor area (GIFA) of the building). The area served is measured using the rules of measurement ascertaining the GIFA. M2 – Where more than one system is employed, the area served by each system is to be measured separately. Areas are to be measured using rules of measurement for ascertaining the GIFA. M3 – Where components are to be enumerated, the number of components is to be stated. M4 – Installations to residential units, hotel rooms, student accommodation units and the like may be enumerated (nr). The type of residential unit or room and size (by number of bedrooms) of unit shall be stated. M5 – Contractor-designed work is to be described and identified separately. M6 – The percentage additions for testing/set to work are to be applied to the total cost of the items comprising the sub-elements. A single combined percentage addition can be applied to cover the costs of both testing, commissioning and setting to work. M7 – Planned procedures to be itemised.
			m^2/(nr)	11 Off-peak heating system, including storage radiators.	Off-peak heating system	Heat emitters	
			N/A	12 Distribution pipelines and pipeline fitting.	(Covered in 5.7.1)	(Covered in 5.7.1)	
			nr	13 Heated towel rails (where an integral part of a heating system).	Heated towel rails	Heat emitters	
			nr	14 Valves and fittings – type to be stated.	Valves	Valves	
			m^2/nr	15 Ductwork.	Ductwork	Ductwork	
			T/E	16 Air-handling equipment.	(covered in 5.7.1)	(covered in 5.7.1)	
			nr	17 Grilles, fans, filters and other ancillary components of central heating systems.	Grilles and the like	Grilles and diffusers	
			nr	18 Plate recuperator.	Plate recuperator	Plate recuperator	
			nr	19 Thermal wheel – rotary recuperator.	Thermal wheel	Thermal wheel	
			nr	20 Duct heater battery – electric.	Duct heater battery – electric	Duct heater battery – electric	
			m^2/(nr)	21 Cables.	Cables	Cables	
			nr	22 Instrumentation and control components to heating systems.	Instrumentation and control components	Instrumentation and controls	
			m^2/(nr)	23 Thermal insulation.	Thermal insulation	Thermal insulation	
			item	24 Sundry items – planned procedures for system.	Actions arising from servicing and planned inspections	Planned procedures	
		2 Testing of installations.	%	25 Testing and commissioning; set to works.	(include in item)	(include in item)	
		3 Commissioning of installations.					
			note	26 Work undertaken by subcontracts; on costs.	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.6.2	**Local heating** **Definition:** Systems where heating is generated in or adjacent to the spaces or locations being treated.	1 Heaters: details to be stated.	nr	1 Room heaters or fires, with or without boilers.	Room heaters or fires	Heat emitters	**Component Specifications** – To be described for each item 1–3, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. **Note:** State specific types of controls components, as the supplementary listing at the end of this group element table. **Renewal Actions** **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. **Minor new works** – To be described and identified separately. **Maintain Actions** **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable local heating systems **Proactive** – Visual inspection of local heating systems **Reactive** – Response and carry out unscheduled minor repairs. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Installations to residential units, hotel rooms, student accommodation units and the like may be enumerated (nr). The type of residential unit or room and size (by number of bedrooms) of unit is to be stated.
			nr	2 Chimneys and flues, where not part of the building structure (e.g. proprietary chimneys and flue pipes).	Chimneys and flues	Flues	
			nr	3 Instrumentation and control components to heating systems.	Instrumentation and control	Instrumentation and controls	
			item	4 Sundry items – planned procedures for local heating.	Actions arising from servicing and planned inspections	Planned procedures	
		2 Testing of installations.	%	5 Testing and commissioning; set to works.	(include in item)	(include in item)	
		3 Commissioning of installations.					
			note	6 Subcontractor on costs (where applicable)	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
							M3 – Contractor-designed work is to be described and identified separately. M4 – The percentage additions for testing and setting to work are to be applied to the total cost of the items comprising the subelement. A single combined percentage addition can be applied to cover the costs of testing, commissioning and setting to work. M5 – Planned procedures to be itemised.
5.6.3	**Central cooling** **Definition:** Systems where cooling is performed at a central plant and distributed to the spaces and/or locations being treated.	1 Central cooling systems: details to be stated.	m^2/(nr)	1 Chilled beams.	Chilled beams	Chilled beams	<u>Component Specifications</u> – To be described for each item 1–17, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. **Note:** State types of pumps, valves and ductwork etc, as the supplementary listing at the end of this group element. (nr) – unit of measurement for maintain systems. <u>Renewal Actions</u> **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. **Minor new works** – To be described and identified separately. <u>Maintain Actions</u> **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable central cooling systems
			m^2/(nr)	2 Fan coil systems for cooling only.	Fan coil systems	Terminal units – Fan coils	
			m^2/(nr)	3 Air-based systems – variable air volume (VAV) for cooling only.	VAV cooling systems	Terminal units – VAV	
			m^2/(nr)	4 Variable refrigerant volume (VRV) systems.	VRV systems	Terminal units – VRV	
			nr	5 Chillers and packaged chillers.	Chillers	Chillers	
			nr	6 Central refrigeration plant.	Central refrigeration plant	Refrigeration distribution system	
			nr	7 Cooling towers – including adiabatic coolers.	Cooling towers	Cooling towers	
			m^2/(nr)	8 Distribution pipelines and pipeline fittings.	Pipework systems	Pipework systems	
			m^2/(nr)	9 Cold and treated water feeds.	Cold and treated water feeds	Pipework systems	
			nr	10 Valves – type to be stated.	Valves	Valves	
			nr	11 Pumps – type to be stated.	Pumps	Pumps	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			m^2/(nr)	12 Distribution ductwork and ductwork fittings and ancillaries, e.g. supports, hangers, access openings and dampers (control, fire and smoke).	Distribution ductwork and fittings	Distribution ductwork and fittings	**Proactive** – Visual inspection of central cooling systems; **Reactive** – Response and carry out unscheduled minor repairs. M1 – The area measured is the area served by the system (i.e. the area of the rooms and circulation spaces that is served by the system, which is not necessarily the total gross internal floor area (GIFA) of the building). The area served is measured using the rules of measurement ascertaining the GIFA. M2 – Where components are to be enumerated, the number of components is to be stated. M3 – Contractor-designed work is to be described and identified separately. M4 – The percentage additions for Testing/set to work are to be applied to the total cost of the items comprising the sub-elements. A single combined percentage addition can be applied to cover the costs of both testing, commissioning and setting to work.
			nr	13 Grilles, fans, filters and other ancillary components of central cooling systems.	Grilles, fans, filters and diffusers and the like	Grilles and diffusers Fans Filters	
			nr	14 Air handling units (AHUs).	Air handling units	Air handling units	
			nr	15 Emission units, including fan coil units, chilled beam and the like.	Emission units	(Include with terminal units)	
			nr	16 Instrumentation and control components to central cooling systems.	Instrumentation and controls	Instrumentation and controls	
			m^2/(nr)	17 Thermal insulation.	Thermal insulation	Thermal insulation	
			item	18 Sundry items – planned procedures to system.	Actions arising from servicing and planned inspections	Planned procedures	
		2 Testing of installations.	%	19 Testing and commissioning; set to work	(include in item)	(include in item)	
		3 Commissioning of installations.					
			note	20 Subcontractor on costs (where applicable)	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.6.4	**Local cooling** **Definition:** Systems where cooling is performed in or adjacent to the spaces or locations to be treated.	1 Cooling units: details to be stated.	nr	1 Local cooling units, including those with remote condensers.	Local cooling units	Air conditioning units	Component Specifications – To be described for each item 1–7, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. **Note** – State types of pumps, valves, fans and ductwork etc, as the supplementary listing at the end of this group element. (m^2) – unit of measure for some maintain items. Renewal Actions **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. Maintain Actions **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable local cooling systems **Proactive** – Visual inspection of local cooling systems **Reactive** – Response and carry out unscheduled minor repairs.
			nr/(m^2)	2 Distribution pipelines and pipeline fittings.	Pipework systems	Pipework systems	
			nr	3 Valves – type to be stated.	Valves	Valves	
			nr/(m^2)	4 Distribution ductwork and ductwork fittings.	Ductwork system	Ductwork system	
			nr	5 Grilles, fans, filters and other ancillary components of local cooling systems.	Grilles, fans, filters and diffusers and the like	Grilles and diffusers Fans	
			nr	6 Instrumentation and control components to local cooling systems.	Instrumentation and controls	Instrumentation and controls	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			nr/(m^2)	7 Thermal insulation.	Thermal insulation	Thermal insulation	M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The area measured is the area served by the system (i.e. the area of the rooms and circulation spaces that is served by the system, which is not necessarily the total gross internal floor area (GIFA) of the building). The area served is measured using the rules of measurement ascertaining the GIFA. M3 – Installations to residential units, hotel rooms, student accommodation units and the like may be enumerated (nr). The type of residential unit or room and size (by number of bedrooms) of unit is to be stated. M4 – Contractor-designed work is to be described and identified separately. M5 – The percentage additions for testing and setting to work are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of testing, commissioning and setting to work.
			item	8 Sundry items – planned procedures for system	Actions arising from servicing and planned inspections	Planned procedures	
		2 Testing of installations.	%	9 Testing and commissioning – resetting to work.	(setting to work include in items)	(include in item)	
		3 Commissioning of installations.					
			note	10 Subcontractor on costs (where applicable)	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.6.5	**Central heating and cooling** **Definition:** Combined systems where heating and cooling are performed at a central point and distributed to the spaces and locations being treated.	1 Combined central heating and cooling systems: details to be stated.	m^2/(nr)	1 Fan coil systems for heating and cooling.	Fan coil units 1	Termination units – fan coil units 1	Component Specifications – To be described for each item 1–14, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. **Note 1:** State types of pumps, valves, fans and ductwork etc, as the supplementary listing at the end of this group element. **Note 2:** Item 1 and 11 – are alternative types of fan coil systems (denoted fan coil units 1 and 2). (nr) – unit of measure for maintaining systems. Renewal Actions **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. Maintain Actions **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable central heating and cooling systems, as per items 1–14. **Proactive** – Visual inspection of central heating and cooling systems. **Reactive** – Response and carry out unscheduled minor repairs.
			m^2/(nr)	2 Air based systems – variable air volume (VAV) for heating and cooling.	VAV systems	Termination units – VAV systems	
			m^2/(nr)	3 Reverse-cycle heat pump systems.	Reverse-cycle heat pump systems	Reverse-cycle heat pump systems	
			nr	4 Chillers, including vapour compression chillers, absorption chillers (run using low-grade waste heat from other industrial process), solar thermal absorption chillers, and the like.	Chillers	Chillers	
			m^2/(nr)	5 Distribution pipelines and pipeline fittings.	Pipework systems	Pipework systems	
			nr	6 Valves – type to be stated.	Valves	Valves	
			nr	7 Pumps – type to be stated.	Pumps	Pumps	
			$m/(nr)^2$	8 Distribution ductwork and ductwork fittings and ancillaries, e.g. supports, hangers, access openings and dampers (control, fire and smoke).	Distribution ductwork and fittings	Ductwork systems	
			nr	9 Grilles, fans, filters and other ancillary components of central heating and cooling systems.	Grilles, diffusers, fans and filters	Grilles and diffusers Fans	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			nr	10 Air handling units.	Air handling units	Air handling units	M1 – The area measured is the area served by the system (i.e. the area of the rooms and circulation spaces that is served by the system, which is not necessarily the total gross internal floor area (GIFA) of the building). The area served is measured using the rules of measurement ascertaining the GIFA. M2 – Where more than one system is employed, the area served by each system is to be measured separately. Areas are to be measured using rules of measurement for ascertaining the GIFA. M3 – Where components are to be enumerated, the number of components is to be stated. M4 – Installations to residential units, hotel rooms, student accommodation units and the like may be enumerated (nr). The type of residential unit or room and size (by number of bedrooms) of unit shall be stated. M5 – Contractor-designed work is to be described and identified separately. M6 – The percentage additions for testing/set to work are to be applied to the total cost of the items comprising the sub-elements. A single combined percentage addition can be applied to cover the costs of both testing, commissioning and setting to work.
			$m/(nr)^2$	11 Emission equipment, including fan coil units and the like.	Fan coil units 2	Termination units – fan coil units 2	
			nr	12 Vibration isolation mountings.	Vibration isolation mountings	N/A	
			nr	13 Instrumentation and control components to central heating and cooling systems.	Instrumentation and control	Instrumentation and controls	
			$m^2/(nr)$	14 Thermal insulation.	Thermal insulation	Thermal insulation	
			item	15 Sundry items – planned procedures for system.	Actions arising from servicing and planned inspections	Planned procedures	
		2 Testing of installations.	%	16 Testing and commissioning; set to works.	(include in item)	(include in item)	
		3 Commissioning of installations.					
			note	17 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.6.6	**Local heating and cooling** **Definition:** Combined systems where heating and cooling are performed in or adjacent to the space to be treated.	1 Local heating and cooling units: details to be stated.	nr	1 Local heating and cooling units, including those with remote condensers.	Local heating and cooling units	Split systems	<u>Component Specifications</u> – To be described for each item 1–9, to determine the appropriate reference service life (RSL) and to assign the applicable planned maintenance task schedules to the components included in scope. **Note:** state specific types of pumps and valves, ductwork as the supplementary listing at the end of this group element. (m^2) – unit of measure for specific maintain items. <u>Renewal Actions</u> **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. **Minor new works** – To be described and identified separately. <u>Maintain Actions</u> **Note** — Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable local heating and cooling systems **Proactive** – Visual inspection of local heating and cooling systems; **Reactive** – Response and carry out unscheduled minor repairs.
			nr	2 Distribution pipelines and pipeline fittings.	Pipelines and fittings	Pipework systems	
			nr	3 Valves – type to be stated.	Valves	Valves	
			nr	4 Pumps – type to be stated.	Pumps	Pumps	
			nr/(m^2)	5 Distribution ductwork and ductwork fittings and ancillaries, e.g. supports, hangers, access openings and dampers (control, fire and smoke).	Distribution ductwork system	Ductwork system	
			nr	6 Grilles, fans, filters and other ancillary components of local heating and cooling systems.	Grilles, diffusers, fans and filters	Grilles Diffusers Fans	
			nr	7 Vibration isolation mountings.	Vibration isolation mountings	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			nr	8 Instrumentation and control components to local heating and cooling systems.	Instrumentation and controls	Instrumentation and controls	M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The area measured is the area served by the system (i.e. the area of the rooms and circulation spaces that is served by the system, which is not necessarily the total gross internal floor area (GIFA) of the building). The area served is measured using the rules of measurement ascertaining the GIFA. M3 – Installations to residential units, hotel rooms, student accommodation units and the like may be enumerated (nr). The type of residential unit or room and size (by number of bedrooms) of unit is to be stated.
			nr/(m^2)	9 Thermal insulation.	Thermal insulation	Thermal insulation	
			item	10 Sundry items – planned procedures for system.	Actions arising from servicing and planned inspections	Planned procedures	
		2 Testing of installations.	%	11 Testing and commissioning; set to work.	(include in item)	(include in item)	
		3 Commissioning of installations.					
			Note	12 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	
5.6.7	**Central air conditioning** **Definition:** Systems where air treatment is performed at a central point and air is distributed to the spaces and locations being treated.	1 Central air conditioning systems: details to be stated.	m^2/(nr)	1 Plenum air-heating systems.	Plenum air-heating systems	Plenum air-heating systems	Component Specifications – To be described for each item 1–16, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. **Note:** state the types of pumps, valves and ductwork and controls, as the supplementary listing at the end of this group element. (ACS) – To include VAV, multi-zone, induction and hybrid. (nr) – unit of measure for maintain. Renewal Actions **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.
			m^2/(nr)	2 VAV (variable air volume) and constant volume air conditioning systems.	VAV systems	Central air conditioning systems (CACS)	
			m^2/(nr)	3 Dual-duct and induction air conditioning systems.	Dual-duct air induction conditioning systems	(CACS) Humidifiers	
			m^2/(nr)	4 Multi-zone air conditioning systems.	Multi-zone conditioning systems	(CACS)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			m^2/(nr)	5 Induction air conditioning systems.	Induction air conditioning systems	(CACS)	**Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. Maintain Actions **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable central air conditioning systems. **Proactive** – Visual inspection of central air conditioning systems. **Reactive** – Response and carry out unscheduled minor repairs. M1 – The area measured is the area served by the system (i.e. the area of the rooms and circulation spaces that is served by the system, which is not necessarily the total gross internal floor area (GIFA) of the building). The area served is measured using the rules of measurement ascertaining the GIFA. M2 – Where more than one system is employed, the area served by each system is to be measured separately. Areas are to be measured using rules of measurement for ascertaining the GIFA. M3 – Where components are to be enumerated, the number of components is to be stated.
			m^2/(nr)	6 Hybrid air conditioning systems (i.e. systems based on a combination of a number of other air conditioning systems).	Hybrid air conditioning systems	(CACS)	
			nr	7 Chillers.	Chillers	Chillers	
			nr	8 Air handling units.	Air handling units	Air handling units	
			nr	9 Terminal units/emitters.	Terminal units/emitters	Terminal units	
			m^2/(nr)	10 Distribution pipelines and pipeline fittings.	Pipelines and fittings	Pipework systems	
			nr	11 Valves – type to be stated.	Valves	Valves	
			nr	12 Pumps – type to be stated.	Pumps	Pumps	
			m^2/(nr)	13 Distribution ductwork and ductwork fittings and ancillaries, e.g. supports, hangers, access openings and dampers (control, fire and smoke).	Ductwork and fittings	Ductwork system	
			nr	14 Grilles, fans, filters and other ancillary components of central air conditioning systems.	Grilles, fans, filters and diffusers and the like	Grilles and diffusers Fans	
			nr	15 Instrumentation and control components to central air conditioning systems.	Instrumentation and controls	Instrumentation and controls	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			m^2/(nr)	16 Thermal insulation.	Thermal insulation	Thermal insulation	M4 – Installations to residential units, hotel rooms, student accommodation units and the like may be enumerated (nr). The type of residential unit or room and size (by number of bedrooms) of unit shall be stated. M5 – Contractor-designed work is to be described and identified separately.
			item	17 Sundry items – planned procedures for air conditioning system.	Actions arising from servicing and planned inspections	Planned procedures	
		2 Testing of installations.	%	18 Testing and commissioning – reset to work.	(included in item)	(included in item)	
		3 Commissioning of installations.					
			note	19 Work undertaken by subcontractors; on costs.	Subcontractor on costs	Subcontractor on costs	
5.6.8	**Local air conditioning** **Definition:** Systems where air treatment is performed in or adjacent to the space to be treated.	1 Self-contained air conditioning units: details to be stated.	nr	1 Self-contained air conditioning units providing conditioned air to rooms or areas, including units with remote condensers.	Self-contained air conditioning units	Room air conditioning units	Component Specifications – To be described for each item 1–11, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. **Note** – For pumps, valves, ductwork and controls etc see the supplementary listing at the end of this group element; 5. ACU – To include air conditioning unit types, in-room and clean-room local air conditioning systems. (m^2) – unit of measure for maintain. Renewal Actions **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.
		2 Other local air condition systems: details to be stated.	nr	2 Separate clean-room or other local air conditioning systems requiring air management (e.g. terminal re-heat and terminal heat pump air conditioning systems).	Separate clean-room or other local air conditioning systems	Room air conditioning units	
			nr/(m^2)	3 Distribution pipelines and pipeline fittings.	Pipework systems	Pipework systems	
			nr	4 Valves – type to be stated.	Valves	Valves	
			nr	5 Pumps – type to be stated.	Pumps	Pumps	
			nr/(m^2)	6 Distribution ductwork and ductwork fittings and ancillaries, e.g. supports, hangers, access openings and dampers (control, fire and smoke).	Ductwork system	Ductwork system	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			nr	7 Grilles, fans, filters and other ancillary components of local air conditioning systems.	Grilles, diffusers, fans, filters	Grilles and diffusers Fans	**Maintain actions** **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable local air conditioning systems **Proactive** – Visual inspection of local air conditioning systems. **Reactive** – Response and carry out unscheduled minor repairs. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The area measured is the area served by the system (i.e. the area of the rooms and circulation spaces that is served by the system, which is not necessarily the total gross internal floor area (GIFA) of the building). The area served is measured using the rules of measurement ascertaining the GIFA. M3 – Installations to residential units, hotel rooms, student accommodation units and the like may be enumerated (nr). The type of residential unit or room and size (by number of bedrooms) of unit is to be stated. M4 – Contractor-designed work is to be described and identified separately.
			nr	8 Vibration isolation mountings.	Vibration isolation mountings	N/A	
			nr	9 Instrumentation and control components to local air conditioning systems.	Instrumentation and controls	Instrumentation and controls	
			nr/(m^2)	10 Thermal insulation.	Thermal insulation	Thermal insulation	
			nr	11 Air curtains (i.e. air movement systems for circulating a 'curtain' of tempered air across the dividing space between two areas of differing temperatures).	Air curtains	Air curtains	
			item	12 Sundry items – planned procedures for system.	Actions arising from servicing and planned inspections	Planned procedures	
		3 Testing of installations.	%	13 Testing and commissioning – resetting to work.	(include in item)	(include in item)	
		4 Commissioning of installations.					
			note	14 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Element 5.7: Ventilation

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.7.1	**Central ventilation** **Definition:** Air movement systems removing vitiated air from spaces and/or supplying fresh outside air to spaces. No environmental control or air treatment except filtration when required.	1 Central ventilation systems: details to be stated.	m^2/(nr)	1 Air extract systems.	Air extract systems	Fans	<u>Component Specifications</u> – To be described for each item 1–11 to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. **Note:** state types of pumps , fans and valves, as the supplementary listing at the end of this group element. (nr) – unit of measure for maintain. <u>Renewal Actions</u> **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. <u>Maintain Actions</u> **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable ventilation systems **Proactive** – Visual inspection of ventilation system types. **Reactive** – Response and carry out unscheduled minor repairs. **Note:** state types of pumps, valves and controls, as the supplementary listing at the end of this group element.
			m^2/(nr)	2 Air supply and extract systems.	Air supply and extract systems	Fans	
			m^2/(nr)	3 Extract units/terminal units.	Extract units/terminal units	Terminal units	
			m^2/(nr)	4 Fan units.	Fan units	Fans	
			m^2/(nr)	5 Distribution ductwork and ductwork fittings and ancillaries, e.g. supports, hangers, access openings and dampers (control, fire and smoke).	Ductwork systems	Ductwork systems	
			nr	6 Grilles, fans, filters and other ancillary components of central ventilation systems.	Grilles, diffusers, fans and filters	Grilles and diffusers Fans	
			m^2/(nr)	7 Distribution pipelines and pipeline fittings.	Pipelines system	Pipelines system	
			nr	8 Valves – type to be stated	Valves	Valves	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			nr	9 Pumps – type to be stated	Pumps	Pumps	M1 – The area measured is the area served by the system (i.e. the area of the rooms and circulation spaces that is served by the system, which is not necessarily the total gross internal floor area (GIFA) of the building). The area served is measured using the rules of measurement ascertaining the GIFA. M2 – Where more than one system is employed, the area served by each system is to be measured separately. Areas are to be measured using rules of measurement for ascertaining the GIFA. M3 – Where components are to be enumerated, the number of components is to be stated. M4 – Installations to residential units, hotel rooms, student accommodation units, and the like may be enumerated (nr). The type of residential unit or room and size (by number of bedrooms) of unit shall be stated. M5 – Contractor-designed work is to be described and identified separately. M6 – The percentage additions for Testing/set to work are to be applied to the total cost of the items comprising the sub-elements. A single combined percentage addition can be applied to cover the costs of both testing, commissioning and setting to work. M7 – Planned procedures to be itemised.
			nr	10 Vibration isolation mountings.	Vibration isolation mountings	N/A	
			nr	11 Instrumentation and control components to central ventilation systems.	Instrumentation and controls	Instrumentation and controls	
			item	12 Sundry items – planned procedures for ventilation systems.	Actions arising from servicing and planned inspections	Planned procedures	
		1 Testing of installations.	%	13 Testing and commissioning – setting to work.	(include in item)	(include in item)	
		2 Commissioning of installations.					
				14 Work undertaken by subcontractors; on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.7.2	**Local and special ventilation** **Definition:** Local and special air movement systems removing vitiated air from spaces and/or supplying fresh outside air to spaces. No environmental control or air treatment except filtration when required.	1 Toilet/bathroom ventilation units: details to be stated.	nr	1 Toilet/bathroom ventilation (air movement systems for removing smells, odours and other unwanted contaminants from, or supplying fresh air to, toilet areas, e.g. packaged toilet extract fans).	Toilet/bathroom ventilation extract fans	Fans	Component Specifications – To be described for each item 1–15, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. **Note:** State the types of pumps, fans and valves etc, as the supplementary listing at the end of this group element. (m^2) – unit of measure for maintaining systems. Renewal Actions **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. Maintain Actions **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable ventilation systems **Proactive** – Visual inspection of ventilation system types. **Reactive** – Response and carry out unscheduled minor repairs. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The area measured is the areas served by the system (i.e. the area of the rooms and circulation spaces that is served by the system, which is not necessarily the total gross internal floor area (GIFA) of the buildings).
		2 Kitchen ventilation units: details to be stated.	nr	2 Kitchen ventilation (air movement systems for collecting, containing and removing smells, fumes and other unwanted contaminants from, or supplying fresh air to, kitchen areas), including hoods, canopies and grease filters.	Kitchen ventilation	Kitchen ventilation (ductwork cleaning)	
		3 Safety cabinet and fume cupboard extracts: details to be stated.	nr	3 Safety cabinet and fume cupboard extracts (air movement systems for collecting, containing, cleaning and removing smells, fumes and other unwanted contaminants), including safety cabinets and fume cupboard extracts with integral extract.	Safety cabinet and fume cupboard extracts	Safety cabinet and fume cupboard extracts	
		4 Fume extracts: details to be stated.	nr	4 Fume extracts (air movement systems for collecting, containing, cleaning and removing smells, fumes and other unwanted contaminants), including hoods, canopies and valances.	Fume extracts	Fume extracts	
		5 Dust collection units: details to be stated.	nr	5 Dust collection, including dust and particle extraction or separation equipment, discharge stacks, hoods and collection equipment.	Dust collection unit	Dust collection unit	
		6 Anaesthetic gas extracts: details to be stated.	nr	6 Anaesthetic gas extracts (i.e. scavenging systems for the removal of anaesthetic gases).	Anaesthetic gas extracts	Anaesthetic gas extract	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
		7 Cyclone systems: details to be stated.	nr	7 Cyclone systems.	Cyclone system	Cyclone systems	M3 – Contractor-designed work is to be described and identified separately. M4 – The percentage additions for testing and commissioning and setting to work, are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of testing and set to work. N/A – Not applicable to renewal and/or maintain work. The area serviced is measured using the rules of measurement for ascertaining the gross internal floor area (GIFA).
		8 Unit extract fans: details to be stated.	nr	8 Unit extract fans.	Unit extract fans	Fans	
		9 Rotating ventilators: details to be stated.	nr	9 Rotating ventilators.	Rotating ventilators	Fans	
		10 Roof-mounted ventilation: details to be stated.	nr	10 Roof-mounted ventilation units.	Roof-mounted ventilation units	Fans	
		11 Car parking ventilation: details to be stated.	nr	11 Car parking ventilation (i.e. air movement systems for removing fumes, smells and other contaminants of the air from car parks to the outside), including systems involving no air treatment and systems supplying fresh air to the car parking spaces.	Car parking ventilation	Car park ventilation (see fans)	
		12 Other local and special ventilation units: details to be stated.	$(nr)/m^2$	12 Distribution ductwork and ductwork fittings and ancillaries, e.g. supports, hangers, access openings and dampers (control, fire and smoke).	Ductwork systems	Ductwork asystems	
			nr	13 Grilles, fans, filters and other ancillary components of central air conditioning systems.	Grilles, fans, filters and diffusers and the like	Grilles and diffusers Fans	
			nr	14 Vibration isolation mountings.	Vibration isolation mountings	N/A	
			nr	15 Instrumentation and control components to local and special ventilation systems.	Instrumentation and controls	Instrumentation and controls	
			item	16 Sundry items – planned procedures for ventilation systems.	Actions arising from servicing and planned inspections	Planned procedures	
		13 Testing of installations.	%	17 Testing and commissioning – setting to work.	(included in item)	(included in item)	
		14 Commissioning of installations.					
			Note	18 Work undertaken by subcontractors; on costs.	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.7.3	**Smoke extract/Control** **Definition:** Air movement and pressurisation systems for removing and controlling the build-up of smoke arising from a fire, and to assist in procuring the safety of personnel and in maintaining safe escape routes.	1 Smoke extract/control systems: details to be stated.	m^2/(nr)	1 Automatic smoke extract systems.	Automatic smoke extract systems	Smoke extract/controls	Component Specifications – To be described for each item 1–7, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. **Note:** State types of fans, grilles and controls etc – as the supplementary listing at the end of this group element. (nr) – unit of measure for maintain. Renewal Actions **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. Maintain Actions **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable smoke extract systems **Proactive** – Visual inspection of ventilation system types. **Reactive** – Response and carry out unscheduled minor repairs.
			m^2/(nr)	2 Automatic smoke compartmentalisation systems.	Automatic smoke compartmentalisation systems	Automatic smoke compartmentalisation systems	
			m^2/(nr)	3 Fan units – type to be stated.	Fan units	Fans	
			m^2/(nr)	4 Distribution ductwork and ductwork fittings and ancillaries, e.g. supports, hangers, access openings and dampers (control, fire and smoke).	Ductwork systems	Ductwork systems	
			nr	5 Grilles, fans, filters and other ancillary components of smoke ventilation systems.	Grilles, diffusers, fans and filters	Grilles and diffusers Fans	
			nr	6 Vibration isolation mountings.	Vibration isolation mountings	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			nr	7 Instrumentation and control components to smoke ventilation systems.	Instrumentation and control	Instrumentation and controls	M1 – The area measured is the area served by the system (i.e. the area of the rooms and circulation spaces that is served by the system, which is not necessarily the total gross internal floor area (GIFA) of the building). The area served is measured using the rules of measurement ascertaining the GIFA. M2 – Where more than one system is employed, the area served by each system is to be measured separately. Areas are to be measured using rules of measurement for ascertaining the GIFA. M3 – Where components are to be enumerated, the number of components is to be stated. M4 – Installations to residential units, hotel rooms, student accommodation units, and the like may be enumerated (nr). The type of residential unit or room and size (by number of bedrooms) of unit shall be stated. M5 – Contractor-designed work is to be described and identified separately. M6 – The percentage additions for Testing/set to work are to be applied to the total cost of the items comprising the sub-elements. A single combined percentage addition can be applied to cover the costs of both testing, commissioning and setting to work. M7 – Planned procedures to be itemised.
			item	8 Sundry items – planned procedures for system.	Actions arising from servicing and planned inspections	Planned procedures	
		2 Testing of installations.	%	9 Testing and commissioning; reset to works.	(include in item)	(include in item)	
		3 Commissioning of installations.					
			note	10 Work undertaken by subcontractors; on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Element 5.8: Electrical installations

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.8.1	**Electrical mains and sub-mains distribution** **Definition:** The distribution of LV electricity from (and including) the building main switchgear panel to (and including) the area distribution boards.	1 Electrical mains and sub-mains LV distribution: details to be stated.	m^2/(nr)	1 Distribution of LV electricity from (and including) the building main switchgear panel to (and including) the area distribution boards.	LV distribution	LV distribution	<u>Component Specifications</u> – To be described for each item 1–9, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. **Note:** State the types of ancillary electrical components, as the supplementary listing at the end of this group element. (nr) – unit of measurement for maintain systems. <u>Renewal Actions</u> **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. <u>Maintain Actions</u> **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable electrical mains and sub-mains systems. **Proactive** – Visual inspection of electrical mains and sub-mains system types. **Reactive** – Response and carry out unscheduled minor repairs.
			m^2/(nr)	2 HV switchgear.	HV switch gear	HV switch gear	
			m^2/(nr)	3 LV switchgear and distribution boards.	LV switchgear and distribution boards	LV switch gear and distribution boards	
			m^2/(nr)	4 HV and LV cables and wiring, including support components, cable trays and the like.	HV and LV cables and wiring	HV and LV cables and wiring	
			m^2/(nr)	5 Conduits and cable trunking, including all fittings and support components.	Conduits and cable trunking	Conduits and cable trunking	
			m^2/(nr)	6 Busbar trunking.	Busbar trunking	Busbar trunking	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			m^2/(nr)	7 Earthing and bonding components.	(Covered in 5.8.6)	(Covered in 5.8.6)	M1 – The area measured is the area served by the system (i.e. the area of the rooms and circulation spaces that is served by the system, which is not necessarily the total gross internal floor area (GIFA) of the building). The area served is measured using the rules of measurement ascertaining the GIFA. M2 – Installations to residential units, hotel rooms, student accommodation units and the like may be enumerated (nr). The type of residential unit or room and size (by number of bedrooms) of unit is to be stated. M3 – Where components are to be enumerated, the number of components is to be stated. M4 – Contractor-designed work is to be described and identified separately. M5 – The percentage additions for testing and commissioning and setting to work are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs.
			nr	8 Transformers.	Transformers	Transformers	
			nr	9 Fuse pillars, base units and the like.	Fuse pillars, base units and the like.	Feeder pillars, base units and the like	
			item	10 Sundry items – planned procedures for electrical system.	Actions arising from servicing and planned inspections	Planned procedures	
			item	10a Other sundry items.	Surge protection	Surge protection	
		2 Testing of installations.	%	11 Testing and commissioning; set to works.	Electricity monitoring system	Electricity monitoring system	
		3 Commissioning of installations.					
			note	12 Work undertaken by subcontractors; on cost.	(include in item)	(include in item)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.8.2	**Power installations** **Definition:** Sub-circuit power installations from sub-distribution boards terminating at socket outlets, fuse connection units and other accessories. Including final connections to permanent mechanical and electrical equipment.	1 Power installations: details to be stated.	m^2/(nr)	1 General low voltage (LV) power installations.	General LV power installations	General LV power installations	(nr) – unit of measurement for maintain systems. Renewal Actions **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts; stating sixing, type and materials. Maintain Actions **Note:** include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable power installations **Proactive** – Visual inspection of power installation types. **Reactive** – Response and carry out unscheduled minor repairs. Component Specifications – To be described for each item 1–12 to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. **Note:** For specific types of electrical ancillaries, see the supplementary listing at the end of this group element 5. (nr) – unit of measure for maintain system.
			m^2/(nr)	2 Extra LV supply installations.	Extra LV supply installations	Extra LV supply installations	
			m^2/(nr)	3 Direct current (DC) installations.	DC installations	DC installations	
			m^2/(nr)	4 LV switchgear and distribution boards, where not included as part of the sub-mains distribution.	LV switchgear Distribution board	LV switchgear Distribution board	
			nr	5 Uninterruptible power supply (UPS) installations and the like (capacity kW duty to be stated).	UPS system	UPS system	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			m^2/(nr)	6 Cables and wiring, including support components from sub-distribution boards to socket outlets, fuse connection units and the like.	Cables and wiring	Cables and wiring	M1 – The area measured is the area served by the system (i.e. the area of the rooms and circulation spaces that is served by the system, which is not necessarily the total gross internal floor area (GIFA) of the building). The area serviced is measured by using the rules of measurement for ascertaining GIFA. M2 – Where more than one system is employed, the area served by each system is to be measured separately. Areas are to be measured by using the rules of measurement for ascertaining the GIFA. M3 – Installations to residential units, hotel rooms, student accommodation units and the like may be enumerated (nr). The type of residential unit or room and size (by number of bedrooms) of unit is to be stated. M4 – Where components are to be enumerated, the number of components is to be stated. M5 – Contractor-designed work is to be described and identified separately. M6 – The percentage additions for testing and commissioning and setting to work are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs. Socket outlets testing to be included as part of PAT testing and electrical fixing wiring tests. **Note:** include reset to works in with respective item.
			m^2/(nr)	7 Conduits and cable trunking, including all fittings and support components.	Conduits and cable trunking and the like	Wiring and components	
			m^2/(nr)	8 Earthing and bonding components.	(Covered in 5.8.6)	N/A	
			m^2/(nr)	9 Socket outlets, fuse connection units and other outlet accessories.	Socket outlets, fuse connection units	Socket outlets	
			N/A	10 Final connections to equipment (e.g. boilers, kitchen and catering equipment, instantaneous water heaters, cookers and extract terminals).	N/A	N/A	
			m^2	11 Separate power installations to specialist mechanical and electrical equipment (e.g. to transportation systems).	Specialist power installations	Specialist power installations	
			N/A	12 Final connections to specialist mechanical and electrical equipment where not carried out by the equipment installer.	N/A	N/A	
			item	13 Sundry items – planned procedures for electrical system.	Actions arising from servicing and planned inspections	Planned procedures	
		2 Testing of installations.	%(nr)	14 Testing and commissioning: reset to works	PAT testing	PAT testing	
		3 Commissioning of installations.	(m^2/nr)	– portable appliances testing (PAT) – fixed electrical wiring testing.	Fixed electrical wiring testing	Fixed electrical wiring testing	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			note	15 Subcontractor on costs (where applicable)	Subcontractor on costs	Subcontractor on costs	
5.8.3	**Lighting installations** **Definition:** Sub-circuit installations from sub-distribution boards to provide lighting.	1 Lighting installations: details to be stated.	m^2/(nr)	1 General internal lighting, including lighting fixed to the exterior of the building (e.g. bulkhead fittings and down lighters to soffits/external suspended ceilings).	Light fittings – general	Light fittings – general	**Component Specifications** – To be described for each item 1–11, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. **Note:** State types of electrical ancillaries components, as the supplementary listing at the end of this group element. (nr) – unit of measure for maintain system. **Renewal Actions** **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. **Maintain Actions** **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable lighting installations – including re-lamping of lighting fittings (according to lamp life hours). **Proactive** – Visual inspection of lighting installations types. **Reactive** – Response and carry out unscheduled minor repairs. M1 – The area measured is the total gross internal floor area (GIFA) of the building, measured using the rules of measurement for ascertaining the GIFA.
			m^2/(nr)	2 Emergency lighting.	Emergency lighting	Emergency lighting	
			m^2/(nr)	3 Lighting fixed to the exterior of the building supplied as part of the interior system.	External lighting	External lighting	
			m^2/(nr)	4 Low voltage (LV) switchgear and distribution boards, where not included as part of the sub-mains distribution.	LV switchgear and distribution boards	LV switchgear and distribution boards	
			m^2/(nr)	5 Cables and wiring, including support components from sub-distribution boards to lighting points, switches and the like.	Cables and wiring	Cables and wiring	
			m^2/(nr)	6 Conduits and cable trunking, including fittings and support components.	Conduits and cable trunking	Conduits and cable trunking	
			nr	7 Earthing and bonding.	(Covered in 5.8.6)	(Covered in 5.8.6)	
			nr	8 Fittings to lighting points, including roses, pendants and the like	Fittings to lighting points	Fittings to lighting points	
			nr	9 Switches, including pull cords.	Lighting switches	Lighting switches	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			m^2/nr	10 Luminaires and lamps.	Luminaires/lamps	Luminaires/lamps	M2 – Where more than one system is employed, the area served by each system is to be measured separately. Areas are to be measured by using the rules of measurement for ascertaining the GIFA. M3 – Installations to residential units, hotel rooms, student accommodation units and the like may be enumerated (nr). The type of residential unit or room and size (by number of bedrooms) of unit is to be stated. M4 – Where components are to be enumerated, the number of components is to be stated. M5 – Contractor-designed work is to be described and identified separately. M6 – The percentage additions for testing and commissioning and setting to work are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs.
			nr	11 Lighting control equipment.	Lighting control equipment	Lighting control equipment	
			item	12 Sundry items – planned procedures for system.	Actions arising from servicing and planned inspections	Planned procedures	
		2 Testing of installations.	%	13 Testing and commissioning; reset to work.	(include in item)	(include in item)	
		3 Commissioning of installations.					
			note	14 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.8.4	**Specialist lighting installations** **Definition:** Specialist or special-effects internal illumination systems.	1 Specialist lighting installations: details to be stated.	nr	1 Illuminated display signs, lettering, emblems and symbols for information purposes, advertising and the like.	Illuminated display signs	Illuminated display signs	<u>Component Specifications</u> – To be described for each item 1–14 to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. **Note:** For types of electrical ancillaries – see the services supplementary listing at the end of this group element 5. <u>Renewal Actions</u> **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. <u>Maintain Actions</u> **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable specialist lighting, – including re-lamping of lighting (according to lamp life hours). **Proactive** – Visual inspection of specialist lighting system types. **Reactive** – Response and carry out unscheduled minor repairs.
			nr/m^2	2 Studio lighting.	Studio lighting	Studio Lighting	
			nr/m^2	3 Auditorium lighting, theatre lighting, stage lighting and the like.	Auditorium lighting	Auditorium lighting	
			nr/m^2	4 Arena lighting.	Arena lighting	Arena lighting	
			nr/m^2	5 Operating theatres and other specialist lighting installations.	Operating theatre and other specialist lighting	Operating theatre and other specialist lighting	
			nr/m^2	6 Low voltage (LV) switchgear and distribution boards, where not included as part of the sub-mains distribution.	LV switchgear and distribution boards	LV switchgear and distribution boards	
			nr/m^2	7 Cables and wiring, including support components from sub-distribution boards to lighting points, switches and the like.	Cables and wiring and supports	Cables and wiring	
			nr/m^2	8 Conduits and cable trunking, including all fittings and support components.	Conduits and cable trunking	Conduits and cable trunking	
			nr/m^2	9 Earthing and bonding.	(Covered in 5.8.6)	(Covered in 5.8.6)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			nr	10 Fittings to lighting points.	Fittings to lighting points	Fittings to lighting points	M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The area measured is the area served by the system (i.e. the area of the rooms and circulation spaces that is served by the system, which is not necessarily the total gross internal floor area (GIFA) of the building). The area serviced is measured by using the rules of measurement for ascertaining GIFA. M3 – Where more than one system is employed, the area measured for each system. Areas are to be measured by using the rules of measurement for ascertaining the GIFA. M4 – Contractor-designed work is to be described and identified separately. M5 – The percentage additions for testing and commissioning and setting to work are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs.
			nr	11 Switches, including pull cords.	Switches	Switches	
			nr/m^2	12 Luminaires and lamps.	Luminaires/lamps	Luminaires/lamps	
			nr	13 Lighting gantries and the like.	Lighting gantries	Lighting gantries	
			nr	14 Lighting control equipment.	Lighting control equipment	Lighting control equipment	
			item	15 Sundry items – planned procedures for specialist lighting system.	Actions arising from servicing and planned inspections	Planned procedures	
		2 Testing of installations.	%	16 Testing and commissioning; reset to works.	(include in item)	(include in item)	
		3 Commissioning of installations.					
			note	17 Work undertaken by subcontractors; on costs.	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.8.5	**Local electricity generation systems** **Definition:** Local generation equipment for the production of electrical energy, including emergency and/or standby generator plant.	**Local generation equipment:** 1 Electricity generation systems: details to be stated.	nr	1 Emergency/standby generator plant (gas, oil and dual fuel).	Standby generator	Standby generator	<u>Components Specifications</u> – To be described for items 1 and 2, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. <u>Renewal Actions</u> **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. <u>Maintain Actions</u> **Note**: Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable local generation systems. **Proactive** – Visual inspection of local generation systems. **Reactive** – Response and carry out unscheduled minor repairs. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Contractor-designed work is to be described and identified separately. M3 – The percentage additions for testing, commissioning and setting to work are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of testing and setting to work.
			nr	2 Ancillary cables and wiring, conduits and cable trunking, and controls required to connect local electricity generation systems to other systems.	Ancillary cables and wiring	Ancillary components	
			item	3 Sundry items – planned procedures for local electricity generation system.	Actions arising from servicing and planned inspections	Planned procedures	
		2 Testing of installations.	%	4 Testing (including full-load and off-load testing) and commissioning.	(include in item)	(include in item)	
		3 Commissioning of installations.					
			note	5 Work undertaken by subcontractors; on costs.	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
	Local electrical generation systems	Transformation devices:			Wind turbines	Wind turbines	Component Specifications – To be described for each item 1–6, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the components included in scope. Renewal Actions **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.
		4 Wind turbines: details, including output (kW), to be stated.	nr	1 Wind turbines, including rooftop wind energy systems.	Photovoltaic devices	Photovoltaic devices	
		5 Photovoltaic devices: details, including surface area of units (m^2) and output (kW), to be stated.	nr	2 Photovoltaic devices, including cells, panels, modules and the like.	Solar collectors devices and the like	Solar collectors devices and the like	
			nr	3 Solar collectors, including supporting framework (including fish plate collectors, evacuated tube collectors and the like).	Other transformation devices	Other transformation devices	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
		6 Other transformation devices: details, including output (kW), to be stated.	nr	4 Other transformation devices.	Generators	Generators	**Maintain Actions** **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable transformation devices. **Proactive** – Visual inspection of transformation device types. **Reactive** – Response and carry out unscheduled minor repairs. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Contractor-designed work is to be described and identified separately. M3 – The percentage additions for testing, commissioning and setting to work are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of testing and setting to work. M4 – Planned procedures to be itemised.
			nr	5 Generators in connection with transformation devices.	Ancillary equipment	Ancillary components	
			nr	6 Ancillary cables and wiring, conduits and cable trunking, and controls required to connect transformation devices to other systems.	Actions arising from servicing and planned inspections	Planned procedures	
			item	7 Sundry items – planned procedures for system.			
		7 Testing of installations.	%	8 Testing and commissioning; reset to works.	(included in item)	(included in item)	
		8 Commissioning of installations.					
			Note	9 Work undertaken by subcontractors; on costs.	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.8.6	**Earthing and bonding systems** **Definition:** Systems for the transfer of electrical current to the earth to protect personnel, buildings, structure, plant and equipment in the case of electrical fault within the electrical supply system. Also to protect against interference from electromagnetic fields and electromagnetic forces.	1 Earthing and bonding systems: details to be stated.	m^2/(nr)	1 Earthing and bonding cables.	Earthing and bonding cables	Earthing and bonding cables	Component Specifications – To be described for each item 1–2, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. (nr) – unit of measure for maintain system. Renewal Actions **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. Maintain Actions **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable earthing and bonding systems. **Proactive** – Visual inspection of earthing and bonding system types. **Reactive** – Response and carry out unscheduled minor repairs.
			m^2/(nr)	2 Earthing and bonding components, including protective conductors, earth clamps, earth tapes, clean-earth bars, earth electrodes, earthing busbars, earth rod covers and boxed, equipotential bonding and all other ancillary components.	Earthing and bonding components	Protective conductor and earth	
			Item	3 Sundry items – planned procedures for earthing and bonding system.	Actions arising from servicing and planned inspections	Planned procedures	
			m^2/(nr)	3a Other sundry items – i.e. Hazardous area (electrics) earthing.	Hazardous area (electrics) earthing	Hazardous area (electrics) earthing	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
		2 Testing of installations.	%	4 Testing and commissioning; resetting to work.	(include in item)	(include in item)	M1 – The area measured is the total gross internal floor area (GIFA) of the building, measured using the rules of measurement for ascertaining the GIFA. M2 – Where more than one system is employed, the area served by each system is to be measured separately. Areas are to be measured by using the rules of measurement for ascertaining the GIFA. M3 – Installations to residential units, hotel rooms, student accommodation units and the like may be enumerated (nr). The type of residential unit or room and size (by number of bedrooms) of unit is to be stated. M4 – Where components are to be enumerated, the number of components is to be stated. M5 – Contractor-designed work is to be described and identified separately. M6 – The percentage additions for testing and commissioning and setting to work are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs.
		3 Commissioning of installations.					
			note	5 Work undertaken by subcontractors; on costs.	Subcontractor on costs	Subcontractor on costs	

Element 5.9: Fuel installations

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.9.1	**Fuel storage** **Definition:** Storage tanks and vessels for storage of oil, petrol, diesel or liquefied petroleum gas (LPG)	1 Fuel storage: details to be stated.	nr	1 Oil, petrol, diesel and liquefied petroleum gas (LPG), biomass and other fuel systems.	Fuel systems – (type)	Fuel systems – (type)	Component Specifications – To be described for each item 1–5, to determine the appropriate reference service life and to assign the applicable planned maintenance task. schedules to the component. Renewal Actions **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. Maintain Actions **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable fuel storage systems **Proactive** – Monitor and inspect fuel storage systems. **Reactive** – Response and carry out unscheduled minor repairs. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The area measured is the area served by the system (i.e. the area of the rooms and circulation spaces that is served by the system, which is not necessarily the total gross internal floor area (GIFA) of the building). The area serviced is measured by using the rules of measurement for ascertaining GIFA.
			nr	2 Storage tanks and vessels not supplied in connection with heat source installations.	Fuel storage tanks and vessels	Fuel storage tanks and vessels	
			nr	3 Proprietary supports forming an integral part of the storage tank/vessel unit.	Proprietary supports	N/A	
			nr	4 Off-site painting/anti-corrosion treatments.	Anti – corrosion paint	N/A	
			nr	5 Thermal insulation.	Thermal insulation	Thermal insulation	
			item	6 Sundry items – planned procedures for fuel storage system.	Actions arising from servicing and planned inspections	Planned procedures	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
		2 Testing of installations.	%	7 Testing and commissioning; reset to works.	(include in item)	(include in item)	M3 – Installations to residential units, hotel rooms, student accommodation units and the like may be enumerated (nr). The type of residential unit or room and size (by number of bedrooms) of unit is to be stated. M4 – Contractor-designed work is to be described and identified separately. M5 – The percentage additions for testing and setting to work are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of testing, commissioning and setting to work. N/A – Not applicable to renewal and/or maintain work.
		3 Commissioning of installation.					
			note	8 Work undertaken by subcontractors; on costs.	Subcontractor on costs	Subcontractor on costs	
5.9.2	**Fuel distribution systems** **Definition:** Piped supply systems distributing gas from point of mains supply within buildings and oil, petrol, diesel or liquefied petroleum gas (LPG) from storage tanks or vessels to user points.	1 Piped distribution systems: detailed to be stated.	m^2/(nr)	1 Gas, oil, petrol, diesel and liquefied petroleum gas (LPG), and other fuel systems.	Fuel systems – (type)	Fuel systems – (type)	**Component Specifications** – To be described for each item 1–9, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. (nr) – unit of measurement for maintain systems. **Note:** state types of pumps and valves as the supplementary listing at the end of this group element 5: Services. **Renewal Actions** **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.
			m^2/(nr)	2 Distribution pipelines from point of mains connection within building to user points, including pipeline ancillaries and fittings.	Pipeworks systems	Pipeworks systems	
			m^2/(nr)	3 Pipeline components/ancillaries (e.g. valves and pumps – see the supplementary listing).	Pipelines components and ancillaries	Pumps Valves	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			item/nr	4 Bracketary.	Bracketary	N/A	**Maintain Actions** **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable fuel distribution systems **Proactive** – Monitor and inspect fuel distribution systems. **Reactive** – Response and carry out unscheduled minor repairs. M1 – The area measured is the total gross internal floor area (GIFA) of the building, measured using the rules of measurement ascertaining the GIFA. M2 – Installations to residential units, hotel rooms, student accommodation units and the like may be enumerated (nr). The type of residential unit or room and size (by number of bedrooms) of unit is to be stated. M3 – Contractor-designed work is to be described and identified separately. M4 – The percentage additions for testing and setting to work are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of testing, commissioning and setting to work. N/A – Not applicable to renewal and/or maintain work.
			nr	5 Manifolds, local meters, gas governors, gas boosters and gas connection outlets.	Manifolds, local meters and the like	Gas distribution components	
			m^2/(nr)	6 Terminal control equipment.	Terminal control equipment	Terminal control equipment	
			m^2/(nr)	7 Thermal insulation.	Thermal insulation	Thermal insulation	
			m^2/(nr)	8 Off-site painting/anti-corrosion treatments.	Anti-corrosion paint	N/A	
			m^2/(nr)	9 Monitoring equipment.	Monitoring equipment	Monitoring equipment	
			item	10 Sundry items – planned procedures for system.	Actions arising from servicing and planned inspections	Planned procedures	
		2 Testing of installations.	%	11 Testing and commissioning; reset to works	(include in item)	(include in item)	
		3 Commissioning of installations.					
			Note	12 Work undertaken by subcontractors; on costs.	Subcontractor on costs	Subcontractor on costs	

Element 5.10: Lifts and conveyor installations

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.10.1	**Lifts and enclosed hoists** **Definition:** Electro-mechanical or electro-hydraulic installations for the conveyance of persons, goods or equipment from one level to another in a vertical plane.	**Lifts:** 1 Passenger lifts: details, including capacity (i.e. number of persons), speed (in m/sec), number of doors (nr), door heights and number of levels serviced (nr), to be stated.	nr	1 Complete lift installation, including lift cars, doors and equipment, guides and counter balances, hydraulic and lifting equipment, emergency lighting, lift alarms and telephones.	Lifts (state type)	Lifts (state type)	<u>Component Specifications</u> – To be described for each item 1 and 5, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the components included in scope. <u>Renewal Actions</u> **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. <u>Maintain Actions</u> **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable lifts and enclosed hoists. **Proactive** – Monitor and inspect lifts and hoists. **Reactive** – Response and carry out unscheduled minor repairs. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Contractor-designed work is to be described and identified separately.
			nr	2 Firefighting lifts.	Firefighting lifts	Firefighting lifts	
		2 Wall-climbing lifts: details, including capacity (in kg), number (nr) of persons, speed (in m/sec) and number of levels serviced (nr), to be stated.	nr	3 Wall-climbing lifts.	Wall-climbing lifts	Wall-climbing lifts	
		3 Goods lifts: details, including the capacity (in kg), number of doors, (nr), door heights and number of levels served (nr), to be stated.	nr	4 Gantries, trolleys, blocks, hooks and ropes, down-shop leads, pendants and the like.	Gantries, trolleys blocks and the like	Gantries, trolley blocks and the like	
			nr	5 Controls and electrical work from and including, the isolator where supplied with installation.	Controls and electrical works	Controls and electrical works	
			item	6 Sundry items – planned procedures for lifts and enclosed hoists.	Actions arising from servicing and planned inspections	Planned procedures	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
		4 Testing of installations.	%	7 Testing and commissioning; reset to works.	(include in item)	(include in item)	M3 – The percentage additions for testing, commissioning and setting to work are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of testing and setting to work. M4 – Planned procedures to be itemised.
		5 Commissioning of lift installations.					
			note	8 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	
	Lifts	**Enclosed hoists:** 6 Enclosed hoists: details, including capacity (in kg) and number of levels (nr) serviced, to be stated.	nr	1 Hoists, kitchen service hoists, dumb waiters and the like.	Hoists, kitchen service hoists & dumb waiters	Hoists (H)	All as per lifts above.
			nr	2 Complete hoist installations, including cages, doors and equipment, guides and counter balances, hydraulic and lifting equipment.	Hoist	(H)	
			nr	3 Controls and electrical work from, and including, the isolator where supplied with installation.	Controls and electrical work	Controls and electrical work	
			item	4 Sundry items – planned procedures for hoists.	Actions arising from servicing and planned inspections	Planned procedures	
		7 Testing of installations.	%	5 Testing and commissioning; reset to works.	(include in item)	(include in item)	
		8 Commissioning of enclosed hoist installation.					
			note	6 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.10.2	**Escalators** **Definition:** Permanently fixed lifting equipment, either electro-mechanical or hydraulically operated, for the raising or lowering of persons, goods or equipment.	1 Escalators: details, including number of flights served (nr), angle of rise (in degrees), rise (m) and step width (mm), to be stated.	nr	1 Escalators.	Escalator	Escalator	Component Specifications – To be described for each item 1–3, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the components included in scope. Renewal Actions **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. Maintain Actions **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable escalators **Proactive** – Monitor and inspect escalators. **Reactive** – Response and carry out unscheduled minor repairs.
			nr	2 Ancillary components, including under-step lighting, under-handrail lighting, balustrades, cladding to sides and soffits, and chairs.	Ancillary components	Ancillary components	
			nr	3 Controls and electrical work from, and including, the isolator where supplied with installation.	Controls and electrical works	Controls and electrical works	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			item	4 Sundry items – planned procedures for escalators.	Actions arising from servicing and planned inspections	Planned procedures	M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The rise is the distance (m) between the finished floor level at the bottom of the escalator and the finished floor level at the top of the escalator. M3 – Contractor-designed work is to be described and identified separately. M4 – The percentage additions for testing, commissioning and setting to work are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of testing and setting to work.
		2 Testing of installations.	%	5 Testing and commissioning; reset to works.	(include in item)	(include in item)	
		3 Commissioning of installations.					
			note	6 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	
5.10.3	**Moving pavements** **Definition:** Electro-mechanical systems for the conveyance of persons from one level to another by means of a continually moving stairway.	1 Moving pavements: details, including length (m) and width (mm), to be stated.	nr	1 Moving pavements.	Moving pavements	Moving pavements	**Component Specifications** – To be described for each item 1–4, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the components included in scope. **Renewal Actions** **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.
			nr	2 Travelators.	Travelators	Travelators	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			nr	3 Stairlifts.	Stairlifts	Stairlifts	M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The linear length measured is the extreme length. M3 – Contractor-designed work is to be described and identified separately. M4 – The percentage additions for testing, commissioning and setting to work are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of testing and setting to work. Maintain Actions **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable moving pavements. **Proactive** – Monitor and inspect moving pavements. **Reactive** – Response and carry out unscheduled minor repairs.
			nr	4 Controls and electrical work from, and including, the isolator where supplied with installation.	Controls and electrical works	Controls/ electrical works	
			item	5 Sundry items – planned procedures for systems.	Actions arising from servicing and planned inspections	Planned procedures	
		2 Testing of installations.	%	6 Testing and commissioning; reset to works.	(include in item)	(include in item)	
		3 Commissioning of installations.					
			note	7 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.10.4	**Powered stairlifts** **Definition:** Electro-mechanical systems for the conveyance of persons from one place to another by means of a moving flat strip of pavement either level or inclined to elevate from one level to another.	1 Powered stairlifts: details to be stated.	nr	1 Complete stairlift installations, including rails, folding rails, carriages, hinged bridging platforms, guards, drive units and signage.	Powered stairlifts	Powered stairlifts	<u>Component Specifications</u> – To be described for items 1 and 2, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. <u>Renewal Actions</u> **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. <u>Maintain Actions</u> **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable powered stairlifts. **Proactive** – Monitor and inspect powered stairlifts. **Reactive** – Response and carry out unscheduled minor repairs. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Contractor-designed work is to be described and identified separately. M3 – The percentage additions for testing, commissioning and setting to work are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of testing and setting to work.
			nr	2 Controls and electrical work from, and including, the isolator where supplied with installation.	Controls and electrical works	Controls and electrical works	
			item	3 Sundry items – planned procedures for stair lifts.	Actions arising from servicing and planned inspections	Planned procedures	
		2 Testing of installations.	%	4 Testing and commissioning; reset to works.	(include in item)	(include in item)	
		3 Commissioning of installations.					
			note	5 Works undertaken by subcontractors (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.10.5	**Conveyors** **Definition:** Systems for the mechanical conveyance of goods between two or more points.	1 People conveyors: details, including length (m) and width (mm), to be stated.	nr	1 Complete conveyor systems.	Conveyor systems	Conveyor systems	<u>Maintain Actions</u> **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable conveyors. **Proactive** – Monitor and inspect conveyors. **Reactive** – Response and carry out unscheduled minor repairs. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The linear length measured is the extreme length. M3 – Contractor-designed work is to be described and identified separately. M4 – The percentage additions for testing, commissioning and setting to work are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of testing and setting to work. <u>Component Specifications</u> – To be described for each item 1–3, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. <u>Renewal Actions</u> **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.
		2 Goods conveyor: details, including length (m) and width (mm), to be stated.	nr	2 Specialist systems, e.g. baggage handling systems and the like.	Specialist systems (e.g. Baggage handling system)	Specialist systems (e.g. Baggage handling system)	
			nr	3 Controls and electrical work from, and including, the isolator where supplied with installation.	Controls and electrical work	Controls and electrical works	
			item	4 Sundry items – planned procedures for conveyors.	Actions arising from servicing and planned inspections	Planned procedures	
		3 Setting to work.	%	5 Testing and commissioning; reset to works.	(include in item)	(include in item)	
			note	6 Work undertaken by subcontractors (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.10.6	**Dock levellers and scissor lifts** **Definition:** Localised lifting systems for goods and people.	1 Dock levellers: details, including total rise (m), to be stated.	nr	1 Dock levellers, including canopy.	Dock levellers	Dock levellers	<u>Component Specifications</u> – To be described for each item 1–3, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. <u>Renewal Actions</u> **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. <u>Maintain Actions</u> **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable dock levellers and scissor lifts. **Proactive** – Monitor and inspect dock levellers and scissor lifts. **Reactive** – Response and carry out unscheduled minor repairs. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Contractor-designed work is to be described and identified separately. M3 – The percentage additions for testing, commissioning and setting to work are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of testing and setting to work.
		2 Scissor lifts: details, including total rise (m), to be stated.	nr	2 Scissor lifts.	Scissor lifts	Scissor lifts	
			nr	3 Controls and electrical work from, and including, the isolator where supplied with installation.	Controls and electrical work	Controls and electrical works	
			item	4 Sundry items – planned procedures for systems.	Actions arising from servicing and planned inspections	Planned procedures	
		3 Testing of installations.	%	5 Testing and commissioning; reset to works.	(include in item)	(include in item)	
		4 Commissioning of installations.					
			Note	6 Work undertaken by subcontractors (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.10.7	**Cranes and unenclosed hoists** **Definition:** Cranes and unenclosed hoists for the lifting and movement of heavy goods and equipment.	1 Cranes: details, including design load (kN) and total rise (m), to be stated.	nr	1 Cranes.	Cranes	Cranes	<u>Component Specifications</u> – To be described for each item 1-4 to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. <u>Renewal Actions</u> **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. <u>Maintain Actions</u> **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable cranes and hoists items. **Proactive** – Monitor and inspect cranes and hoists. **Reactive** – Response and carry out unscheduled minor repairs.
		2 Travelling cranes: details, including design load (kN) and total rise (m), to be stated.	nr	2 Travelling cranes.	Travelling cranes	Travelling cranes	
		3 Unenclosed hoists: details, including total rise (m), to be stated.	nr	3 Unenclosed hoists and other lifting systems for materials and goods.	Unenclosed hoists and other lifting systems	Unenclosed hoists and cradles	
			nr	4 Controls and electrical work from, and including, the isolator where supplied with installation.	Controls and electrical work	Controls and electrical work	
			item	5 Sundry items – planned procedures for cranes.	Actions arising from servicing and planned inspections	Planned procedures	
		4 Testing of installations.	%	6 Testing and commissioning; reset to works.	(include in item)	(include in item)	M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Contractor-designed work is to be described and identified separately. M3 – The percentage additions for testing, commissioning and setting to work are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of testing and setting to work.
		5 Commissioning of installations.					
			note	7 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.10.8	**Car lifts, car stacking systems, turntables and the like** **Definition:** Vehicle lifting, storage and moving systems.	1 Car lifts: details, including number of floors served (nr), to be stated.	nr	1 Car lifts, car stacking systems and the like.	Car lifts and car stacking systems	Car lifts and car stacking systems	<u>Component Specifications</u> – To be described for each item 1–3, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. <u>Renewal Actions</u> **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. <u>Maintain Actions</u> **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable car lifts and car stacking systems **Proactive** – Monitor and inspect car lifts and stacking systems. **Reactive** – Response and carry out unscheduled minor repairs. M1–M3 measurement rules are the same as sub-element 5.10.7.
		2 Car stacking systems: details, including capacity (i.e. number of cars), to be stated.					
		3 Vehicle turntables.	nr	2 Vehicle turntables.	Vehicle turntables	Vehicle turntables	
			nr	3 Controls and electrical work from, and including, the isolator where supplied with installation.	Controls and electrical work	Controls and electrical work	
			item	4 Sundry items. – planned procedures for systems.	Actions arising from servicing and planned inspections	Planned procedures	
		4 Testing of installations.	%	5 Testing and commissioning; reset to works.	(include in item)	(include in item)	
		5 Commissioning of installations.					
			note	6 Work undertaken by subcontractors; on costs.	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.10.9	**Document handling systems** **Definition:** Specialist document handling/delivery systems, warehouse picking systems and the like.	1 Document handling/delivery systems: details to be stated.	nr	1a Document handling/delivery systems.	Document handling systems	Document handling systems	<u>Component Specifications</u> – To be described for each item 1 and 2, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. <u>Renewal Actions</u> **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. <u>Maintain Actions</u> **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable document handling system. **Proactive** – Monitor and inspect document handling systems. **Reactive** – Response and carry out unscheduled minor repairs. M1–M3 measurement rules are same as sub-element 5.10.7.
		2 Warehouse picking systems: details to be stated.	nr	1b Warehouse picking systems and the like.	Warehouse picking systems	Warehouse picking systems	
		3 Other systems: details to be stated.	nr	2 Controls and electrical work from, and including, the isolator where supplied with installation.	Controls and electrical work	Controls and electrical work	
			item	3 Sundry items – planned procedures.	Actions arising from servicing and planned inspections	Planned procedures	
		4 Testing of installations.	%	4 Testing and commissioning – reset to work.	(include in item)	(include in item)	
		5 Commissioning of installations.					
			note	5 Work undertaken by subcontractors; on costs.	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.10.10	**Other transport systems** **Definition:** Transport systems not covered by sub-elements 5.10.1–5.10.9.	1 Other lift and conveyor installations: details to be stated.	nr	1 Paternoster lifts.	Paternoster lifts	Paternoster lifts	**Component Specifications** – To be described for items 1–4, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the components included in scope. **Renewal Actions** **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. **Maintain Actions** **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable other lift and conveyor systems, as per items 1–4. **Proactive** – Monitor and inspect lift and conveyor systems. **Reactive** – Response and carry out unscheduled minor repairs. M1–M3 measurement rules are same as sub-element 5.10.9.
			nr	2 Hoists for moving people with disability.	Hoists for moving people with disability	Hoists for moving people with disability	
			nr	3 Other transport systems.	Other transport systems	Other transport systems	
			nr	4 Controls and electrical work from and including isolator where supplied with installation.	Controls and electrical work	Controls and electrical work	
			item	5 Sundry items – planned procedures for systems.	Actions arising from servicing and planned inspections	Planned procedures	
		2 Testing of installations.	%	6 Testing and commissioning – reset to work.	(include in item)	(include in item)	
		3 Commissioning of installations.					
			note	7 Work undertaken by subcontractors; on costs.	Subcontractor on costs	Subcontractor on costs	

Element 5.11: Fire and lightning protection

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.11.1	**Firefighting systems** **Definition:** Piped distribution systems within the confines of the building for firefighting purposes.	1 Fire hose reels: details of each type of system to be stated.	nr	1 Fire hose reels, including hose reels and pressure booster sets.	Fire hose reel systems	Fire hose reel system	**Component Specifications** – To be described for each item 1–7 to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. (nr) – unit of measurement for maintain systems. **Renewal Actions** **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. **Maintain Actions** **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable fire-fighting systems **Proactive** – Visual inspection of firefighting systems.
		2 Dry risers: details to be stated.	nr	2 Dry risers, including inlet breechings, inlet boxes, landing valves, outlet boxes and drain valves.	Dry risers	Dry risers	
		3 Wet risers: details to be stated.	nr	3 Wet risers, including landing valves, outlet boxes, pressure vessel within diaphragm, and control panels.	Wets risers	Wet risers	
		4 Fire and oxide protection curtains: details of each type of system to be stated.					
		5 Other firefighting systems: details of each type of system to be stated.	nr/m^2	4 Distribution pipelines, pipeline ancillaries and fittings.	Pipework systems	Pipework systems	
			nr/m^2	5 Thermal insulation.	Thermal insulation	Thermal insulation	
			nr	6 Control components.	Control components	Control components	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			nr	7 Fire and smoke protection curtains (e.g. drop-down curtains), including control panels.	Fire and smoke protection curtains	Fire and smoke protection curtains	M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The area measured is the area served by the system (i.e. the area of the rooms and circulation spaces that is served by the system, which is not necessarily the total gross internal floor area (GIFA) of the building). The area serviced is measured by using the rules of measurement for ascertaining GIFA. M3 – Where more than one system is employed, the area served by each system is to be measured separately. Areas are to be measured by using the rules of measurement for ascertaining the GIFA. M4 – Contractor-designed work is to be described and identified separately. M5 – The percentage additions for testing and commissioning and setting to work are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs.
			item	8 Sundry items – planned procedures for systems.	Action arising	Planned procedures	
		6 Testing of installations.	%	9 Testing and commissioning – reset to work.	(include in item)	(include in item)	
		7 Commissioning.					
			note	10 Work undertaken by subcontractors: on costs.	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.11.2	**Fire suppression systems** **Definition:** Piped distribution systems within the confines of the building for fire suppression purposes.	1 Sprinklers: details of each type of system to be stated.	m^2/(nr)	1 Sprinklers, including reaction and control devices and sprinkler heads.	Sprinkler system	Sprinkler system	<u>Component Specifications</u> – To be described for each item 1–8 to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. **Note:** state types of pumps, tanks, controls etc, as the supplementary listing at the end of this group element. (nr) – unit of measurement for maintain systems. <u>Renewal Actions</u> **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. <u>Maintain Actions</u> **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable fire suppression system. **Proactive** – Visual inspection of fire suppression systems. **Reactive** – Response and carry out unscheduled minor repairs.
		2 Deluge systems: details of each type of system to be stated.	m^2/(nr)	2 Deluge systems, including water storage, reaction and control devices and deluge discharge nozzles.	Deluge system	Deluge system	
		3 Gas firefighting systems: details of each type of system to be stated.	m^2/(nr)	3 Gas firefighting systems, including gas storage cylinders and vessels, gas manifolds and equipment, discharge nozzles, detectors and activators.	Gas firefighting system	Gas firefighting injection	
		4 Foam firefighting systems: detail of each type of system to be stated.	m^2/(nr)	4 Foam firefighting systems, including foam generation equipment, storage vessels, detectors and activators, and foam discharge nozzles, etc.	Foam firefighting system	Foam dispensing firefighting system	
		5 Other fire suppression systems: details of each type of system to be stated.	m^2/(nr)	5 Distribution pipelines, pipeline ancillaries and fittings.	Pipeworks systems	Pipeworks systems	
			nr	6 Water tanks and cisterns for firefighting installations.	Tanks and cisterns	Tanks and cisterns	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			m^2/(nr)	7 Thermal insulation.	Thermal insulation	Thermal insulation	M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The area measured is the area served by the system (i.e. the area of the rooms and circulation spaces that is served by the system, which is not necessarily the total gross internal floor area (GIFA) of the building). The area serviced is measured by using the rules of measurement for ascertaining GIFA. M3 – Where more than one system is employed, the area served by each system is to be measured separately. Areas are to be measured by using the rules of measurement for ascertaining the GIFA. M4 – Contractor-designed work is to be described and identified separately. M5 – The percentage additions for testing and commissioning and setting to work are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs.
			nr	8 Control components.	Control components	Control components	
			item	9 Sundry items – planned procedures for systems.	Actions arising from servicing and planned inspections	Planned procedures	
		6 Testing of installations.	%	10 Testing and commissioning; reset to works.	(include in item)	(include in item)	
		7 Commissioning of installations.					
			note	11 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.11.3	**Lightning protection** **Definition:** Lightning protection installations.	1 Lightning protection installations (details of each type of system to be stated.	m^2/(nr)	1 Bonded steel-frame and tape-based systems.	Lightning protection	Lightning protection	**Component Specifications** – To be described for each item 1–4 to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. LP – included in lightning protection. (nr) – unit of measurement for maintain systems. **Renewal Actions** **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. **Maintain Actions** **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable lightning protection. **Proactive** – Visual inspection of lightning protection installations. **Reactive** – Response and carry out unscheduled minor repairs.
			(nr)	2 Finials.	Finials	(LP)	
			(nr)	3 Conductor tapes.	Conductor tapes	(LP)	
			(nr)	4 Grounding/earthing, e.g. tape-based systems, including lightning conductor and earth lightning protector.	Grounding/earthing	(LP)	
			item	5 Sundry items – planned procedures for system.	Actions arising from servicing and planned inspections	Planned procedures	
		2 Setting to work.	%	6 Testing and commissioning; reset to works.	(include in item)	(include in item)	
		3 Commissioning of installations.					
			note	7 Work undertaken by subcontractors; on costs.	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
							M1 – The area measured is the area served by the system (i.e. the area of the rooms and circulation spaces that is served by the system, which is not necessarily the total gross internal floor area (GIFA) of the building). The area serviced is measured by using the rules of measurement for ascertaining GIFA. M2 – Where more than one system is employed, the area served by each system is to be measured separately. Areas are to be measured by using the rules of measurement for ascertaining the GIFA. M3 – Contractor-designed work is to be described and identified separately. M4 – The percentage additions for testing and commissioning and setting to work are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs.

Element 5.12: Communications, security and control systems

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.12.1	**Communication systems** **Definition:** Systems for communicating, including visual, audio and data installations.	Details of each type of system to be stated: 1 Tele-communication.	m^2/(nr)	1 Telecommunication systems, including wiring, handsets and equipment, telex equipment, facsimile equipment, combined systems (e.g. PAX, PAXB and PMBX systems) and the like.	Telecommunication systems	Telecommunication systems	**Note:** Television systems includes TV monitors. Component Specifications – To be described for each item 1–16 to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. (nr) – unit of measurement for maintain systems. Renewal Actions **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. Maintain Actions **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable communication systems. **Proactive** – Monitor and inspect communication systems. **Reactive** – Response and carry out unscheduled minor repairs.
		2 Data transmission.		2 Data transmission systems, including wiring, computer networking, modems, multiplexers, data terminals and data-bus systems.	Data transmission systems	Data transmission systems	
		3 Paging and emergency.		3 Paging and emergency call systems, including emergency call buttons, pull cords and the like.	Paging and emergency call systems	Paging and emergency call systems	
		4 Public address and conference audio.		4 Public address and conference audio facilities, including public address systems, hospital radio, conference audio facilities, audio frequency induction loop systems, background noise systems (including microphones, amplifiers, and speakers.	Public address and conference audio system	Public address system and conference audio system	
		5 Radio systems.		5 Radio systems, including cable and satellite systems (including receivers).	Radio systems	Radio systems	
		6 Projection systems.	nr	6 Projection systems (e.g. cinematographic equipment, fixed or portable projection equipment, screens, back-projection equipment, sound equipment).	Projection systems	Projection systems	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
		7 Fire detection and alarm systems.	m^2/(nr)	7 Fire detection and alarm systems, including manual call points, automatic detection equipment, sounders, controls and indicator panels.	Fire detection and alarm systems	Fire detection and alarm systems	M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The area measured is the area served by the system (i.e. the area of the rooms and circulation spaces that is served by the system, which is not necessarily the total gross internal floor area (GIFA) of the building). The area serviced is measured by using the rules of measurement for ascertaining GIFA.
		8 Smoke detection and alarm systems.	m^2/(nr)	8 Smoke detection and alarm systems.	Smoke detection and alarm system	Smoke detection	
		9 Liquid detection systems.	m^2/(nr)	9 Liquid detection alarms (i.e. systems giving early warning of water/liquid leakage to prevent damage).	Liquid detection alarms	Liquid detection alarms	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
		10 Clocks, card clocks and flexitime installations.	nr	10 Clocks, card clocks, flexitime installations.	Clocks, card clocks, flexitime installations	Clocks	M3 – Where more than one system is employed, the area served by each system is to be measured separately. Areas are to be measured by using the rules of measurement for ascertaining the GIFA. M4 – Installations to residential units, hotel rooms, student accommodation units and the like may be enumerated (nr). The type of residential unit or room and size (by number of bedrooms) of unit is to be stated. M5 – Contractor-designed work is to be described and identified separately. M6 – The percentage additions for testing and commissioning and setting to work are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs.
		11 Door entry systems.	m^2/(nr)	19 Door entry systems.	Door entry systems	Door entry systems	
		12 Radio and televisions.	m^2/(nr)	11 Radio and television, including cabling and satellite systems.	Radios	Radios	
		13 Television systems.	nr	12 Television systems, including cable and satellite systems.	Television systems	Television systems	
		14 TV monitors.		13 TV monitors.	TV monitors	N/A	
		15 Pneumatic message systems.	m^2/(nr)	14 Pneumatic message systems.	Message systems	Pneumatic message systems	
		16 Other communication systems.	m^2/(nr)	15 Other communication system.	Other communication systems	Other communication systems	
			item	16 Sundry items – planned procedures for systems.	Actions arising from servicing and planned inspections	Planned procedures	
		17 Testing of installations.	%	17 Testing and commissioning; set to works.	(include in item)	Testing/set to work	
		18 Commissioning of installations.					
			note	18 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.12.2	**Security systems** **Definition:** Observation and access control installations and the like.	Details of each type of system to be stated: 1 Surveillance equipment.	nr/m^2	1 Surveillance equipment.	Surveillance equipment	Surveillance equipment	<u>Component Specifications</u> – To be described for each item 1–8 to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. <u>Renewal Actions</u> **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. <u>Maintain Actions</u> **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable security systems. **Proactive** – Visual inspection of security systems. **Reactive** – Response and carry out unscheduled minor repairs. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The area measured is the area served by the system (i.e. the area of the rooms and circulation spaces that is served by the system, which is not necessarily the total gross internal floor area (GIFA) of the building). The area serviced is measured by using the rules of measurement for ascertaining GIFA. M3 – Where more than one system is employed, the area served by each system is to be measured separately. Areas are to be measured by using the rules of measurement for ascertaining the GIFA.
		2 Security detection.		2 Security detection equipment.	Security detection equipment	Security detection equipment	
		3 Security alarm equipment.		3 Security alarm equipment.	Security alarm equipment	Security alarm equipment	
		4 Access control systems.		4 Access control systems.	Access control systems	Access control systems	
		5 Burglar and security alarms.		5 Burglar and security alarms.	Burglar and security alarms	Burglar and security alarms	
		6 Door entry systems.	nr	6 Door entry systems (audio and visual).	Door entry systems	Door entry systems	
		7 Security, lights and lighting systems.	nr/m^2	7 Security lights and lighting systems.	Security lights and lighting systems	Security lights and lighting systems	
		8 Other security systems.	nr/m^2	8 Other security systems.	Other security systems	Other security systems	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			item	9 Sundry items – planned procedures for systems.	Actions arising from servicing and planned inspections	Planned procedures	M4 – Installations to residential units, hotel rooms, student accommodation units and the like may be enumerated (nr). The type of residential unit or room and size (by number of bedrooms) of unit is to be stated. M5 – Contractor-designed work is to be described and identified separately. M6 – State if external security systems are included with building security systems (cross reference to sub-element 8.7.8: External security systems). M7 – The percentage additions for testing and commissioning and setting to work are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs.
		9 Testing of installations.	%	10 Testing and commissioning; set to works.	(include in item)	(include in item)	
		10 Commissioning of installations.					
			note	11 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	
5.12.3	**Central control/building management systems** **Definition:** Control systems which, from a central remote location, provide a means for controlling and reporting on the performance of the operational systems of a building.	1 Central control/building management systems: details of each type to be stated.	m^2/(nr)	1 Control panels for mechanical and electrical equipment.		Control panels	<u>Component Specifications</u> – To be described for each item 1–6 to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the components included in scope. (nr) – unit of measurement for maintain systems. <u>Renewal Actions</u> **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.
			m^2/(nr)	2 Building management systems (BMS), including central and satellite computer terminal software.	BMS and central operating station systems	BMS and central operating station systems	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
			m^2/(nr)	4 Controlling terminal units and switches.	Controlling terminal units and switches	Controlling terminal units and switches	**Maintain actions** **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable central control/BMS. **Proactive** – Visual inspection of central control/BMS installations. **Reactive** – Response and carry out unscheduled minor repairs. M1 – The area measured is the area served by the system (i.e. the area of the rooms and circulation spaces that is served by the system, which is not necessarily the total gross internal floor area (GIFA) of the building). The area serviced is measured by using the rules of measurement for ascertaining GIFA. M2 – Where more than one system is employed, the area served by each system is to be measured separately. Areas are to be measured by using the rules of measurement for ascertaining the GIFA. M3 – Contractor-designed work is to be described and identified separately. M4 – The percentage additions for testing and commissioning and setting to work are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs.
			m^2/(nr)	5 Control cabling and containment.	Control cabling and containment	Control cabling and containment	
			m^2/(nr)	6 Compressed air- and vacuum-operated control systems.	Compressed air- and vacuum-operating controls	Compressed air- and vacuum-operating controls	
		2 Computer-aided facilities management systems: details of each type of system to be stated	item (nr)	3 Computer-aided facilities management systems (CAFM).	Computer-aided facilities management systems (CAFM)	Computer-aided facilities management systems (CAFM)	
				7 Sundry items – planned procedures for systems.	Actions arising from servicing and planned inspections	Planned procedures	
		3 Testing of installations.	%	8 Testing and commissioning; set to works.	(include in item)	(include in item)	
		4 Commissioning of installations.					
			note	9 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Element 5.13: Specialist installations

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.13.1	**Specialist piped supply systems** **Definition:** – Piped gas supply systems of high purity (e.g. oxygen or nitrous oxide) from storage source to distribution points in medical treatment, medical research or similar establishments. – Piped distribution systems providing suction for vacuum cleaning and collection facilities. – Piped water supply systems where the water is treated to obtain a high degree of purity for special use and application. – Systems for the treatment and circulation of water for swimming pools.	Details of each type of system to be stated: 1 Medical and laboratory gas supply systems.	nr/m^2	1 Medical and laboratory gas supply systems, including gas bottles and bulk storage vessels, manifold headers, gas governors, monitoring equipment, terminal control equipment, gas detection and alarm equipment, gas connection outlets and the like.	Medical and laboratory gas supply systems	Medical and laboratory gas supply systems	Component Specifications – To be described for each item 1–12 to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the components included in scope. Renewal Actions **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. Maintain Actions **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable specialist piped systems **Proactive** – Visual inspection of specialist piped systems. **Reactive** – Response and carry out unscheduled minor repairs. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The area measured is the area served by the system (i.e. the area of the rooms and circulation spaces that is served by the system, which is not necessarily the total gross internal floor area (GIFA) of the building). The area serviced is measured by using the rules of measurement for ascertaining GIFA.
		2 Centralised vacuum cleaning systems.	nr/m^2	2 Centralised vacuum cleaning systems, including vacuum pumps, blowers and vacuum connection units.	Centralised vacuum cleaning systems	Centralised vacuum cleaning systems	
		3 Treated water systems.	nr/m^2	3 Treated water systems, including de-alkalisation, de-ionisation, de-aeration, raw sewage storage tanks and vessels, chemical storage tanks and vessels, purified water tanks and vessels, distillation equipment, electrolytic chlorine ion generation equipment, demineralisation plant, reverse osmosis plant and the like.	Treated water systems	Treated water systems	
		4 Swimming pool water treatment systems.	nr/m^2	4 Swimming pool water treatment, including filter vessels, chemical storage vessels, chemical dosing equipment, ozone generation and injection equipment, de-ozoning vessels, electrolytic chlorine ion generation equipment, pool inlet jets, scum channels, perimeter draw-off grilles and the like.	Swimming pool water treatment	Swimming pool water treatment	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
		5 Compressed air systems.	nr/m^2	5 Compressed air systems, including compressors (including motors and starters), inter-coolers, after-coolers, air storage vessels and receivers, air separators, cooling water systems, lubrication systems, local water coolers, compressed air ancillaries, compressed air connection outlets, instrument air pipeline ancillaries (including manifolds), instrument air connection outlets and the like.	Compressed air systems	Compressed air systems	M4 – Contractor-designed work is to be described and identified separately. M5 – The percentage additions for testing and commissioning and setting to work are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs. M3 – Where more than one system is employed, the area served by each system is to be measured separately. Areas are to be measured by using the rules of measurement for ascertaining the GIFA.
		6 Vacuum installations.	nr/m^2	6 Vacuum systems, including vacuum pumps, intercoolers and driers, vacuum connection points and the like.	Vacuum systems	Vacuum systems	
		7 Other specialist piped supply systems.	nr/m^2	7 Other specialist piped supply systems.	Other specialist piped supply systems	Other specialist piped supply systems	
			m	8 Pipelines, pipeline ancillaries and fittings.	Pipework system	Pipework system	
			m	9 Air duct lines, duct line ancillaries and fittings.	Air duct lines, duct line ancillaries and fittings	Air duct lines, duct line ancillaries and fittings	
			m^2/(nr)	10 Thermal insulation.	Thermal insulation	Thermal insulation	
			item	11 Silencers and acoustic treatment.	Silencers and acoustic treatment	Silencers and acoustic treatment	
			nr	12 Control components.	Control components	Control components	
			item	13 Sundry items – planned procedures for systems.	Actions arising from servicing and planned inspections	Planned procedures	
		8 Testing of installations.	%	14 Testing and commissioning; set to works.	(include in item)	(include in item)	
		9 Commissioning of installations.					
			note	15 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.13.2	**Specialist refrigeration systems** **Definition:** Specialist refrigeration systems.	1 Cold rooms: details of each type of system to be stated.	nr/m^2	1 Cold rooms, including packaged cold rooms, packaged walk-in freezers, wall panels and linings, ceiling panels and linings, flooring systems, doors and door mechanisms, jointing material, thermal cladding, refrigeration plant and equipment, evaporators, lighting and the like.	Cold rooms	Cold rooms	<u>Component Specifications</u> – To be described for each item 1–3 to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. <u>Renewal Actions</u> **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. <u>Maintain Actions</u> **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable refrigeration systems. **Proactive** – Monitor and inspect refrigeration systems. **Reactive** – Response and carry out unscheduled minor repairs. M1–M5 measurement rules are the same as sub-element 5.13.1.
		2 Ice pads: details to be stated.	nr/m^2	2 Ice pads, including waterproof layer, insulation layer, working screed, slip-plane layer, bonded refrigeration pads (incorporating pipelines, reinforcement, etc), floor drains and sealing plates, cooling towers, evaporative condensers, heat recovery systems and the like.	Ice pads	Ice pads	
		3 Other specialist refrigeration systems: details of each type of system to be stated.	nr/m^2	3 Other specialist refrigeration systems.	Other specialist refrigeration systems	Other specialist refrigeration systems	
			item	4 Sundry items – planned procedures for specialist refrigerator systems.	Actions arising from servicing and planned inspections	Planned procedures	
		4 Testing of installations.	%	5 Testing and commissioning; set to works.	(include in item)	(include in item)	
		5 Commissioning of installations.					
			note	6 Work undertaken by subcontractors.	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.13.3	**Specialist mechanical installations** **Definition:** Specialist installations not covered by elements 5.1–5.12 or sub-elements 5.13.1 and 5.13.2.	1 Other specialist installations: details of each type of system to be stated.	nr/m²	1 Wave machines.	Wave machines	Wave machines	<u>Component Specifications</u> – To be described for each item 1–5 to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. <u>Renewal Actions</u> **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. <u>Maintain Actions</u> **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable specialist mechanical systems **Proactive** – Monitor and inspect specialist mechanical systems. **Reactive** – Response and carry out unscheduled minor repairs. M1–M5 measurement rules are the same as sub-element 5.13.1.
			nr/m²	2 Saunas.	Saunas	Saunas	
			nr/m²	3 Jacuzzis.	Jacuzzis	Jacuzzis	
			nr/m²	4 Swimming pools.	Swimming pools	Swimming pools	
			nr/m²	5 Other specialist installations (to be stated).	Other specialist installations	Other specialist installations	
			item	6 Sundry items – planned procedures for systems.	Actions arising from servicing and planned inspections	Planned procedures	
		2 Testing of installations.	%	7 Testing and commissioning; set to works.	(include in item)	(include in item)	
		3 Commissioning of installations.					
			note	8 Work undertaken by subcontractors.	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.13.4	**Specialist electrical/electronic installations** **Definition:** Radio and television studios and the like.	1 Specialist electrical and electronic installation or systems: details to be stated.	nr	1 Radio and television studio equipment and installations.	Radio and television studio equipment	Radio and television studio equipment	<u>Component Specifications</u> – To be described for each item 1–7 to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. <u>Renewal Actions</u> **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. <u>Maintain Actions</u> **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable special electrical systems **Proactive** – Monitor and inspect special electrical systems. **Reactive** – Response and carry out unscheduled minor repairs. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Contractor-designed work is to be described and identified separately. M3 – The percentage additions for testing and commissioning are to be applied to the total cost of items comprising the sub-element A single combined percentage addition can be applied to cover the costs of the testing, commissioning and setting to work.
			nr	2 Recording studio equipment and installations.	Recording studio equipment	Recording studio equipment	
			nr	3 Discrete and communal television aerial and satellite systems.	Television aerial and satellite systems	Television aerial and satellite systems	
			nr	4 Home cinemas.	Home cinemas	Home cinemas	
			nr	5 Multi-room audio and video systems.	Multi-room audio and video	Multi-room audio and video	
			nr	6 Automated curtains and blinds.	Automated curtains and blinds	Automated curtains and blinds	
			nr	7 Other specialist electrical and electronic installations and systems.	Other specialist electrical and electronic systems	Other specialist electrical and electronic systems	
			item	8 Sundry items – planned procedures for systems.	Actions arising from servicing and planned inspections	Planned procedures	
		2 Testing of installations.	%	9 Testing and commissioning; set to works.	(include in item)	(include in item)	
		3 Commissioning of installations.					
			note	10 Work undertaken by subcontractors (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.13.5	**Water features** **Definition:** Water systems for display or decorative purposes involving the movement of water.	1 Water features: details to be stated.	nr	1 Water features, including ornamental fountains and waterfalls.	Water features	Water features	<u>Component Specifications</u> – To be described for each item 1–5 to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules to the component. <u>Renewal Actions</u> **Replacement** – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. **Major repairs** – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. <u>Maintain Actions</u> **Note:** Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. **Planned** – PPM on applicable water features **Proactive** – Monitor and inspect water features. **Reactive** – Response and carry out unscheduled minor repairs. M1 – Where components are to be enumerated, the number of water features components is to be stated. M2 – Contractor-designed work is to be described and identified separately. M3 – The percentage addition for testing and commissioning are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of testing, commissioning and setting to work.
			nr	2 Water filtration equipment.	Water filtration equipment	Water filtration equipment	
			nr	3 Nutrient treatment and equipment.	Nutrient treatment and equipment	Nutrient treatment and equipment	
			N/A	4 Final electrical connections.	N/A	N/A	
			nr	5 Control components.	Control components	Control components	
			item	6 Sundry items – planned procedures for water feature.	Actions arising from servicing and planned inspections	Planned procedures	
		2 Testing of installations.	%	7 Testing and commissioning; set to works.	(include in item)	(include in item)	
		3 Commissioning of installations.					
			note	8 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Element 5.14: Builder's work in connection with services

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewals (R)	Maintain (M)	
5.14.1	**Builder's work in connection with services** **Definition:** Sundry builder's work associated with the installation of water, gas, electricity, heating, ventilation, above-ground drainage, telecommunications and other services, as well as to swimming pools.	1 Builder's work in general areas: details to be stated.	m^2/nr/m/%	1 General builder's work associated with the installation of water, gas, electrical, heating, ventilation above-ground drainage, telecommunications and other services.	General builder's works	BWIC with services	Renewal and Maintain – **BWIC with services** to be measured as M1–M8 above. M1 – Where quantifiable, cost-significant builder's work in connection with services shall be separately identified and measured by area (m^2), linear measurement (m) or enumerated (nr). M2 – Where components are to be enumerated, the number of components is to be stated. M3 – Where the length of a component is to be measured, the length of linear components measured is their extreme length, over all obstructions. M4 – Where not quantifiable, or not cost-significant, builder's work items in connection with services shall be identified and quantified by a percentage allowance or by applying the GIFA. M5 – The area measured is the floor area relating to each builders work classification. The area is measured using the rules of measurement for ascertaining the gross internal floor area (GIFA). M6 – Percentage additions for builder's work in connection with services shall be applied to the total cost of all elements comprising group element 5: Services (i.e. elements 5.1–5.13 inclusive). M7 – Other cost-significant items are to be measured by area (m^2), linear measurement (m) or enumerated (nr) and identified separately. M8 – Contractor-designed work is to be described and identified separately.
		2 Builder's work to landlord areas: details to be stated.	m^2/nr/m/%	2 Builder's work to landlord areas.	Builder's work to landlord areas	(included above)	
		3 Builder's work to plant rooms: details to be stated.	m^2,nr	3 Builder's work to plant rooms.	Builders work to plant rooms	(included above)	
		4 Large plant and equipment bases: details, including overall size (m), to be stated.	nr	4 Large plant and equipment bases.	Large plant and equipment bases	(included above)	
		5 Fuel bunds: details, including construction and overall size (m), to be stated.	nr/m^2/m	5 Builder's work to fuel bunds.	Builders work to fuel bunds	(included above)	

Supplementary listing of building services sub-components/ancillaries (applicable to various systems)

Below is a list of sub-components which have a B&ES SFG20 maintenance task schedule.

Applicable components are to be included with the relevant systems or components (e.g. pumps, valves, fuse, filters, controls (referred to in the group tables 5.1 to 5.3 in Part 6 of these rules)).

ID	Included components – Supplementary List of Ancillaries Components	Unit
	Actuators	
1	Thermal actuators	nr
2	Pneumatic actuators	nr
3	Hydraulic actuators	nr
4	Motor-driven actuators	nr
5	Power fail – motor-return actuators	nr
6	Power fail – spring-return actuators	nr
	Compressors	
7	Compressors – refrigeration (reciprocal)	nr
8	Compressor – screw	nr
9	Compressor refrigeration – centrifugal	nr
10	Compressors – scroll	nr
11	Air compressors and receivers	nr
12	Air compressors – compressed-air dryers	nr
13	Air compressors – network distribution	nr
14	Compressors air network distribution	m^2
	Controllers and sensors	
15	Boiler controls – single boiler on/off	nr
16	Boiler protection controls	nr

ID	Included components – Supplementary List of Ancillaries Components	Unit
17	Boilers – space temperature controls	nr
18	Boilers – fire and safety circuits	nr
19	Control panels – electrical services	nr
20	Control panels – lamps, meters and alarms	nr
21	Control optimisers	nr
22	Heating controls – compensator type	nr
23	Controller single input type	nr
24	Controller unit and sensor type	nr
25	Controllers – timer type	nr
26	Step controllers	nr
27	Time switches	m^2
28	Multi-input controllers	nr
29	Indicators and displays	nr
30	Alarm modules	nr
31	Level controllers	nr
32	Speed controllers	nr
33	Transducers	nr
34	Control dampers	nr
35	Pneumatic controls	nr
36	Temperature measurement sensors	nr
37	Relative humidity sensors	nr
38	Absolute humidity sensors	nr
39	Air quality sensors	nr
40	Carbon dioxide sensors	nr
41	Velocity sensors	nr

ID	Included components – Supplementary List of Ancillaries Components	Unit
42	Occupancy and light sensors	nr
43	Control valves	m^2
	Ductwork	
44	Ductwork system – general galvanised (rectangular and circular) plastic flexible (circular)	m^2
45	Ductwork ancillaries – various	m^2
46	Ducting – volume control dampers and fire/smoke dampers	m^2
47	Ducting – attenuators and acoustics	m^2
48	Ductwork – cleaning hygiene, inspections and monitoring	m^2
	Electrical ancillaries	
49	Control relays	nr
50	Isolators / starters and fuse switches	nr
51	Motors – drive elements	nr
	Fans	
52	Fans – ventilating general	nr
53	Fans – centrifugal	nr
54	Fans – axial	nr
55	Fans – propeller	nr
56	Fans – mixed flow	nr
57	Fans – bifurcated	nr
58	Fans – extract (domestic purposes)	nr
59	Fans – extract (including fire/smoke units)	nr
60	Fans – high temperature (boiler combustion)	nr
61	Fans – roof mounted units	nr

ID	Included components – Supplementary List of Ancillaries Components	Unit
	Filters	
62	Air handling unit – filters	nr
63	Kitchen extract canopy – grease filters	nr
64	Electrostatic filters	nr
65	Ductwork ancillaries – filters	nr
	Humidifiers	
66	Humidifiers – cold water evaporator drum type	nr
67	Humidifiers – direct stream injection type	nr
68	Humidifiers – electrode boiler	nr
69	Humidifiers – compressed-air type	nr
70	Humidifiers – ultrasonic	nr
71	Humidifiers – resistance heater type	nr
72	Humidifiers – disinfection procedures	item
73	Humidifiers – chemical dehumidifiers	nr
	Pumps	
74	Pumps – general	nr
75	Circulating pumps	nr
76	Centrifugal pumps	nr
77	Pressurisation pumps	nr
78	Rotary hand pumps	nr
79	Secondary hot water circulation pumps	nr
80	Sewage or drainage pumps – submersible	nr
81	Sewage and drainage pumps – drywell	nr
82	Sewage pumps – compressed air	nr
83	Sump pumps – extended shaft	nr

ID	Included components – Supplementary List of Ancillaries Components	Unit
84	Domestic water accelerators	nr
85	Shower booster pumps	nr
	Starters	
86	Drive element – starters	nr
87	Starters – star date	nr
88	Starters – two speed (dual wound)	nr
89	Starters – two speed (pole change)	nr
90	Starters – reversing	nr
91	Starters – auto transformer	nr
92	Starters – quick transition (electric heater)	nr
93	Starters – electrolyte type	nr
94	Starters – air-break and contactors	nr
	Taps and outlet fittings	
95	Taps and outlet fittings	nr
96	Taps and outlet fittings – sluice valves	nr
97	Taps – service valves	nr
98	Combination tap assemblers – mixing 22. valves, taps	nr
	Valves	
99	Valves – gate	m^2
100	Valves – float-operated	m^2
101	Valves – automatic control	m^2
102	Rotary valves – shoe or slipper	m^2
103	Butterfly and ball valves	m^2
104	Self-acting and thermal valves	m^2
105	Solenoid valves	m^2

ID	Included components – Supplementary List of Ancillaries Components	Unit
106	Pressure-control valves	m^2
107	Seat valves	m^2
	Water treatment	
108	Ultraviolet disinfection unit	nr
109	Ozonation plant	nr
110	Chlorine dioxide low-dosing domestic water systems	nr

Note: 1 Refer to B&ES SFG20 for details of maintenance schedules for each supplementary item.

Group element 6: Prefabricated buildings and building units

Note – not covered by NRM 3 rules (as post construction the assets dealt with elsewhere in other elements)

Refer to NRM 1 for measurement rules for the acquisition of prefabricated buildings and building units.

Group element 7: Work to existing buildings

Group element 7 comprises the following elements:

7.1 Minor demolition works and alteration works

7.2 Repairs to existing services

7.3 Damp-proof courses/fungus and beetle eradication

7.4 Facade retention

7.5 Cleaning existing surfaces

7.6 Renovation works

Subcontractor on costs	Where works are to be carried out by a subcontractor, an allowance is to be made within the unit rate applied to elements or components for subcontractor's preliminaries, design fees, risk, overheads and profit
Not applicable	In the following pages 'N/A' means not applicable to renewal and/or maintain works
Works (action required)	The work items, or actions required, within each section of the building element have been categorised into the following: **Renewal (R)** – Replacement, Major repairs, Refurbishment, Upgrade work and Removals – plus Redecoration works (if measured separately) **Maintain (M)** – Planned, Proactive and Reactive/Minor Repair works **Note** – The required work actions included in the measurement rules are not an exhaustive list and is for guidance only
Planned procedures	For safety and performance reasons planned procedures (permits to work) for each systems and asset type should be included with the measurement of specific work items

Note: This group element of tabulated rules of measurement has been aligned with NRM 1 to create a standardised costs structure that links all construct (C) sub-element, components and inclusions with the 'applicable' renewal (R) and maintain (M) work items. Specific construction works that are not applicable (N/A) to maintenance works have been identified throughout.

Element 7.1: Minor demolition works and alteration works

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
7.1.1	**Minor demolition works and alteration works** **Definition:** Individual items of work to existing buildings, involving one or more trades, in altering, adapting or repairing existing buildings. Includes cutting away and removing existing work and inserting new and minor demolition works and soft strip.	1 Spot items – details to be stated.	item	15 Repairs to external wall cladding and covering systems.	Repairs to external wall coverings	Minor demolition works and alteration works	Component Specifications – To be described for each item 1–43, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. Renewal Actions **Major repairs** – To include preparation, repair and making good, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishing, as appropriate. Maintain Actions Planned procedures for undertaking inspections and for safety performing the works. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Where the length of a component is to be measured, the length of linear components is their extreme length, over all obstructions. M3 – Where the area of a component is to be measured, the area measured for items is the surface area of the item. No deduction for voids. M4 – Work arising out of party wall awards/agreements is to be described and identified separately. M5 – Contractor-designed work is to be described and identified separately.
				16 Repairs to roof coverings (e.g. tiles, slates, sheet coverings, flexible sheet coverings and asphalt).	Repairs to roof coverings	N/A	
				17 Repairs to existing rainwater installations.	Repairs to rainwater installations	N/A	
				22 Repairs to sheet linings (e.g. plasterboard and timber sheeting to walls, floors and ceilings).	Repairs to sheet linings	N/A	
				26 Re-glazing.	Re-glazing	N/A	
				27 Repairs to screeds.	Repairs to screeds	N/A	
				28 Repairs to toppings (e.g. granolithic).	Repairs to toppings	N/A	
				29 Repairs to latex screeds (i.e. to existing floors).	Repairs to latex screed	N/A	
				30 Repairs to plastered, rendered and roughcast coatings (including lathing and baseboards).	Repairs to coatings	N/A	
				31 Repairs to tiled finishes – walls and floors (e.g. quarry tiles, ceramic tiles, etc.).	Repairs to tiled finishes	N/A	

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
				Renewal (R)	Maintain (M)	
			32 Repairs to wood block flooring.	Repairs to wood block flooring	N/A	
			33 Repairs to floor coverings.	Repairs to floor coverings	N/A	
			34 Degreasing old painted surfaces.	Degreasing	N/A	
			35 Stripping previously decorated surfaces.	Stripping	N/A	
			36 Removing paint from timber, metal and other similar surfaces (e.g. burning off paint and chemically stripping paint).	Removing paint	N/A	
			37 Repainting existing timber, metal and other similar surfaces (e.g. windows, doors, rooflights and the like).	Repairs to windows, doors and the like	N/A	
			38 Scraping paint from plastered surfaces and the like.	Scraping paint from plastered surfaces	N/A	
			39 Minor painting and redecoration (e.g. touch-up painting).	Minor redecorations	N/A	
			40 Overhauling ironmongery to windows, doors and the like.	Overhauling ironmongery	N/A	
			41 Applying sealants to existing window and door frames, rooflights and the like.	Applying sealants	N/A	
			42 Other alteration works (spot items).	Other spot items	N/A	
			44 Sundry items – planned procedures for assets.	Actions arising from planned inspections	Planned procedures	
		note	45 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	
	2 Minor demolition works.	nr/m/m^2	1 Stripping out existing services installations, including pipe casings and the like.	Stripping out services	Minor demolition works and alteration works	
			2 Stripping out fixtures and fittings.	Stripping out fixtures and fittings	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
				3 Stripping out skirtings, dado rails, picture rails, architraves and the like.	Stripping out skirtings, dado rails, picture rails, architraves and the like	N/A	
				5 Removing shelves, work benches and the like.	Removing shelves, work benches and the like	N/A	
				6 Removing sanitary appliances and fittings.	Removing sanitary appliances and fittings	N/A	
				7 Removing parts of existing buildings.	Removing parts of existing buildings	N/A	
				11 Removing wall, floor and ceiling finishes.	Removing wall, floor and ceiling finishes	N/A	
				12 Removing internal walls and partitions, including making good.	Removing internal walls and partitions	N/A	
				13 Removing floor construction.	Removing floor construction	N/A	
				14 Removing existing roof coverings.	Removing roof coverings	N/A	
		3 Removals.	item/nr/m/m^2	4 Removing kitchen fittings and appliances.	Removals	Minor demolition works and alteration works	
		4 Alteration works.		8 Cutting openings in existing work.	Cutting openings in existing work	Minor demolition works and alteration works	
				9 Strutting and supports to openings in walls or after removal of walls.	Strutting and supports	N/A	
				10 Inserting tie beams, tie rods and the like.	Inserting tie beams/tie rods	N/A	
				18 Rebuilding chimney stacks.	Chimney stacks	N/A	

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
				Renewal (R)	Maintain (M)	
			19 Cutting back chimney breasts.	Chimney breasts	N/A	
			20 Rebuilding piers and columns.	Piers and columns	N/A	
			21 Rebuilding walls and partitions (where not included in element 2.7: Internal walls and partitions).	Walls and partitions	N/A	
			23 Removing windows, doors, frames, linings, screens and the like preparatory to filling openings and/or taking down wall or partition.	Windows, doors, frames, linings, screens etc.	N/A	
			24 Filling in or covering over existing openings.	Filling in or covering over existing openings	N/A	
			25 Inserting new windows, doors, stairs, rooflights and the like into the existing building fabric.	Inserting new windows, doors, stairs, rooflights	N/A	
			43 Temporary screens required for alteration works.	Temporary screens	N/A	

Element 7.2: Repairs to existing services

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
7.2.1	**Repairs to existing services** **Definition:** Refurbishment of existing services installations, systems, equipment and plant.	1 Equipment/plant repairs.	nr	2 Repairs to overhaul the existing mechanical and electrical plant and equipment (e.g. boilers, water heaters, storage tanks and vessels, and extractor fans), including the replacement of components.	Equipment/plant repairs	Repairs to existing services	Component Specifications – To be described for each item 1–6, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. Renewal Actions **Refurbishment** – To include removal of existing, preparation and refurbishment of existing services, as appropriate. Maintain Actions **Reactive** – Minor repairs to existing services. **Proactive** – Visual inspection of existing services. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The area measured is the area serviced by the installation/system, the area serviced is measured using the rules of measurement for ascertaining the gross internal floor area (GIFA). M3 – Where more than one installation/system is employed, the area measured for each system is the area serviced by the installation/system. Areas are to be measured using the rules of measurement for ascertaining the GIFA.
				3 Fault finding (not part of consultant/specialist fees).	Fault finding	Include with repairs	
				6 Renewing flue pipes.	Renewing flues	N/A	
			item	7 Sundry items – planned procedures for repairs to existing services.	Actions arising from planned inspections	Planned procedures	
			note	9 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
		2 Overhauling services installations/systems.	m^2	1 Repairs to existing sanitary appliances (including clearing blockages).	Repairs to sanitary appliances	Repairs to existing services	M4 – Where components are to be itemised, the number of key sub-components comprising the component are to be identified, described and enumerated within the description of the component. M5 – Other cost-significant items are to be measured by area (m^2), linear measurement (m) or enumerated (nr) and identified separately. M6 – Work arising out of party wall awards/agreements is to be described and identified separately. M7 – Contractor-designed work is to be described and identified separately. M8 – The percentage additions for testing and commissioning are to be applied to the total cost of the items comprising the subelement. A single combined percentage addition can be applied to cover the costs of both testing and commissioning.
				4 Overhauling existing mechanical and electrical installations and systems (e.g. heating installation, ventilation systems, electrical systems and the like), including the replacement of components.	Overhauling mechanical and electrical installations and systems	N/A	
				5 Repairs and upgrades to existing specialist services (e.g. lifts).	Repairs and upgrades to specialist services	N/A	
		3 Testing of equipment/plant and/or installations.	%	8 Testing and commissioning; reset to works.	(included in item)	(included in item)	
		4 Commissioning of equipment/plant and/or installations.					

Element 7.3: Damp-proof courses/fungus and beetle eradication

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
7.3.1	**Damp-proof courses** **Definition:** Preventing rising damp in existing masonry walls.	1 Damp-proof courses.	m^2/(item)	1 Chemical damp-proof courses, including drilling holes, injecting chemicals and making good holes.	Damp-proof courses	Damp-proof courses	**Component Specifications** – To be described for each item 1–4, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. (item) – unit of measurement for maintain **Renewal Actions** **Damp-proof courses** – state type and specification. **Maintain Actions** **Reactive** – Minor repairs to damp-proof courses. **Proactive** – Visual inspection of damp-proof courses M1 – The area measured is the surface area of the treatment. No deduction for voids. M2 – Work arising out of party wall awards/agreements is to be described and identified separately. M3 – Contractor-designed work is to be described and identified separately. N/A – Not applicable to renewal and/or maintain work.
				2 Injection of mortar damp-proof courses.	DPC	N/A	
				3 Inserting mechanical damp-proof courses.	DPC	N/A	
				4 Local making good to finishes.	N/A	N/A	
			item	5 Sundry items – planned procedures for damp-proof courses.	Actions arising from planned inspections	Planned procedures	
			note	6 Subcontractor on costs (where applicable).	N/A	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
7.3.2	**Fungus/beetle eradication** **Definition:** Treating existing timbers to eradicate fungus attacks (such as dry and wet rot) and various types of wood-boring infestation.	1 Eradication treatment.	m^2/(item)	1 Opening up existing work (e.g. lifting and replacing floor boards).	Fungus/beetle eradication	Fungus/beetle detection	Component Specifications – To be described for each item 1–7, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. (item) – unit of measurement for maintain Renewal Actions Treatment to eradicate fungus/beetle. Maintain Actions **Reactive** – Minor repairs to timber. **Proactive** – Visual inspection of timber. M1 – The length of linear components measured is their extreme length, over all obstructions. M2 – Work arising out of party wall awards/agreements is to be described and identified separately. M3 – Contractor-designed work is to be described and identified separately.
				2 Cutting out fungus- or beetle-infested timber, plaster and the like, and disposing of cut-out material.	FBE – treatment	N/A	
				3 Applying preservative treatment (e.g. irrigation of walls by pressure injection, application of anti-fungicide solution and treating with insecticide).	FBE – treatment	N/A	
				4 Solid-rod preservative inserts.	FBE – treatment	N/A	
				5 Preservative treatments.	FBE – treatment	N/A	
				6 Paste preservative treatment.	FBE – treatment	N/A	
				7 Insecticidal smoke treatment.	FBE – treatment	N/A	
			item	8 Sundry items – planned procedures.	Actions arising from planned inspections	Planned procedures	N/A – Not applicable to renewal and/or maintain work.
			note	9 Subcontractor on costs (where applicable)	N/A	Subcontractor on costs	

Element 7.4: Facade retention

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
7.4.1	**Facade retention** **Definition:** Temporary or semi-permanent support for unstable structures or facades (i.e. structures not to be demolished).	1 Support structures.	nr	1 Facade retention works where existing facade is to be integrated into new building.	Facade retention	Facade inspection	Component Specifications – To be described for each item 1–7, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. **(FR)** – included as part of facade retention works Renewal Actions As identified by inspection. Maintain Actions **Reactive** – Minor repairs to facades. **Proactive** – Visual inspection of facades. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Work arising out of party wall awards/agreements is to be described and identified separately. N/A – Not applicable to renewal and/or maintain work.
				2 Location surveys.	(group element 11)	N/A	
				3 Commencement and completion condition surveys.	(group element 11)	N/A	
				4 Dead, raking, flying or box shores; strutting (including bracing; sole plates and wall plates; needles, including holes; brackets, blockings and wedges; dog irons and similar metal work).	(FR)	N/A	
				5 Foundations for shores.	(FR)	N/A	
				6 Cutting holes in existing structures for needles and the like.	(FR)	N/A	
				7 Design, erection, maintenance, reposition and removal of support structures.	(FR)	N/A	
			item	9 Sundry items – planned procedures for the facade retention works.	Actions arising from planned inspections	Planned procedures	
			note	10 Subcontractor on costs (where applicable)	N/A	Subcontractor on costs	
		2 Periodic technical inspections of support structures.	nr	8 Periodic technical inspections.	N/A	Facade inspection	
		3 Removing support structures.	nr	Included in item 7 above.	(FR)	N/A	

Element 7.5: Cleaning existing surfaces

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
7.5.1	**Cleaning** **Definition:** Cleaning and removing stains and deposits from existing surfaces.	1 Cleaning existing surfaces.	m^2	1 Removing efflorescence, stains, soot, graffiti, vegetation, algae, bird droppings and the like.	N/A	Cleaning surfaces	**Component Specifications** – To be described for each item 1–3 to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. **Renewal Actions** None. **Maintain Actions** **Reactive** – Minor repairs to damp-proof courses. **Proactive** – Visual inspection of existing surfaces. M1 – The area measured is the surface area of the surface to be cleaned. No deduction for voids. M2 – Work arising out of party wall awards/agreements is to be described and identified separately. N/A – Not applicable to renewal and/or maintain work.
				2 Cleaning by washing, abrasive blasting, chemical treatment or other methods.	N/A	(CS)	
				3 Artificial weathering.	N/A	(CS)	
			item	4 Sundry items – planned procedures for the works.	Actions arising from planned inspections	Planned procedures	
			note	5 Subcontractor on costs (where applicable).	N/A	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
7.5.2	**Protective coatings** **Definition:** Coatings to protect existing surfaces, including bird/vermin-repellent coatings.	1 Protective coatings to existing surfaces.	m^2	1 Internal and external surfaces.	N/A	Protective coatings	Component Specifications – To be described for each item 1–7, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. Renewal Actions Actions arising from inspection Maintain Actions **Reactive** – Minor repairs to protective coatings. **Proactive** – Visual inspection of protective coatings. M1 – The area measured is the surface area of the surface to be coated. No deduction for voids. M2 – Work arising out of party wall awards/agreements is to be described and identified separately. N/A – items not applicable to renewal and/or maintain work.
				2 Specialist painting/coating systems (i.e. designed for use on concrete, masonry, steelwork or the like).	N/A	(PS)	
				3 Lime washing, colourless waterproofers, anti-graffiti colourless coatings and the like.	N/A	(PS)	
				4 Bird-repellent coatings and the like.	N/A	T/E	
			item	5 Sundry items – planned procedures for the works.	Actions arising from planned inspections	Planned procedures	
			note	6 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Element 7.6: Renovation works

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
7.6.1	**Masonry repairs** **Definition:** Local cutting out and reinstatement of existing brick, block or stonework and re-pointing defective joints.	1 Masonry repairs.	nr/m/m^2	1 Cutting out decayed, defective and cracked bricks, blocks or stones and inserting new (including isolated repairs, stitching and the like).	Masonry repairs	Masonry inspections	Component Specifications – To be described for each item 1–6, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. Renewal Actions Actions arising from inspection. Maintain Actions **Reactive** – Minor repairs to masonry. **Proactive** – Visual inspection of masonry M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Where the length of a repair is to be measured, the length of linear components measured is their extreme length, over all obstructions. M3 – Where the area of a repair is to be measured, the area measured is the surface area of the repair. M4 – Work arising out of party wall awards/agreements is to be described and identified separately.
				2 Plastic stone repairs.	MR	M1	
				3 Re-dressing stonework to new profiles.	MR	M1	
				4 Inserting new wall ties (without demolition).	MR	M1	
				5 Grouting.	MR	M1	
				6 Rejointing/repointing existing masonry.	MR	M1	
			item	7 Sundry items – planned procedures for the works.	Actions arising from planned inspections	Planned procedures	
			note	8 Subcontractor on costs (where applicable).	N/A	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
7.6.2	**Concrete repairs** **Definition:** Cutting out, repairing, partially replacing, resurfacing and rehabilitating eroded and defective concrete.	1 Concrete repairs.	nr/m/m^2	1 Cutting out defective concrete and replacing with new.	Concrete repairs	Concrete inspections	<u>Component Specifications</u> – To be described for each item 1–6, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. <u>Renewal Actions</u> Actions arising from inspection. <u>Maintain Actions</u> **Reactive** – Minor repairs to concrete. **Proactive** – Visual inspection of concrete. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The length of linear components measured is their extreme length, over all obstructions. M3 – The area measured is the surface area of the repair. M4 – Work arising out of party wall awards/agreements is to be described and identified separately. N/A – Not applicable to renewal and/or maintain work.
				2 Cutting out defective reinforcement and replacing with new.	CR	CI	
				3 Cleaning and rust-proofing existing rusted reinforcement.	CR	CI	
				4 Concrete and resin/cement mixes in repairs and resurfacing, including spray-applied concrete.	CR	CI	
				5 Anchored mesh reinforcement.	CR	CI	
				6 Resin or cement impregnation/injection.	CR	CI	
			item	7 Sundry items – planned procedures for the works.	Actions arising from planned inspections	Planned procedures	
			note	8 Subcontractor on costs (where applicable).	N/A	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
7.6.3	**Metal repairs** **Definition:** Repairing, renovating and conserving existing architectural metalwork, metal components and finishes.	1 Metal repairs.	nr/m/m^2	1 Taking down metalwork.	Metal repairs	Metal inspections	Component Specifications – To be described for each item 1–10, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. Renewal Actions Actions arising from inspection. Maintain Actions **Reactive** – Minor repairs to metalwork. **Proactive** – Visual inspection of metalwork. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The length of linear components measured is their extreme length, over all obstructions. M3 – The area measured is the surface area of the repair. M4 – Work arising out of party wall awards/agreements is to be described and identified separately. N/A – Not applicable to renewal and/or maintain work.
				2 Cleaning and restoring surface finishes.	MR	M1	
				3 Straightening.	MR	M1	
				4 Rust-proofing.	MR	M1	
				5 Metalwork repairs (e.g. welding, riveting and bolting), rejointing, reassembling and refixing.	MR	M1	
				6 Renewing surface finishes off-site.	MR	M1	
				7 Repairs to structural members (e.g. roof members and structural beams).	MR	M1	
				8 Repairs to existing windows, doors, hatches, rooflights, frames, linings and the like (including overhauling/renewing ironmongery (e.g. sash cords, opening gear and the like)).	MR	M1	
				9 Repairs to staircases, including handrails and balustrades.	MR	M1	
			item	10 Sundry items – planned procedures for the works.	Actions arising from planned inspections	Planned procedures	
			note	11 Subcontractor on costs (where applicable).	N/A	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
7.6.4	**Timber repairs** **Definition:** Repairing, renovating and conserving existing timber structures, components and finishes.	1 Timber repairs.	nr/m/m^2	1 Taking down existing work, cleaning and resurfacing, cutting out defective or decayed timber, piecing-in new timber, rejointing and refixing work.	Timber repairs	Timber inspections	Component Specifications – To be described for each item 1–6, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. Renewal Actions Actions arising from inspection. Maintain Actions **Reactive** – Minor repairs to timber structures. **Proactive** – Visual inspection of timber structures. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The length of linear components measured is their extreme length, over all obstructions. M3 – The area measured is the surface area of the repair. M4 – Work arising out of party wall awards/agreements is to be described and identified separately. N/A – Not applicable to renewal and/or maintain work.
				2 Resin repairs to timbers.	TR	TI	
				3 Preservative/fire-retardant treatments.	TR	TI	
				4 Repairs to structural members (e.g. roof members and structural beams).	TR	TI	
				5 Repairs to existing windows, doors, hatches, rooflights, frames, linings and the like (including overhauling/renewing ironmongery, sash cords, opening gear and the like).	TR	TI	
				6 Repairs to staircases, including handrails and balustrades.	TR	TI	
			item	7 Sundry items – planned procedures for the works.	Actions arising from planned inspections	Planned procedures	
			note	8 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
					Renewal (R)	Maintain (M)	
7.6.5	**Plastic repairs** **Definition:** Repairs to plastic windows, roof lights, doors, cladding and the like.	1 Plastic repairs.	nr/m/m^2	1 Renewing domed rooflights.	Plastic repairs	Plastic inspections	<u>Component Specifications</u> – To be described for each item 1–3, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. <u>Renewal Actions</u> Actions arising from inspection. <u>Maintain Actions</u> **Reactive** – Minor repairs to plastic windows, rooflights, doors and cladding. **Proactive** – Visual inspection of plastic windows, rooflights, doors and cladding.
				2 Overhauling of windows, rooflights, doors and the like.	PR	PI	
				3 Repairs to rooflights, doors and the like.	PR	PI	
			item	4 Sundry items – planned procedures for the works.	Actions arising from planned inspections	Planned procedures	M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The length of linear components measured is their extreme length, over all obstructions. M3 – The area measured is the surface area of the repair. M4 – Work arising out of party wall awards/agreements is to be described and identified separately. N/A – Not applicable to renewal and/or maintain work.
			note	5 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Group element 8: External works

Group element 8 comprises the following elements:

8.1 Site preparation works

8.2 Roads, paths, pavings and surfacings

8.3 Soft landscaping, planting and irrigation systems

8.4 Fencing, railings and walls

8.5 External fixtures

8.6 External drainage

8.7 External services

8.8 Minor building works and ancillary buildings

Note: This group element of tabulated rules of measurement has been aligned with NRM 1 to create a standardised costs structure that links all construct (C) sub-element, components and inclusions with the 'applicable' renewal (R) and maintain (M) work items. Specific construction works that are not applicable (N/A) to maintenance works have been identified throughout.

Group element 8: External works (continued)

Note 1: Works associated with general site preparation and groundworks, minor demolition works, permanent roads, paths and pavings are included in group element 8: External works. The provision of temporary roads and services is included in group element 9: Maintenance contractor's management and administration costs.

Note 2: Works associated with toxic/hazardous/contaminated material treatment, major demolition works, temporary support to adjacent structures, specialist groundworks, temporary diversion works and extraordinary site investigation works are included in group element 0: Facilitating works.

Note 3: Works requiring site establishments, temporary services, security, safety and environmental protection (e.g. temporary roofing, scaffolding externally or internally etc), control and protection, mechanical plant, temporary works, site services etc. to facilitate the measured work item are included in group element 9: Maintenance contractor's management and administration costs.

Subcontractor on costs

Where works are to be carried out by a subcontractor, an allowance is to be made within the unit rate applied to elements or components for subcontractor's preliminaries, design fees, risk, overheads and profit

Testing and commissioning

Where testing and commissioning is required to be measured under sub-element 8.3.3: Irrigation systems, the terms shall include the following works:

(1) Testing includes:

(a) Water tests

(b) Water required for testing

(2) Commissioning includes:

(a) commissioning, including preliminary checks, setting systems and installations to work and regulation thereof, and commissioning records

(b) temporary operation of equipment to employer's requirements

(c) fuels required for commissioning

(3) Setting all mechanical and electrical services and installations to work after completion of testing and commissioning (following repairs, replacement and fitting new works).

Where testing and commissioning is required to be measured under element 8.6: External drainage, the terms shall include the following works:

(1) Testing includes:

(a) air tests

(b) water tests

(c) dyes required for testing

(2) Commissioning includes:

(a) commissioning, including preliminary checks, setting systems and installations to work and regulation thereof, and commissioning records

(b) temporary operation of employer's requirements.

(3) Setting all drainage installations to work after completion of commissioning.

Where testing and commissioning is required to be measured under element 8.7: External services, the terms shall include the following works:

(1) Testing includes:

(a) testing equipment and consumables

(b) calibration

(c) site installation tests

(d) static testing, including testing records

(e) performance testing, including performance test records

(f) fuels required for testing.

(2) Commissioning includes:

(a) preliminary checks, setting systems and installations to work and regulation thereof, and commissioning records

(b) temporary operation of equipment to employer's requirements

(c) fuels required for commissioning.

(d) setting all mechanical and electrical services and installations to work after completion of commissioning (following repairs, replacement and fitting new works).

(3) Setting all mechanical and electrical services and installations to work after completion of commissioning (following repairs, replacement and fitting new works).

Not applicable

In the following pages 'N/A' means not applicable to renewal and/or maintain works

Works (action required)

The work items, or actions required, within each section of the building element have been categorised into the following:

Renewal (R) – Replacement, Major repairs, Refurbishment, Upgrade work and Removals – plus Redecoration works (if measured separately)

Maintain (M) – Planned, Proactive and Reactive/Minor Repair works

Note – The required work actions included in the measurement rules is not an exhaustive list and is for guidance only

Planned inspections

Non-invasive planned inspections are included in the external works section, which is normally undertaken as part of the maintain (M) regime. Actions arising from the planned inspections are normally dealt with as renewal (M) works, when they are not covered by the minor repairs provision within the planned preventative maintenance regime.

Element 8.1: Site preparation works

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
8.1.1	**Site clearance** **Definition:** Preparatory work required to clear existing site vegetation, trees and the like, including the application of herbicides over the site before commencement of excavations works	1 Clearing vegetation: details to be stated.	m^2	1 Clearing existing site vegetation (e.g. shrubs and undergrowth), including disposing of arisings.	N/A	N/A	N/A – Not applicable to renewal and/or maintain work. M1 – Where components are to be enumerated, the number of components is to be stated. M2 –Where components are to be itemised the number of key elements comprising the component are to be identified, described and enumerated within the description of the component M3 – The area measured is the surface area to which the work applies. M4 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element. M5 – Work outside the curtilage of the site is to be described and identified separately. M6 – Contractor-designed work is to be described and identified separately. **Note:** Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project).
			item	6 Sundry items – details to be stated.	N/A	N/A	
			note	7 Subcontractor on costs (where applicable).	N/A	N/A	
		2 Taking down trees: details to be stated.	nr	2 Taking down trees, including grubbing-up tree stumps and roots and disposing of arisings.	N/A	N/A	
		3 Removing tree stumps and roots: details to be stated.		See item 2 above.	N/A	N/A	
		4 Tree protection: details to be stated.	item	3 Protection of trees.	N/A	N/A	
		5 Minor demolition works: details to be stated.	item/nr	4 Minor demolition works (e.g. to outbuildings and the like).	N/A	N/A	
		6 Applying herbicides: details to be stated.	m^2	5 Applying herbicides before commencement of excavation works.	N/A	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
8.1.2	**Preparatory groundworks** **Definition:** Preparatory earthworks to form new contours	1 Forming new site contours and adjusting existing site levels: details to be stated.	m^2	1 Excavation and earthworks to form new site contours and adjust existing site levels.	N/A	N/A	N/A – Not applicable to renewal and/or maintain work. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The area measured is the surface area to which the work applies. M3 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element. M4 – Work outside the curtilage of the site is to be described and identified separately. M5 – Contractor-designed work is to be described and identified separately. **Note:** Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project).
				3 Extracting old piles, including disposal.			
		2 Breaking out existing substructures: details to be stated.	m^2	2 Breaking-out (or grubbing-up) existing substructures, ground slabs, strip foundations, basement retaining walls and the like, including disposal.	N/A	N/A	
		3 Breaking out existing hard pavings: details to be stated.		4 Breaking-out existing hard pavings, including concrete, bituminous bound material, brick, block and other hard materials, including disposal.	N/A	N/A	
		4 Grubbing-up old drainage pipelines: details to be stated.	m	6 Grubbing-up redundant foul and surface water drainage, including manholes, soakaways, catch pits, interceptors and the like, including disposal.	N/A	N/A	
		5 Grubbing-up old manholes and the like: details to be stated.	nr	See item 6 above.	N/A	N/A	
		6 Filling disused manholes and the like: details to be stated.		7 Filling disused manholes, shafts and the like.	N/A	N/A	
		7 Removing existing underground storage tanks, including disposal: details to be stated.		5 Removing existing underground storage tanks, including disposal and decontamination where not undertaken as part of facilitating works.	N/A	N/A	
			item	8 Sundry items – details to be stated.	N/A	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
			note	9 Subcontractor on costs (where applicable).	N/A	N/A	

Element 8.2: Roads, paths, pavings and surfacings

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
8.2.1	**Roads, paths and pavings** **Definition:** Roads, paths and pavements, vehicular and pedestrian, including car parks and protection of grassed areas, and non-specialist surfacings and pavings used for sports and general amenities.	1 Roads: details, including width (m), to be stated.	m	1 Excavation and earthworks associated with the construction of roads, paths and pavings. 2 Disposal of excavated material, including tipping charges and landfill tax (including inert, non-hazardous and hazardous materials where not to be carried out as part of facilitating works). **Note:** where no contamination/ remediation strategy report exists, an allowance is to be made within the construction risk allowance for the extra cost of disposing of contaminated material. 3 Disposal of surface water and groundwater. 4 Preparation of subgrades, including applying herbicides, levelling, grading, rolling, subgrade improvement layers and geotextile membranes. 5 Sub-bases to roads, paths and pavings (e.g. granular and soil-cement), including laying, levelling, grading and compacting.	Roads, paths and pavings (RPP) (RPP) (RPP) (RPP) (RPP)	Roads, paths and pavings – condition inspections N/A N/A N/A N/A	Component Specifications – To be described for each item 1 to 29, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. **RPP** – included in roads, paths and pavings **PPS** – included in paths – paving slabs Renewal Actions **Replacement** – To include removal of existing, preparation and replacement of roads, paths and pavings, as appropriate. **Major repairs** – To include preparation, repair and making good of roads, paths and pavings, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishing of roads, paths and pavings, as appropriate. Maintain Actions **Planned** – Normally covered by site tours and checks; remedial works to surfacings. **Proactive** – Visual inspection of roads, paths and pavings; design joints, etc. **Reactive** – Minor repairs to roads, paths and pavings. **Note:** Snow clearance excluded as part of excavation works.

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
				6 Blinding (e.g. sand, cement-bound sand and lean-mix concrete).	(RPP)	N/A	M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The length of linear components measured is their extreme length, over all obstructions. M3 – The area measured for paved areas, hardstandings and the like is the surface area of the paving. No deduction is made for voids caused by tree grilles and the like. M4 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element. M5 – Descriptions shall include the amount of any PC Sum included in the unit rates applied to the item. M6 – Curved work is to be described and identified separately. M7 – Work outside the curtilage of the site is to be described and identified separately. M8 – Contractor-designed work is to be described and identified separately. **Note:** Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project). N/A – not applicable to renewal and/ or maintain work. **Note:** Snow clearance excluded from NRM 3 (part of operation costs).
				7 In-situ concrete to roads, paths and pavings, including formwork, reinforcements, joints, worked finishes and the like.	(RPP)	(RPP)	
				8 Coated macadam and asphalt to roads, paths and pavings, including road bases, base courses and wearing courses, application of binders, forming channels and the like.	Coated macadam and asphalt	(RPP)	
				9 Interlocking bricks and blocks to roads, paths and pavings, including sand beds, geotextile membranes, paving units, integral kerbs and edgings, and vibrating pavings.	Interlocking bricks and blocks	(RPP)	
				14 Sett and cobbled pavings to roads, paths and pavings, including sand and mortar beds, separating layers, geotextile membranes, brick paving, shallow channels and low edgings formed with standard paving units, movement joints and dividing strips (e.g. stone setts, concrete setts and cobbles).	Sett/cobbled pavings	(RPP)	
				15 Gravel surfacings to roads, paths and pavings (sealed and unsealed), including treating base with weedkiller, geotextile membranes, sealing surface with bituminous emulsion and the like.	Gravel surfacings	(RPP)	
				16 Uncoated stone chipping surfacings to roads, paths and pavings, including treating base with weedkiller, binders and the like.	Uncoated stone chipping surfacings	(RPP)	

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
			17 Hoggin and woodchip surfacings to roads, paths and pavings, including treating base with weedkiller, binders and the like.	Hoggin and woodchip surfacings	(RPP)	
			18 Perforated units as protection to grassed areas (e.g. to form roads, paths and car parking areas).	Perforated units as protection to grassed areas	(RPP)	
			19 Kerbs, kerb channels and the like, including concrete foundations, haunchings, kerbs and kerb accessories (standard and purpose-made kerbs).	Kerbs, kerb channels	(RPP)	
			25 Paving accessories, including cat's eyes, tree grilles, traffic calming accessories and the like.	Pavings accessories	(RPP)	
		item	30 Sundry items – details to be stated	Actions arising from planned inspections	Planned inspections	
		note	31 Subcontractor on costs (where applicable)	Subcontractor on cost	Subcontractor on costs	
	2 Paths: details, including width (m), to be stated.	m	10 Paving slabs to paths and pavings, including sand and mortar beds, separating layers, geotextile membranes, paving slabs, shallow channels and low edgings formed with standard paving units, movement joints and dividing strips (e.g. precast concrete, natural and artificial stone slab paving).	Paths – paving slabs (PPS)	Paths – paving slabs (PPS)	
			11 Frangible smoke outlet paving panels to basements.	Frangible smoke outlets	(PPS)	
			13 Brick paving to paths and pavings, including sand and mortar beds, separating layers, geotextile membranes, brick paving, shallow channels and low edgings formed with standard paving units, movement joints and dividing strips.	Path – brick paving	(PPS)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
				20 Edgings, including concrete foundations and haunchings (standard and purpose-made edgings).	Edgings	(PPS)	
				21 Timber edgings and pegs.	Timber edgings	(PPS)	
		3 Paved areas, hard standings and the like: details to be stated.	m^2	12 Paving slab cycle stands (see items 1–9, 14–21 above).	Paved areas – slab cycle stands	Paved areas	
		4 Roundabouts: details to be stated.	nr	Roundabouts (see items 1–9, 14–21 above).	Roundabouts	Roundabouts	
		5 Road crossings: details to be stated.		22 Road crossings, zebra crossings and pelican crossings, including road markings, beacons, lights, signs, advance danger signs and the like, and final connections to services. (Also see items 1–9, 14–21 above).	Road crossings	Road crossings	
		6 Steps: details to be stated.		27 Steps, including structure, finishings, balustrades and handrails.	Steps	Steps	
		7 Ramps: details to be stated.	nr/m	28 Ramps, including structure, finishings, balustrades and handrails.	Ramps	Ramps	
		8 Traffic calming accessories: details to be stated.	nr	25 Paving accessories, including cats eyes, tree grilles, traffic calming accessories and the like.	Traffic calming accessories	N/A	
		9 Tree grilles: details to be stated.			Tree grilles	N/A	
		10 Vehicle protection barriers: details to be stated.	m	23 Vehicle protection barriers.	Vehicle protection barriers	N/A	
		11 Vehicle bumper rails: details to be stated.		24 Vehicle bump rails and the like.	Vehicle bumper rails	N/A	
		12 Pavement markings: details to be stated.	nr/m	26 Pavement markings, including paint, thermoplastic-and hot-applied markings.	Pavement markings	Pavement markings	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
		13 Repairs to existing roads, paths and pavings: details to be stated.	nr/m/m^2	29 Repairs to existing roads, paths and pavings.	Taken elsewhere with roads, paths and pavings	Taken elsewhere – with roads, paths and pavings	
8.2.2	**Special surfacings and pavings** **Definition:** Surfacings and pavings specially and specifically for outdoor sporting activities and general amenities.	1 Surfacings and pavings: details to be stated.	m^2	1 Surfacings and pavings designed specially and specifically for sports and general amenities, such as: – sheet and liquid-applied surfacings (e.g. synthetic rubber, granulated rubber, plastics and fibre) – synthetic tufted surfacings for ski slopes – proprietary coloured no-fines concrete and clay/shale surfacings and pavings.	Special surfacings and paving (SSP)	Special surfacings and pavings	<u>Component Specifications</u> – To be described for each item 1 to 8, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. **SSP** – included in special surfacing and pavings. <u>Renewal Actions</u> **Replacement** – To include removal of existing, preparation and replacement of special surfacings and pavings, as appropriate. **Major repairs** – To include preparation, repair and making good of special surfacings and pavings, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishing of special surfacings and pavings, as appropriate. <u>Maintain Actions</u> **Planned** – Normally covered by site tours/surveys. **Proactive** – Visual inspection of special surfacings and pavings. **Reactive** – Minor repairs to special surfacings and pavings. M1 – Where components are to be enumerated, the number of components is to be stated.
				2 Excavation and earthworks associated with the construction of surfacings and pavings for sporting activities and general amenities.	(SSP)	N/A	
				3 Disposal of excavated material, including tipping charges and landfill tax (including inert, non-hazardous and hazardous materials where not to be carried out as part of facilitating works). **Note:** Where no contamination/ remediation strategy report exists, an allowance is to be made within the construction risk allowance for the extra cost of disposing of contaminated material.	(SSP)	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
				4 Disposal of surface water and groundwater.	(SSP)	N/A	M2 – The length of linear components measured is their extreme length, over all obstructions.
				5 Preparation of subgrades, including applying herbicides, levelling, grading, rolling, subgrade improvement layers and geotextile membranes and the like.	(SSP)	N/A	M3 – The area measured for surfacings and pavings is the surface area of the surfacings or paving.
				6 Sub-bases to surfacings and pavings, including laying, levelling, grading and compacting.	(SSP)	N/A	M4 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element.
				7 Accessories to surfacings and pavings.	(SSP)	N/A	M5 – Descriptions shall include the amount of any PC Sum included in the unit rates applied to the item.
							M6 – Curved work is to be described and identified separately.
				8 Markings to surfacings and pavings.	Markings	Markings	M7 – Work outside the curtilage of the site is to be described and identified separately.
							M8 – Contractor-designed work is to be described and identified separately. **Note:** Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project).
			item	9 Sundry items – details to be stated.	Actions arising from planned inspections	Planned inspections	
			note	10 Subcontractor on costs (where applicable).	Subcontractor on cost	Subcontractor on costs	

Element 8.3: Soft landscaping, planting and irrigation systems

Note: Where testing and commissioning is required to be measured under sub-element 8.3.3: Irrigation systems, the terms shall include the following works:

1 Testing includes:

(1) Water tests

(2) Water required for testing

2 Commissioning includes:

(1) Commissioning, including preliminary checks, setting systems and installations to work and regulation thereof, and commissioning records

(2) Temporary operation of equipment to employer's requirements

(3) Fuels required for testing and commissioning

3 Setting all installations to work after completion of commissioning.

Note: This group element of tabulated rules of measurement has been aligned with NRM 1 to create a standardised costs structure that links all construct (C) sub-element, components and inclusions with the 'applicable' renewal (R) and maintain (M) work items. Specific construction works that are not applicable (N/A) to maintenance works have been identified throughout.

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
8.3.1	**Seeding and turfing** **Definition:** Preparing soil and seeding or turfing to form lawns, parklands and other general grassed areas.	1 Grassed areas: details to be stated.	m^2	1 Applying herbicides.	N/A	Seeding and turfing (ST) as part of grounds maintenance, if in scope	Component Specifications – To be described for each item 1 to 16, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. ST – included in seeding and turfing. Renewal Actions **Replacement** – To include removal of existing, preparation and replacement of seeding and turfing, as appropriate. **Major repairs** – To include preparation, repair and making good of seeding and turfing, as appropriate. Maintain Actions **Planned** – PPM on applicable seeding and turfing, as applicable if a ground maintenance regime. **Proactive** – Visual inspection of seeding and turfing. **Reactive** – Minor repairs to seeding /turfing, as appropriate. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The length of linear components measured is their extreme length, over all obstructions. M3 – The area measured for grassed areas is the surface area of the area to be grassed, measured over all obstructions. Areas of roads, paths, pavings, ponds and the like to be deducted.
				2 Topsoil, including transporting from stockpiles or importing topsoil and spreading.	Topsoil	(ST)	
				3 Cultivating topsoil, including removing stones and weeds.	N/A	(ST)	
				4 Fine-grading of topsoil.	N/A.	(ST)	
				5 Providing, spreading and working in manure, compost, mulch, fertiliser, soil ameliorants and the like.	N/A	N/A	
				6 Light mesh reinforcement.	N/A	(ST)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
				7 Seeding, including hydraulic seeding.	N/A	(ST)	M4 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element.
				8 Turfing.	N/A	(ST)	M5 – Descriptions shall include the amount of any PC Sum included in the unit rates applied to the item.
				10 Seeding and turfing to retaining structures.	N/A	(ST)	M6 – Work outside the curtilage of the site is to be described and identified separately.
				11 Initial grass cutting.	N/A	(ST)	M7 – Contractor-designed work is to be described and identified separately. **Note:** Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project).
				13 Watering, before end of defects liability period, period for rectifying defects or maintenance period.	N/A	(ST)	N/A – Not applicable to renewal and/or maintain work.
				14 Replacement seeding and turfing.	N/A	(ST)	
		2 Reinforced grass proprietary systems: details to be stated.	m^2	9 Reinforced grass proprietary systems, including sub-base, topsoil, reinforced root zone, seeding or turfing.	N/A	Seeding and turfing	
		3 Marking out of grass sports pitches: details to be stated.	nr	12 Initial marking out of grass sports pitches (e.g. football, rugby and cricket).	N/A	Seeding and turfing	
		4 Works to existing grassed areas: details to be stated.	m^2	16 Work to existing grassed areas, including scarifying, forking, fertilising, applying weedkillers, local reseeding or re-turfing, etc.	N/A	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
		5 Maintenance of grassed areas: details, including time period (weeks), to be stated.	m^2	15 Maintenance work specified to be executed during the defects liability period, period for rectifying defects or maintenance period (i.e. as distinct from making good defects), including owing and fertilising.	N/A	N/A	
			item	17 Sundry items – details to be stated.	Actions arising from maintenance and planned inspections	Planned inspections	
			note	18 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	
8.3.2	**External planting** **Definition:** Preparing soil and planting bulbs, corms, tubers, herbaceous plants, trees, hedges, shrubs and reed beds.	1 Planting: details to be stated.	m^2	1 Applying herbicides.	N/A	External planting (EP) as part of grounds maintenance, if in scope	Component Specifications – To be described for each item 1 to 24, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. EP – included in external planting Renewal Actions **Replacement** – To include removal of existing, preparation and replacement of external planting, as appropriate. **Major repairs** – To include preparation, repair and making good of external planting, as appropriate. **Replace trees** – arising from storm damage /vandal damage Maintain Actions **Planned** – PPM on applicable external planting. **Proactive** – Visual inspection of external planting. **Reactive** – Minor repairs to external planting.
				2 Topsoil, including transporting from stockpiles or importing topsoil and spreading.	N/A	(EP)	
				3 Cultivating topsoil, including removing stones and weeds.	N/A	(EP)	
				4 Fine-grading of topsoil.	N/A	N/A	
				5 Forming raised and sunken beds, borders and the like.	N/A	(EP)	
				6 Providing, spreading and working in manure, compost, mulch, fertiliser, soil ameliorants and the like.	N/A	(EP)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
				7 Overlays, including mulch matting, gravel, bark or other materials.	N/A	(EP)	M1 – Where components are to be enumerated, the number of components is to be stated.
				8 Planting bulbs, corms, tubers and the like.	N/A	(EP)	M2 – The length of linear components measured is their extreme length, over all obstructions.
				9 Planting container-grown plants.	N/A	(EP)	M3 – The area measured is the surface area of the area external planting, measured over all obstructions. Areas of roads, paths, pavings, ponds and the like to be deducted.
				10 Planting to retaining structures.	N/A	(EP)	M4 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element.
				11 Planting shrubs and hedges.	N/A	Shrubs and hedges	M5 – Descriptions shall include the amount of any PC Sum included in the unit rates applied to the item.
				15 External prefabricated plant/tree containers.	N/A	N/A	M6 – Work outside the curtilage of the site is to be described and identified separately.
				16 Support wires for climbers, tree stakes, tree guards, wrapping, labelling and other protection of trees, shrubs and plants.	N/A	(EP)	M7 – Contractor-designed work is to be described and identified separately. **Note:** Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project).
				20 Applying anti-desiccants.	N/A	N/A	N/A – Not applicable to renewal and/or maintain work. **Excluded** – tress and woodland are not in scope of NRM 3. Refer to NRM 2 for rules of measurement for these items.

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
				21 Watering, before end of defects liability period, period for rectifying defects or maintenance period.	N/A	N/A	
				22 Protecting new planted areas with temporary fencing, boards, tarpaulins and the like.	N/A	(EP)	
				24 Replacement planting.	N/A	(EP)	
		2 Planting reed beds: details to be stated.	m^2	17 Planting reed beds and the like.	Reed beds	(EP)	
		3 Hedges: details to be stated.	m	12 Fence support for hedges. See item 11 above.	Fence support for hedges	(EP)	
		4 Trees: details to be stated.	nr	13 Planting trees, including nursery stock and semi-mature trees.	Trees	(EP)	
				14 Excavating and backfilling tree pits.	Trees pits	N/A	
		5 Woodland planting: details to be stated.	m^2	18 Woodland planting.	Excluded from NRM 3	(EP)	
		6 Tree surgery, thinning and pruning: details to be stated	nr	19 Tree surgery, thinning and pruning.	N/A	(EP)	
		7 Maintenance work to plants, shrubs and planting beds: details including time period (weeks), to be stated.	m^2	23 Maintenance work specified to be executed during the defects liability period, period for rectifying defects or maintenance period (i.e. as distinct from making good defects), including weeding and pruning.	N/A	(EP)	
		8 Maintenance work to trees: details, including time period (weeks), to be stated.	nr	Maintenance work to trees	Trees	Trees maintenance	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
		9 Maintenance work to hedges: details, including time period (weeks), to be stated.	m	Maintenance works to hedges.	Hedges	Hedge maintenance	
			item	25 Sundry items – details to be stated.	Actions arising from maintenance and planned inspections	Planned inspections	
			note	26 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	
8.3.3	**Irrigation systems** **Definition:** Piped water supply systems to landscape-planted areas or crop-planted areas providing a water supply for growing purposes.	1 Irrigation systems: details to be stated.	m^2	1 Pipelines, including pipeline fittings and ancillaries.	Pipelines	Irrigation system (IS)	Component Specifications – To be described for each item 1 to 8, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. Renewal Actions **Replacement** – To include removal of existing, preparation and replacement of irrigation systems, as appropriate. **Major repairs** – To include preparation, repair and making good of irrigation systems, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishing of irrigation systems, as appropriate. Maintain Actions **Planned** – PPM on applicable irrigation systems. **Proactive** – Visual inspection of irrigation systems. **Reactive** – Minor repairs to irrigation systems. M1 – The area measured for irrigation systems is the surface area of land serviced by the system.
				2 Storage tanks and vessels.	Storage tanks	(IS)	
				3 Chemical storage vessels.	Chemical storage vessels	(IS)	
				4 Chemical dosing equipment.	Chemical dosing equipment	(IS)	
				5 Nutrient treatment and equipment.	Nutrient treatments	(IS)	
				6 Outlet pipes and nozzles.	Outlet pipes	(IS)	
				7 Painting, anti-corrosion treatments and coating systems to storage tanks and vessels, pipelines and the like.	Painting and preservative treatments	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
				8 Builder's work in connection with land drainage.	N/A	N/A	M2 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element. M3 – Work outside the curtilage of the site is to be described and identified separately. M4 – Contractor-designed work is to be described and identified separately. **Note:** Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project). M5 – The percentage additions for testing and commissioning are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of both testing and commissioning. N/A – Not applicable to renewal and/or maintain work.
			item	9 Sundry items – details to be stated.	Actions arising from maintenance and planned inspections	Planned inspections	
			note	11 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	
		2 Testing of installations.	%	10 Testing and commissioning; reset to works.	(included in item)	(included in item)	
		3 Commissioning of installations.					

Element 8.4: Fencing, railings and walls

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
8.4.1	**Fencing and railings** **Definition:** Fencing and railings and the like to prevent access to or from an area, or to provide light or noise screening, with associated gates.	1 Fencing: details, including height (m), to be stated.	m	1 Timber, metal and concrete fencing systems, including all system components.	Fencing system	Fencing (F)	Component Specifications – To be described for each item 1 to 10, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. F – included in fencing Renewal Actions **Replacement** – To include removal of existing, preparation and replacement of fencing and railings, as appropriate. **Major repairs** – To include preparation, repair and making good of fencing and railings, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishing of fencing and railings, as appropriate. Maintain Actions **Planned** – PPM regime applied to fencing and railings. **Proactive** – Visual inspection of fencing and railings. **Reactive** – Minor repairs to fencing and railings. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The length of linear components measured is their extreme length, over all obstructions.
				3 Noise/light screening, including systems applied to fencing.	Noise/light screening	(F)	
				7 Fencing to provide light or noise screening, including systems attached to fencing (as item 3).	Noise light screening	(F)	
				8 Excavating, concreting and backfilling holes for posts and the like.	Excavating, concreting and backfilling	(F)	
				9 Fixing railings to concrete and masonry.	Fixing railings	(F)	
				10 Painting, coating and preservative treatments.	Painting, coating and preservative treatments	(F)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
		2 Railings: details, including height (m), to be stated.	m	2 Railings.	Railings	Railings	M3 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element. M4 – Descriptions shall include the amount of any PC Sum included in the unit rates applied to the item. M5 – Curved work is to be described and identified separately. M6 – Work outside the curtilage of the site is to be described and identified separately. M7 – Contractor-designed work is to be described and identified separately. **Note:** Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project).
		3 Gates: details to be stated.	nr	4 Gates and gate posts associated with fencing and railings.	Gates	Gates	
				5 Security gates and gate posts associated with fencing and railings, including mechanical and electrical operating equipment, guide rails and the like.	Security gates	Security gates	
				6 Ironmongery for gates.	Ironmongery	Ironmongery	
			item	11 Sundry items – details to be stated	Actions arising from maintenance and planned inspections	Planned inspections	
			note	12 Subcontractor on costs (where applicable)	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
8.4.2	**Walls and screens** **Definition:** Non-retaining walls and screens and the like to prevent access to or from an area, or to provide light or noise screening, with associated gates.	1 Walls: details, including height (m), to be stated.	m	1 Masonry walls and screens (e.g. brickwork, blockwork and stonework) including foundations, reinforcement and design joints.	Walls (state type)	Walls (state type)	Component Specifications – To be described for each item 1 to 13, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. **W** – included in walls and screens. Renewal Actions **Replacement** – To include removal of existing, preparation and replacement of walls and screens, as appropriate. **Major repairs** – To include preparation, repair and making good of walls and screens, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishing of walls and screens, as appropriate. **Redecoration** – To external walls and screens is to be described and identified with the renewal work items, as appropriate – and/or measured separately if part of decoration programme of works. Maintain Actions **Planned** – PPM on applicable walls and screens. **Proactive** – Visual inspection of walls and screens. **Reactive** – Minor repairs to walls and screens. Re-pointing and rebidding pier caps and copings as necessary
				3 Trench and pit excavations.	N/A	N/A	
				4 Disposal of excavated material, including tipping charges and landfill tax (including inert, non-hazardous and hazardous materials where not to be carried out as part of facilitating works). **Note:** Where no contamination/remediation strategy report exists, an allowance is to be made within the construction risk allowance for the extra cost of disposing of contaminated material.	N/A	N/A	
				5 Disposal of surface water and groundwater.	N/A	N/A	
				6 Consolidating and compacting formation level to receive foundations.	N/A	N/A	
				7 Blinding.	N/A	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
				8 Piers, including reinforcement.	(W)	N/A	M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The length of linear components measured is their extreme length, over all obstructions. M3 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element. M4 – Descriptions shall include the amount of any PC Sum included in the unit rates applied to the item. M5 – Work outside the curtilage of the site is to be described and identified separately. M6 – Contractor-designed work is to be described and identified separately. **Note:** Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project). N/A – Not applicable to renewal and/or maintain work.
				9 Pier caps.	Pier caps	Pier caps	
				10 Copings and the like.	Copings	Copings	
		2 Screens: details, including height (m), to be stated.	m	2 Masonry walls and screens with timber infill panels, including foundations.	Screens	Screens	
		3 Gates: details to be stated.	nr	11 Gates and gate posts associated with walls and screens.	Gates	Gates	
				12 Security gates and gate posts associated with walls and screens, including mechanical and electrical operating equipment, guide rails and the like.	Security gates	Security gates	
				13 Ironmongery for gates.	Ironmongery	(G&SG)	
			item	14 Sundry items – details to be stated.	Actions arising from maintenance and planned inspections	Planned inspections	
			note	15 Subcontractor on costs (where applicable).	Subcontractor on cost	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
8.4.3	**Retaining walls** **Definition:** Retaining walls that are not an integral part of the building.	1 Retaining walls: details, including height (m) above ground, to be stated.	m	1 Concrete retaining walls, including reinforcement, formwork and design joints.	Retaining walls – concrete (RWC)	Retaining walls (RW)	<u>Component Specifications</u> – To be described for each item 1 to 18, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. <u>Renewal Actions</u> **Replacement** – To include removal of existing, preparation and replacement of retaining walls, as appropriate. **Major repairs** – To include preparation, repair and making good of retaining walls, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishing of retaining walls, as appropriate. **Redecoration** – To retaining walls is to be described and identified with the renewal work items, as appropriate – and/or measured separately if part of decoration programme of works. <u>Maintain Actions</u> **Planned** – PPM on applicable retaining walls. **Proactive** – Visual inspection of retaining walls. **Reactive** – Minor repairs to retaining walls. M1 – Where components are to be enumerated, the number of components is to be stated.
				2 Fixings cast into or fixed to concrete retaining walls to retain masonry facing wall (e.g. brickwork, blockwork and stonework).	(RWC)	(RW)	
				3 Masonry facing walls to concrete retaining walls (e.g. brickwork, blockwork and stonework), including reinforcement and design joints.	Masonry facing walls	(RW)	
				4 Masonry retaining walls (e.g. brickwork, blockwork and stonework), including reinforcement and design joints.	Retaining walls – masonry	(RW)	
				5 Crib walls, including timber (and preservative treatment) and precast concrete headers and stretchers, combined units, and sand and gravel filling.	Crib walls	(RW)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
				6 Gabions, including steel mesh cages/mattresses and wiring together, graded stone filling and filter membranes.	Gabions	(RW)	M2 – The length of linear components measured is their extreme length, over all obstructions. M3 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element. M4 – Descriptions shall include the amount of any PC Sum included in the unit rates applied to the item. M5 – Work outside the curtilage of the site is to be described and identified separately. M6 – Contractor-designed work is to be described and identified separately. **Note:** Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project). N/A – Not applicable to renewal and/or maintain work.
				7 Reinforced earth, including reinforcement layers (e.g. steel, polymeric and geotextile), selected fill material, anchors and soil nails, mesh to support soft landscape facing, concrete, timber facing and the like.	(RW)	(RW)	
				8 Other types of retaining structure.	Other types of retaining structure	(RW)	
				9 Piles associated with external retaining walls (individual, continuous and steel sheet), including piling mats and platforms (installing and removing), piling rigs, cutting off excess lengths of piles or steel sheet piles, cutting out concrete to tops of piles and preparing pile heads and reinforcements, and pile tests.	Piles associated with external retaining walls	N/A	
				10 Trench and pit excavations, including earthwork support (including insertion and extraction of steel sheet piling, if used).	(RW)	N/A	
				11 Excavating below groundwater level.	(RW)	N/A	
				12 Disposal of excavated material, including tipping charges and landfill tax (including inert, non-hazardous and hazardous materials where not to be carried out as part of facilitating works). **Note:** Where no contamination/remediation strategy report exists, an allowance is to be made within the construction risk allowance for the extra cost of disposing of contaminated material.	(RW)	N/A	

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
			13 Disposal of surface water and groundwater.	(RW)	N/A	
			14 Consolidating and compacting formation level to receive foundations.	(RW)	N/A	
			15 Blinding.	(RW)	N/A	
			16 Weep holes.	(RW)	N/A	
			17 Land drainage forming an integral part of the retaining wall.	Land drainage	(RW)	
			18 Copings and the like.	Copings	N/A	
		item	Sundry items – details to be stated	Actions arising from maintenance and planned inspections	Planned inspections	
		note	Subcontractor on costs (where applicable)	Subcontractor on cost	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
8.4.4	**Barriers and guardrails** **Definition:** External vehicle and pedestrian barriers and guardrail systems with associated gates.	1 Vehicle restraint systems: details to be stated.	m	1 Vehicle restraint systems including parapets.	Vehicle restraint (VS)	Barriers and guardrails (BG)	<u>Component Specifications</u> – To be described for each item 1 to 6, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. VRS – included in vehicle restraint systems <u>Renewal Actions</u> **Replacement** – To include removal of existing, preparation and replacement of barriers and guardrails, as appropriate. **Major repairs** – To include preparation, repair and making good of barriers and guardrails, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishing of barriers and guardrails, as appropriate. **Redecoration** – To barriers and guardrails is to be described and identified with the renewal work items, as appropriate – and/or measured separately if part of decoration programme of works. <u>Maintain Actions</u> **Planned** – PPM on applicable barriers and guardrails. **Proactive** – Visual inspection of barriers and guardrails. **Reactive** – Minor repairs to barriers and guardrails.
				4 Excavating, disposal of excavated material, concreting and backfilling holes for posts and the like.	(VR)	(BG)	
				5 Fixing barriers and guardrails to concrete and masonry.	(VR)	(BG)	
				6 Painting, coating and the like.	Redecoration works	(BG)	
		2 Pedestrian restraint systems: details to be stated.	m	2 Pedestrian restraint systems, including parapets.	Pedestrian restraint systems	Barriers and guardrails	
		3 Vehicle and pedestrian control barriers and gates: details to be stated.	nr	3 Vehicle and pedestrian control barriers and gates not associated with fencing.	Control barriers and gates	Barriers and guardrails	

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
		item	7 Sundry items – details to be stated	Actions arising from maintenance and planned inspections	Planned inspections	M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The length of linear components measured is their extreme length, over all obstructions. M3 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element. M4 – Work outside the curtilage of the site is to be described and identified separately. M5 – Contractor-designed work is to be described and identified separately. **Note:** Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project).
		note	8 Subcontractor on costs (where applicable)	Subcontractor on costs	Subcontractor on costs	

Element 8.5: External fixtures

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
8.5.1	**Site/street furniture and equipment (SSFE)** **Definition:** Furniture and equipment designed for use externally, but excluding items provided by a statutory undertaker.	1 Component: details to be stated.	nr	1 Gates – where not part of fencing, railings, walls, screens, barriers or guardrails.	Gates	Gates	<u>Renewal Actions</u> **Replacement** – To include removal of existing, preparation and replacement of site/street furniture and equipment, as appropriate. **Major repairs** – To include preparation, repair and making good of site/street furniture and equipment, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishing of site/street furniture and equipment, as appropriate. **Redecoration** – To site/street lighting furniture and equipment, is to be described and identified with the renewal work items, as appropriate – and/or measured separately if part of decoration programme of works. <u>Component Specifications</u> – To be described for each item 1 to 19, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. SSFE – included in site/street furniture and equipment <u>Maintain Actions</u> **Planned** – PPM on applicable site/street furniture and equipment. **Proactive** – Visual inspection of site/street furniture and equipment. **Reactive** – Minor repairs to site/street furniture and equipment.
				2 Turnstiles.	Turnstiles	Turnstiles	
				3 Bollards, including removable and collapsible.	Bollards	Bollards	
				4 Seats, benches and tables.	Seats and benches	N/A	
				5 Litter bins, grit bins and dustbins (including continental bins).	Litter bins	N/A	
				6 Poster display units and notice boards.	Poster display units/ notice boards	Poster display units/ notice boards	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
				7 Cycle stands.	Cycle stands	N/A	M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Work outside the curtilage of the site is to be described and identified separately. M3 – Contractor-designed work is to be described and identified separately. Note – Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project). N/A – Not applicable to renewal and/or maintain work.
				8 Directional signs, including reflective traffic signs.	Directional signage	Directional signage	
				9 Flagpoles.	Flagpoles	Flagpoles	
				10 Sports and playground equipment to be used externally.	Sports/playground equipment	Sports/playground equipment	
				11 Other furniture and equipment to be used externally.	Other furniture	Other furniture	
				12 Minor footbridges.	Minor footbridges	N/A	
				13 Clothes-drying fittings.	Clothes-drying fittings	N/A	
				14 Bus stops, bus shelters, telephone boxes/booths, post boxes and road signs where not the responsibility of a statutory undertaker.	Bus stops/shelters	Bus stops/ shelters	
				15 Sculptures and other works of art external to the building envelope.	Sculptures and other external works of art	Sculptures	
				16 Site/street furniture and equipment that act as transformation devices (i.e. generate energy).	Site/street furniture and equipment	(SSFE)	
				17 Other site and street furniture and equipment.	Taken elsewhere as item 11	Taken elsewhere as item 11	
				18 All builder's work in connection with site/street furniture and equipment.	N/A	N/A	
				19 Painting, coating and preservation treatments.	Painting, coating and preservation treatments	(SSFE)	
			item	20 Sundry items – details to be stated	Actions arising from maintenance and planned inspections	Planned inspections	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
			note	21 Subcontractor on costs (where applicable)	Subcontractor on costs	Subcontractor on costs	
8.5.2	**Ornamental features** **Definition:** Ornamental water features and the like.	1 Water features: details to be stated.	nr	1 Water features and the like.	Water features	Water features	<u>Component Specifications</u> – To be described for each item, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. <u>Renewal Actions</u> **Replacement** – To include removal of existing, preparation and replacement of ornamental features, as appropriate. **Major repairs** – To include preparation, repair and making good of ornamental features, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishing of ornamental features, as appropriate. **Redecoration** – To ornamental features, is to be described and identified with the renewal work items, as appropriate – and/or measured separately if part of decoration programme of works. <u>Maintain Actions</u> **Planned** – PPM on applicable ornamental features. **Proactive** – Visual inspection of ornamental features. **Reactive** – Minor repairs to ornamental features. M1 – Where components are to be enumerated, the number of components is to be stated.
				2 Builder's work in connection with installing water features or the like.	N/A	N/A	
			item	3 Sundry items – details to be stated.	Actions arising from maintenance and planned inspections	Planned inspections	
			note	4 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
	2 Other features: details to be stated.	nr	Ornamental features	Ornamental features	Ornamental features	M2 – Work outside the curtilage of the site is to be described and identified separately. M3 – Contractor-designed work is to be described and identified separately. **Note:** Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project).

Element 8.6: External drainage

Subelement		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
8.6.1	**Surface water and foul water drainage** **Definition:** Foul water and surface water drainage systems, below- and above-ground, from first manhole beyond the enclosing walls of the building, the sewer connection, or other outfall (e.g. on-site sewage treatment facility).	1 Connections to statutory undertaker's sewers: details to be stated.	nr	1 Connection to statutory undertaker's sewer or sewers.	N/A	N/A	Component Specifications – To be described for each item 1 to 28, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. GG – included in gullies and gratings SWFWD – included in surface water and foul water drainage
		2 Drainage runs, below ground: details, including depth of trench (m) and nominal pipe size (mm), to be stated.	m	2 Trenches for pipework, including excavation, earthwork support, backfilling and disposal of surplus material.	(Taken with pipeline)	N/A	Renewal Actions **Replacement** – To include removal of existing, preparation and replacement of surface water and foul water drainage, as appropriate. **Major repairs** – To include preparation, repair and making good of surface water and foul water drainage, as appropriate.
				3 Pipeline and pipeline fittings.	Pipeline and pipeline fittings	Surface water and foul water drainage (SWFWD)	**Refurbish** – To include removal of existing, preparation and refurbishing of surface water and foul water drainage, as appropriate.
				4 Granular beds and surrounds, concrete beds, cradles, haunchings and surrounds, and foamed concrete backfill.	Pipeline bedding, haunching and surrounds	(SWFWD)	Maintain Actions **Planned** – PPM on applicable surface water and foul water drainage.
				6 Connections to manholes and the like.	N/A	N/A	**Proactive** – Visual inspection of surface water and foul water drainage.
				7 Connections to above-ground soil stacks, sanitary appliances and wastes.	N/A	N/A	**Reactive** – Minor repairs to surface water and foul water drainage.
				8 Connections to ancillary equipment and systems (e.g. pumping stations and sewage treatment vessels).	N/A	N/A	M1 – Where components are to be enumerated, the number of components is to be stated.

Subelement		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
				9 Gullies and gratings, including road gullies and gratings.	Gullies and gratings	Gullies and gratings (G&G)	M2 – The length of linear components measured is their extreme length, over all branches fittings and the like.
				10 Rodding and access points.	Rodding and access points	(G&G)	M3 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element.
				20 Connections to sewers, where not statutory undertaker's sewers.	N/A	N/A	M4 – Work outside the curtilage of the site is to be described and identified separately.
				21 Connections to ancillary drainage systems.	N/A	N/A	M5 – Contractor-designed work is to be described and identified separately. **Note:** Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project).
		3 Drainage runs, above ground: details, including height above-ground (m) and nominal size of pipe (mm), to be stated.	m	5 Supports for above-ground drainage, including earth embankments.	Supports for above-ground drainage	N/A	M6 – The percentage additions for testing and commissioning are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of both testing and commissioning.
				18 Packaged pumping stations.	Packaged pumping stations	Packaged pumping stations	N/A – Not applicable to renewal and/or maintain work.
				19 Outfalls/outlet headwalls.	Outfalls/outlet headwalls	(SWFWD)	
				22 Painting, anti-corrosion treatments and coating systems to drainage above ground.	Painting, anti-corrosion treatments and coating systems	(SWFWD)	
				23 Builder's work in connection with external surface water and foul water drainage.	N/A	N/A	

Subelement		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
		4 Prefabricated channels: details, including nominal size, to be stated.	m	11 Prefabricated channels (i.e. in roads, paths and pavements).	Prefabricated channels	(SWFWD)	
		5 Manholes and the like: details, including depth (m), to be stated.	nr	12 Interceptor traps and fresh-air inlets, and air-release and wash-out valves to pressure pipelines.	Interceptor traps and fresh air inlets	(SWFWD)	
				13 Inspection chambers, manholes and catch pits, including channels, benchings, step irons, access covers and other accessories.	Inspection chambers, manholes and catch pits	(SWFWD)	
				14 Soakaways.	Soakaways	(SWFWD)	
				15 Retention/storage tanks and vessels.	Retention/storage tanks and vessels	N/A	
				16 Cesspools and septic tanks.	Cesspools and septic tanks	Septic tanks	
				17 Petrol interceptor units.	Petrol interceptor units	Petrol interceptor units	
		6 Alterations to existing external drainage systems: details to be stated.		24 Alterations to existing external drainage systems.	N/A	N/A	
		7 Work to existing manholes or the like: details to be stated.		25 Work to existing manholes or the like.	N/A	N/A	
		8 Clearing existing drains: details to be stated.	nr/m	26 Clearing existing drains.	N/A	Cleaning drains	
		9 Sealing redundant drains: details to be stated.		27 Sealing redundant drains, including filling entire length of drain with foam concrete or the like.	N/A	N/A	

Subelement	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
	10 Filling disused manholes or the like: details to be stated.	nr	28 Filling disused manholes.	N/A.	N/A	
	11 Testing of installations.	%	29 Testing and commissioning of external surface water and foul water drainage.	(included in item)	CCTV surveys of drains	
	12 Commissioning of installations.		31 Testing and commissioning.			
		item	30 Sundry items – details to be stated.	Actions arising from maintenance and planned inspections	Planned inspections	
		note	32 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Subelement		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
8.6.2	**Ancillary drainage systems** **Definition:** Systems with a storage tank or vessel for the reception of foul water and sewage at one level, for transfer by pump to drains or sewers at a higher level; sewage treatment systems to meet local special needs where it is necessary to treat human or animal sewage to render it safe for discharge into the statutory undertaker's drainage system; and sustainable urban drainage schemes.	1 Pumping stations: details to be stated.	nr	1 Pumping stations.	Pumping stations	Ancillary drainage systems (ADS)	Component Specifications – To be described for each item 1 to 10, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. ADS – included in ancillary drainage systems Renewal Actions **Replacement** – To include removal of existing, preparation and replacement of ancillary drainage systems, as appropriate. **Major repairs** – To include preparation, repair and making good of ancillary drainage systems, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishing of ancillary drainage systems, as appropriate. Maintain Actions **Planned** – PPM on applicable ancillary drainage systems. **Proactive** – Visual inspection of ancillary drainage systems. **Reactive** – Minor repairs to ancillary drainage systems. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The length of linear components measured is their extreme length, over all obstructions. M3 – The area measured for sustainable urban drainage schemes is the surface area of land served by the scheme.
				7 Control components located externally.	Control components	(ADS)	
				8 Monitoring equipment located externally.	Monitoring equipment	(ADS)	
				9 Painting, anti-corrosion treatments and coating systems to ancillary drainage systems.	Painting, anti-corrosion treatments and coating systems	(ADS)	
				10 Builder's work in connection with the provision of ancillary drainage equipment and systems.	N/A	N/A	
			item	11 Sundry items associated with the provision of ancillary drainage equipment: details to be stated.	Actions arising from maintenance and planned inspections	Planned inspections	

Subelement		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
				13 Subcontractor on costs (where applicable).	Subcontractor on cost	Subcontractor on costs	M4 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element. M5 – Work outside the curtilage of the site is to be described and identified separately. M6 – Contractor-designed work is to be described and identified separately. **Note:** Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project). M7 – The percentage additions for testing and commissioning are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of both testing and commissioning.
		2 Ejector stations: details to be stated.	nr	2 Ejector stations.	Ejector station	Ancillary Drainage Systems	
		3 Storage/retention tanks and vessels: details to be stated.		3 Storage/retention tanks and vessels (e.g. concrete and proprietary), including supports, forming protective bunds and the like.	Storage/retention tanks/vessels	Ancillary Drainage Systems	
		4 Sewage treatment systems: details to be stated.		4 Sewage treatment systems, including receivers or storage vessels and treatment vessels (e.g. concrete and proprietary), control components and monitoring equipment.	Sewage treatment system	Ancillary Drainage Systems	
		5 Enzyme systems: details to be stated.		5 Enzyme systems.	Enzyme systems	Ancillary Drainage Systems	
		6 Sustainable urban drainage schemes: details to be stated.	m^2	6 Sustainable urban drainage schemes (SUDS).	Sustainable urban drainage schemes	Ancillary Drainage Systems	
		7 Testing of installations. 8 Commissioning of installations.	%	12 Testing and commissioning; set to works	(included in item)	(included in item)	

Subelement		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
8.6.3	**External chemical, toxic and industrial liquid waste drainage** **Definition:** Laboratory/industrial waste drainage, from the external face of the external wall to the point of disposal.	1 Drainage runs, below ground: details, including depth of trench (m) and nominal size of pipe (mm), to be stated.	m	1 Trenches for pipework, including excavation, earthwork support, backfilling and disposal of surplus material.	N/A	External chemical, toxic and industrial liquid waste drainage	Component Specifications – To be described for each item 1 to 15, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. ECTILWD – included in external chemical, toxic and industrial liquid waste drainage Renewal Actions **Replacement** – To include removal of existing, preparation and replacement of external laboratory and industrial liquid waste drainage, as appropriate. **Major repairs** – To include preparation, repair and making good of external laboratory and industrial liquid waste drainage, as appropriate. **Refurbish** – To include removal of existing, preparation and refurbishing of external laboratory and industrial liquid waste drainage, as appropriate. Maintain Actions **Planned** – PPM on applicable external laboratory and industrial liquid waste drainage. **Proactive** – Visual inspection of external laboratory and industrial liquid waste drainage. **Reactive** – Minor repairs to external laboratory and industrial liquid waste drainage.
				2 Pipework and pipework fittings.	Pipework and pipework fittings	(ECTILWD)	
				3 Granular beds and surrounds, concrete beds, cradles, haunchings and surrounds, and foamed concrete backfill.	Drainage bedding, haunchings and surrounds	(ECTILWD)	
				5 Connections, tanks and the like.	N/A	(ECTILWD)	
				11 Connections to equipment	N/A	N/A	
				14 Painting, anti-corrosion treatment and coating systems to drainage pipelines.	Painting, anti-corrosion treatment and coating systems	(ECTILWD)	
				15 Builder's work in connection with external laboratory and industrial liquid waste drainage.	N/A	N/A	
			item	16 Sundry items.	Actions arising from maintenance and planned inspections	Planned inspections	

Subelement		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
			note	18 Subcontractor on costs.	Subcontractor on costs	Subcontractor on costs	M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The length of linear components measured is their extreme length, over all branches fittings and the like. M3 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element. M4 – Descriptions shall include the amount of any PC Sum included in the unit rates applied to the item. M5 – Work outside the curtilage of the site is to be described and identified separately. M6 – Contractor-designed work is to be described and identified separately. **Note:** Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project). M7 – The percentage additions for testing and commissioning are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of both testing and commissioning. N/A – not applicable to renewal and/or maintain works.
		2 Drainage runs, above ground: details, including height above ground (m) and nominal size of pipe (mm), to be stated.	m	4 Supports for above-ground drainage, including earth embankments. See items 2, 5, 11 and 14 above.	N/A Drainage runs above ground	N/A (ECTILWD)	
		3 Equipment and plant: details to be stated.	nr	6 Storage tanks and vessels.	Storage tanks	Storage tanks	
				7 Settlement tanks.	Settlement tanks	Settlement tanks	
				8 Effluent treatment plant.	Effluent treatment	Effluent treatment	
				9 Dosing equipment.	Dosing equipment	Dosing equipment	
				10 Sterilisation equipment.	Sterilisation equipment	Sterilisation equipment	
				12 Control components located externally.	Control components	Control components	
				13 Monitoring equipment located externally.	Monitoring equipment	Monitoring equipment	

Subelement		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
		4 Testing of installations.	%	17 Testing and commissioning; set to works	(include in item)	(include in item)	
		5 Commissioning of installations.					
8.6.4	**Land drainage** **Definition:** Disposal systems for drainage of waterlogged ground.	1 Drainage runs, below ground: details, including depth of trench (m) and nominal size of pipe (mm), to be stated.	m	1 Filter drains, with or without pipes.	Filter drains	Land drainage (LD)	**Component Specifications** – To be described for each item 1 to 16, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. LD – included in land drainage **Renewal Actions** **Replacement** – To include removal of existing, preparation and replacement of land drainage, as appropriate. **Major repairs** – To include preparation, repair and making good of land drainage, as appropriate. **Maintain Actions** **Planned** – PPM on applicable land drainage. **Proactive** – Visual inspection of land drainage. **Reactive** – Minor repairs to land drainage. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The length of linear components measured is their extreme length, over all branches fittings and the like. M3 – The area measured for drainage blankets is the surface area of land serviced by the blanket. M4 – The area measured for land drainage to parklands is the surface area of parkland.
				2 Fin drains, with or without pipes.	Fin drains	(LD)	
				3 Mole drains.	Mole drains	(LD)	
				4 Trenchless drains.	Trenchless drains	(LD)	
				5 Pipe drains, including fittings.	Pipe drains	(LD)	
				7 Trenches for pipework, including excavation, earthwork support, backfilling and disposal of surplus material.	Trenches for pipework	(LD)	
				8 Pipework and pipework fittings (to point of disposal).	Pipework and pipework fittings	(LD)	

Subelement	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
		m	9 Granular fill and surrounds.	Granular fill and surrounds	(LD)	M5 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element.
			10 Geotextile filters and trench linings.	Geotextile filters and trench linings	(LD)	M6 – Descriptions shall include the amount of any PC Sum included in the unit rates applied to the item.
						M7 – Work outside the curtilage of the site is to be described and identified separately.
			11 Silt traps, silt trap manholes and the like.	Silt traps/silt trap manholes	(LD)	M9 – The percentage additions for testing and commissioning are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of both testing and commissioning.
			14 Outfalls/outlet headwalls.	Outfalls	(LD)	
			15 Builder's work in connection with land drainage.	N/A	N/A	N/A – Not applicable to renewal and/or maintain work.
			16 Clearing existing ditches, channels and the like.	N/A	N/A	M8 – Contractor-designed work is to be described and identified separately. **Note:** Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project).
		item	17 Sundry item – details to be stated.	Actions arising from maintenance and planned inspections	Planned inspections	
		note	18 Subcontractor on costs (where applicable)	Subcontractor on costs	Subcontractor on costs	
	2 Manholes and the like: details, including depth (m), to be stated.	nr	12 Soakaways.	Soakaways	Land drainage	
			13 Storage tanks and vessels.	Storage tanks and vessels	(LD)	
	3 Drainage blankets: details to be stated.	m^2	6 Drainage blankets (e.g. comprising layer of aggregate, porous pipes and upper/lower geotextile pipes).	Drainage blanket	N/A	

Subelement		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
		4 Land drainage to parkland: details, including centres of main runs (m) and laterals (m), to be stated.	ha	See items 1–16 above	Land drainage	Land drainage	
		5 Testing of installations.	%	18 Testing and commissioning; set to works	(include in item)	(include in item)	
		6 Commissioning of installations.					

Element 8.7: External services

Note: Where testing and commissioning is required to be measured under element 8.7: External services, the terms shall include the following works:

1 Testing includes:

(1) Testing equipment and consumables

(2) Calibration

(3) Site installation tests

(4) Static testing, including testing records

(5) Performance testing, including performance test records

(6) Fuels required for testing

2 Commissioning includes:

(1) Commissioning, including preliminary checks, setting systems and installations to work and regulation thereof, and commissioning records

(2) Temporary operation of equipment to employer's requirements

(3) Fuels required for commissioning

3 Setting all mechanical and electrical services and installations to work after completion of commissioning (initial operation)

Note: This group element of tabulated rules of measurement has been aligned with NRM 1 to create a standardised costs structure that links all construct (C) sub-element, components and inclusions with the 'applicable' renewal (R) and maintain (M) work items. Specific construction works that are not applicable (N/A) to maintenance works have been identified throughout.

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
8.7.1	**Water mains supply** **Definition:** Piped water supply systems bringing water from the statutory undertaker's mains to point of entry into building, including distribution to external user points (e.g. external plant and equipment) and fire hydrants.	1 Connections to statutory undertaker's water main: details to be stated.	nr	1 Connections to statutory undertaker's water main.	Connections to water mains	Water mains supply (WMS)	<u>Renewal Actions</u> **Replacement** – To include removal of existing, preparation and replacement of water mains supply, as appropriate. **Major repairs** – To include preparation, repair and making good of water mains supply, as appropriate. <u>Maintain Actions</u> **Planned** – PPM on applicable water mains supply. **Proactive** – Visual inspection of water mains supply. **Reactive** – Minor repairs to water mains supply. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – For connections to external plant and equipment, the number of draw-off points is to be stated. <u>Component Specifications</u> – To be described for each item 1 to 11, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. WMS – included in water mains supply
				5 Water meters, where not provided by the statutory undertaker, including chambers and enclosures.	Meters	(WMS)	
				6 Fire hydrants.	Hydrants	Hydrants	
				7 Trace heating – pipeworks.	Trace heating	Trace heating	
				8 Thermal insulation.	Thermal insulation	Thermal insulation	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
				9 Constructing stop-valve surface boxes.	Stop valve boxes	(WMS)	M3 – The length of linear components measured is their extreme length, over all branches fittings and the like. M4 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element. M5 – Work outside the curtilage of the site is to be described and identified separately. M6 – Contractor-designed work is to be described and identified separately. **Note:** Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project). M7 – The percentage additions for testing and commissioning are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of both testing and commissioning.
		2 Connections to external plant and equipment: details to be stated.	nr	3 Connections to external plant and equipment.	Connection to plant and equipment	(WMS)	
		3 Service runs: details to be stated.	m	2 Water main from statutory undertaker's mains to water meter, including pipelines and pipeline fittings, excavation and backfilling trenches, ground anchor blocks and the like.	Water main from statutory undertaker's mains	(WMS)	
				4 Mains water supply and distribution of water supply to external plant and equipment, including pipelines and pipeline fittings, excavation and backfilling trenches, ground anchor blocks and the like.	Mains water supply and distribution	(WMS)	
		4 Rainwater harvesting systems: details, including the number (nr) of collection points to be stated.	nr	10 Rainwater harvesting systems external to the building, including collection pipelines.	Rainwater harvesting systems	Rainwater harvesting systems	
		5 Grey water systems: details, including the number (nr) of collection points, to be stated.		11 Grey water systems external to the building, including collection pipelines.	Grey water systems	Grey water systems	
		6 Testing of installations.	%	13 Testing and commissioning; set to works.	(included in item)	(included in item)	
		7 Commissioning of installations.					
			item	12 Sundry items – details to be stated.	Actions arising from maintenance and planned inspections	Planned inspections	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
			note	14 Subcontractor on costs (where applicable).	Subcontractor on cost	Subcontractor on costs	
8.7.2	**Electricity mains supply** **Definition:** The distribution of high voltage (HV) electricity from statutory undertaker's supply to an on-site transformer station; the distribution of low voltage (LV) electricity from the on-site transformer (or other supply intake) to the main switchgear panel within the building; and external installations for providing electricity including emergency or standby generation plant.	1 Connections to statutory undertaker's electricity main: details to be stated.	nr	1 Connections to statutory undertaker's electricity main.	N/A	Electricity mains supply	Component Specifications – To be described for each item 1 to 7, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. **EMS** – included in electricity mains supply Renewal Actions **Replacement** – To include removal of existing, preparation and replacement of electricity mains supply, as appropriate. **Major repairs** – To include preparation, repair and making good of electricity mains supply, as appropriate. Maintain Actions **Planned** – PPM on applicable electricity mains supply. **Proactive** – Visual inspection of electricity mains supply. **Reactive** – Minor repairs to electricity mains supply. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The length of linear components measured is their extreme length, over all obstructions.
		2 Service runs: details to be stated.	m	2 Distribution of HV electricity to on-site transformer, including cables, excavating and backfilling trenches and the like.	HV and LV cables and wiring	Electricity mains supply (EMS)	
				4 Distribution of LV electricity to main switchgear panel within the building, including excavating and backfilling trenches and the like.	Distribution of LV electricity	(EMS)	
				5 Constructing draw pits, including access covers.	Draw pits	(EMS)	
				6 Marker tape, cover tiles and other special protection for electrical cables.	Marker tape, cover tiles etc	(EMS)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
			item	8 Sundry items – details to be stated.	Actions arising from maintenance and planned inspections	Planned inspections	M3 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element. M4 – Work outside the curtilage of the site is to be described and identified separately. M5 – Contractor-designed work is to be described and identified separately. **Note:** Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project). M6 – The percentage additions for testing and commissioning are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of both testing and commissioning.
		3 Transformer substations: details to be stated.	nr	3 Transformer substations, including packaged substations.	Transformer stations	Transformer stations	
		4 External electricity generation installation/plant: details to be stated.		7 External electricity generation plant, including emergency or standby generation plant.	Generator plant	Generator plant	
			%	9 Testing and commissioning; set to works.	(included in item)	(included in item)	
			note	10 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	
8.7.3	**External transformation devices** **Definition:** Systems using the natural elements (i.e. wind turbines and sun) to generate energy.	1 Wind turbines: details to be stated.	nr	1 Wind turbines where external to the building.	Wind turbines	External transformation devices (ETD)	<u>Component Specifications</u> – To be described for each item 1 to 8, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. **ETD** – included in external transformation devices <u>Renewal Actions</u> **Replacement** – To include removal of existing, preparation and replacement of external transformation devices, as appropriate. **Major repairs** – To include preparation, repair and making good of external transformation devices, as appropriate.
				6 Distribution of LV electricity to main switchgear panel within building, excavating and backfilling trenches and the like.	LV distribution	(ETD)	
				7 Constructed draw pits including access covers.	Draw pits	(ETD)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
				8 Marker tape, cover tiles and other special protection for electrical cables.	Marker tape	(ETD)	**Maintain Actions** **Planned** – PPM on applicable external transformation devices. **Proactive** – Visual inspection of external transformation devices. **Reactive** – Minor repairs to external transformation devices.
			nr	9 Sundry items – details to be stated	Actions arising from maintenance and planned inspections	Planned inspections	M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Contractor-designed work is to be described and identified separately. **Note:** Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project). M3 – The percentage additions for testing and commissioning are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of both testing and commissioning.
			note	10 Subcontractor on costs (where applicable)	Subcontractor on costs	Subcontractor on costs	
		2 Photovoltaic devices: details, including surface area of units (m^2), to be stated.	nr	2 Photovoltaic devices where external to the building.	Photovoltaic devices	(ETD)	
				3 Solar collectors where external to the building. See item 6 above.	Solar collectors	(ETD)	
		3 Other transformation devices: details to be stated.		4 Other transformation devices.	Other transformation devices	(ETD)	
				5 Generators in connection with transformation devices. See item 6 above.	Generator plant	Generator plant	
		4 Testing of installations.	%	11 Testing and commissioning; set to works.	(include in item)	(include in item)	
		5 Commissioning of installations.					

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
8.7.4	**Electricity distribution to external plant and equipment** **Definition:** Subcircuit power installations from the subdistribution boards to external equipment terminating at socket outlets, fuse connection units and other accessories, including final connections to permanent mechanical and electrical plant and equipment, external features (e.g. water features) and the like.	1 Connections to external plant or equipment: details to be stated.	nr	1 General low voltage (LV) power installations to external plant and equipment, including cables, excavating and backfilling trenches and the like.	LV power installations	Electricity distribution	Component Specifications – To be described for each item 1 to 12, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. EDEPE – included in electrical distribution external plant and equipment UPS – uninterruptible power supply Renewal Actions **Replacement** – To include removal of existing, preparation and replacement of electricity distribution to external plant and equipment, as appropriate. **Major repairs** – To include preparation, repair and making good of electricity distribution to external plant and equipment, as appropriate. Maintain Actions **Planned** – PPM on applicable electricity distribution to external plant and equipment. **Proactive** – Visual inspection of electricity distribution to external plant and equipment. **Reactive** – Minor repairs to electricity distribution to external plant and equipment. M1 – Where components are to be enumerated, the number of components is to be stated.
				2 LV switchgear and distribution boards, where not included as part of the submains distribution.	LV switchgear and distribution board	(EDEPE)	
				3 Uninterruptible power supply (UPS) installations and the like, specific to external plant and equipment.	UPS	(EDEPE)	
				4 Cables and wiring, including support components from subdistribution boards to fuse connection units and the like.	LV cables and wiring	UPS	
				5 Conduits and cable trunking, including all fittings and support components.	Conduits, cable trunking and supports	(EDEPE)	
				6 Earthing and bonding components.	Earthing and bonding	(EDEPE)	
				7 Constructing draw pits, including access covers.	Draw pits	Earthing and bonding	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
				8 Marker tape, cover tiles and other special protection for electrical cables.	Marker tape	(EDEPE)	M2 – The length of linear components measured is their extreme length, over all obstructions. M3 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element. M4 – Work outside the curtilage of the site is to be described and identified separately. M5 – Contractor-designed work is to be described and identified separately. **Note:** Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project). M6 – The percentage additions for testing and commissioning are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of both testing and commissioning. N/A – Not applicable to renewal and/or maintain work.
				9 Fuse connection units and other outlet accessories.	Fuse connection units	(EDEPE)	
				10 Final connections to equipment (e.g. to pumping stations and ejector stations).	N/A	(EDEPE)	
				11 Separate power installations to specialist mechanical and electrical equipment (e.g. to sewage treatment plant).	Specialist power installations	N/A	
				12 Final connections to specialist mechanical and electrical equipment where not carried out by the equipment installer.	N/A	(EDEPE)	
			item	13 Sundry items – details to be stated.	Actions arising from maintenance and planned inspections	Planned inspections	
			note	15 Subcontractor on costs (where applicable).	Subcontractor on cost	Subcontractor on costs	
		2 Connections to external equipment: details to be stated.	m	See items included in component 1 – Connections to external plant or equipment, as appropriate.	N/A	(EDEPE)	
		3 Service runs: details to be stated.		See items included in component 1 – Connections to external plant or equipment, as appropriate.	N/A	(EDEPE)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
		4 Testing of installations. 5 Commissioning of installations.	%	14 Testing and commissioning; set to works	(included in item)	(included in item)	
8.7.5	**Gas mains supply** **Definition:** Piped natural gas supply systems taking gas from the statutory undertaker's mains to the gas meter; and taking liquefied petroleum gas (LPG) from external storage vessels to distribution point, including mains gas supply and distribution of gas supply to external user points (e.g. to external plant and equipment).	1 Connections to statutory undertaker's gas main: details to be stated.	nr	1 Connections to statutory undertaker's gas main. **Note:** Items numbered 5 to 9 below are numbered 3 to 7 in NRM 1.	N/A	Gas mains supply	Component Specifications – To be described for each item 1 to 6, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. Renewal Actions **Replacement** – To include removal of existing, preparation and replacement of gas mains supply, as appropriate. **Major repairs** – To include preparation, repair and making good of gas mains supply, as appropriate. Maintain Actions **Planned** – PPM on applicable gas mains supply. **Proactive** – Visual inspection of gas mains supply. **Reactive** – Minor repairs to gas mains supply. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The length of linear components measured is their extreme length, over all obstructions.
			item	7 Sundry items – details to be stated	Actions arising from maintenance and planned inspections	Planned inspections	
			note	9 Subcontractor on costs (where applicable)	Subcontractor on costs	Subcontractor on costs	
		2 Service runs: details to be stated.	m	2 Gas main from statutory undertaker's mains to point of mains connection within building, including pipelines and fittings, excavating and backfilling trenches and the like.	Gas mains	Gas mains supply	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
				3 Connections to external plant and equipment. 4 Mains gas supply and distribution of gas supply to external plant and equipment, including pipelines and fittings, excavation and backfilling trenches.	N/A Distribution pipelines		M3 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element. M4 – Work outside the curtilage of the site is to be described and identified separately. M5 – Contractor-designed work is to be described and identified separately. **Note:** Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project). M6 – The percentage additions for testing and commissioning are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of both testing and commissioning
		3 Governing stations: details to be stated.	nr	5 Governing stations. 6 LPG installations, including storage bottles and containers, pipelines and fittings to gas distribution points in building.	Governing stations LPG installations	Gas mains supply	
		4 Testing of installations.	%	8 Testing and commissioning; set to works	(include in item)	(include in item)	
		5 Commissioning of installations.					

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
8.7.6	**Telecommunications and other communication system connections** **Definition:** Connection of telecommunications systems, cable television and other communication systems from statutory undertaker's or other service provider's supply to the main distribution point within the building.	1 Telecommunication system connections: details to be stated.	nr	1 Connections to statutory undertaker's or service provider's supply.	N/A	Telecommunications and other communication system connections (TOCSC)	<u>Component Specifications</u> – To be described for each item 1 to 4, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. **TOCSC** – telecommunication and other communication systems connections. <u>Renewal Actions</u> **Replacement** – To include removal of existing, preparation and replacement of TOCSC, as appropriate. **Major repairs** – To include preparation, repair and making good of TOCSC, as appropriate. <u>Maintain Actions</u> **Planned** – PPM on applicable TOCSC. **Proactive** – Visual inspection of TOCSC. **Reactive** – Minor repairs to TOCSC.
				2 Distribution of telecommunications, cable television, and other communication systems, including wiring to main distribution point within building, including cables, excavating and backfilling trenches and the like.	Telecomm distribution systems	(inc.)	
				3 Constructing draw pits, including access covers.	Draw pits	(inc.)	
				4 Marker tape, cover tiles and other special protection for electrical cables.	Marker tape	(inc.)	
			item	5 Sundry items – details to be stated.	Actions arising from maintenance and planned inspections	Planned inspections	
			note	7 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The length of linear components measured is their extreme length, over all obstructions. M3 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element.
		2 Cable television connections: details to be stated.	nr	Cable television connections.	N/A	(TOCSC)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
		3 Other communication system connections: details to be stated.		Other communication systems.	N/A	(TOCSC)	M4 – Work outside the curtilage of the site is to be described and identified separately. M5 – Contractor-designed work is to be described and identified separately. **Note:** Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project). M6 – The percentage additions for testing and commissioning are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of both testing and commissioning.
		4 Service runs: details to be stated.	m	Service runs.	Service runs	(TOCSC)	
		5 Testing of installations.	%	6 Testing and commissioning; set to work.	(include in item)	(include in item)	
		6 Commissioning of installations.					
8.7.7	**External fuel storage and piped distribution systems** **Definition:** Storage tanks and vessels external to building, and piped supply systems distributing oil, petrol or diesel from storage tanks or vessels to the entry point within building or to external plant and equipment.	1 Fuel storage and piped distribution systems: details to be stated.	nr	1 Oil, petrol and diesel.	Oil, petrol and diesel	Fuel storage and piped distribution systems (FSPD)	**Component Specifications** – To be described for each item 1 to 11, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. FSPD – included in fuel storage and piped distribution system. **Renewal Actions** **Replacement** – To include removal of existing, preparation and replacement of fuel storage and piped distribution systems, as appropriate. **Major repairs** – To include preparation, repair and making good of fuel storage and piped distribution systems, as appropriate. **Maintain Actions** **Planned** – PPM on applicable fuel storage and piped distribution systems. **Proactive** – Visual inspection of fuel storage and piped distribution systems. **Reactive** – Minor repairs to fuel storage and piped distribution systems.
			nr	2 Storage tanks and vessels not supplied in connection with heat source installations.	Storage tanks and vessels	(FSPD)	
			N/A	3 Proprietary supports forming an integral part of the storage tank/vessel unit.	Proprietary supports	(FSPD)	
			N/A	4 Off-site painting/anti-corrosion treatments.	Off-site painting/anti-corrosion treatments	(FSPD)	
			N/A	5 Connections to external plant and equipment.	N/A	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
			m	6 Distribution pipelines and pipeline fittings, from storage tank or vessel to plant or equipment being served, above- and below-ground, including excavating and backfilling trenches and the like.	Pipelines, and fittings	(FSPD)	M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The length of linear components measured is their extreme length, over all obstructions.
			nr	7 Pipeline components/ancillaries (e.g. valves and pumps).	Pipelines components/ancillaries	(FSPD)	M3 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element.
			nr/(m^2)	8 Thermal insulation.	Thermal insulation	Thermal insulation	M4 – Work outside the curtilage of the site is to be described and identified separately.
			nr/(m^2)	9 Off-site painting/anti-corrosion treatments.	(Taken in item 4)	(FSPD)	M5 – Contractor-designed work is to be described and identified separately. **Note:** Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project).
			N/A	10 Meters.	Meters	N/A	M6 – The percentage additions for testing and commissioning are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of both testing and commissioning.
			nr	11 Monitoring equipment.	Monitoring equipment	Monitoring equipment	
			item	12 Sundry items – details to be stated.	Actions arising from maintenance and planned inspections	Planned inspections	
			note	14 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
		2 Service runs: details to be stated.	m	See item 5–11 above.	Service runs	(FSPD)	
		3 Testing of installations.	%	13 Testing and commissioning; set to works.	(include in item)	(include in item)	
		4 Commissioning of installations.					
8.7.8	**External security systems** **Definition:** External observation and access control installations and the like.	1 Surveillance equipment: details of each type of system to be stated.	item/nr	1 Surveillance equipment (e.g. CCTV).	Surveillance equipment	External security systems (ESS)	<u>Component Specifications</u> – To be described for each item 1 to 12, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. ESS – included in external security systems <u>Renewal Actions</u> **Replacement** – To include removal of existing, preparation and replacement of external security systems, as appropriate. **Major repairs** – To include preparation, repair and making good of external security systems, as appropriate. <u>Maintain Actions</u> **Planned** – PPM on applicable external security systems. **Proactive** – Visual inspection of external security systems. **Reactive** – Minor repairs to external security systems.
				9 Camera poles and the like, including excavating, concreting and backfilling holes for poles and the like.	Camera poles	(ESS)	
				10 General power installations to external security systems, including cables, excavating and backfilling trenches and the like.	General power installations	(ESS)	
				11 Constructing draw pits, including access covers.	Draw pits	(ESS)	
				12 Marker tape, cover tiles and other special protection for electrical cables.	Marker tape	(ESS)	

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
		item	13 Sundry items – details to be stated.	Actions arising from maintenance and planned inspections	Planned inspections	M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Where components are to be itemised, the number of key elements comprising the component are to be identified, described and enumerated within the description of the component. M3 – The length of linear components measured is their extreme length, over all obstructions. M4 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element. M5 – Work outside the curtilage of the site is to be described and identified separately. M6 – Contractor-designed work is to be described and identified separately. **Note:** Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project). M7 – State if external security systems are included with building security systems (cross-reference to sub-element 5.12.2: Security systems). M8 – The percentage additions for testing and commissioning are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of both testing and commissioning.
		note	15 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	
	2 Security detection equipment: details of each type of system to be stated.	item/nr	2 Security detection equipment.	Security detection	(ESS)	
	3 Security alarm equipment: details of each type of system to be stated.	nr	3 Security alarm equipment.	Security alarms	(ESS)	
	4 Gate access control systems: details of each type of system to be stated.	nr	4 Gate access control systems.	Gate access control	(ESS)	
	5 Gate entry systems: details of each type of system to be stated.		5 Gate entry systems (audio and visual).	Gate entry systems	(ESS)	
	6 Security lights and lighting systems: details of each type of system to be stated.	item/nr	6 Security lights and lighting systems.	Security lighting	(ESS)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
		7 Other security systems: details of each type of system to be stated.		7 Other security systems.	Other security systems	(ESS)	
		8 Service runs: details to be stated.	m	8 Cables/wiring and interlinking components of external security systems, including excavating and backfilling trenches, protection and the like.	Cables/wiring	(ESS)	
		9 Testing of installations.	%	14 Testing and commissioning; reset to work	(include in item)	(include in item)	
		10 Commissioning of installations.					
8.7.9	**Site/street lighting systems** **Definition:** External illumination systems, including lighting to pedestrian areas, paths and roads, and illuminated traffic signs.	1 External lighting to pedestrian areas: details to be stated.	nr	1 External lighting, columns, poles, bollards, masts, luminaires and lamps, cables and lighting to external surfaces/areas.	External lighting	Site/street lighting systems (SSLS)	Component Specifications – To be described for each item 1 to 9, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. **SSS** – included in sites/ street lighting systems
				2 Fixing luminaires and lamps to building fabric.	Luminaires and lamps	(SSLS)	Renewal Actions **Replacement** – To include removal of existing, preparation and replacement of site/street lighting systems, as appropriate.
				4 General power installations to external illumination systems, including cables, excavating and backfilling trenches and the like.	General power installations	(SSLS)	**Major repairs** – To include preparation, repair and making good of site/street lighting systems, as appropriate.
				5 Constructing draw pits, including access covers.	Draw pits	(SSLS)	Maintain Actions **Planned** – PPM on applicable site/street lighting systems.
				6 Marker tape, cover tiles and other special protection for electrical cables.	Marker tape	(SSLS)	**Proactive** – Visual inspection of site/street lighting systems. **Reactive** – Minor repairs to site/street lighting systems.

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
				7 Luminaires and lamps.	Luminaires/lamps	(SSLS)	M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element. M3 – Work outside the curtilage of the site is to be described and identified separately. M4 – Contractor-designed work is to be described and identified separately. **Note:** Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project). M5 – The percentage additions for testing and commissioning are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of both testing and commissioning.
				8 Lighting control points.	Lighting control points	(SSLS)	
				9 Painting and anti-corrosion treatments to poles, bollards, masts and the like.	Painting and preservative treatment	(SSLS)	
		2 External lighting to paths: details to be stated.	nr	See items in component 1 – External lighting to pedestrian areas, as appropriate.		Site/street lighting systems	
		3 External lighting to roads: details to be stated.		See items in component 1 – External lighting to pedestrian areas, as appropriate.		Site/street lighting systems	
		4 Illuminated traffic signs: details to be stated.		3 Illuminated traffic signs.	Illuminated traffic signs	Site/street lighting systems	
		5 Testing of installations.	%	11 Testing and commissioning; set to works.	(include in item)	(include in item)	
		6 Commissioning of installations.					
			item	10 Sundry items – details to be stated.	Actions arising from maintenance and planned inspections	Planned inspections	
			note	12 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
8.7.10	**Local/district heating installations** **Definition:** Local/district heating installations, including heat source.	1 Heat source associated plant and equipment: details to be stated.	item/nr	1 Externally located heat source (e.g. boiler plant), including ancillary plant and equipment.	Heat source, associated plant and equipment	Local/district heating installations (LDHI)	<u>Component Specifications</u> – To be described for each item 1 to 6, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. **LDHI** - included in local district heating installations <u>Renewal Actions</u> **Replacement** – To include removal of existing, preparation and replacement of local/district heating systems, as appropriate. **Major repairs** – To include preparation, repair and making good of local/district heating systems, as appropriate. <u>Maintain Actions</u> **Planned** – PPM on applicable local/district heating systems. **Proactive** – Visual inspection of local/district heating systems. **Reactive** – Minor repairs to local/district heating systems M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Where components are to be itemised, the number of key elements comprising the component are to be identified, described and enumerated within the description of the component.
				2 Instrumentation and control components to heat source.	Instrumentation and control components	(LDHI)	
				5 Instrumentation and control components to heating systems.	Instrumentation and control components	(LDHI)	
				6 Thermal insulation.	Thermal insulations	(LDHI)	
		2 Service runs: details to be stated.	m	3 Heat distribution pipelines from heat source to point of entry into building, including pipelines, pipeline fittings and ancillaries (e.g. valves and pumps).	Heat distribution pipelines	(LDHI)	
		3 External heating ducts and duct access covers: details to be stated.		4 Heating ducts and access covers to local/district heating pipelines.	Heating ducts and access covers	(LDHI)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
		4 Testing of installations.	%	8 Testing and commissioning; set to works	(include in item)	(include in item)	M3 – The length of linear components measured is their extreme length, over all obstructions. M4 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element. M5 – Work outside the curtilage of the site is to be described and identified separately. M6 – Contractor-designed work is to be described and identified separately. **Note:** Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project). M7 – The percentage additions for testing and commissioning are to be applied to the total cost of the items comprising the sub-element. A single combined percentage addition can be applied to cover the costs of both testing and commissioning.
		5 Commissioning of installations.					
			item	7 Sundry items – details to be stated.	Actions arising from maintenance and planned inspections	Planned inspections	
			note	9 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	
8.7.11	**Builder's work in connection with external services** **Definition:** Sundry builder's work associated with the installation of water, gas, electricity, heating, ventilation, above-ground drainage, telecommunications and other services.	1 Ducts and the like: details to be stated.	nr/m	1 Ducts and the like for external mains services.	Ducts	Builder's work in connection with external services (BWIC)	Component Specifications – To be described for each item 1 to 13, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. Renewal Actions **Replacement** – To include removal of existing, preparation and replacement of builder's work in connection with external services, as appropriate. **Major repairs** – To include preparation, repair and making good of builder's work in connection with external services, as appropriate.
				7 On-site painting or anti-corrosion treatments of mechanical services equipment, including fuel storage tanks and vessels, pipelines and the like.	On-site painting or anti-corrosion treatments	(BWIC)	
				8 Forming/cutting holes, mortices, sinkings, chases and the like, including making good.	N/A	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
				9 Pipe ducts, sleeves and the like.	Pipe ducts and sleeves	(BWIC)	<u>Maintain Actions</u> **Planned** – PPM on applicable builder's work in connection with external services. **Proactive** – Visual inspection of builder's work in connection with external services. **Reactive** – Minor repairs to builder's work in connection with external services. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Where components are to be itemised, the number of key elements comprising the component are to be identified, described and enumerated within the description of the component. M3 – Where the linear length of a component is to be measured, the length measured is its extreme length, over all fittings and the like.
				10 Trench covers, duct covers and frames.	Trench covers, duct covers and frames	(BWIC)	
				11 Stopping-up and sealing holes.	N/A	(BWIC)	
				12 Fire-resistant stopping, including fire sleeves.	Fire-resistant stopping	(BWIC)	
				13 Identification labelling and colour coding of services installations and systems.	Identification labelling and colour coding	(BWIC)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
			item	15 Sundry items – details to be stated.	Actions arising from planned inspection	Planned inspections	M4 – Where a percentage addition is to be applied, the percentage addition is to be applied to the cost targets for sub-elements 8.7.1 to 8.7.11 inclusive, as appropriate. Each system is to be identified separately. M5 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element. M6 – Work to existing buildings is to be described and identified separately. M7 – Work outside the curtilage of the site is to be described and identified separately. M8 – Contractor-designed work is to be described and identified separately. **Note** – Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project). N/A – Not applicable to renewal and/or maintain work.
			note	17 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	
		2 Supports to external storage tanks, vessels and the like: details to be stated.	item/nr	2 Supports to external storage tanks, vessels and the like.	Supports to external storage tanks	(BWIC)	
		3 Fuel bunds and the like to storage/retention tanks and vessels: details to be stated.		3 Fuel bunds and the like to storage/retention tanks and vessels.	Fuel bunds	(BWIC)	
		4 Protective compounds, fencing, storage racks associated with LPG installations and the like: details to be stated.		4 Protective compounds, fencing, storage racks associated with LPG installations and the like.	Compounds and fencing for LPG	(BWIC)	
		5 Protective compounds, connected with transformer substations and the like: details to be stated.		5 Protective compounds connected with transformer substations and the like.	Compounds connected with transformer substations	(BWIC)	
		6 Bases for services equipment: details, including size, to be stated.	nr	6 Bases for services equipment, including for transformation devices (i.e. wind turbines, photovoltaic devices and the like).	Bases for services equipment	(BWIC)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
		7 Other builder's work in connection with external services: details to be stated.	nr	14 Other builder's work items in connection with external services.	Other BWIC	(BWIC)	
		8 Testing of installations.	%	16 Testing and commissioning; set to works.	(include in item)	(include in item)	
		9 Commissioning of installations.					

Element 8.8: Minor building works and ancillary buildings

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
8.8.1	**Minor building works** **Definitions:** Refurbishment of and alteration to existing separate external small ancillary buildings, including overhauling existing mechanical and electrical plant and equipment	1 Refurbishment of existing ancillary buildings: details, including GIFA (m^2), to be stated.	item/nr	1 Refurbishment (including alterations) of existing separate external small ancillary buildings (e.g. boiler houses). 4 Works arising out of party wall awards/agreements. 5 Other minor building works to ancillary buildings.	N/A	N/A	N/A – Not applicable to renewal and/or maintain work. M1 – Where components are to be enumerated, the number of components is to be stated. M2 – Where components are to be itemised, the number of key elements comprising the component are to be identified, described and enumerated within the description of the component. M3 –The area measured is the gross internal floor area (GIFA), measured using the rules of measurement for ascertaining GIFA. M4 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element. M5 – Work outside the curtilage of the site is to be described and identified separately. M6 – Contractor-designed work is to be described and identified separately. **Note:** Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project).
		2 Overhauling existing mechanical and electrical plant and equipment: details to be stated.	item/nr	2 Overhauling existing mechanical and electrical plant and equipment (externally located).	N/A	N/A	
		3 Repairs to existing fences, railings, walls and screen walls: details to be stated.	nr/m	3 Repairs to existing fences, railings, walls, screen walls and retaining walls.	N/A	N/A	
			item	6 Sundry items.	N/A	N/A	
			note	7 Subcontractor on costs.	N/A	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
8.8.2	**Ancillary buildings and structures** **Definition:** Separate external small ancillary building and structures, including specialist structures	1 Minor ancillary buildings – built: details including GIFA (m^2), to be stated.	nr	1 Boiler houses.	Boiler houses	Ancillary buildings and structures (ABS)	<u>Renewal Actions</u> **Replacement** – To include removal of existing, preparation and replacement of ancillary buildings and structures, as appropriate. **Major repairs** – To include preparation, repair and making good of ancillary buildings and structures, as appropriate. <u>Component Specifications</u> – To be described for each item 1 to 9, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. ABB – included in ancillary buildings and structures. <u>Maintain Actions</u> **Planned** – PPM on applicable ancillary buildings and structures. **Proactive** – Visual inspection of ancillary buildings and structures. **Reactive** – Minor repairs to ancillary buildings and structures M1 – Where components are to be enumerated, the number of components is to be stated. M2 – The area measured is the gross internal floor area (GIFA), measured using the rules of measurement for ascertaining GIFA.
				2 Substation buildings or housings, where not supplied and installed by the statutory undertaker.	Substation buildings or housings	(ABS)	
				3 Fuel storage buildings and the like.	Fuel storage buildings	(ABS)	
				4 Specialist structures (e.g. external cooling towers).	Specialist structures	(ABS)	
				5 Bicycle stores.	Bicycle stores	(ABS)	
				6 Prefabricated/timber workshops, sheds, stores and the like.	Prefabricated/timber workshops, sheds, stores	(ABS)	
				7 Guard huts and the like.	Guard huts	(ABS)	
				8 Canopies to external areas.	Canopies to external areas	(ABS)	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
				9 Other ancillary buildings.	Other ancillary buildings	(ABS)	M3 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element. M4 – Work outside the curtilage of the site is to be described and identified separately. M5 – Work arising out of party wall awards/agreements is to be described and identified separately. M6 – Contractor-designed work is to be described and identified separately. **Note:** Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project).
		2 Minor ancillary buildings – prefabricated.	nr	See items included in component 1 – Minor ancillary buildings – built, as appropriate.		Ancillary buildings and structures	
			item	10 Sundry items – details to be stated.	Sundry items	Sundry items	
			note	11 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	
8.8.3	**Underpinning to external site boundary walls**	1 Underpinning to external site boundary walls and the like.	m	1 Underpinning to external site boundary walls.	Underpinning	N/A	Component Specifications – To be described for each item 1 to 8, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. Renewal Actions **Underpinning works** – As per rule M1 to M5 above. Maintain Actions – Covered by structural surveys included in group element 11: Consultants' and specialists' fees. M1 – The length of underpinning measured is the extreme length.
				2 Preliminary trenches and underpinning pits, excavation and earthwork support.	(included)	N/A	
				3 Temporary supports.	(included)	N/A	
				4 Disposal of excavated material.	(included)	N/A	

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
					Renewal (R)	Maintain (M)	
				5 Cutting away existing projecting foundations and the like.	(included)	N/A	M2 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m^2), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element. M3 – Curved work is to be described and identified separately. M4 – Work arising out of party wall awards/agreements is to be described and identified separately. M5 – Contractor-designed work is to be described and identified separately. **Note:** Applies only when the contractor is responsible for designing specific elements and/or components of the building project (i.e. not the entire building project). N/A – Not applicable to renewal and/or maintain work.
				6 Preparing existing work to receive pinning-up of new work.	(included)	N/A	
				7 Concrete, including reinforcement and formwork.	(included)	N/A	
				8 Masonry (brickwork, blockwork and the like).	(included)	N/A	
			item	9 Sundry items – details to be stated.	Sundry items	N/A	
			note	10 Subcontractor on costs (where applicable).	Subcontractor on costs	N/A	

Group element 9: Maintenance contractor's management and administration costs

Group element 9 comprises the following elements:

9.1 Employer's requirements:

- 9.1.1 Site accommodation
- 9.1.2 Site records
- 9.1.3 Completion and post-completion requirements

9.2 Main contractor's cost items:

- 9.2.1 Management and staff
- 9.2.2 Site establishment
- 9.2.3 Temporary services
- 9.2.4 Security
- 9.2.5 Safety and environmental protection
- 9.2.6 Control and protection
- 9.2.7 Mechanical plant
- 9.2.8 Temporary works
- 9.2.9 Site records
- 9.2.10 Completion and post-completion requirements
- 9.2.11 Cleaning
- 9.2.12 Fees and charges
- 9.2.13 Site services
- 9.2.14 Insurance, bonds, guarantees and warranties.

Note 1: Where the unit of measurement for a component or a sub-component has been given as 'per week', a week shall mean a period of 7 calendar days irrespective of public holidays.

Note 2: Works associated with general site preparation and groundworks, minor demolition works, and permanent roads, paths and pavings are included in group element 8: External works. The provision of temporary roads and services is included in group element 9: Maintenance contractor's management and administration costs.

Element 9.1: Employer's requirements

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Excluded
9.1.1	**Site accommodation**	1 Site accommodation.	T/E	May be included in section 12.	Employer's site accommodation is not part of NRM 3.
		2 Furniture and equipment.	T/E	May be included in section 12.	Employer's furniture and equipment are not part of NRM 3.
		3 Telecommunications and IT systems.	T/E	May be included in section 12.	Employer's telecommunications and IT systems are not part of NRM 3.
9.1.2	**Site records**	1 Site records.	T/E	Updating O+M manuals – include with section 12.	1 Operation and maintenance manuals (paper and electronic copies on CD ROM/DVD/USB).
				Updating CDM files include in section 12.	2 Compilation of health and safety file (if required by installation contractor – paper and electronic copies on CD ROM/DVD/USB) (part of NRM 1 works).
			nr	3 Web-based facilities management systems for the collation, review and delivery of maintenance requirements, commissioning, asset and other facilities management-related information, and health and safety file: – program software and installation – hardware (e.g. computers, monitors, printers, etc).	
			item	Uploading data and initial implementation and training of building management team by system provider.	3 Attendance on system provider by maintenance contractor (included in component 9.2.9.2: Web-based facilities management systems).

Sub-element		Component	Unit	Included (aligned to NRM 1 structure)	Excluded
9.1.3	**Completion, handover and post-occupancy requirements**	1 Handover requirements.	T/E	May be included in section 12.	1 Training of building user's staff in the operation and maintenance of the building engineering services systems (part of construction project works).
			item	2 Provision of spare parts for maintenance of building engineering services.	
				3 Provision of tools and portable indicating instruments for the operation and maintenance of building engineering services systems.	
		2 Operation and maintenance services.	per week	1 Operation and maintenance of building engineering services installations, mechanical plant and equipment and the like during the defects liability period, period for rectifying defects, maintenance period or other specified period (i.e. additional services to those normally required by the contract).	1 Ongoing maintenance of internal and external planting (included in sub-element 4.1.7: Internal planting and sub-element 8.3.2: External planting, as appropriate.

Element 9.2: Maintenance contractor's cost items

Subelement		Component	Unit	Included (aligned to NRM 1 structure)	Excluded
9.2.1	**Management and staff**	1 Contract-specific management and staff.	per week (number of staff by number of man hours per week by number of weeks)	Maintenance contractor's specific management and staff such as:	1 External design consultants (included in group element 11: Consultants' and specialists' fees).
				1 Maintenance contractor's account manager.	
				2 Maintenance manager.	2 Security staff (included in sub-element 9.2.4: Security).
				3 Supervisors, including works/trade-package managers, building services engineering managers/co-ordinators and off-site production managers.	
				4 Health and safety manager/officers.	
				5 Commissioning manager – building engineering services.	
				6 Materials management staff (e.g. store man).	
				7 Administrative staff, including secretary, document controllers, finance clerks and the like.	
				8 Other management and staff.	
		2 Visiting management and staff.	per week (number of staff by number of man hours per week by number of weeks)	Maintenance contractor's visiting management and staff such as:	1 Visiting management and staff for which an allowance has been made within the maintenance contractor's overheads (included in element 10.1: Maintenance contractor's overheads).
				1 Managing director, regional director, operations director, commercial director and the like.	
				2 Quality manager.	
				3 Contract/commercial manager.	
				4 Health and safety manager.	
				5 Environmental manager/consultant.	
				6 Other visiting management and staff.	

Subelement		Component	Unit	Included (aligned to NRM 1 structure)	Excluded
		3 Extraordinary support costs (if required under the terms of the maintenance contract).	item	1 Legal advice costs (i.e. solicitors).	1 Extraordinary support costs for which an allowance has been made *within the maintenance contractor's overheads (included in element 10.1: Maintenance contractor's overheads).*
				2 Recruitment costs.	
				3 Team-building costs.	
				4 Other extraordinary support costs.	
			per week (number of days per week by number of weeks)	5 Day transport.	
				6 Personnel transport (i.e. transportation of work operatives to site).	
			per week (number of staff by number of days by number of weeks)	7 Temporary living accommodation (e.g. long/medium term accommodation costs).	
				8 Subsistence payments.	
				9 Out-of-hours provision.	
		4 Staff travel.	nr (number of occasions)	Maintenance contractor's visiting management and staff such as:	
				1 Visits to employer and consultants' office.	
				2 Visits to subcontractor's office/works.	
				3 Overseas visits.	
				4 Accommodation charges and overnight expenses.	
9.2.2	**Site establishment**	1 Site accommodation.	T/E	May be included in section 12.	Site accommodation for site establishment is not part of NRM 3.
		2 Temporary works in connection with site establishment.	T/E	May be included in section 12.	Temporary works for site establishment is not part of NRM 3.
		3 Furniture and equipment.	T/E	May be included in section 12.	Furniture and equipment for temporary site accommodation is not part of NRM 3.

Subelement		Component	Unit	Included (aligned to NRM 1 structure)	Excluded
		4 IT systems.	per person (nr)	1 Computer hardware, including purchase/rental, installation, initial set-up, maintenance and running costs, such as: desktop computers and laptop computers, CAD stations, server and network equipment, printers and plotters, other computer system hardware.	1 Computer and printer consumables (included in component 9.2.2.5: Consumables and services).
				2 Software and software licences.	2 Document management, including electronic data management systems (included in component 9.2.2.6: Bought-in services).
				3 Internet lines, modems, routers and connections (i.e. email and internet capability).	
				4 Wide area network (WAN lines and connections (if on WAN).	
				5 Line rental charges.	
				6 Internet/website addresses.	
				7 Internet service provider (ISP) charges.	
			per week (number of staff by number of weeks)	8 Line calls charges.	
			per person (nr)	9 IT support and maintenance.	
		5 Consumables and services.	quantity per week	1 Stationery.	
				2 Computer and printer consumables (e.g. ink cartridges).	
				3 Postage.	
				4 Courier charges.	
				5 Tea, coffee, water bottles and the like.	
				6 First aid consumables.	
				7 Photocopier consumables (e.g. paper and toners).	
				8 Fax consumables (e.g. paper and toners).	

Subelement		Component	Unit	Included (aligned to NRM 1 structure)	Excluded
				9 Drawing printer consumables (e.g. ink cartridges).	
		6 Bought-in services. **Definition:** Services outsourced by the maintenance contractor.	T/E	May be included in section 12: Employer definable maintenance related costs.	Bought-in services are not part of NRM 3.
		7 Sundries.	item	1 Maintenance contractor's signboards.	
				2 Safety and information notice boards.	
					3 Fire points.
				4 Shelters.	
				5 Tool stores.	
				N/A	6 Crane signage.
					7 Employer's composite signboards.
9.2.3	**Temporary services**		T/E	Taken with work item costs.	Temporary services are not part of NRM 3.
9.2.4	**Security**	1 Security staff.		Security staff is covered by security (part of operations costs – if part of wider LCC).	Security staff are not part of NRM3.
		2 Security equipment.		Security pass is covered by security (part of operations costs– if part of wider LCC).	Provision of security equipment is not part of NRM3.
			Taken elsewhere	See sub-element 8.7.8: External services (External security systems) for permanent provision.	Taken in external 8.7.8
		3 Hoardings, fences and gates.	nr/mr/item	Security hoardings covered by security (part of operations costs – if part of wider LCC).	Provision of hoardings, fencing and gates is not part of NRM 3.
			nr/m/item	See element 8.4: Fencing, railings and walls for permanent provision.	

Subelement		Component	Unit	Included (aligned to NRM 1 structure)	Excluded
9.2.5	**Safety and environmental protection** **Definition:** Works required to satisfy requirements of CDM Regulations.	1 Safety programme.	per week (number of staff by number of man hours per week by number of weeks)	Works required to satisfy requirements of CDM Regulations.	1 Health and safety manager/officers (included in sub-element 9.2.1: Management and staff). 2 Welfare facilities (included in sub-element 9.2.2: Site establishment).
				1 Health and safety manager/officers.	
			nr	2 Safety audits, including safety audits carried out by external consultant.	
				3 Staff safety training.	
			item	4 Site safety incentive scheme	
				5 Notices and information to neighbours.	
			per set (nr)	6 Personal protective equipment (PPE), including those for the employer and consultants.	
				7 Personal protective equipment (PPE) for multi-service gangs.	
			nr	8 Fire points.	
				9 Temporary fire alarms.	
				10 Fire extinguishers.	
			item	11 Statutory safety signage.	
			per week /number of weeks	Include if part of wider LCC.	12 Nurse.
				Include if part of wider LCC.	13 Traffic marshals.
				Include if part of wider LCC.	14 Temporary traffic lights.

Subelement		Component	Unit	Included (aligned to NRM 1 structure)	Excluded
		2 Barriers and safety scaffolding.	per week/item	1 Guard rails and edge protection (e.g. to edges of suspended slabs and roofs), including supply, erection, maintenance and dismantling on completion of the works.	1 Debris netting/plastic sheeting provided as part of access scaffolding (included in sub-element 9.2.8: Temporary works). 2 Fan protection provided as part of access scaffolding (included in sub-element 9.2.8: Temporary works).
				2 Temporary staircase balustrades (i.e. to new staircases during construction), including supply, erection, maintenance and dismantling on completion of the works.	
				3 Lift shaft protection, including supply, erection, maintenance and dismantling on completion of the works.	
				4 Protection to holes and openings in ground floor slabs, suspended slabs and the like, including supply, erection, maintenance and dismantling on completion of the works.	
				5 Debris netting/plastic sheeting, including supply, erection, maintenance and dismantling on completion of the works.	
				6 Fan protection, including supply, erection, maintenance and dismantling on completion of the works.	
			per week (number of inspections by number of weeks)	7 Scaffold inspections.	
			per week/item	8 Hoist run-offs, including supply, erection, maintenance and dismantling on completion of the works.	
				9 Protective walkways, including supply, erection, maintenance and dismantling on completion of the works.	
				10 Other safety measures, including supply, erection, maintenance and dismantling on completion of the works.	

Subelement		Component	Unit	Included (aligned to NRM 1 structure)	Excluded
		3 Environmental protection measures.	T/E	Part of operation costs – include if part of wider LCC.	Environmental protection measures are not part of NRM 3. Environmental monitoring (included in sub-element 9.2.5: Safety and environmental protection).
9.2.6	**Control and protection**	1 Surveys, inspections and monitoring.	T/E	Taken elsewhere in specialist/consultancy fees.	Refer to specialist fees in table 11.
		2 Setting out.	T/E	Included with construction work items (taken elsewhere).	Part of work item
		3 Protection of works.	T/E	Included with construction work items (taken elsewhere).	
		4 Samples.	T/E	Construction-related samples.	
		5 Environmental control of building.	T/E	Temporary environmental control of buildings.	Covered by operation costs
9.2.7	**Mechanical plant**	1 Generally.		Common user mechanical plant and equipment used specifically for renewal and maintain works.	Plant and equipment used for specific construction operations, such as: 1 Earthmoving plant (included in group element 1: Substructure, group element 8: External works, or group element 0: Facilitating works, as appropriate). 2 Piling plant (included in group element 1: Substructure or group element 8: External works, as appropriate). 3 Paving and surfacings plant (included in group element 8: External works). 4 Wheel spinners and road sweepers (included in component 9.2.11.2: Maintenance of roads, paths and pavings). 5 Access scaffolding (included in sub-element 9.2.8: Temporary works).
		2 Tower cranes.		Type of craneage to be provided shall be stated (each type separately quantified).	1 Temporary electrical supply to tower crane (included in sub-element 9.2.3: Temporary services).
			per week	1 Hire charges (type of tower crane to be stated, including type and length of jib, and lifting capacity).	

Subelement	Component	Unit	Included (aligned to NRM 1 structure)	Excluded
		per week (number of operators by number of man hours per week by number of weeks)	2 Crane operator. 3 Overtime for crane and operator.	
		nr (number of bases)	4 Piles for tower crane bases, including installation and removal on completion of the works (size of base in m^2, and number of piles supporting base, to be stated).	
		m^2	5 Temporary bases and/or ground anchors for tower cranes, including installation, maintenance, removal and reinstatement of all disturbed surfaces on completion of the works (size of base in m^2 to be stated).	
		per week	6 Ties.	
		nr	7 Connections to temporary electrical supply. 8 Bring to site, erection, test and commission.	
		per week	9 Periodic safety checks/inspections.	
		nr	10 Dismantling and removing from site.	
		item	11 Other costs specific to tower crane such as: chain pack and sundries, relief operator, banksman and man cage.	
				12 Temporary voids in building structure for craneage, hoists and the like including filling voids after removal. **Note:** Where tower crane is sited within building structure, the completion of works in connection with the building structure and fabric shall be measured in accordance with the measurement rules for the specific types of work required (e.g. infilling of voids within suspended floor construction shall be measured in accordance with element 2.2: Upper floors).

Subelement		Component	Unit	Included (aligned to NRM 1 structure)	Excluded
		3 Mobile cranes.	per week (number of days hired per week by number of weeks)	1 Mobile crane hire charges, including driver/operator charges (type of mobile crane to be stated).	
			per week (number man hours per visit, or day hired, by number of days hired per week by number of weeks)	2 Attendance.	
			nr (cost per visit)	3 Other costs specific to mobile crane hire.	
		4 Hoists: type of hoist to be provided shall be stated (each type separately quantified).	per week	State type of hoists t be provided and include protection systems and bringing to site, erecting, testing and commissioning, and dismantling and removing form site after the works completed	Provision of hoists is not part of NRM 3.
		5 Access plant.	item	1 Fork lifts.	
				2 Scissor lifts.	
				3 Loading platforms.	
				4 Maintenance of mechanical access equipment.	
				5 Other costs specific to mechanical access equipment.	
		6 Concrete plant.	per week	Include plant operator and bases for plant, including power connections and bringing plant to site erecting, testing and commissioning and dismantling and removing from site.	
		7 Other plant.	per week	Small plant and tools.	

Subelement		Component	Unit	Included (aligned to NRM 1 structure)	Excluded
9.2.8	**Temporary works**	1 Access scaffolding.		User access scaffolding (type of stated) – including bringing to site, erecting and initial safety checks; dismantling and removing form site after works completed.	
		2 Temporary works.		Common user temporary works – (type to be stated) e.g. crash decks, protection to existing trees and floodlights, etc.	
9.2.9	**Site records**	1 Maintenance records.	item	Unless otherwise indicated, costs associated with the following shall be deemed to be included in management and staff costs:	
				1 Photography:	
				– camera purchase	
				– consumables	
				– printing and presentation.	
				2 Maintenance records:	
				– progress reporting	
				– operation and maintenance manuals	
				– as-built/installed drawings and schedules	
				– co-ordinating, gathering and compiling health and safety information and presentation to CDM co-ordinator	
				– compilation of health and safety file (if required).	
		22 Web-based facilities management systems.	per week (number of operators by number of man hours per week by number of weeks)	2 Attendance on system provider.	

Subelement		Component	Unit	Included (aligned to NRM 1 structure)	Excluded
9.2.10	Transition and exit requirements	1 Testing and commissioning plan.	item	Costs associated with the following shall be deemed to be included in sub-element 9.2.1: Management and staff costs: 1 Preparation of commissioning plan.	1 Testing and commissioning of services (included in group element 5: Services and/or group element 8: External works, as appropriate.
		2 Handover.	item	Unless otherwise indicated, costs associated with the following shall be deemed to be included in sub-element 9.2.1: Management and staff costs: 1 Preparation of handover plan.	
				2 Training of building user's staff in the operation and maintenance of the building engineering services systems.	
				3 Provision of spare parts for maintenance of building engineering services.	
				4 Provision of tools and portable indicating instruments for the operation and maintenance of building engineering services systems.	
				5 Pre-completion inspections.	
				6 Final inspections.	
		3 Post-completion services.	T/E	May be included in section 12.	Post-completion services are not part of NRM 3.
9.2.11	**Cleaning**	1 Site tidy.		Site tidy.	
		2 Maintenance of roads, paths and pavings.		Maintenance of roads, paths and pavings.	
9.2.12	**Fees and charges**	1 Fees.	item	1 Building control fees, where not paid by the employer.	1 Building control fees, where paid by the employer (included in group element 11: Consultants' and specialists' fees). 2 Oversailing fees, where paid by the employer (included in group element 11: Consultants' and specialists' fees). 3 Building scheme registration fees or similar fees, where paid by the employer (included in group element 11: Consultants' and specialists' fees).
				2 Oversailing fees, where not paid by the employer.	
				3 Considerate Constructors' Scheme fees (or alternative scheme operated by local authority).	
				4 Building scheme registration fees (e.g. NHBC Buildmark) or similar fees, where not paid by the employer.	
		2 Charges.	N/A	Charges for temporary works and licences are not part of NRM 3.	1 Statutory undertaker's charges in connection with permanent services to the building (included in element 8.7: External services, as appropriate).

Subelement		Component	Unit	Included (aligned to NRM 1 structure)	Excluded
					2 Statutory undertaker's charges in connection with temporary services (included in sub-element 9.2.3: Temporary services).
9.2.13	**Site services**	1 Temporary works.	taken with work item elsewhere	Temporary works are not part of NRM 3.	1 Temporary screens (included in sub-element 7.1.1: Minor demolition works and alteration works). 2 Supports to small openings cut into existing walls or after removal of internal walls and the like (included in sub-element 7.1.1: Minor demolition works and alteration works). 3 Temporary or semi-permanent support for unstable structures or facades, i.e. structures not to be demolished (included in sub-element 7.4.1: Facade retention).
		2 Multi-service gang.	per week (number of staff by number of man hours per week by number of weeks)	1 Ganger.	
				2 Labour.	
				3 Fork lift driver.	
				4 Service gang plant and transport.	
9.2.14	**Insurances, bonds, guarantees and warranties**	1 Works insurances.	item	1 Contractor's 'all risks' (CAR) insurance.	
				2 Contractor's plant and equipment insurance.	
				3 Temporary buildings insurance.	
				4 Terrorism insurance.	
				5 Other insurances in connection with the works.	
				6 Insurance premium tax (IPT).	
				7 Allowance for recovery of all or part of insurance premium excess.	
		2 Public liability insurances.	item	1 Non-negligence insurance.	
				2 Professional indemnity insurance.	
				3 Insurance premium tax (IPT).	

Subelement		Component	Unit	Included (aligned to NRM 1 structure)	Excluded
				4 Allowance for recovery of all or part of insurance premium excess.	
		3 Employer's (main contractor's) liability insurances.	item	1 Management and staff, including administrative staff.	
				2 Works operatives.	
				3 Insurance premium tax (IPT).	
				4 Allowance for recovery of all or part of insurance premium excess.	
		4 Other insurances.	item	1 Employer's loss of liquidated damages.	
				2 Latent defects cover.	
				3 Motor vehicles.	
				4 Other insurances.	
				5 Insurance premium tax (IPT).	
				6 Allowance for recovery of all or part of insurance premium excess.	
		5 Bonds.	T/E	May be included in section 12.	Bonds are not part of NRM 3.
		6 Guarantees.	item	1 Parent company guarantees.	
				2 Product guarantees (insurance backed).	
		7 Warranties.	item	1 Collateral warranties.	
				2 Funder's warranties.	
				3 Purchaser's and tenant's warranties.	
				4 Other warranties.	

Group element 10: Maintenance contractor's overheads and profit

Group element 10 comprises the following elements:

10.1 Maintenance contractor's overheads

10.2 Maintenance contractor's profit

Element	Included	Excluded
1 Maintenance contractor's overheads	1 Generally, the costs of head office set up and administration proportioned to each contract by the maintenance contractor.	1 Visiting management and staff for which an allowance has been made within the maintenance contractor's management and administration costs (included in component 9.2.1.2: Visiting management and staff). 2 Extraordinary support costs for which an allowance has been made within the maintenance contractor's management and administration costs (included in component 9.2.1.3: Extraordinary support costs).
2 Maintenance contractor's profit	1 The amount of net profit that the maintenance contractor needs to achieve.	

Group element 11: Consultants' and specialists' fees

Group element 11 comprises the following elements:

11.1 Consultants' fees

11.2 Maintenance contractor's pre-contract fees and transition mobilisation costs

11.3 Maintenance contractor's design fees

Note: Included items that are different to NRM 1 are included in italics in the following table:

Note: Where the unit of measurement for a component or a sub-component has been given as 'per week', a week shall mean a period of 7 calendar days irrespective of public holidays.

Element 11.1: Consultants' and specialists' fees

Component	Unit	Included	Excluded
1.1.1 Project team and design team consultants' fees	% or item	**Note**: Percentage applied to the 'Works Cost Estimate'; or item if actual fees known) 1 Professional advisers. 2 Project managers. 3 Contract administrators. 4 Employer's agents. 6 Quantity surveyor/cost managers. 7 Building services engineer(s). 8 Structural engineers. 9 CDM co-ordinators. 10 Interior designers. 11 Landscape architects. 12 Infrastructure engineers. 13 Drainage engineers.	Excluded from NRM 3 as not normally required for maintenance works *5 Architect* 14 Construction/logistics/sequencing advisers.

Component	Unit	Included	Excluded
	Sum	15 Fees in connection with procurement of the maintenance contracts.	
		16 Fees in connection with updating asset register and condition surveys.	
		17 Fees in connection with other forms of assessments (e.g. Disability Discrimination Act etc).	
11.1.2 Other consultants' fees	% or item	**Note**: Percentage applied to the 'Works Cost Estimate'; or item if actual fees known) 1 Measuring surveyors (to carry out topographical survey of site; to verify ground levels/contours, physical features, existing boundaries, adjacent properties and site access, etc). 2 Drainage and utilities surveyors (to trace and locate existing drainage and other services, both underground and above ground, on or near the site, including, water, electricity, telecommunications, data lines and oil/fuel pipelines; advising on extent of existing utilities, etc). 3 Geotechnical engineers (to check trial pits, boreholes and borehole logs, geology of site, including underground workings, laboratory and soil tests, groundwater observation and pumping tests, and geophysical surveys, etc). 4 Environmental consultants (environmental audits, contamination surveys for asbestos, methane, toxic waste, chemical waste and radioactive substances; and preparation and management of remediation strategy/action plan). 5 Ecologists. 6 Arboriculturists (to survey and provide advice on trees and the like). 7 Party wall surveyor (to prepare party wall notices and awards/agreements). 8 Rights of light surveyors (rights of light agreements). 9 Asbestos consultants.	

Component	Unit	Included	Excluded
		10 Acoustics consultants. 11 Facade consultants. 12 Facade access consultants 13 Lift consultants. 14 Fire consultants. 15 Building control consultants. 16 Traffic consultants (to examine traffic records, take traffic count, advise on traffic patterns, carry out computer simulation of existing traffic flows, delay analysis and advise on noise levels). 17 Invasive weeds consultants. 18 Sustainability consultants (to advise on renewable technologies and sustainability issues). 19 Archaeologists (to examine existing records and archaeological remains – desktop study, etc.). 20 Environmental assessment method assessors (e.g. BREEAM or Code for Sustainable Homes). 21 Facilities manager (to advise on operational and maintenance matters). 22 Value engineering facilitators. 23 Risk management facilitators. 24 Building surveyors (to carry out structural/ dilapidations survey of adjoining buildings; and carry out condition surveys). 25 Unexploded devices consultant (to research and advise on possibility of unexploded bombs on site, etc). 26 Photographers (to carry out a photographic survey of the site). 27 Specialist contractors/consultants (to provide early advice on viability of ground source heating). 28 Other specialist consultants (to be stated).	

Component	Unit	Included	Excluded
11.1.3 Site investigation fees	item	1 Site investigation. 2 Geotechnical investigation. 5 Intrusive investigations for toxic or hazardous materials (for asbestos-containing materials). 6 Other site investigations (to be stated).	1 Removal of toxic or hazardous materials, e.g. asbestos (included in sub-element 0.1.1: Toxic or hazardous material removal). 3 Trial pits. 4 Pile probing.
11.1.4 Specialist support consultants' fees	item	1 Planning consultants (to advise on planning matters and facilitate planning process). 2 Political consultants (to assist with planning application). 3 Letting agents (advice on market needs, advice on design proposals and selling). 4 Legal advice – property (to advise on ownership of site, restrictive covenants, easements, boundaries, party wall agreements, highway agreements, local authority agreements and air rights). 5 Legal advice – construction (to advise on construction contracts, warranties, financial protection measures and the like). 6 Legal advice – environmental. 7 Tax specialists – (to advise on VAT, availability of capital allowances and recovery thereof, tax relief in respect of land remediation and other specialist tax matters). 8 Grants advice (to advise on availability of grants for construction works). 9 Other specialist support consultants (to be stated).	

Element 11.2: Maintenance contractor's pre-contract and transition mobilisation costs

Component	Unit	Included	Excluded
11.2.1 Management and staff fees	per week (number of staff by number of man hours per week by number of weeks).	Management and staff, such as: 1 Project director. 2 Contract account manager. 3 Supervisory staff. 4 Project managers. 5 Construction managers. 4 Commercial managers. 6 Quantity surveyors/maintenance estimators. 7 Procurement managers. 8 Planning/programming managers and staff. 9 Design managers. 10 Temporary works design engineers. 11 Works package managers. 12 Building services engineering managers/co-ordinators. 13 Health and safety managers. 14 Secretary/administrative support. 15 Other pre-construction management and staff.	
	Sum	16 Bid costs (that are not included as part of the overheads and profit). 17 TUPE costs	
11.2.2 Specialist support services fees	item	1 Legal advice (i.e. solicitors). 2 Specialist subcontractor advice/participation. 3 Geotechnical investigations, procured by main contractor as part of pre-construction services. 4 Site investigations, procured by main contractor as part of pre-construction services. 5 Other pre-construction support services.	

Component	Unit	Included	Excluded
11.2.3 Temporary accommodation, services and facilities charges	per week	1 Offices, including rental of temporary office space. 2 Service providers' charges for water, electricity and gas. 3 Rates. 4 Furniture and equipment, including workstations. 5 Office equipment, including photocopiers. 6 Telecommunications, including internet and intranet access. 7 IT systems, including hardware, printers, plotters and the like. 8 Office consumables. 9 Cleaning. 10 Other costs associated with the provision of pre-construction accommodation, services and facilities. 11 Reinstating accommodation to original condition on completion of pre-construction services.	
11.2.4 Maintenance contractor's overheads and profit	%	1 Maintenance contractor's overheads and profit associated with pre-construction services. **Note**: Percentage applied to the total estimated cost of elements 1: Management and staff fees, 2: Specialist support services fees, and 3: Temporary accommodation, services and facilities charges 2 Management and staff fees. 3 Specialist support services fees. 4 Temporary accommodation, services and facilities charges.	
	Sum	5 Contract set-up costs included in tender price (during mobilisation).	

Element 11.3: Maintenance contractor's design fees

Component	Unit	Included	Excluded
1 Main contractor's design consultants' fees **Note**: Where design liability is to be transferred to the main contractor (i.e. where a design and build or other main contractor-led design contract strategy is to be used) and all, or some, of the consultants within the design team are to be novated, the balance of the consultants' fees due after novation has occurred is to be transferred from element 11.1: Maintenance consultants' fees to element 11.3: Maintenance contractor's design fees.	% or item	**Note**: Percentage applied to the 'Building Works Estimate'; or item if actual fees known) 1 Architect. 2 Building services engineers. 3 Structural engineers. 4 Interior designers. 5 Landscape architects. 6 Infrastructure engineers. 7 Drainage engineers. 8 Site investigation services (by specialist subcontractor or consultant). 9 Other design consultants or specialist services. **Note**: The gap between the design and consultancy services required by the contractor and those covered by the services of the novated design team need to be considered; with an allowance made for any gaps in (i.e. an allowance for gap in design and consultancy services provision.	
	Sum	10 Building services engineers. 11 Drainage engineers. 12 Landscape architects. 13 Interior designers.	

Group element 12: Employer-definable maintenance-related costs

Group element 12 comprises the following elements:

12.1 Employer-definable maintenance-related costs

Note 1: Where the unit of measurement for a component or a sub-component has been given as 'per week', a week shall mean a period of 7 calendar days irrespective of public holidays.

Note 2: Included items that are different from NRM 1 are identified in italics in the following table.

Element 12.1: Employer-definable maintenance-related costs

Component	Unit	Included	Excluded
12.1.1 Land acquisition costs	item	1 Costs in connection with land acquisition.	Not normally part of maintenance works unless agreed to be in scope.
12.1.2 Employer finance costs	item	1 Costs in connection with funding of maintenance and renewal works project.	
12.1.3 Fees	item	1 Planning fees. 2 Building control fees, where not paid by the main contractor. 3 Oversailing fees, where not paid by the main contractor. 4 Fees in connection with party wall awards. 5 Fees in connection with rights of light agreements. 6 Building scheme registration fees (e.g. NHBC Buildmark) or similar fees, where not paid by the main contractor.. 7 Fees in connection with other agreements between the employer and neighbours to facilitate the building project. 8 Other fees in connection with licences, permits and agreements, where not paid by the main contractor.	1 Building control fees, where paid by the maintenance contractor (included in sub-element 9.2.12: Fees and charges). 2 Oversailing fees, where paid by the maintenance contractor (included in sub-element 9.2.12: Fees and charges). 3 Building scheme registration fees (e.g. NHBC Buildmark) or similar fees, where paid by the maintenance contractor (included in sub-element 9.2.12: Fees and charges). 4 Considerate Constructors' Scheme fees (or alternative scheme operated by local authority). Paid by main contractor (included in sub-element 9.2.12: Fees and charges). 5 Other fees in connection with licences, permits and agreements, where paid by the main contractor (included in sub-element 9.2.12: Fees and charges).

Component	Unit	Included	Excluded
12.1.4 Charges		Excluded from scope of NRM 3.	*1 Adoption charges in connection with highways.* *2 Maintenance costs in connection with highways.* *3 Adoption charges in connection with services (e.g. sewers, water, electricity and gas).* *4 Maintenance costs in connection with services.*
12.1.5 Planning contributions		Excluded from NRM 3 as this relates to new build (which is covered by NRM 1). Typically not included in maintenance works.	1 Building works subject to a planning contribution which forms an integral part of the building project (included in the appropriate group element, element or sub-element). *2 Direct financial contributions in connection with planning consent (e.g. Section 106 and section 278 contributions in the UK).* *3 Environmental improvement works.*
12.1.6 Insurances	item	1 Insurance for the works – existing buildings. 3 Other insurances in connection with the works. 4 Insurance premium tax (IPT).	1 Insurance for the works – new buildings, where insurance taken out by the main contractor (included in sub-element 9.2.14 Insurance, bonds, guarantees and warranties). *2 Insurance for the works – buildings, where insurance taken out by the employer.*
12.1.7 Archaeological fieldwork	item	Fees and charges in connection with fieldwork carried out by an archaeologist.	1 Physical works in connection with extraordinary site investigations carried out by the main contractor for a specialist, including temporary works and attendance (included in sub-element 11.1.2: Other consultant's fees.
12.1.8 Other specialist fieldwork	item	1 Fees and charges in connection with fieldwork carried out by a specialist	1 Physical works in connection with extraordinary site investigations carried out by the main contractor for a specialist, including temporary works and attendance (included in sub-element 0.6.3: Other extraordinary site investigation works).
12.1.9 Decanting and relocation costs	item	1 Temporary relocation costs. 2 Fit-out of temporary accommodation.	
	per week	3 Rents and other running costs.	
12.1.10 Fittings, furnishings and equipment	item	1 Fittings, furnishings and equipment which do not form part of a building contract.	1 Fittings, furniture and equipment which form part of a building contract (included in group element 4: Fittings, furnishings and equipment).
12.1.11 Tenant's costs/contributions	item	1 Tenant's costs. 2 Tenant's contributions.	

Component	Unit	Included	Excluded
12.1.12 Marketing costs	item	1 Launch event.	
		2 Site based advertising (e.g. sales hoardings).	
		3 Show unit/marketing suites (i.e. separate or within building to be built).	
	per week	4 Operating costs associated with show unit/marketing suites.	
12.1.13 Other employer costs	item	1 Other employer costs in connection with the building project (to be stated). *2 Employer's costs involved in the management and administration of the life cycle maintenance of the building or its part.* *3 Audits and performance-monitoring regimes.* *4 Inspections and compliance management.*	
12.1.14 Allowances	item	1 Capital allowances	*2 Asset depreciation/write down provisions (impairments)*
12.1.15 Energy efficiency	item	1 Energy-efficiency initiatives (e.g. upgrades/improvement works).	
12.1.16 Office churn	N/A	Note – part of occupancy costs (which is excluded from NRM 3 works.	2 Churn costs
12.1.17 Soft services	item	1 Helpdesk function (including covering soft services provisions). 2 Security equipment maintenance (if agreed in scope). 3 Vending machine maintenance (if agreed in scope). 4 Catering and hospitality equipment (if agreed in scope). 5 Other operation and occupancy costs (e.g. Utilities, cleaning/waste management, taxes as applicable).	
12.1.18 End of life	item	*Note – if part of contractual obligations then include in renewal works (details to be stated (see Appendix G)).*	*1 End of life costs not included elsewhere (such as disposal, decommissioning costs, reinstatement costs, salvage costs).*
12.1.19 Third-party income	item	*Note – if included in scope. Normally part of wider life cycle costing.*	*1 Third-party income during the in use period.*
12.1.20 Loss of income	item	*Note – if included in scope. Normally part of wider life cycle costing.*	*1 Loss of income*

Group element 13: Risks

Group element 13 comprises the following elements:

13.1 Design and installation risks

13.2 Maintenance risks

13.3 Employer change risks

13.4 Employer other risks

Note: Typical causes of risks that should be considered under these elements are listed in the tables below. The risks that might arise from these causes can then be identified and the cost implications to the project should any of the risks materialise be estimated (i.e. the risk allowance required to manage and resolve the each risk should it materialise). The lists are not meant to be definitive or exhaustive, but are merely a guide. The lists can be used to prompt the employer or other relevant parties associated with the building maintenance works.

Element 13.1: Design and installation risks

13.1.1 Design development and standards:

Inadequate maintenance considerations during design and installations, such as:

- inadequate or unclear project brief
- unclear design team responsibilities
- ineffective quality control procedures
- inadequate site investigation
- planning constraints/requirements
- soundness of design data
- degree of novelty (i.e. design novelty)
- ineffective design co-ordination.
- reliability of area schedules.
- health and safety/local risk assessment implications
- access for maintenance and services not appropriately addressed
- lack of provision for lifting arrangements for replacing components
- reliability of estimating data
- changes in labour, materials, equipment and plant costs
- inflation (i.e. differential inflation due to market factors and/or timing)
- design solution does not comply with required asset life cycle performance standards
- availability of installation information and the accuracy of operation and maintenance manuals as-built, and health and safety files, etc.

13.1.2 Construction – installation legacy issues – adjacent structures (i.e. requiring special precautions) – geotechnical problems (e.g. mining and subsidence) – groundwater – asbestos and other hazardous materials – tree preservation orders – ecological issues (e.g. presence of endangered species) – environmental impact – physical access to site (i.e. restrictions and limitations) – appropriateness of specification – incomplete design – competence of contractor and subcontractor – health and safety considerations – ineffective quality management procedure – impact of construction using substandard materials ad workmanship – ineffective testing and commissioning – latent defects.
13.1.3 Handover: – ineffective handover procedures – accuracy and completeness of operation and maintenance manuals and CAD information – occupancy of facilities significantly different to original design parameters – reliability of estimating data, e.g. charges in labour, materials, equipment and plant costs – insurance and inspection implications, e.g. inadequate policies put into practice.
13.1.4 Legislation and changing future regulations – e.g. health and safety at work; Part L

Element 13.2: Maintenance risks

13.2.1 Procurement – quality of brief – information to cost maintenance – contract terms (allocation of risks) – work packages (boundaries and interfaces) – resources and competence – budget constraints – mobilisation.
13.2.2 Maintenance delivery: – maintenance strategy not deliverable – scope of service provided (not in accordance with fit-for-function maintenance standards) – non-compliance with statutory/legal and regulatory requirements – system failure – organisation and staffing arrangements, e.g. agility and adequacy to cover critical risk events – relationship with employer and contract support staff – ineffective contract mobilisation and operating procedures and controls – business disruption leading to significant loss of productivity and cost to the end user – lack of transparency of service standards and accountability – asbestos and hazardous materials – weather and seasonal implications – quality of asset information made available and subsequently not being kept up to date – incompatibility of asset management databases or ineffective use of IT/Computerised Maintenance Management System CMMS systems.

13.2.3 Life cycle replacement works:

- actual costs much higher than predicted
- inappropriate service life planning forecasts – impacts on actual frequency of renewal works
- legacy data – inconsistent and missing asset information
- condition data (short term) and lack of residual life data to predict longer term replacement plans
- early failure of asset and components
- product failing prior to predicted life due to manufacturer defect
- maximum repair obligations and unclear lines of responsibilities, e.g. confusion over who pays
- competency to effectively predict 1-, 5- or 1-year forward life cycle replacement schedules.

Element 13.3: Employer change risks

13.3.1 Project brief: – inadequate or unclear project brief – changes in quality (e.g. specification of materials and workmanship) – employer's specific requirements (e.g. functional standards).
13.3.2 Scope creep: – specific changes in requirements (e.g. scope of works, time horizon and facilities to maintain) – agility a nd mechanism to change the contract and realise cost/performance efficiencies – change of purpose and use of LCC exercise – carbon reduction commitments and taxation implications.
13.3.3 System redundancy: – Lack of resilience to prevent major business disruption – obsolescence – technology and system changes (e.g. renewables) – disposal risks associated with removal of plant and equipment from occupied areas.
13.3.4 Timescales: – replacement frequency forecasts wrong – peaks in expenditure versus forecast profile of life cycle replacement costs – change in periods of analysis – base dates altered or not clearly stated from the outset.

Element 13.4: Employer other risks

13.4.1 Maintenance brief: – inadequate or unclear brief, including understanding end user's specific requirements – uncertainty over who is responsible for repairs and maintenance (limits of liability/thresholds) – environmental and sustainability considerations – employer specific requirements (e.g. functional standards, site establishment rules and regulations and standing orders) – changes in use or function of facilities – impact of estate rationalisation, e.g. impact of footprint reductions and disposal of sites.
13.4.2 Timescales: – reference service life data predictions – product fails prior to predicted life due to manufacturer defect – timescales for decision making
13.4.3 Third party: – works arising out of party wall agreements – requirements relating to listed buildings and/or conservation areas – requirements relating to sites of special scientific interest (SSSI) – requirements relating to environmental impact assessments.
13.4.4 Management: – unclear roles and responsibilities – ineffective const-control procedures – ineffective performance measures, audit and monitoring procedures – ineffective or no risk management strategy – inadequate design and maintenance review procedures – ineffective reporting and information management systems.

13.4.5 Financial: – availability of funds – unavailable of grants/grant refusal – changing interest rates – changes in taxation (e.g. VAT) – liquidation/insolvency of main contractor – actual costs much higher than estimated (undermining the incentive to deliver maintenance) – labour costs vary due to labour market/economic climate – provision for unscheduled maintenance, e.g. historical data (significantly more in reality) – availability of funds to do minimum maintenance standard – availability of competent resources – cash flow effect on timing of approval of extra works – existing risks and liabilities (e.g. backlog maintenance/condition status) – service charging obligations – landlord and tenant (could led to non-recovery of costs) – changing inflation/economic climate conditions
13.4.6 Other: – availability of labour, materials and plant – statutory and legal requirements changes.

Group element 14: Inflation

Group element 14 comprises the following elements:

14.1 Tender inflation

14.2 Construction inflation

14.3 Life cycle replacement inflation

14.4 Life cycle discount rate

Element	Unit	Included	Excluded
1 Tender inflation	%	Inflationary price increases during the period from the estimate base date to the date of tender return.	Unexpected price increases associated with market conditions and wider economic factors outside of provisions of the maintenance and life cycle replacement contract (included in element 13.4: Employer's other risks).
2 Construction inflation	%	Inflationary price changes during the period from the tender return to the end of the maintenance contract.	
3 Life cycle replacement inflation	%	Annual inflation during the period from the end of construction or such other base date as requested by the client. Applied to annualised and periodic costs to provide a cash flow forecast.	Refer to 3.19 for present value and discounting time value of money rules of measurement.
4 Life cycle discount rate	%	Annual inflation adjusted for the future value of money during th period from the end of construction or such other base date as requested by the client. Applied to annualised and periodic costs to provide a net present value.	Refer to 3.15 and 4.19 for measurement rules for inflation.

Appendices

Appendix A:	Core definition of gross internal area (GIA)
Appendix B:	Core definition of net internal area (NIA)
Appendix C:	Commonly used functional units and functional units of measurement
Appendix D:	Special use definitions for shops
Appendix E:	Logic and levels for elemental cost planning of the construct (C), renewal (R) and maintain (M) works
Appendix F:	Maintenance cost categories and definitions
Appendix G:	Methods of economic evaluation and discounting equations (time value of money)
Appendix H:	Information requirements for formal cost plans, for the construction and maintenance works procurement and during the building's life cycle
Appendix I:	Report template for elemental cost plans for renewal (R) and Maintain (M) Works (condensed: based on level 1 codes)
Appendix J:	Report template for elemental cost plans for renewal (R) and Maintain (M) Works (expanded: based on level 2 codes)

Appendix A: Core definition of gross internal area (GIA)

The definitions and diagrams in this appendix are reproduced from the *RICS Code of Measuring Practice* (6th edition).

Core definitions: gross internal area

2.0 Gross Internal Area (GIA)

Gross Internal Area is the area of a building measured to the internal face of the perimeter walls at each floor level (see note GIA 4).

	Including
2.1	Areas occupied by internal walls and partitions
2.2	Columns, piers, chimney breasts, stairwells, lift-wells, other internal projections, vertical ducts, and the like
2.3	Atria and entrance halls, with clear height above, measured at base level only
2.4	Internal open-sided balconies, walkways, and the like
2.5	Structural, raked or stepped floors are to be treated as a level floor measured horizontally
2.6	Horizontal floors, with permanent access, below structural, raked or stepped floors
2.7	Corridors of a permanent essential nature (e.g. fire corridors, smoke lobbies)
2.8	Mezzanine floor areas with permanent access
2.9	Lift rooms, plant rooms, fuel stores, tank rooms which are housed in a covered structure of a permanent nature, whether or not above the main roof level
2.10	Service accommodation such as toilets, toilet lobbies, bathrooms, showers, changing rooms, cleaners' rooms, and the like
2.11	Projection rooms
2.12	Voids over stairwells and lift shafts on upper floors
2.13	Loading bays
2.14	Areas with a headroom of less than 1.5m (see APP 6)
2.15	Pavement vaults
2.16	Garages
2.17	Conservatories

	Excluding
2.18	Perimeter wall thicknesses and external projections
2.19	External open-sided balconies, covered ways and fire escapes
2.20	Canopies
2.21	Voids over or under structural, raked or stepped floors
2.22	Greenhouses, garden stores, fuel stores, and the like in residential property

Applications
(when to use GIA)

APP 4	**Building cost estimation** – GIA is a recognised method of measurement for calculating building costs
APP 5	**Estate agency and valuation** – GIA is a basis of measurement for the marketing and valuation of industrial buildings (including ancillary offices), warehouses, department stores, variety stores and food superstores. For the avoidance of doubt the basis of measurement should be stated
APP 6	**Rating** – GIA is the basis of measurement in England and Wales for the rating of industrial buildings, warehouses, retail warehouses, department stores, variety stores, food superstores and many specialist classes valued by reference to building cost (areas with a headroom of less than 1.5m being excluded except under stairs)
APP 7	**Property management** – GIA is a basis of measurement for the calculation of service charges for apportionment of occupiers' liabilities
APP 8	**New homes valuation** – a modified version of GIA is an accepted basis of measurement for the valuation and marketing of residential dwellings, particularly in new developments (see NSA on page 32)

Notes
(how to use GIA)

GIA 1	**Diagrams** – diagrams C and D illustrate how to apply GIA
GIA 2	**Separate buildings** – GIA excludes the thickness of perimeter walls, but includes the thickness of all internal walls. Therefore, it is necessary to identify what constitutes a separate building
GIA 3	**Advice** – apart from the applications shown, GIA tends to have specialist valuation applications only. Valuers and surveyors who choose this definition for marketing purposes must have regard to the provisions of the *Property Misdescriptions Act* 1991 and *Property Misdescriptions (Specified Matters) Order* 1992 (see Introduction on page 1)
GIA 4	**Internal face** – means the brick/block work or plaster coat applied to the brick/block work, not the surface of internal linings installed by the occupier
GIA 5	**Lift rooms, etc.** – the items covered by 2.9 should be included if housed in a roofed structure having the appearance of permanence (e.g. made of brick or similar building material)
GIA 6	**Level changes** – the presence of steps or a change in floor levels is to be noted
GIA 7	**Voids** – attention is drawn to the exclusion of voids over atria at upper levels (see 2.3) and the inclusion of voids over stairs, etc. (see 2.12). Where an atrium-like space is formed to create an entrance feature and this also accommodates a staircase, this does not become a stairwell but remains an atrium measurable at base level only

Supplementary definitions: Gross internal area

The following definitions have been adapted from the BCIS *Standard Form of Cost Analysis*, (4th edition)

1 Areas of open ground floors and the like shall be excluded.
2 Walkways across an atrium at upper levels shall be included in the measurement of upper floors.
3 Areas in the roof space intended for use with permanent access shall be included in the gross internal area – measured to the internal face of the enclosing wall, or, where the extremities of roof space are used, the roof space at floor level.
4 Re-entrant balconies, i.e. open sided balconies within the predominant line of the eternal wall should be treated as open sided balconies and excluded.

Diagram C – Example of appropriate dimensions for GIA defined industrial/warehouse unit

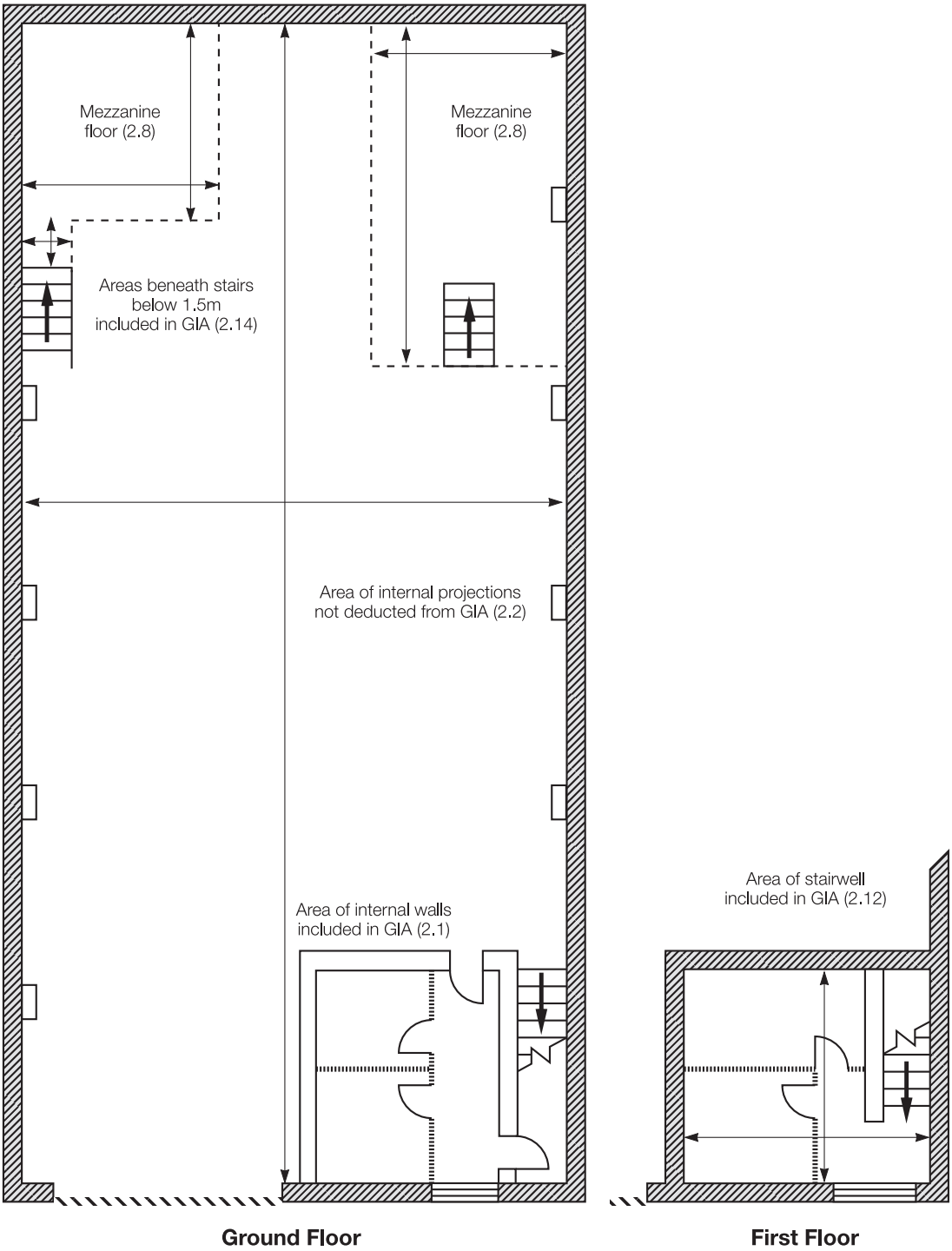


Diagram D – Example of appropriate dimensions for GIA defined industrial/warehouse unit

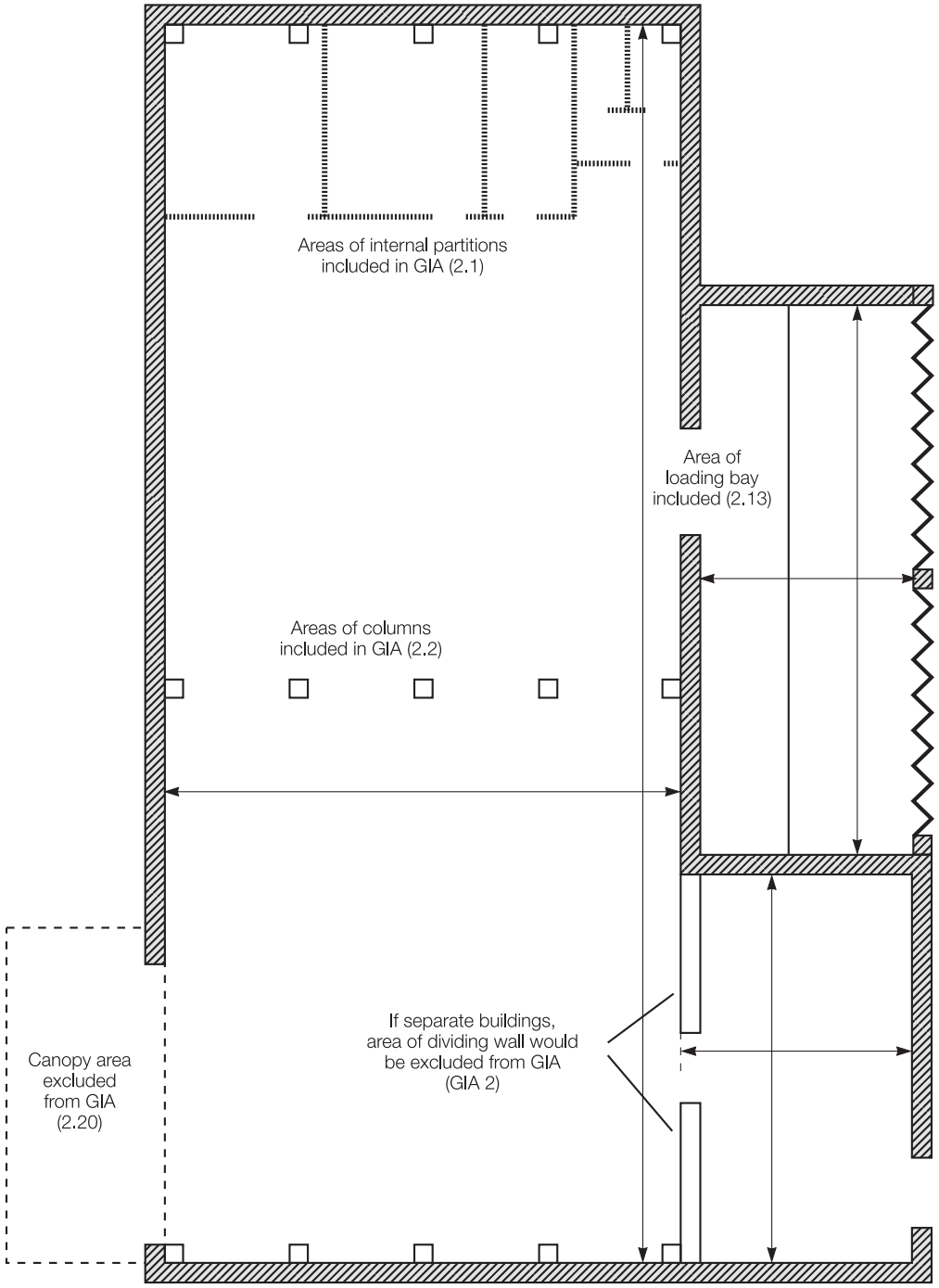
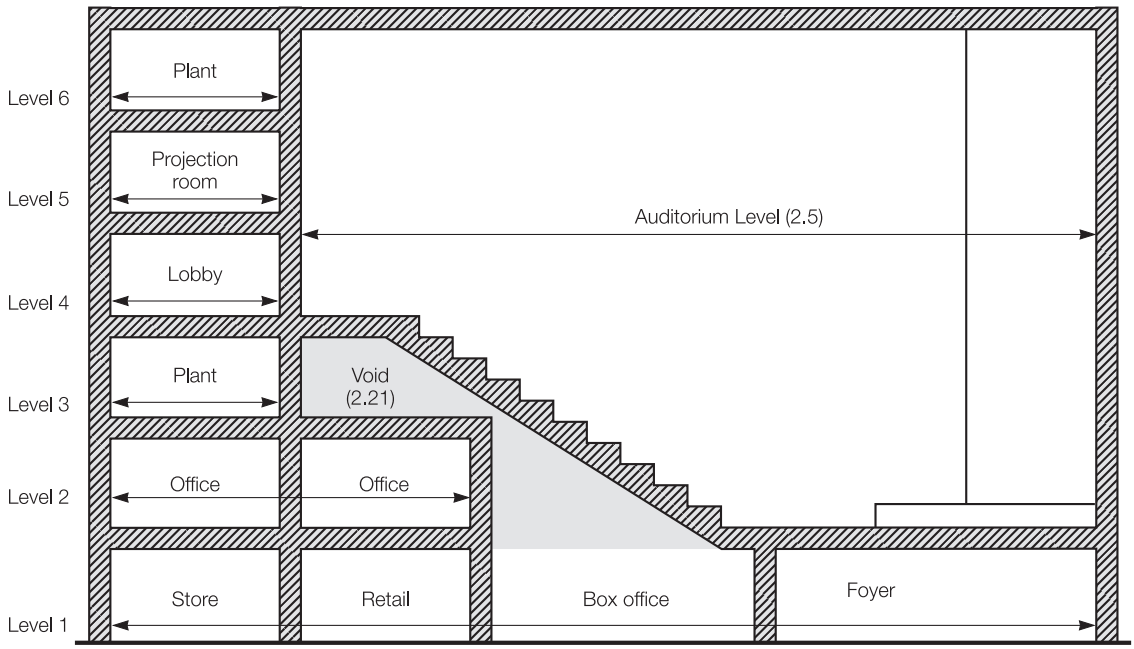
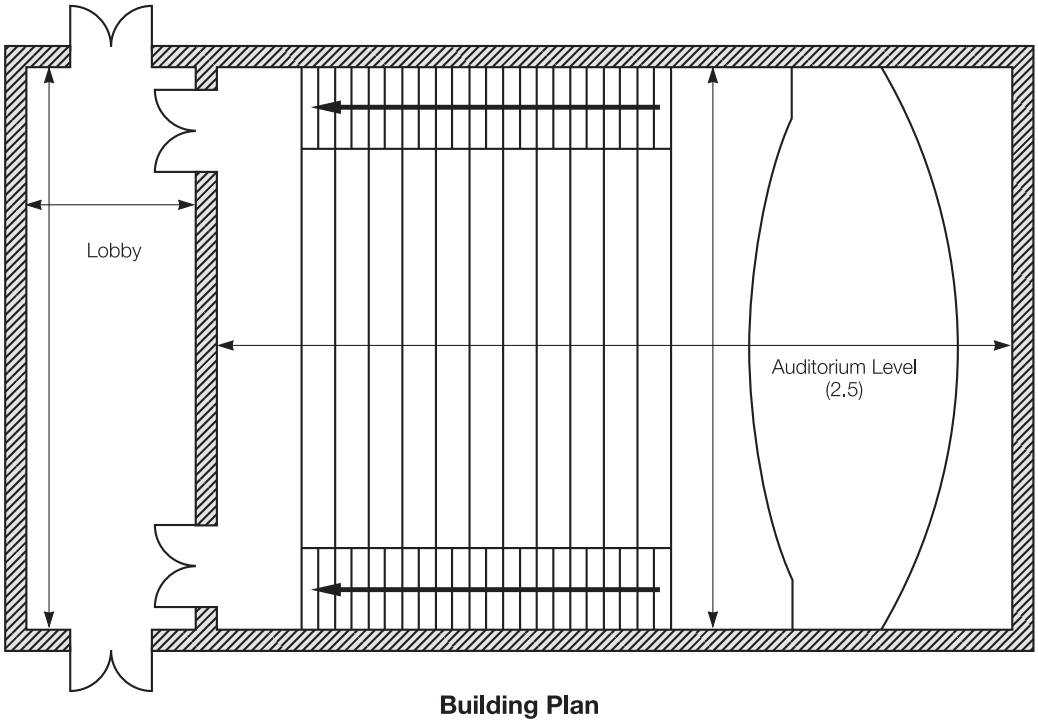


Diagram M – Example of appropriate dimensions for GIA floor area defined at each level – Leisure facilities

[Note: Numbers in brackets are cross references to the Core definitions: gross internal area.]



Building Section



Building Plan

Appendix B: Core definition of net internal area (NIA)

The definitions and diagrams in this appendix are reproduced from the *RICS Code of Measuring Practice* (6th edition).

Core definitions: net internal area

3.0 Net Internal Area (NIA)

Net Internal Area is the usable area within a building measured to the internal face of the perimeter walls at each floor level. (See note NIA 3)

	Including		Excluding
3.1	Atria with clear height above, measured at base level only (but see 3.11)	3.11	Those parts of entrance halls, atria, landings and balconies used in common (see 3.1 and 3.2)
3.2	Entrance halls (but see 3.11)	3.12	Toilets, toilet lobbies, bathrooms, cleaners' rooms, and the like
3.3	Notional lift lobbies and notional fire corridors	3.13	Lift rooms, plant rooms, tank rooms (other than those of a trade process nature), fuel stores, and the like
3.4	Kitchens	3.14	Stairwells, lift-wells and permanent lift lobbies
3.5	Built-in units, cupboards, and the like occupying usable areas	3.15(a)	Corridors and other circulation areas where used in common with other occupiers
3.6	Ramps, sloping areas and steps within usable areas	3.15(b)	Permanent circulation areas, corridors and thresholds/recesses associated with access, but not those parts that are usable areas
3.7	Areas occupied by ventilation/heating grilles	3.16	Areas under the control of service or other external authorities including meter cupboards and statutory service supply points
3.8	Areas occupied by skirting and perimeter trunking	3.17	Internal structural walls, walls enclosing excluded areas, columns, piers, chimney breasts, other projections, vertical ducts, walls separating tenancies and the like
3.9	Areas occupied by non-structural walls subdividing accommodation in sole occupancy	3.18(a)	The space occupied by permanent and continuous air-conditioning, heating or cooling apparatus, and ducting in so far as the space it occupies is rendered substantially unusable
3.10	Pavement vaults	3.18(b)	The space occupied by permanent, intermittent air-conditioning, heating or cooling apparatus protruding 0.25m or more into the usable area
		3.19	Areas with a headroom of less than 1.5m
		3.20	Areas rendered substantially unusable by virtue of having a dimension between opposite faces of less than 0.25m. See diagram E
		3.21	Vehicle parking areas (the number and type of spaces noted)

Applications

(when to use NIA)

APP 9 **Estate agency and valuation** – NIA is the basis of measurement for the valuation and marketing of the following types of buildings:
- Shops and supermarkets;
- offices; and
- business use (except those in APP 5)

APP 10 **Rating** – NIA is the principal basis of measurement for rating of shops including supermarkets, offices, business use (except those in APP 6), and composite hereditaments

APP 11 **Property management** – NIA is a basis of measurement for the calculation of service charges for apportionment of occupiers' liability

Notes

(how to use NIA)

NIA 1 **Usable area** – an area is usable if it can be used for any sensible purpose in connection with the purposes for which the premises are to be used

NIA 2 **Diagrams** – diagrams E, F, G, H, K, and L illustrate how to apply NIA

NIA 3 **Internal face** – means the brick/block work or plaster coat applied to the brick/block work, not the surface of internal linings installed by the occupier

NIA 4 **Full-height glazing** – where there is full-height glazing, measurements should be taken to the glazing unless elements of the window structure or design render the space substantially unusable.

NIA 5 **Advice** – when dealing with rent reviews or lease renewals, the exclusions are generally intended to relate to the premises as demised. Unless otherwise indicated by statutory provision or the terms of the lease, it will not normally be appropriate to exclude demised usable space which has been subsequently converted by a tenant to any of the exclusions listed

NIA 6 **Level changes** – the presence of steps or a change in floor levels is to be noted for valuation and marketing purposes

NIA 7 **Restricted headroom** – when marketing on an NIA basis it may be appropriate to identify floor areas below full height but above 1.5m

NIA 8 **Perimeter trunking** – when marketing on an NIA basis reference to the inclusion of perimeter trunking may be appropriate in order not to mislead

NIA 9 **Corridors** – whether or not a wall defining a corridor is structural or permanent (see 3.15 and 3.17), is a matter of fact. It depends upon the circumstances of the particular case. When marketing on an NIA basis reference to the inclusion of corridors may be appropriate

Diagram E – Example of appropriate dimensions for NIA floor area defined purpose designed offices

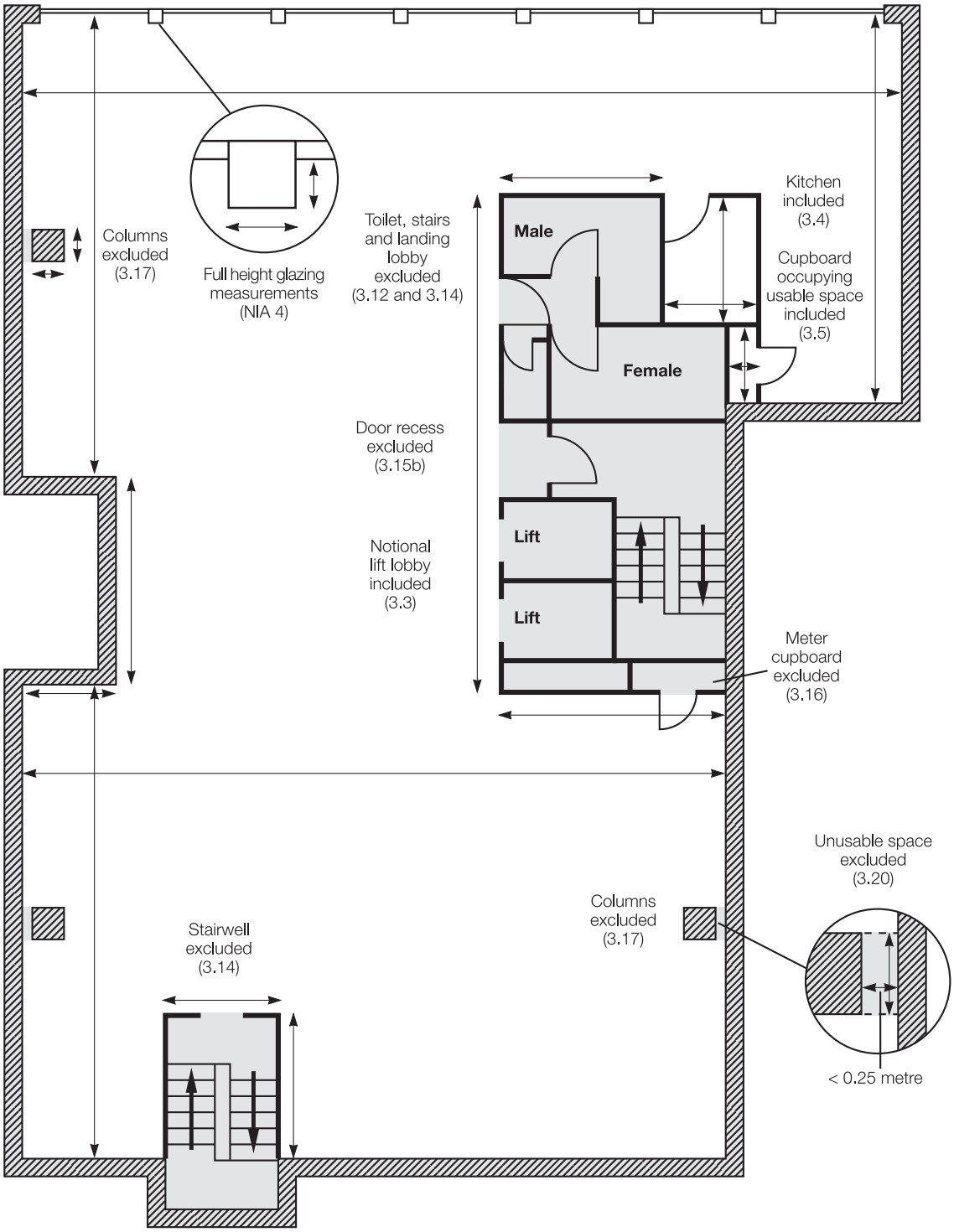


Diagram F – Example of appropriate dimensions for NIA floor area defined offices converted from dwelling house

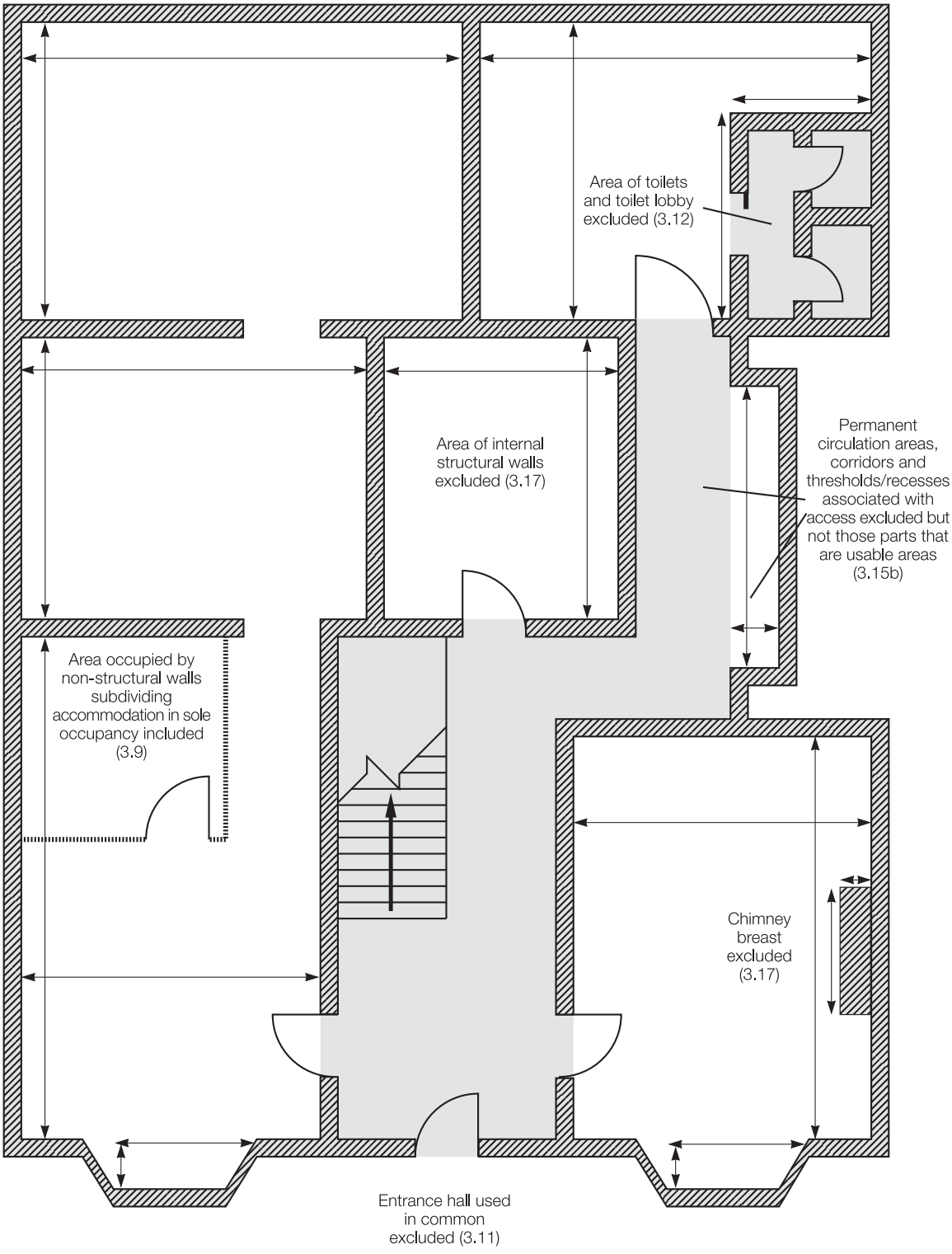


Diagram G – Example of appropriate dimensions for NIA floor areas defined offices (open plan) multiple occupation

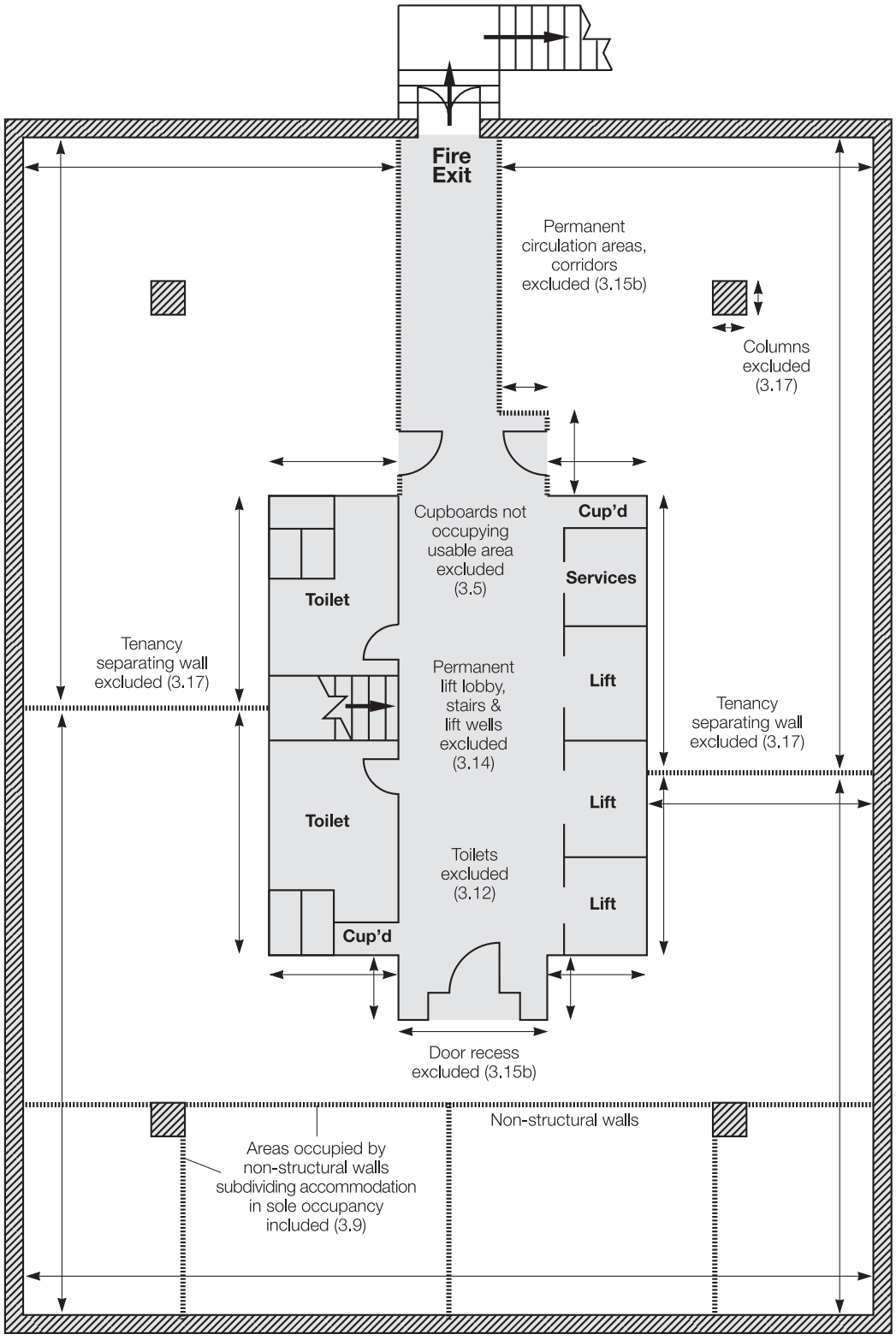
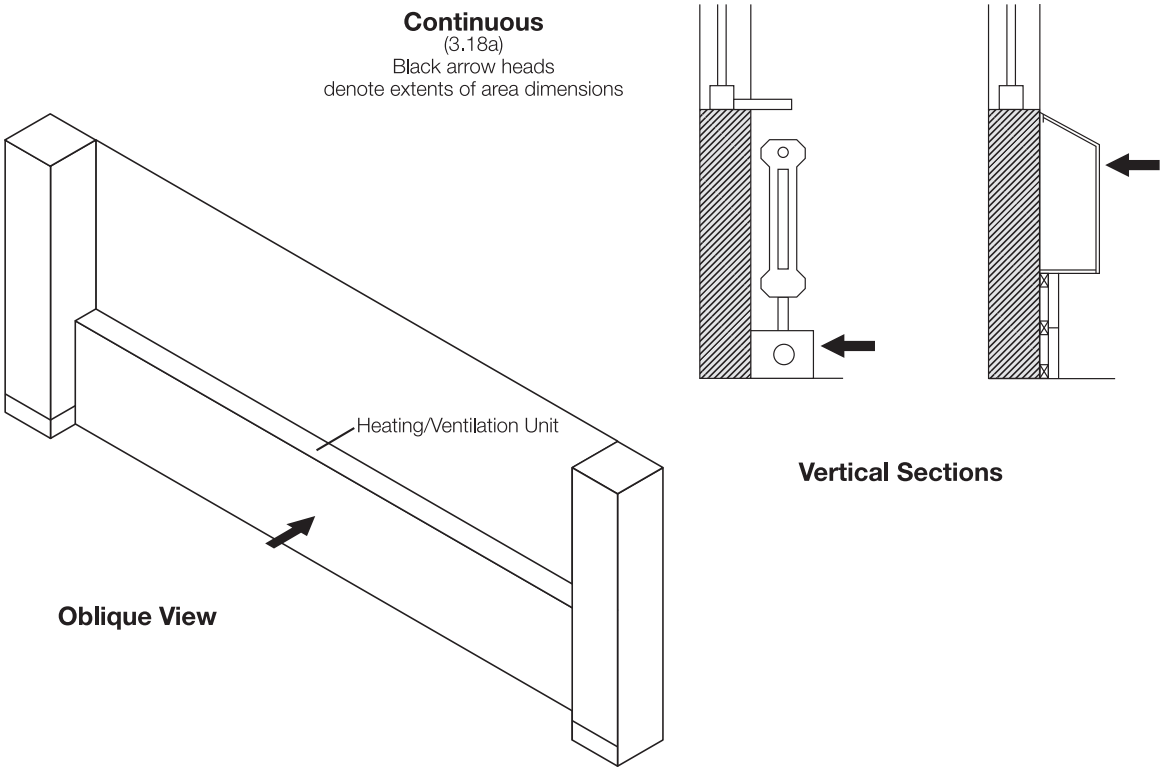
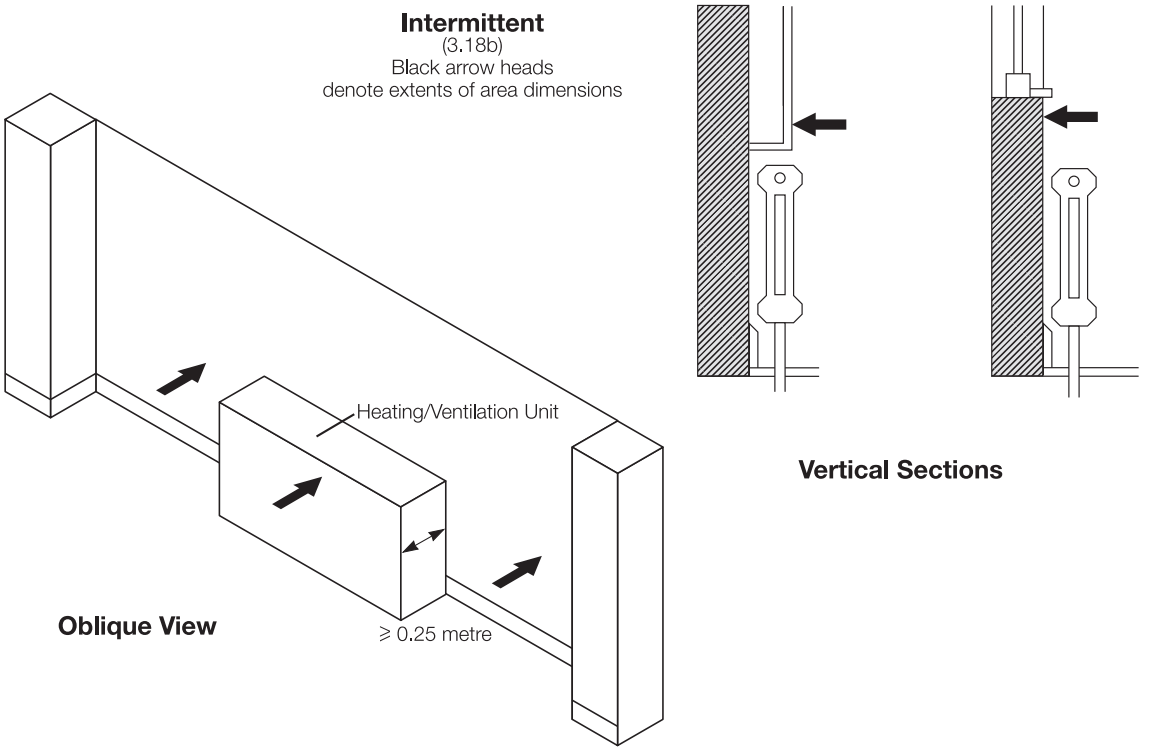


Diagram H – Net Internal Area (NIA) – Examples of appropriate points from which to measure in respect of various types of heating installations





Appendix C: Commonly used functional units and functional units of measurement

The list below indicates the main groups and most types of buildings likely to be found by function. While comprehensive, it cannot be exhaustive as there may be buildings with unique functions as well as those developed in the future with new functions. These examples simply provide a guide.

Function	Functional unit of measurement
Administrative, commercial, protective	
Administrative and office buildings	per person or m^2 of Net Internal Area (NIA)
Banks and building society branches	per m^2 of Net Internal Area (NIA)
Car parking	per car parking space
Coach and bus stations	per coach/bus spaces
Shops, supermarkets and hypermarkets	per m^2 of retail area (m^2)
Department stores	per m^2 of retail area (m^2)
Shopping centres	per m^2 of retail area (m^2)
Retail warehouses	per m^2 of retail area (m^2)
Fire stations	per vehicle spaces
Ambulance stations	per vehicle spaces
Law courts	per courtrooms
Prisons	per prisoner space
Industrial facilities	
Livestock buildings – farms (pig pens, milking parlours and the like)	per animal
Agricultural storage buildings	per m^2 of Net Internal Area (NIA)
Breweries and distilleries	per m^2 of Net Internal Area (NIA)
Factories	per m^2 of Net Internal Area (NIA)
Warehouses/stores/cold stores	per m^2 of Net Internal Area (NIA)
Residential facilities	
Houses	per house type (based on nr of bedrooms)
Bungalows	per bedroom
Apartments/flats	per apartment/flat type (nr of bedrooms)
Hotels/motels/guesthouses	per bedroom
Dormitories/Staff/nursing residential accommodation	per bedroom
Student accommodation	per bedroom
Youth hostels	per bedroom per person
Religious	
Churches, chapels, temples, mosques and the like	per pew or per seat
Convents/monasteries	per ascetic

NRM 3: Order of cost estimating and cost planning for building maintenance works

Function	Functional unit of measurement
Education, scientific, information facilities	
Schools	per child or student place
Universities, colleges and the like	per student place
Research facilities and laboratories	per laboratory space
Record offices archives and patent offices	per thousand volumes/records
Libraries	per place and population served
Conference centres	per place
Common amenities facilities	
Kitchens	per meals per day or per population served
Public conveniences, toilets, utility blocks	per male and female toilet
Laundries	per m^2 of net laundry area
Boiler houses	per kW
Health and welfare facilities	
Hospitals	per bed space
Nursing homes	per bed space
Specialist care and treatments units	per patient/bed space
Specialist care homes	per patient/bed space
Doctors' surgeries	per doctor consulting room
Dentists' surgeries	per dentist workspace
Animal clinics and hospitals	per practitioner suite
Animal rearing and living facilities	per animal
Recreational facilities	
Theatres/opera houses	per seat
Cinemas	per seat or per screen
Concert halls/function rooms/and the like	per seat
Drama and music rehearsal studios	per studio
Restaurants/cafes/refectories	per seat
Community centres and the like	per person
Squash courts, tennis courts and the like	per court
Sports stadia	per seat
Swimming pools/indoor sports centres	per person or population served
Indoor motor sports centres	per person or population served
Gymnasia and sports halls	per person and halls
Golf/rifle ranges	per range
Indoor Ice rinks	per person
Military facilities	
Accommodation blocks – *messes, junior, officers, etc*	per person
Accommodation blocks – multi occupancy *(armoury, air traffic control tower, communications facility, guard room, fire and police stations, telephone exchange)*	per person
Catering facilities	per meal or populated served
Hangars (fixed wing and helicopter etc)	per aircraft space
Live stock building (stables, kennels etc)	per animal
Mechanical transport facilities (garages, vehicle storage, commercial garages)	per garage
Outside sports and recreational facilities	per places
Single living accommodation (by ranks)	per bed space

Function	Functional unit of measurement
Service families accommodation	per bed space and type 1 to 5 type A to E
Stores (non specialised/specialised)	per store
Stores (munitions/hazardous stores)	per store
Training/education facilities (conference centre/lecture hall, classroom, simulator)	per person
Workshops (general shop, processing non specialised, specialised & hazardous)	per workshop

Appendix D: Special use definitions for shops

The definitions and diagrams in this appendix are reproduced from the *RICS Code of Measuring Practice* (6th edition).

Special use definitions: Shops

16.0 Retail Area (RA)

The retail area of the shop is the Net Internal Area (NIA)

	Including		Excluding
16.1	Storerooms and ancillary accommodation formed by non-structural partitions, the existence of which should be noted	16.3	Storerooms and ancillary accommodation formed by structural partitions
16.2	Recessed and arcaded areas of shops created by the location and design of the window display frontage	16.4	Display cabinets which should be identified separately

17.0 Storage Area (StoA)

The NIA of a shop which does not form part of the RA (see 16.0) and which is usable exclusively for storage purposes

18.0 Ancillary Areas (AA)

All NIA not included in RA and StoA but capable of beneficial use

19.0 Gross Frontage (GF)

The overall external measurement in a straight line across the front of the building, from the outside of external walls, or the centre line of party walls

20.0 Net Frontage (NF)

The overall external frontage on the shop line measured between the internal face of the external walls, or the internal face of support columns

	Including		Excluding
20.1	The display window frame and shop entrance	20.2	Recesses, doorways or access to other accommodation

21.0 Shop Width (SW)

Internal width between inside faces of external walls at front of shop or other point of reference

22.0 Shop Depth (SD)

Measurement from the notional display window to the rear of the retail area

Including

22.1 The thickness of the display window (or any support structure)

23.0 Built Depth (BD)

Maximum external measurement from front to rear walls of a building at ground level

Applications
(when to use)

APP 19 **Estate agency and valuation** – RA is the basis of measurement for the valuation and marketing of shops and supermarkets

Notes
(how to use)

RA 1 **Diagrams** – diagrams E to H, K and L illustrate how to apply NIA; diagrams K and L are specific to shops

RA 2 **Zoning** – the use of zones when assessing the values of shops is a valuation, not a measurement, technique. Consequently it is not part of this Code. Market custom shall prevail

RA 3 **Display window** – location for the purpose of assessing GEA, GIA or NIA, in the case of shop property where the display window forms the non-structural 'fourth wall', its location should be assumed to be at the forward-most point at which a shop display window could be installed

AA 1 **Ancillary areas** – include staff rooms, kitchens, training rooms, offices, and the like

GF 1 **Return gross frontage** – to be measured in the same way as Gross Frontage

NF 1 **Return net frontage** – to be measured in the same way as Net Frontage

NF 2 **Display windows** – the existence and nature of display windows and integral shop fronts are to be noted

SW 1 **Shop width** – if the shop width is not reasonably constant throughout the whole sales area, then this should be stated and additional measurements may need to be provided

ShD1 **Notional display window** – the notional display window is to be assumed placed at the forward-most point at which a shop (see RA 3) display window could be installed

ShD2 **Shop depth** – if the depth is not reasonably constant throughout the whole sales area, then this should be stated and additional measurements may need to be provided

ShD3 **Building line** – the position of the building line is to be noted

Diagram K – An example of NIA in practice in a retail context

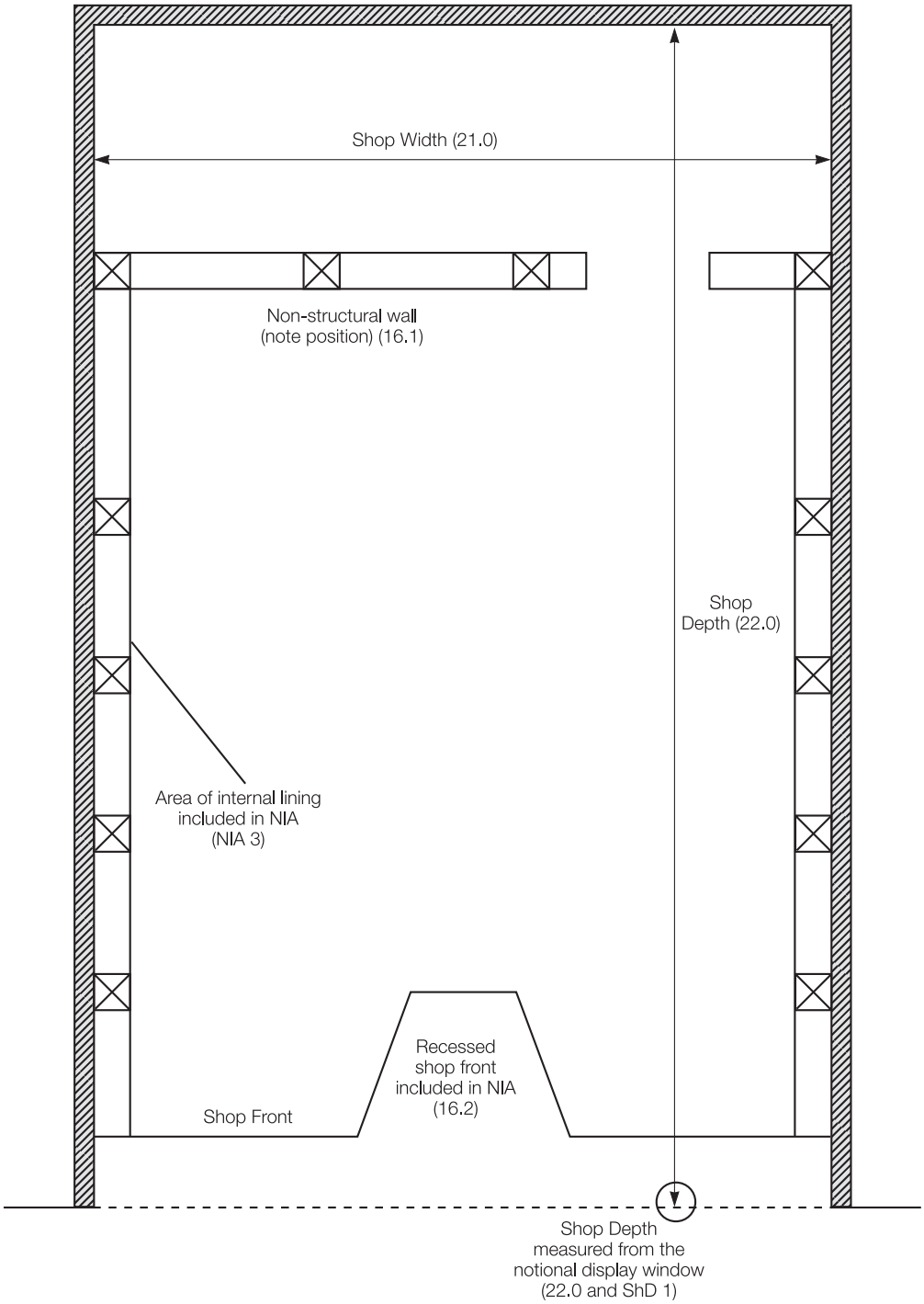
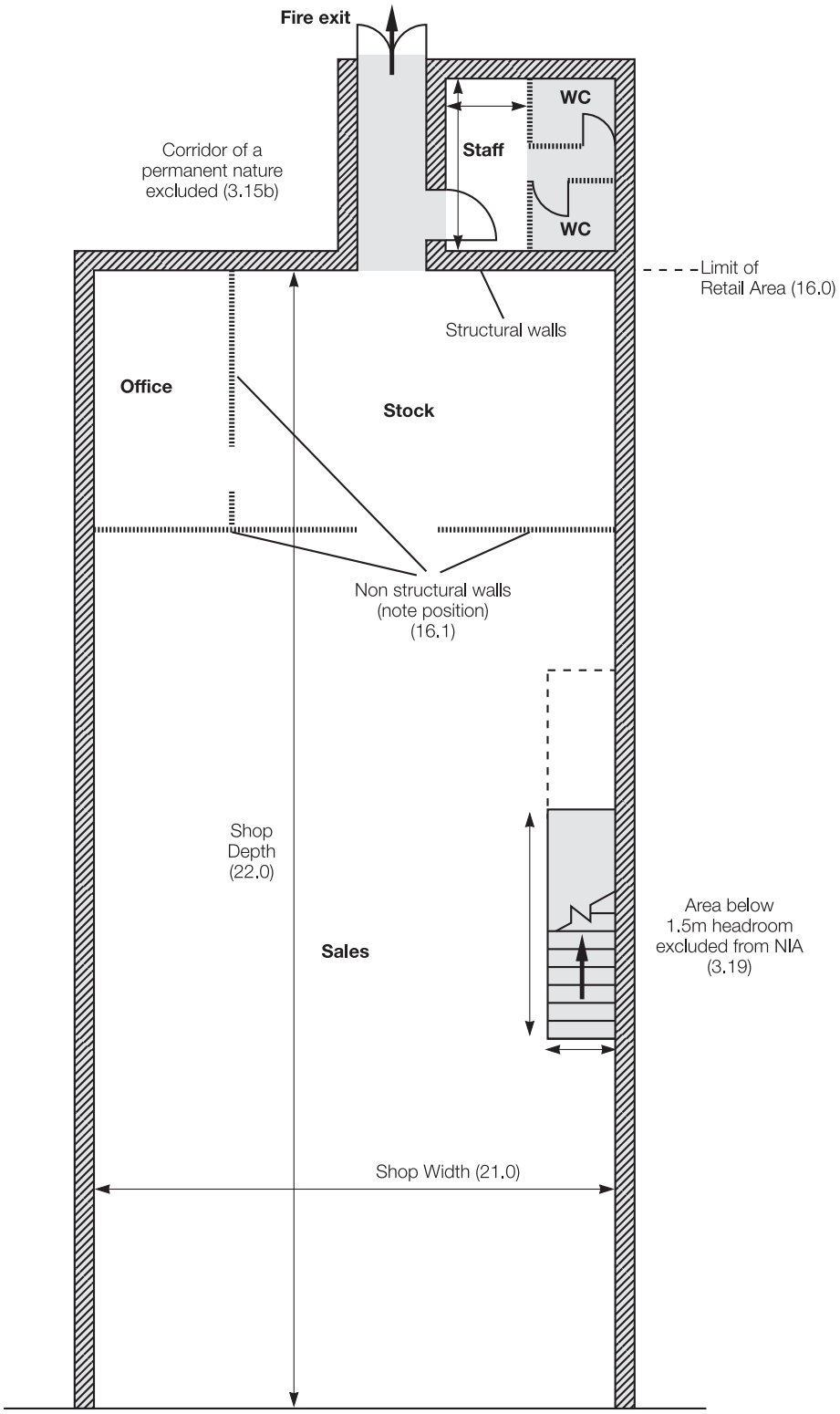


Diagram L – An example of NIA in practice in a retail context



Appendix E: Logic and levels for elemental cost planning of the construct (C), renewal (R) and maintain (M) works

The table below aligns the logic and arrangement as published in Appendix E of NRM 1: *order of cost estimating and cost planning for capital building works* – and then links the construction (C) and renewal (R) works (level 1, 2 and 3 codes) to the relevant maintain components or systems and sub-components (level 4 and 5 codes).

Column 1 – the level 1 classification code for group elements

Column 2 – the level 1 group element heading, with a list of group elements

Column 3 – the level 2 classification code for elements

Column 4 – the level 2 element heading, with a list of elements

Column 5 – the level 3 classification code for sub-elements or systems

Column 6 – the level 3 sub element or system heading, with a list of sub elements and systems for construction (C) and renewal (R)

Column 7 – the level 4 maintain components or systems, with a list maintain descriptors (as aligned to the inclusions list in NRM 1 and NRM 3 part 6 tables)

Column 8 – the level 5 maintain sub-components heading, with a list of maintain descriptors for applicable sub-components or systems (as aligned to the inclusions list in NRM 1 and NRM3 part 6 tables)

Note: In column 4 (#) denotes the maintain works includes for planned inspections of the substructure, superstructure and internal finishes and fittings, furnishings and equipment elements.

The detailed listing of all maintenance descriptors for renewal and maintain works and their associated rules of measurement for elemental cost planning. is defined in the tabulated tables in part 6 of these rules.

– planned inspection N/A – not applicable to maintain

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
0	Facilitating works	1	Toxic/hazardous material removal	1	Toxic or hazardous material removal	1 Toxic or hazardous material removal 2 Toxic or hazardous chemicals removal	Control of asbestos
				2	Contaminated land	Not covered by NRM 3	Not covered by NRM 3
				3	Eradication of plant growth	*Taken in 8.3.2.1*	N/A
		2	Major demolition works	1	Demolition works	Not covered by NRM 3	Not covered by NRM 3
		3	Temporary support to adjacent structures	1	Temporary support to adjacent structures	Not covered by NRM 3	Not covered by NRM 3
		4	Special groundwork's	1	Other extraordinary site investigation works	1 Site dewatering	Pumps
				2	Soil stabilisation measures	Not covered by NRM 3	Not covered by NRM 3
				3	Ground gas venting measures	1 Ground gas venting measures	N/A
		5	Temporary diversion works	1	Temporary diversion of drains	*T/E*	N/A
				2	Temporary diversion of services	*T/E*	N/A
				3	Temporary diversion of waterways	*T/E*	N/A
		6	Extraordinary site investigation works	1	Archaeological investigation	*T/E*	N/A
				2	Reptile/wildlife mitigation measures	N/A	N/A
				3	Other extraordinary site investigation works	1 Physical site investigation works 2 Temporary screens, fences and barriers and the like 3 Attendance	N/A
1	Substructure	1	Substructures	1	Standard Foundations	1 Strip foundations #	N/A
				2	Specialist foundations	14 Underpinning	Monitoring subsidence

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				3	Lowest floor construction	(1 to 7 – Not applicable to maintain)	N/A
						8 Gullies, floor outlets 9 Internal manholes	Prefabricated floor channels
				4	Basement excavation	N/A	N/A
				5	Basement retaining walls	19 Basement retaining walls #	Instrumentation and monitoring
2	Superstructure	1	Frame	1	Structural steel frames	1 Frame – steel	N/A
				2	Space frames/decks	1 Frame – space deck	N/A
				3	Concrete casings to steel frames	1 Frame – concrete casings	N/A
				4	Concrete frames	1 Frame – concrete	N/A
				5	Timber frames	1 Frame – timber	N/A
				6	Specialist frames	1 Frame – specialist	N/A
		2	Upper floors	1	Floors	1 UF – Concrete floors	N/A
						5 UF – Precast concrete decking	N/A
						6 UF – Timber	N/A
						7 UF – Structural screeds	N/A
				2	Balconies	1 UF – Balconies – purpose made	N/A
				3	Drainage to balconies	1 Downpipes 2 Floor outlets	N/A
		3	Roof	1	Roof structure	1 Roof structure – pitched 2 Roof structure – flat	Thermal insulation
				2	Roof coverings	1 Roof coverings (pitched/flat) 2 Roof paving 3 Green roofs/gardens	Surface treatments Photovoltaic devices Thermal insulation

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				3	Specialist roof systems	1 Specialist roof systems	Patents glazing Glazed roofing systems perspex roofing systems Roof components
				4	Roof drainage	1 Downpipes and gutters 2 Syphonic roof drainage	Rainwater heads
				5	Roof lights, skylights and openings	1 Skylights 2 Pavement lights 3 Roof hatches	Access hatches Smoke vents
				6	Roof features	1 Roof features	Turrets Wind vanes Spires False chimneys Fall arrest systems Access systems for cleaning roof Edge protection Balustrades and railings
		4	Stairs and ramps	1	Stair/ramp structures	1 Stairs/ramps structures #	N/A
				2	Stair/ramp finishes	1 Stair/ramp finishes #	N/A
				3	Stair/ramp balustrade and handrails	1 Stair/ramp balustrades and handrails #	N/A
				4	Ladders/chutes/slides	1 Ladders/chutes/slides	N/A
		5	External walls	1	External enclosing walls above ground floor level	1 External walls #	Chimneys Curtain walling Photovoltaic glazing (see CW) Safety barriers and the like
				2	External enclosing walls below ground floor level	1 External basement walls #	Photovoltaic-part of curtain walling

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				3	Solar/rain screen cladding	1 Solar/rain screening – vertical	N/A
						2 Solar/rain screening – horizontal	N/A
				4	External soffits	1 External soffits #	N/A
				5	Subsidiary walls, balustrades, handrails, railings and proprietary balconies	1 Walls # 2 Walls forming planters 3 Combined balustrades and handrails 4 Wall mounted handrails 5 Parapet railings 6 Proprietary bolt on balconies 7 Rainwater pipes 8 Floor outlets	N/A
				6	Facade access/cleaning systems	1 Facade cleaning system	1 Window/facade cleaning cradles 2 Combined facade/roof cleaning system 3 Building maintenance units 4 Other facade access system
		6	Windows and external doors	1	External windows	1 Windows # 2 Louvres 3 Shop fronts # 4 Roller shutters	Solar/rain screening Photovoltaic glazing Canopies Roller/sliding doors Screens/shutters – internal blinds Blinds and shutters
				2	External doors	1 External doors # 2 Revolving doors 3 Shop front doors 4 Roller shutters 5 Garage doors 6 Canopies 7 Grilles	Automatic doors Screen and storm doors Solar/rain screening Architraves

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
		7	Internal walls and partitions	1	Walls and partitions	1 Walls and partitions # 2 N/A 3 Fixed partitions #	Borrowed lights/screens
				2	Balustrades and handrails	1 Combined Balustrades and handrails #	N/A
				3	Movable room dividers	1 Moveable room dividers #	N/A
				4	Cubicles	1 Cubicles #	N/A
		8	Internal doors	1	Internal doors	1 Internal Doors – standard # 2 Fire resisting doors 3 Door sets 4 Composite door and sidelights/over panels 5 Roller /sliding shutters and the like	Door (types to be stated) Sliding/folding doors Hatches Ironmongery
3	Internal finishes	1	Wall finishes	1	Finishes to walls	1 Wall finishes # 2 Picture/dado rails 3 Proprietary impact and bumper guards	N/A
		2	Floor finishes	1	Finishes to floors	1 Floor finishes # 2 Specialist flooring systems 3 Skirtings 4 Mat wells 5 Finishes to swimming pools tanks 6 Line markings 7 Numeral and symbols	N/A
				2	Raised access floors	1 Raised access floors 2 Skirtings (taken with raised flooring)	Floor finishes to raised flooring system Skirtings and the like
		3	Ceiling finishes	1	Finishes to ceilings	1 Ceiling finishes # 2 Cornices, covings (inc CF)	N/A

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				2	False ceilings	1 False ceilings # 2 Cornices and covings (inc FC) 3 Access hatches	N/A
				3	Demountable suspended ceilings	1 Demountable suspended ceilings 2 Shadow gas – N/A 3 Access hatches – (include with DSC)	N/A
4	Fittings, furnishings and equipment	1	Fittings, furnishings and equipment	1	General fittings, furnishings and equipment	1 Fittings 2 Furnishings 3 Equipment	General FF&E Furnishings (state types) (as table 4.1) Fire extinguishers
				2	Domestic kitchen fittings and equipment	1 Kitchen units # 2 Kitchen appliances 3 Waste bins, towel ranks and the like – (Not maintained)	Domestic kitchen units Sinks and taps Other kitchen F&E Ovens, cookers etc (white goods) Washing machines, dryers etc
				3	Special-purpose fittings, furnishings & equipment	1 Fittings 2 Furnishings 3 Equipment	*(To be stated)*
				4	Signs/notices	1 Components	Directional signage Notice and white boards Sign writing Shop front lettering Nameplates
				5	Works of art	Not covered by NRM 3	N/A
				6	Non mechanical and non electrical equipment	1 Equipment 2 Removable ladders	Disabled access equipment Non mechanical and electrical equipment
				7	Internal planting	1 Plants and shrub beds 2 Plant containers 3 Trees 4 Tree planters	N/A

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				8	Bird and vermin control	1 Wires, nets, traps and the like 2 Electronic and sonic systems 3 Bird repellent coatings	N/A
5	Services	1	Sanitary appliances	1	Sanitary appliances	1 Sanitary appliances	WC suites, slop hoppers, urinals/cisterns Sinks Wash basins Bidets Baths Shower units and trays Valves Drinking fountains Taps and other fittings Water saving devices Automated control and sensors
				2	Sanitary ancillaries	1 Fittings	Shower cubicles Bath/shower curtains and rails Grab/support rails Towel rails Hand dryers Paper towel dispensers Sanitary incinerators Macerators Other sanitary fittings
		2	Services equipment	1	Services equipment	1 Services equipment	Catering equipment Food storage equipment Other service equipment (to be defined)
		3	Disposal installations	1	Foul drainage above ground	1 Drainage to sanitary appliances 2 Drainage to services equipment	Foul drainage Floor channels/gratings Sump pumps

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				2	Chemical toxic and industrial liquid waste drainage	1 Drainage to appliance or equipment	Pipe work systems Traps, access points/ rodding eyes Gullies Storage tanks and vessels Settlement tanks Effluent treatment plant Dosing equipment Sterilisation equipment Thermal insulation Controls Monitoring equipment Painting/anti-corrosion treatment
				3	Refuse disposal	1 Refuse disposal	Refuse collection and disposal equipment Incineration plant Safety devices
		4	Water installations	1	Mains water supply	1 Mains water supply above ground	Pipe work systems Valves Meters Trace heating Thermal insulation
				2	Cold water distribution	1 Cold water distribution 2 Storage tanks 3 Rainwater harvesting systems 3A Grey water collection pipe systems	Pipe work systems Taps Valves Pumps Pressurisation units Pressure booster sets CW storage tanks and cisterns Instrumentation and controls Thermal insulation

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				3	Hot water distribution	I Hot water distribution	Hot water systems (vented or unvented) Valves Pumps Heat exchangers Storage cylinders and calorifiers Hot water storage vessels Immersion heaters Water softeners Expansion tanks Instrumentation and controls Thermal insulation
				4	Local hot water distribution	I Water heaters	Instantaneous water heaters Under-sink, multipoint and over sink units
				5	Steam and condensate distribution	I Steam and condensate distribution	Steam services pipe work systems Valves Steam reduction stations Condensate receivers Condensate pump sets Steam connection outlets Taps Heat exchangers Storage cylinders and calorifiers Instrumentation and controls Thermal insulation

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
		5	Heat source	1	Heat source	1 Heat source	Boilers – Biomass Boilers – gas/oil Boilers – steam Boilers – Electric Packaged steam generators Boilers – wood pellet CHP Heat pumps Ground source pumps Pumps Valves Non storage calorifiers Solar thermal panels Non storage calorifiers Tanks Instrumentation and controls Fans Gantries Flues

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
		6	Space heating and air conditioning	1	Central heating	1 Central heating systems	Central heating system Pipe work systems Heat emission units Under floor heating Heat emitters Cable heating systems Plenum air heating system Valves Ductwork Grilles and diffusers Plate recuperator Thermal wheel Duct heater battery – electric Instrumentation and controls Thermal insulation
				2	Local heating	1 Heaters	Heat emitters Flues Instrumentation and controls

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				3	Central cooling	1 Central cooling systems	Chilled beams Terminal units – fan coil Terminal units – VAV Terminal units – VRV Chillers Refrigeration distribution systems Cooling towers Pipe work systems Valves Pumps Ductwork and fittings Grilles and diffusers Fans Filters Air handling units Instrumentation and controls Thermal insulation
				4	Local cooling	1 Cooling units	Air conditioning units Pipe work systems Valves Duckwork system Grilles and diffusers Instrumentation and controls Thermal insulation

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				5	Central heating and cooling	1 Combined central heating and cooling systems	Terminal units – fan coils Terminal units – VAV systems Reverse cycle heat pump systems Chillers Pipe work systems Valves Pumps Ductwork systems Grilles and diffusers Fans Air handling units Instrumentation and controls Thermal insulation
				6	Local heating and cooling	1 Local heating and cooling units	Split systems/DX systems Pipe work systems Valves Pumps Ductwork system Grilles and diffusers Instrumentation and controls Thermal insulation

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				7	Central air conditioning	1 Central air conditioning systems	Plenum air – heating systems Central air conditioning systems Humidifiers Chillers Air handling units Terminal units Pipe work systems Valves Pumps Ductwork system Grilles and diffusers Instrumentation and controls Thermal insulation
				8	Local air conditioning	1 Self contained air conditioning units	Room air conditioning units Pipe work systems Valves Pumps Ductwork system Grilles and diffusers Instrumentation and controls Thermal insulation
		7	Ventilation systems	1	Central ventilation	1 Central ventilation systems	Fans Terminal units Ductwork system Grilles and diffusers Pipe work system Valves Pumps Instrumentation and controls

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				2	Local and special ventilation	1 Toilets/bathroom ventilation units 2 Kitchen ventilation units 3 Safety cabinet and fume cupboards 4 Fume extracts 5 Dust collection units 6 Anaesthetic ags extracts 7 Cyclone systems 8 Unit extract fans 9 Rotating ventilators 10 Roof – mounted ventilation 11 Car parking ventilation 12 Other local and special ventilation units	Fans Ductwork cleaning Grilles and diffusers Instrumentation and controls
				3	Smoke extract/control	1 Smoke extract/control systems	Smoke extract/control Automatic smoke compartmentation systems Fans Ductwork systems Grilles and diffusers Instrumentation and controls
		8	Electrical installations	1	Electrical mains and sub mains distribution	1 Electrical mains and sub mains LV distribution	LV distribution HV switch gear LV switchgear and distribution boards HV and LV cables and wiring Conduits and cable trunking Basbar trunking Transformers Feeder pillars, base units and the like Electricity monitoring system

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				2	Power installations	1 Power installations	General LV power installations Extra LV supply installations DC installations LV Switch gear Distribution boards UPS system Cables and wiring Socket outlets (PAT testing) Specialist power installations
				3	Lighting installations	1 Lighting installations	Light fittings – general Emergency lighting External lighting LV Switchgear and distribution boards Cables and wiring Conduits and cable trunking Fittings to lighting points Lighting switches Luminaries/lamps Lighting control equipment

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				4	Specialist lighting installations	1 Specialist lighting installations	Illuminated display units Studio lighting Auditorium lighting Arena lighting Operating theatre lighting LV switchgear and distribution boards Cables and wiring Conduits and cable trunking Fittings to lighting points Switches Luminaries/lamps Lighting gantries Lighting control equipment
				5	Local electricity generation systems	1 Electricity generation systems	Standby generator Ancillary components
					Transforming devices	4 Wind turbines 5 Photovoltaic devices 6 Other transformation devices	Solar collectors Generators Ancillary components
				6	Earthling and bonding systems	1 Earthling and bonding systems	Protection conductor and earth Hazardous areas electric areas – earthing
		9	9 Fuel installations	1	Fuel storage	1 Fuel storage	Fuel systems – oil, petrol, diesel and liquidified petroleum gas, biomass and others Thermal insulation

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				2	Fuel distribution systems	1 Piped distribution systems	Fuel systems – oil, petrol, diesel and liquidified petroleum gas, biomass and others Pipe work systems Pumps Valves Gas distribution components Terminal control equipment Thermal insulation Monitoring equipment
		10	10 Lift and conveyor installations	1	Lifts	1 Passenger lifts 2 Wall climbing lifts 3 Goods lifts	Lifts installations (various types) Fire fighting lifts Gantries Controls and electrical works
					Enclosed hoists	1 Enclosed hoists	Controls and electrical works
				2	Escalators	1 Escalators	Ancillary components Controls and electrical works
				3	Moving pavements	1 Moving pavements	Travelators Stair lifts Controls and electrical works
				4	Powered stair lifts	1 Powered stair lifts	Controls and electrical works
				5	Conveyors	1 People conveyors 2 Goods conveyors	Specialist systems (baggage handling systems) Controls and electrical works
				6	Dock levellers and scissor lifts	1 Dock levellers 2 Scissor lifts	Controls and electrical works
				7	Cranes and unenclosed hoists	1 Cranes 2 Travelling cranes 3 Unenclosed hoists	Controls and electrical works

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				8	Car lifts, car stacking systems, turntables and the like	1 Car lifts 2 Car stacking 3 Vehicle turntables	Controls and electrical works
				9	Document handling systems	1 Document handling/delivery systems 2 Warehouse picking systems 3 Other systems	Controls and electrical works
				10	Other transport systems	1 Other lift and conveyor installations	Paternoster lifts Hoists for moving people with disability Controls and electrical works
		11	Fire and lightning protection	1	Fire fighting systems	1 Fire hose reels 2 Dry risers 3 Wet risers 4 Fire and oxide protection curtains 5 Other fire fighting systems	Fire and smoke protection curtains Pipe work systems Thermal insulation Control components
				2	Fire suppression systems	1 Sprinklers 2 Deluge systems 3 Gas fire fighting systems 4 Foam fighting systems 5 Other fire suppression systems	Pipe work systems Tanks and cisterns Thermal insulation Control components
				3	Lightning protection	1 Lightning protection	Bonded steel frame and tape based systems Finials Conductor tapes Ground/earthing

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
		12	Communication, security and control systems	1	Communication systems	1 Telecommunication 2 Data transmission 3 Paging and emergency 4 Public address and conference audio 5 Radio systems 6 Protection systems 7 Fire detection and alarm systems 8 Smoke detection and alarm systems 9 Liquid detection systems 10 Clocks, card clocks and flexitime installations 11 Door entry systems 12 Radio and televisions 13 Television systems 14 TV monitors 15 Pneumatic message systems 16 Other comms systems	Control panels BMS and operating station systems Controlling terminal units and switches Control cabling and containment Compressed air and vacuum operating controls
				2	Security systems	1 Surveillance equipment 2 Security detection 3 Security alarm equipment 4 Access control systems 5 Burglar and security alarms 6 Door entry systems 7 Security lights and lighting systems 8 Other security systems	N/A
				3	Central control/building management systems	1 Central control/building management systems	Control panels BMS Operating station systems

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
		13	Specialist installations	1	Specialist piped supply systems	1 Medical and laboratory gas supply systems 2 Centralised vacuum cleaning systems 3 Treated water systems 4 Swimming pools water treatment systems 5 Compressed air systems 6 Vacuum installations 7 Other specialist piped supply systems	Pipework systems Air ducts lines and the like Thermal insulation Silencers and acoustic treatment Control components
				2	Specialist refrigeration systems	1 Cold rooms 2 Ice pads 3 Other specialist refrigeration systems	
				3	Specialist mechanical installations	1 Other specialist installations	Wave machines Saunas Jacuzzis Swimming pools
				4	Specialist electrical installations	1 Specialist electrical and electronic installations	Radio and television studio equipment Recording studio equipment Television aerial and satellite systems Home cinemas Multi-room audio and video Automated curtains and blinds
				5	Water features	1 Water features	Water filtration equipment Nutrient treatment and equipment Control components

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
		14	14 Builders' work in connection with services	1	Builders' work in connection with services	1 Builder's work in general areas 2 Builder's work in landlord areas 3 Builder's work to plant rooms 4 Large plant and equipment bases 5 Fuel bunds	N/A
6	Complete buildings and building units	1	Prefabricated buildings	1	Complete buildings	Not covered by NRM 3	Not covered by NRM 3
				2	Building units	Not covered by NRM 3	Not covered by NRM 3
7	Work to existing buildings	1	Minor demolition works and alteration works	1	Minor demolition and alteration works	1 Spot items	As table 7.1
		2	Repairs to existing services	1	Repairs to existing services	1 Equipment/plant repairs 2 Overhaul services installations	As table 7.2
		3	Damp proof courses/fungus and beetle eradication	1	Damp proof courses	1 Damp-proof courses	Chemical damp proof course Inspection of mortar DPC Inserting mechanical DPC Local making good
				2	Fungus/beetle eradication	1 Eradication treatment	Fungus/beetle detection
		4	Facade retention	1	Facade retention	1 Support structures #	As table 7.4
		5	Cleaning existing surfaces	1	Cleaning	1 Cleaning existing surfaces	Cleaning surfaces Remove efflorescence, stains, spot graffiti, algae, bird droppings and the like Chemical cleaning treatment Artificial weathering
				2	Protective coatings	1 Proactive coatings to existing surfaces	Protective coatings (surfaces)
		6	Renovation works	1	Masonry repairs	1 Masonry repairs	
				2	Concrete repairs	1 Concrete repairs	
				3	Metal repairs	1 Metal repairs	
				4	Timber repairs	1 Timber repairs	

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				5	Plastics repairs	1 Plastic repairs	
8	External works	1	Site preparation works	1	Site clearance	Not covered by NRM 3	Not covered by NRM 3
				2	Preparatory ground works	Not covered by NRM 3	Not covered by NRM 3
		2	Roads, paths and pavings	1	Roads, paths and pavings	1 Roads 2 Paths 3 Paved areas 4 Roundabouts 5 Road crossings 6 Steps 7 Ramps 8 Traffic calming accessories 9 Tree grilles 10 Vehicle protection barriers 11 Bumpers 12 Pavement markings	Disposal of surface water and groundwater Accessories Pavement markings
				2	Special surfaces and pavings	1 Surfacing and pavings	Markings to surfaces and pavings
		3	Soft landscaping, planting and irrigation systems	1	Seeding and turfing	1 Grassed areas 2 Reinforced grass proprietary systems 3 Marking out grass sports pitches 4 Work to existing grass areas 5 Maintenance of grassed areas	Seeding and turfing (part of ground maintenance)

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				2	External planting	1 Planting 2 Planting reed beds 3 Hedges 4 Trees 5 Woodland planting 6 Tree surgery 7 Maintenance works to plants 8 Maintenance works to trees 9 Maintenance works to hedges	Grounds maintenance works
				3	Irrigation systems	1 Irrigation systems	Irrigation pipework systems Storage tanks Chemical storage tanks Chemical dosing equipment Nutrient treatment and equipment Outlet pipe and nozzles
		4	Fencing, railing and walls	1	Fencing and railings	1 Fencing 2 Railings 3 Gates	Fencing systems (types) Railings Gates – security Noise/light screening Ironmongery Painting/redecorations
				2	Walls and screens	1 Walls 2 Screens 3 Gates	Copings Pier caps Ironmongery
				3	Retaining walls	1 Retaining walls	Refer to table 8.4.3
				4	Barriers and guardrails	1 Vehicle restraint systems 2 Pedestrian restraint systems 3 Vehicle and pedestrian control barriers and gates	Fixing barriers and guardrails Redecorations

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
		5	Site/street furniture and equipment	1	Site/street furniture and equipment	1 Components	Gates Turnstiles Bollards Poster display units/notice boards Directional signage Flagpoles Sports/playground equipment Other furniture Bus stops/shelters Sculptures
				2	Ornamental features	1 Ornamental features	Water features
		6	External drainage	1	Surface water and foul drainage	1 Connections to statutory undertakers sewers– N/A 2 Drainage runs below ground 3 Drainage runs above ground 4 Prefabricated channels 5 Manholes 6 Alterations to existing external drainage systems 7 Works to exiting manholes 8 Cleaning existing drains 9 Sealing redundant drains – N/A 10 Filling disused manholes – N/A	Gullies and gratings
				2	Ancillary drainage systems	1 Pumping stations 2 Ejector stations 3 Storage/retention tanks and vessels 4 Sewage treatment 5 Enzyme systems 6 Sustainable urban drainage systems	Pipework systems

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				3	External laboratory and industrial liquid waste drainage	1 Drainage runs below ground 2 Drainage runs above ground 3 Equipment and plant	Pipe work systems Storage tanks Settlement tanks Effluent treatment – dosing equipment Sterilisation equipment Control components Monitoring equipment
				4	Land drainage	1 Drainage runs below ground 2 Manholes 3 Drainage blankets 4 Land drainage to parkland	Inspections Drain clearance
		7	External services	1	Water mains supply	1 Connections 2 Connections to external plant 3 Service runs 4 Rainwater harvesting systems 5 Grey water systems	Fire hydrants Trace heating Thermal insulation Meters
				2	Electricity mains supply	1 Connections to SU 2 Service runs 3 Transformer substations 4 External electricity generation installation /plant	Distribution of LV electricity Generator plant Draw pits
				3	External mains transformation devices	1 Wind turbines 2 Photovoltaic devices 3 Other transformation devices	Generator plant
				4	Electricity distribution to external plant and equipment	1and 2 Connections to external plant or equipment 3 Service runs	Electrical distribution systems
				5	Gas mains supply	1 Connections to SU gas main 2 Service runs 3 Governing stations	

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				6	Telecommunications and other communication system connections	1 Telecommunications system connections 2 Cables television connections 3 Other communication systems 4 Service runs	
				7	External fuel storage and piped distribution systems	1 Fuel storage and piped distribution systems 2 Service runs	Storage tanks Thermal insulation Monitoring equipment
				8	External security systems	1 Surveillance equipment 2 Security detection equipment 3 Security alarm equipment 4 Gate access control systems 5 Gate entry systems 6 Security lights and lighting systems 7 Other security systems 8 Service runs	CCTV Camera poles General power installations Cables and wiring Control components
				9	Site/street lighting systems	1 External lighting to pedestrian areas 2 External lighting to paths 3 External lighting to roads 4 Illuminated traffic signs	External lighting/fittings (LED) Columns, poles, masts and the like Fixing luminaries and lamps General power installations
				10	Local/district heating installations	1 Heat source 2 Service runs 3 External heating ducts and duct access covers	Boiler plant and equipment Pipework systems Instrumentation and controls Thermal insulation

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				11	Builders work in connection with external services	1 Ducts and the like 2 Supports to external storage tanks etc 3 Fule bunds and the like 4 Protective compounds, fencing etc for LPG installations and the like 5 Protective compounds, connected with transformer substations and the like 6 Bases for services equipment 7 Other builder's work in connection with external services	To be stated
		8	Minor building works and ancillary buildings	1	Minor building works –INCLUDED IN SECTIONS	1 Refurbishment of existing ancillary buildings 2 Overhaul existing mechanical and electrical plant and equipment 3 Repairs to existing fences, railings, walls and screen walls	N/A
				2	Ancillary buildings and structures	1 Minor ancillary buildings	N/A
				3	Underpinning to external site boundary walls	1 Underpinning to external site boundary walls and the like	N/A
9	Maintenance contractor's management and administration costs	1	Employer's requirements	1	Site accommodation	1 Site accommodation 2 Furniture and equipment 3 Telecommunications and IT systems	N/A
				2	Site records	1 Site records	1 Not covered by NRM3 2 Not covered by NRM 3 3 web based facilities management systems – including uploading data as well as implementation and training on BMS

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				3	Completion and post-completion requirements	1 Handover requirements 2 Operation and maintenance services	(Items NOT covered by NRM 3) Provision of spare parts for maintenance Provision of tools and portable instruments
		2	Maintenance contractor's cost items	1	Management and staff	1 Contract specific management & staff 2 Visiting management and staff 3 Extraordinary support costs 4 Staff travel (not part of labour rates)	Refer to table item 9.2.1
				2	Site establishment – OPTIONAL IF IN SCOPE	1 Site accommodation 2 Temporary works 3 Furniture and equipment 4 IT systems 5 Consumables and services 6 Brought on services 7 Sundries	Refer to table item 9.2.2
				3	Temporary services	Not covered by NRM 3	Not covered by NRM 3
				4	Security – OPTIONAL IF IN SCOPE	1 Security staff 2 Security equipment 3 Hoardings, fences and gates	N/A
				5	Safety and environmental protection	1 Safety performance 2 Barriers and safety scaffolding 3 Environmental protection measures	Refer to table item 9.2.5
				6	Control and protection	1 Surveys, inspections and monitoring 2 Setting out 3 Protection of works 4 Samples 5 Environmental control of building	Refer to table item 9.2.6

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				7	Mechanical plant	1 Generally 2 Tower cranes 3 Mobile cranes 4 Hoists 5 Access plant 6 Concrete plant 7 Other plant	Refer to table item 9.2.7
				8	Temporary works – INCLUDED WITH WORK ITEMS	1 Access scaffolding 2 Temporary works	N/A
				9	Site records	1 Maintenance works 22 Web based facilities management systems	Refer to table 9.2
				10	Transition and exit requirements	1 Testing and commissioning plan 2 Handover 3 Post completion services (handback)	Refer to table item 9.2.9
				11	Cleaning	1 Site tidy 2 Maintenance of roads, paths and parings	Refer to table item 9.2.10
				12	Fees and charges	1 Fees 2 Charges	Refer to table item 9.2.11
				13	Site services	1 Temporary works 2 Multi-service gang	Refer to table item 9.2.13
				14	Insurance, bonds, guarantees and warranties	1 Works insurances 2 Public liability insurances 3 Employers liability insurances 4 Other insurances 5 Bonds 6 Guarantees 7 Warranties	Refer to table item 9.2.14

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
10	Maintenance contractor's overhead and profit	1	Maintenance contractor's overhead				Refer to table item 10.1.1
		2	Maintenance contractor's profit			1 Project team and design team consultant's and other specialist fees	Refer to table item 10.2.1
11	Consultant and specialist fees	1	Consultant's and specialist fees	1	Consultant's and specialist fees	1 Consultant's and specialist fees	Refer to table item 11.1.1
				2	Other consultant's fees	1 Other consultant's fees	Refer to table item 11.1.2
				3	Site investigation fees	1 Site investigation fees	Refer to table item 11.1.3
				4	Specialist support consultant's fees	1 Specialist support consultant's fees	Refer to table item 11.1.4
		2	Maintenance contractor's tender / pre-contract fees	1	Management and staff	1 Management and staff	Refer to table item 11.2.1
				2	Specialist support services fees	1 Specialist support services fees	Refer to table item 11.2.2
				3	Temporary accommodation, services and facilties charges	1 Temporary accommodation, services and facilties charges	Refer to table item 11.2.3
				4	Maintenance contractor's overhead and profit	Maintenance contractor's overhead and profit	Refer to table item 11.2.4
		3	Maintenance contractor's design fees	1	Maintenance contractor's design consultant's fees	Maintenance contractor's design consultant's fees	Refer to table item 11.3
12	Employer definable maintenance related costs	1	Employer definable maintenance related costs	1	Land acquisition costs	Land acquisition costs	
				2	Employer finance costs	1 Employer finance costs	
				3	Fees	1 Fees	Refer to table item 12.1.3
				4	Charges	1.Charges	
				5	Planning contributions	Not covered in NRM 3	Not covered in NRM 3
				6	Insurances	1.Insurances	Refer to table item 12.1.6
				7	Archaeological field work	1 Archaeological field work	
				8	Other specialist fieldwork	1 Other specialist fieldwork	

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				9	Decanting and relocation costs	1.Decanting and relocation costs	Refer to table item 12.1.9
				10	Fittings, furnishings and equipment	1 Fittings, furnishings and equipment	
				11	Tenant's costs/contributions	1 Tenant's costs/contributions	
				12	Marketing costs	1 Marketing costs	
				13	Other employer costs	1 Other employer costs	
				14	Allowances	1 Allowances	
				15	Energy efficiency	1 Energy efficiency	
				16	Office churn	Not covered in NRM 3	Not covered in NRM 3
				17	Not covered in NRM 3	N/A	Not covered in NRM 3
				18	End of life	Taken elsewhere	
				19	Third party income	Not covered in NRM 3	Not covered in NRM 3
				20	Loss of income	Not covered in NRM 3	Not covered in NRM 3
13	Risk	1	1 Design and installation risks			1 Design development and standards 2 Construction installation legacy risks 3 Handover 4 Legislation and changing future regulations, e.g Health & safety at work	Refer to table item 13.1
		2	2 Maintenance risks			1 Procurement 2 Maintenance delivery 3 Life cycle replacement works	Refer to table item 13.2
		3	3 Employer change risks			1 Project brief 2 Scope creep 3 System redundancy 4 Timescales	Refer to table item 13.3

CODE	LEVEL 1 Group element	CODE	LEVEL 2 Element	CODE	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
		4	4 Employer other risks			1 Maintenance brief 2 Timescales 3 Third party 4 Management	Refer to table item 13.4
	Inflation	1	Tender inflation				Refer to table item 14.1
		2	Construction inflation				Refer to table item 14.2
		3	Life cycle replacement inflation				Refer to table item 14.3
14		4	Life cycle discount rate				Refer to table item 14.4

Appendix F: Maintenance cost categories and definitions

Table 2 below provides the maintenance cost categories and definitions, which has been reproduced with the permission of the British Standards Institute (source BS 8544 guide for LCC of maintenance during the in use phase)

Note 1: Definitions of cost categories – Operation and occupancy costs (O) and end of life and environmental costs (E) are not covered in the NRM 3 rules.

Table 2: Maintenance cost categories and definitions

Cost Category	Maintenance cost category definitions
Asset information cost	Information required to manage and optimize the annualized maintenance regimes (maintain) and predict the timing of the life-cycle major repairs and replacement (renewal) programme of works
Asset maintenance registers A), B, C)	A record or inventory of all building and engineering services maintainable assets applicable for the annualised maintenance and service life planning of major life-cycle renewal works, agreed in the Brief stage. Costs to include: ● asset maintenance registers (i.e. initial production and subsequent updates); ● identification of applicable level of assets required for the LCC of maintain and/or renewal plans with or without tagging; ● verification for completeness and capturing specific assets details (e.g. make, model, capacity, rating and other asset details as required with or without tagging); ● asset tagging and bar coding identification if required – (optional); ● relevant maintenance information available for the LCC maintenance and renewal programming (refer to Appendix I); ● relevant as built/computer-aided design (CAD) drawings/room data sheets and object BIM related information.
Condition surveys, reports and the percentage asset remaining life expectancy (PARL) asset assessment data [D)]	Assessment of the applicable building or constructed asset's current age, condition grading and percentage of remaining asset life (compared against accepted reference service life planning and factoring methods), agreed in the Brief stage Included costs for initial, periodic and specialist asset surveys should include: ● stock condition surveys; ● percentage asset remaining life (PARL) assessments; ● inspection/monitoring regimes – e.g. site tours, thermal imaging and vibration analysis, etc.; ● specialist surveys, e.g. historic listed building; ● other costs, as applicable. Excluded costs for initial, periodic and specialist asset surveys: ● inspections carried out as part of the maintenance contract work (included in the maintain regime); ● general inspections and audits commissioned separately by or on behalf of the client (these costs are to be included in the employer's definable maintenance management activities).

Cost Category	Maintenance cost category definitions
Other forms of assessment (Optional)[E)]	Assessment of wider asset investment planning based on functional and performance considerations and other predetermined requirements (if required as part of the LCC plan) – as agreed in the Brief stage. Included costs for other forms of asset assessment may be: ● capacity forecasts/resilience assessments; ● energy efficiency reviews (EPC); ● space utilization; functional suitability (optional); ● Disability Discrimination Act (DDA), Equality Act 2010, e.g. considerations and other regulatory risk surveys; ● wider sustainability implications (to be defined); ● other forms of assessment as applicable (if agreed in scope). Note For example, carbon reduction commitments resulting in energy efficiency improvement work.
NOTES	[A] Applies to asset registers in any form (hardcopy, electronic, building information model, etc.) [B] refer to information and data sources in BS8544, clause 9 for more detail guidance on costing for gathering relevant asset information and establishing robust asset maintenance registers for LCC of maintenance exercises. [C] Stock surveys include for obtaining relevant information from as built /O&M data files and site log books, plus capturing local knowledge to inform findings. [D] Refer to the information assumptions and data sources in BS8544, Clause 9 for detailed guidance on remaining service life data sources. [E] See NRM clause 4.6. in Part 4 for guidance on costing other forms of assessment.
Maintain cost	*Planned, reactive, and proactive maintenance costs (including on costs and employer costs)*
Planned maintenance (including PPM regime) Including minor repairs and asset sub-component replacement costs (up to sub-limit of liability)	Scheduled replacement of parts and scheduled servicing, maintenance and repairs to components and associated making good and minor redecorations including PPM and/or reliability-centred maintenance, proactive maintenance. Included costs: ● labour (annual man hours for scheduled or PPM programmed work); ● subcontracted and specialist scheduled or PPM works; ● consumables, plant and equipment, sundries; ● premium costs for out of normal hours of working. ● Plus on-cost items, if it is a PPM-only contract. [F)] ● Costs include both work with a frequency of less than a year and a cycle of more than a year, expressed as an annual equivalent cost. Excluded costs – major repair, refurbishing replacement costs (i.e. included in life-cycle renewal costs). NOTE: See life-cycle renewal costs for guidance on definitions of "major" and "minor" replacement.
Reactive, responsive and corrective maintenance Including unscheduled component replacement, repairs costs (up to sub limit of costs or liability)	Allowance for unforeseen or unplanned maintenance arising from early failure, inappropriate use, etc. and associated making good and minor redecorations. Included costs: ● labour (man hours for reactive first line work); ● subcontracted and specialist reactive cover; ● consumables, plant and equipment, sundries; ● premium costs for out of normal hours of working Plus on-cost items, if it is a reactive cover only. [F)]
Proactive maintenance provision Including planned inspections and monitoring and site management procedures	Allowance for proactive maintenance provision. [G)] Included costs: ● planned inspections of buildings (PIB); ● tours of plant rooms and critical systems; ● targeted monitoring, e.g. energy focused (BMS controls); ● employer definable maintenance related maintenance management activities; ● others (as defined in scope). Plus on-cost items, if the proactive cover is costed separately. Also, the cost of works resulting from inspections should be included in reactive maintenance.

Cost Category	Maintenance cost category definitions
Maintenance contractors on costs and risk allowance, consultant fees and inflation, taxation etc [G)]	Included costs (for planned, reactive and proactive): ● maintenance contractor's management prelims notes and administration; ● maintenance contractor's overhead and profit; ● contractor's consultants' fees and specialist works costs; ● risk – (including commercial / other considerations). [H)] ● inflation/deflation to bring current cost estimate to the start date of the costing exercise (year zero), inflation during the period of the costing exercise should be covered by discounting using stated method of economic evaluation. ● taxation and incentives – if required to be in scopes (e.g. VAT normally excluded for costing).
NOTES	[F)] On-costs to be costed separately, depending on the type of contract for maintenance (e.g. PPM, reactive only and/or combined or fully comprehensive cover contract). [G)] Proactive maintenance activity to include for early interventions to failing assets. [H)] Risks to include costs for relevant commercial or other considerations.
Renewal cost	*Planned major repairs, refurbishing, replacements, redecorations – plus specific improvements and upgrade works (if required for certain LCC outcomes – e.g. improve energy efficiency)*
Major repairs [J)] and replacements	*Scheduled major repairs, refurbishing and replacement of major system elements and components (within set limits of liability) and associated making good and minor redecorations. Specific asset improvements and upgrades were applicable to achieve certain LCC outcomes, or as a result of obsolescence/technology etc.* Costs to include: ● repair and replacement of major building assets and plant and equipment items [B)] ● access and location adjustment factors; ● travel, transport and subsistence costs; ● facilitating works ● pre-inspection costs; ● landfill tax and income/disposal costs; ● maintenance contractor's management of the works and specialist's on-costs ● maintenance contractors on-costs; ● costs and income from disposal of replaced components and parts, where applicable; ● any life-cycle fund management and the employed direct labour where those costs are considered to be direct overheads to the works. On-cost items, temporary works, access costs, out of hours premium, design and commissioning costs, in connection with replacement should also be included if applicable
Refurbish and adaptation Note – normally dealt with as construction project works	*Scheduled refurbishment, improvement, adaptation and upgrades during the in-use period of analysis.* If in scope, this includes: ● improvement works to buildings or parts thereof; ● refurbishment of whole installations including associated works; ● upgrade works (e.g. carbon reduction/Part L); ● renewables (e.g. CHP, solar panelling); ● alterations and churn costs. This excludes refurbishment and major adaptation carried out as part of initial construction or fit out works, or a subsequent refurbishment project (i.e. dealt with as part of construction works).
Redecorations	*Scheduled redecoration works to existing buildings.* [K)] This excludes decorations carried out in connection with maintenance or replacement work. Plus on-cost items, if separate contracts.

Cost Category	Maintenance cost category definitions
Maintenance contractor's on-costs and risk allowance, fees, taxation, inflation allowances [L)]	Costs to include (for 'renewal' maintenance works): ● maintenance contractor's preliminaries and administration; ● maintenance contractor's overhead and profit; ● consultants fees and specialist works costs; ● employer definable maintenance related works (if in scope) ● risk (including commercial/other considerations); [M)] ● inflation; ● taxes (e.g. VAT normally excluded for costing).
NOTES	[I)] Costs should be presented in an elemental and sub-elemental cost structure categories for buildings and external works, as NRM appendix I and J. [J)] The split between 'major' replacement costs and 'minor' repairs and replacement will depend on the funding arrangements and contractual interface arrangements, and should be defined for each LCC exercise. For example, if the life-cycle major replacement fund is set up, it may be defined by the life of the components or the cost of the replacement. It is recommended that the detailed split by assets or sub asset is made transparent and recorded at the outset of LCC exercise, including references to any specific interface or contractual agreement, where applicable. [K)] Redecoration costs can be calculated within their associated elemental costings but should be shown separately. [L)] On-costs to be costed separately, depending on the type of contract for maintenance (e.g. PPM, reactive only and/or combined or fully comprehensive cover contract). [M)] Risks to include costs for relevant commercial or other considerations
Other employer defined costs	Other employer client-definable costs required to be included by the client, as agreed in scope
Employer Costs	Employer definable costs in managing the work and any other project costs required to be included by the employer or project sponsor, as agreed in scope.
Employer's definable management and administrative costs	All employer client cost involved in managing and administration of the maintenance of the building or its parts. Included costs: supervisory staff (e.g. building maintenance supervisors; maintenance managers); professional staff or consultants (e.g. architects, engineers, surveyors); clerical and administration staff; any relevant general and regulatory inspections and surveys commissioned by or on behalf of the client; staff engaged to maintain the building (e.g. care-takers and other responsible persons); staff costs should include wages, expenses, overtime, insurances, administrative support, overheads, accommodation, supply of uniforms, travel costs, pensions. Excluded costs: 1) contractor's management of the works and of any life-cycle fund covered by the contractor on costs (included in annualized maintenance, grounds maintenance, or periodic life-cycle renewal works); 2) inspections carried out in connection with pricing the items of maintenance works (included in annualized maintenance, grounds maintenance, periodic renewal works); 3) dilapidation surveys or remaining life surveys carried out in connection with disposal of the facility (included in client definable maintenance costs outside of normal maintenance work); NOTE – Condition surveys and other forms of assessment data (see clause 4.7 in Part 4, on asset registers and assessment data)

Cost Category	Maintenance cost category definitions
Other employer definable costs, included in the study	Other employer definable cost and benefits required to be included in the maintenance life-cycle cost plan. Included costs – for example: ● mothball maintenance; ● operation costs (as defined in BS8544 table 2); ● occupancy costs (as defined in BS8544 table 2); ● end of life liabilities, recycling, salvage, etc; ● hand-back contractual obligations; ● capital allowances; ● asset depreciation/write down; ● other elements (to be defined). This is not an exhaustive list, simply a guide.
NOTES	If user-defined maintenance costs are included in the study then it is important that these items are costed separately, in order to facilitate comparative benchmarking of the maintenance cost categories.

Note :

BS 8544 table 2 defines the wider life cycle costs as follows:

Operation costs may include the following:

- Cleaning and janitorial services
- Utilities (energy, carbon emission)
- Security (managed and patrols)
- Staff engaged in supporting the occupiers
- Waste management and disposal
- Property management of operation and occupancy
- Insurances

Occupancy costs may include the following:

- ICT and IT systems
- Helpdesk when part of customer services function
- Catering and hospitality services
- Other employer definable items (stationery, reprographics etc)

End of life costs may include the following:

- Disposal/dilapidations inspections
- Reinstatement to meet the landlords/contractual requirements
- Demolitions
- Salvage and recycling
- Other employer definable items

Appendix G: Methods of economic evaluation and discounting equations (time value of money)

1 Methods of economic evaluation

A number of widely used economic evaluation techniques are available for the assessment of alternative investment options. Using two or more of the techniques together provides a broader picture of value implications.

(a) Annual Cost and Annual Equivalent Value (AC or AEV)

The AC or AEV is a uniform annual amount that, when totalled over the period of analysis, equals the total net cost of the project taking into account the time value of money over the period. It is used to compare investment options where the natural replacement cycle cannot easily be directly related to the period of analysis. The lowest AEV indicates the lowest cost option.

(b) Net Present Value (NPV), Net Present Cost (NPC)

The NPV is the sum of the discounted future cash flows, both cost and benefits/revenues. Where only costs are included this may be termed Net Present Cost (NPC)

NPV is a standard measure in LCC analyses, used to determine and compare the cost effectiveness of proposed solutions. It can be applied across the full range of construction investments, covering whole investment programmes, assets, systems, components and operating and maintenance models. The costs and revenues/benefits to be included in each analysis are defined according to its objectives. For example, revenues from recycling of materials or from surplus energy generation are typically included in LCC analysis of alternative sustainability options.

(c) Payback (PB)

The PB period is the measure of how long it takes to recover initial investment costs and is a useful basis for evaluating alternative investment options. It may be calculated using either real (non-discounted) values for future costs, that is 'Simple PB', or present (discounted) values, that is 'Discounted PB'). PB in general ignores all costs and savings after the payback point has been reached and it is possible that an investment with a short PB is a poorer option than one with a longer payback over the entire period of analysis.

PB is a useful technique for assessing whether additional investment in, for example, lower energy plant, is worthwhile. It enables users to weigh the additional capital costs against the time it takes for these costs to be recouped through savings or income during the operational period. This may be a useful means of judging whether an investment represents good value for money, although the subjective nature of the value for money assessment may make it in appropriate for some public sector investment decisions.

(d) Net Savings (NS), Net Benefits (NB)

NS/NB is the present value of savings/benefits in the operation 'in use' phase less the present value of the additional investment costs to achieve them. It provides a measure of cost effectiveness and of the benefits to be achieved from investment options. NS/NB greater than 0 (zero) indicates positive cost effectiveness.

(e) Savings to Investment Ratio (SIR)

The SIR is a measure of the cost effectiveness of a proposed investment (an SIR greater than 1 is positive) and can be used to prioritise and select investment options.

(f) Adjusted Internal Rate of Return (AIRR)

The AIRR is a measure of the annual yield from a project over the period of analysis taking into account reinvestments of interim receipts, indicating projects with greater net savings. An AIRR greater than the minimum acceptable rate of return (i.e. the discount rate) is positive.

2 Discounting equations

1 **Present Value** of £X received in time (t) at discount rate (r%)

$$PV \text{ of } £x = £x\ (1+r)\ t$$

2 **Present Value factor** (PVF) or discount factor (DF);

$$PVF \text{ (or DF)} = 1/\ (1+r)\ t$$

3 **Present Value of an annuity** (PVA) of £1 for N years at discount rate (r)

$$PVA = \frac{(1 + r)\ N - 1}{(1 + r)\ N \times r}$$

4 **Annual equivalent** (AE) of present value (PV) over N years at discount rate (r%) =

$$\frac{AE = PV}{PVA}$$

Note: More detailed guidance on the use of discounting equations available from various reference sources included in the Bibliography.

3 Discounting (Time value of money)

3.1 The purpose of discounting

Discounting is a widely used technique for comparing costs and revenues occurring at difference points in time on a common basis, normally the present time. It is based on the principle that a sum of money to hand at the present time has a higher value than the same sum at hand at a future date, because of the earning power of the sum in the interim.

Discounting to present value makes an adjustment to the future costs of an asset that takes account of inflation and the real earning power of money, allowing them to be compared and evaluated on the same basis as costs incurred at the present.

The need to discount depends on the use of which the cost analysis will be put. It is necessary only where a series of costs over time has to be put into a common basis for the purpose of a decision, not where the objective is simply to project annual costs on a year by year basis. Therefore when carrying out an evaluation of the two or more options with different cost profiles over time it is likely that discounting will need to be applied, whereas it may not be necessary if the aim is simply to prepare a cost profile for one option alone.

3.2 The effect of discount rates

A decision not to discount, that is, to apply a zero rate, implies that the timing of a cost (e.g. for repair and renewal) is immaterial and disregards the earning power of money. However, use of a zero rate presents the best case for spending a greater sum up front (i.e. capital costs) in order to generate greater savings through the analysis period (e.g. operating, maintenance and energy costs).

Conversely, a high discount rate will present options with low up front costs as appearing more desirable and it can be argued that this has the effect of sacrificing the interests of future generation to those of the present decision makers. However, future uncertainties and external influences unrelated to the asset (e.g. budgetary constraints or changed economic climate etc) may

have an impact on the timing or extent of future costs. It can therefore be agreed that this represents an argument for affording future costs less weight in decision making and hence for discounting.

3.3 Selecting the discount rate

In the public sector, national ministries of finance generally specify the discount rates to be used in the economic analysis of publicly funded projects. These typically fall into the range of 3–5%. The rate may also be assessed on a case by case basis by reference to:

- The opportunity cost of capital
- The societal rate of time preference
- The cost of borrowing funds.

The 'opportunity cost of capital' is the cost of foregoing an alternative investment. This approach assumes that finance for public sector projects is withdrawn from private savings and which would otherwise have gone into private investment. Hence the discount rate is equated to the pre tax rate of return available to private capital.

The 'societal rate of time preference' is the interest rate that reflects a government's judgement about the relative value which society as a whole assigns (or which the government feels it ought to assign) to present versus future consumption. The societal time preference rate is not observed in the market and bears no relation to the rates of return in the private sector, interest rates, or any other measurable market phenomena.

The rationale of the 'Cost of borrowing funds' approach is that the interest rate should match the rate paid by government for borrowed money.

3.3.1 The discount rate:

The life cycle costing technique is concerned with the assessment of the time stream of costs and revenues that will flow throughout the life of a building or constructed facility option.

As 'money today' has a different value from 'money tomorrow' or 'money in 15 years time', a technique has to be adopted that will express future costs and revenues in present values. The process of converting 'future money' to 'present money' is called discounting.

Discounting involves establishing the discount rate to be used. In making the decision on a discount rate for a building project, some judgement will need to be made about the degree of risk return (interest) and the likely levels of future interest.

Interest rates are particular to the employer and the degree of risk. It is essential, therefore, to involve the employer (and his accountant if appropriate) in the process and reach agreement on the discount rate to be used.

There are diversities of views about future levels of inflation and interest rates. Some forecasters might take the view there are different categories of inflation which should be taken into account in setting discount rates. These involve establishing the discount rate to be used. In making the decision on a discount rate for a building project, some judgment will need to be made about the degree of risk return (interest) and the likely levels of future interest. These diversities of views 'before the fact' make it difficult to recommend any firm guidelines for quantity surveyors/cost managers to adopt for selecting discount rates.

Selection of a suitable discount rate is crucial, as it can overwhelm all other discussions.

The two main approaches to discounting are:

(a) use a rate which 'implies' inflation of future costs and values (in this case future costs and values will be costed at today's prices).

(b) use a rate which requires an 'explicit treatment' of inflation in relation to future costs and values (in this case future costs and values will be costed at today's prices and adjusted by a factor to reflect future inflation).

It is suggested that it is easier to deal with the former approach where future costs and values are assessed at current prices (i.e. present value).

It should be noted that some employers, particularly central government, will require the quantity surveyor/cost manager to use a prescribed employer discount rate – based on their internal procedures and policies.

3.3.2 The cost and frequency of future payments:

Costs are generally dealt with using current prices (using the discount rate to allow for inflation), with assumptions made regarding when payments will occur in the future. Again, due to the very early stage of design development, the quantity surveyor/cost manager will need to estimate costs based on assumptions about future events. Such assumptions must be clearly stated. Indeed, any additional advantage of life cycle costing for maintenance and replacement works is that they require design, maintenance and replacement assumptions to be stated explicitly rather than implied.

Although current costs can be used, it is important that future cost assessment of maintenance and replacement works reflect any expected divergence of a specific cost from the level of inflation allowed in the discount rate. For example, it would be unwise to assume that market conditions will remain unchanged for any extended period when tender levels for maintenance and replacement works are very depressed. Consequently, some allowance should be made to adjust current prices and rates for maintenance and replacement works to more normal market conditions when estimating the cost of future maintenance and replacement works.

Sources of data – to be defined (refer to reference material in the bibliography).

3.4 Taking account of how inflation is affected by the type of procurement

This adjustment will be different for different types of procurement as broadly defined below:

(a) **Fixed price contract**. The client will pay for work at the prices in the tender documents. Therefore an estimate of the maintenance contractor's allowance for inflation during the period of contract is required. This can be calculated by applying inflation on an annual basis to estimates but should be totalled for the contract period and spread equally to the years.

(b) **Fluctuating contracts with annual index linking**. An estimate of annual inflation will need to be applied.

(c) **Cost reimbursement contracts or where direct labour costing is being used**. An estimate of the annual inflation will need to be applied.

3.5 The building life

For the purpose of *order of cost estimates*, the building life of the whole building is considered. This is because, at this very early stage of design development, extremely limited or no information will be known about the components and sub-components that will form the building structure, fabric, finishes and services. As the design is developed, more design information will become available (together with details of products, plant and equipment to be incorporated) on which more detailed life assumptions can be made. This will help inform the cost planning process (Note: see clause 3.8: Measurement rules for elemental method of cost planning).

Typically the relevant building life will be the period over which the employer, for whom the estimate is being prepared, will be expected to hold an interest in the building or facility, and would take into account the residual value.

At the end of the life of a building or facility there will be one of two situations. Either the building or facility will have reached the end of its life, with no alternative use, or the building or facility will have reached the end of the life for its planned purpose, but does have an alternative use. In either situation the residual value of the building or facility (and/or the land) may be significant and will need to be carefully assessed as it might well have a substantial effect on life cycle costing calculations. Residual values will be of particular significance if the time horizon used for the life cycle costing calculations is relatively short. Consequently, residual values can be a very significant factor in determining the optimum life cycle cost options

In considering residual values, an allowance is to be made for the cost of disposing of plant and equipment and for the demolition of the building or facility, if appropriate. In assessing demolition costs, allowance should be made for the value of any re-usable materials.

Building or facility life will also be influenced by obsolescence, the causes of which are as summarised in Table 2.1:

Table 2.1: Categories, definitions, basis of assessment and examples of obsolescence

Type of obsolescence	Definition of types of obsolescence	Basis for assessment of building life	Examples of factors leading to obsolescence
Physical	Life of the building to when physical collapse is possible.	How long will the building meet human desires (with the exclusion of economic considerations)?	Deterioration of external brick walls affecting their structural stability. Deterioration of structural steel frame affecting structural stability of the building.
Economic	Life of the building to when occupation is not considered to be the least cost alternative of meeting a particular objective.	How long will the building be economic for the employer to own or operate?	The value of land on which the building stands is more than the capitalised full rental value that could be derived from letting the building. The asset would achieve a better rate of return in the possession of another, or in the redevelopment or refurbishment scheme.
Functional	Life of the building to when the building ceases to function for the same purpose as that for which it was built.	How long will the building be used for the purpose for which it was built?	Churches converted to restaurants, retail units and residential dwellings. Cinemas converted into bingo halls. Railway stations converted into residential dwellings. Bus depots converted into industrial, retail and residential dwellings.
Technological	Life of the building until the building is no longer technologically superior to alternatives.	How long will the building be technologically superior to alternatives?	Prestige offices unable to accommodate introduction of high level of computing facilities. Storage warehouse unable to accommodate introduction of robotics for goods handling.
Social and legal	The life of a building until the time when human desire or legal requirement dictates replacement for reasons other than economic considerations.	How long will the building meet human desires (with the exclusion of economic considerations)?	Timber football stand replaced (following Bradford City Football Club fire disaster). Multi-storey flats in inner city demolished (following social and community problems).

Every building and facility has a predicted length of life at the end of which a physical collapse is possible. However most buildings and facilities never reach that point and are demolished or replaced beforehand, generally due to economic obsolescence.

Buildings usually end their 'life' before the end of their physical life. The most common reasons for buildings becoming obsolete are normally economic and functional considerations. Buildings and facilities designed for a specialised use, with little or no flexibility for changing their use, are therefore likely to have shorter lives than buildings and facilities offering flexibility for change of function of the building or facility.

Notwithstanding the difficulty of the task, the quantity surveyor/cost manager, in consultation with the employer, will have to make an informed assessment of the building life to be used in the life cycle costing of capital building works and maintenance and replacement works. In making that assessment the quantity surveyor/cost manager will need to take account of a number of factors which might influence the final assessment in any particular case.

It should be noted that some employers, particularly central government, will require the quantity surveyor/cost manager to base the life cycle calculation on an 'arbitrary life' (e.g. 25, 30 or 50 years or longer, as agreed in the brief) – based on their internal procedures and policies.

Appendix H: Information requirements for formal cost plans, for the construction and maintenance works procurement and during the building's life cycle

This appendix comprises a list of the key information required to enable the preparation of formal cost plans for annualised maintenance (*maintain* M) and the life cycle *renewal* (R) works – during the construction procurement stages (Formal Cost Plans 1 to 3) and also during the post construction stages of a building's life cycle (Formal Cost Plans 4).

Note: NRM 1 Appendix F comprises a list of the key information required to enable the preparation of the formal cost plan for construction works. Where the 'available information' used for construction formal cost plans is relevant or could be useful in the preparation of the 'maintain and renewal' cost plans, it has been reproduced in this document. Available information should be utilised as reference information, but it's not always essential for cost planning maintenance work.

For a new building or refurbished building the formal cost plans 1 to 3 will be based on technical design, specifications and detailed production information produced for construction, – plus specific additional information applicable to maintenance and renewal works cost planning. Formal cost plan 4 is based on actual built asset information derived from as built information, and/or from asset registers and condition status and remaining life assessments, along with analysis of historical maintenance expenditure and trends. The technical task specifications for planned maintenance can be obtained from B&ES (SFG20 schedules) and other industry sources (inc in bibliography) and manufacturers.

It is important to appropriately use specific building maintenance information available from industry data sources, such as BCIS, BRE, BSRIA, CIBSE (Guide M indicative economic life tables) – as well as from maintenance providers and industry trade associations – i.e. Building & Engineering Services Association provides SFG20 task schedules, the industry recognised maintenance specifications for planned preventative maintenance along with skilling and task times.

The methods used for formal cost planning the 'maintain and renewal' works, during the construction procurement (e.g. floor area method, functional unit method, or elemental method) will be based on using unit cost rates derived from previous project benchmarks, published unit costs and/or cost analysis of building maintenance tender prices. This will be a factor in determining the relevant level of information requirements needed for undertaken formal cost plans 1 to 3.

Formal Cost Plan 1

The formal cost plan 1 for a new built asset or facility is prepared at a point where the scope of work is fully defined and key criteria are specified, but no detailed design development or maintenance planning will have commenced. Note formal cost plan 1 will provide the frame of reference for formal cost plan 2 to develop the cost plans in more detail.

To enable preparation of Formal Cost Plan 1 (at RIBA Work Stage C; Concept or OGC Gateway 3A; Design Brief and Concept Approval), key information will be required as follows:

(a) From the employer:

(i) Confirmation of the cost limit (i.e. the authorised budget for 'maintain and renewals' work).

(ii) Details of any exclusions from the scope – relevant to the 'maintain and renewal' costs.

(iii) Details of any non-building related maintenance (e.g. salvage; loose FFE) and / or non maintenance (i.e. operation or occupancy) costs to be included in the formal cost plans

(iv) Confirmation of the specific purpose of the study – e.g. for a project options appraisal study

(v) Confirmation of the project/design brief (from a service life planning perspective), including a statement of design quality, the service life performance and 'fit-out' work requirements

(vi) Confirmation of the programme as it relates to completion dates and required occupation dates and warranty periods

(vii) Confirmation of construction project requirements in respect of:

- maintenance responsibilities incorporated in the initial construction contract
- procurement strategy – (e.g. work packages and phasing of the construction works)
- contract strategy – (e.g. warranties; setting the cost thresholds for renewals works)
- BIM costs for maintain and renewals – for specific asset classes, elements or objects
- access, security arrangements, temporary moves and the like
- treatment of project consultancy and specialist fees (e.g. condition surveys)
- insurances
- treatment of employer's risk
- treatment of Value Added Tax and
- other considerations (e.g. dealing with capital allowances and grants)

(viii) Post construction requirements which are applicable to the 'maintain and renewal' costs.

(ix) Copy of the construction Formal Cost Plan 1 (if not carried out as integral part of the study).

(x) Confirmation of the project specific 'maintain and renewal' requirements, in respect of:

- maintenance and life cycle renewal strategies and related asset management plans
- boundaries and lines of responsibilities of construct, maintain and renewal works
- treatment of end of life or period of interest – e.g. hand back obligations and liabilities.
- treatment of maintenance and renewal related specialist costs / consultant's fees
- approach to dealing with other employer definable maintenance costs – e.g. inspections
- treatment of employer's and maintenance contractors' risk, allocation / mitigation plans
- obligations for contractual unscheduled maintenance – e.g. comprehensive provisions
- treatment of inflation and basis of pricing used for the building maintenance cost plans
- treatment of Value Added Tax (VAT) and
- other considerations, such as dealing with capital allowances and taxation incentives
- treatment of wider life cycle costing elements (as agreed to be included in scope)

(xi) Confirmation of the employer's brief, – including a statement of the salient information regarding the functional usage, hours of intended occupation, space utilisation (office, stores) and performance requirements (e.g. carbon reduction commitments), as applicable to the building maintenance and life cycle renewal works

(xii) Confirmation of the period of analysis for the maintenance works and life cycle renewal forecasting, – including agreeing the base dates and critical events (i.e. required post occupation dates and schedule frequency for life cycle costing over an agreed period)

(xiii) Confirmation of the specific study rules of measurement and the level of cost planning and the method of economic evaluation to be applied (e.g. NPV analysis) , including:

- base date(s) for costs, for the maintain works and renewal works
- unit of time, i.e. the increments to which the calculations refer, e.g. yearly or cycles

- levels at which the costs are to be analysed, reported and the required format (whole building, functional unit, element unit or at detailed sub element or component level)
- method of costing the maintain and renewal works (e.g. unit cost method, floor area method, or functional unit method, annualised equivalent value for renewal works)
- source of the cost data/benchmarks available and record the cost assumptions used
- factoring methods used to prioritise and optimise the maintain and renewal cost plans
- method of economic evaluation to be used (e.g. net present value, payback etc)
- discount rates to be applied, including which costs are to be discounted

(xiv) Confirmation of the required reporting output(s) and how to express and present them and interest or discount rates to be applied, where appropriate

(xv) Confirmation of the extent of risks/mitigation treatment and cost sensitivity analysis to be used

(xvi) Confirmation on whether there is current building maintenance and/or life cycle renewal cost model, or a base case cost model, that is to be used as a comparator

(xvii) Obtaining of formal agreement to the employer's brief before proceeding with the formal cost plans.

(b) From the architect: (Available information from the preparation of the construction formal cost plan FCP 1)

(i) Concept design drawings to a suitable scale, comprising:

- general arrangement plans (for all floors, including basement levels, and roofs);
- general elevations (with materials clearly annotated);
- general sections;
- external landscaping – general arrangement plan(s);
- plans of key building functions;
- detailed elevations showing construction of external walls, roofs, ground floor construction and upper floor construction;
- sketches showing key details/interfaces (e.g. interface between curtain walling system and structure, balconies and the like);
- concept design for rooms and common areas

(ii) Schedule of gross external areas (GEA), gross internal floor areas (GIFA), and net internal areas (NIA). Client's schedule of accommodation (e.g. usable area for shops, supermarkets and offices, etc; departmental areas for hospitals) and site area (SA)

(iii) Outline specification information, including:

- specification/design intent for all main elements;
- statement of required quality;
- outline specification for components, materials and finishes;
- acoustics/vibration requirements;
- outline performance criteria for main element;
- schedule of finishes; and
- details of alternative specifications.

(iv) Room data sheets.

(v) Schedules of key fittings, furnishings and equipment (FF&E)

(vi) Strategies, including:

- environmental/sustainability (in conjunction with the mechanical and electrical services engineer), including:

- measures to achieve required environmental rating;
- Building Regulations requirements;
- sustainability requirements and assumptions;
- renewable energy requirements and assumptions;
- employer's specific requirements;
- car parking, including motorcycles and bicycles;
- vertical movement (in conjunction with the mechanical and electrical services engineer);
- information technology (IT);
- fire;
- acoustics;
- security;
- DDA (Disability Discrimination Act);
- window cleaning;
- refuse/waste disposal;
- public art;
- conservation/listed buildings and the like (if applicable); and
- other important aspects of the building project.

(vii) Reports, including:

- archaeological assessment/report (desktop study
- measured surveys

(viii) Definition of 'fit-out' works and reinstatement obligations and timings

(ix) Risk register/log.

(c) From the mechanical & electrical services engineer: (Available information from preparing construction FCP1)

(i) Concept design drawings to a suitable scale, comprising:

- general arrangement for each main system;
- schematic diagrams for each major system;
- plant room layouts, including roof plant layout;
- single line diagrams showing primary service routes; and
- typical layouts of landlord's areas, service areas and cores.

(ii) Outline specification information, including:

- mechanical services;
- electrical services;
- transportation systems (e.g. lifts, hoists and escalators);
- protective installations;
- communication, security and control systems;
- special installations;
- plant/equipment schedule (for primary plant/equipment);
- approximate duties, output, and sizes of primary plant/equipment;
- schedule of cost significant builder's work in connection with mechanical and electrical engineering services installations/systems; and

- details of alternative specifications.

(iii) Strategies, including:

- environmental/sustainability (in conjunction with the architect), including:
- measures to required environmental rating;
- Building Regulations requirements;
- sustainability requirements and assumptions;
- renewable energy requirements and assumptions;
- employer's specific requirements.
- vertical movement (in conjunction with the architect); and

(iv) Reports, including:

- survey of underground services.

(v) Identification of requirements for any abnormal mechanical and electrical engineering services installations/systems.

(vi) Details of utilities services connections, including:

- connections;
- upgrading requirements; and
- diversions.

(vii) connections;

(viii) upgrading requirements; and

(ix) diversions.

(x) Risk register/log.

(d) From the structural engineer: (Available information from preparation of the construction cost plan FCP1)

(i) Reports based on desktop studies, including:

- environmental contamination (Phase 1 audit – i.e. to establish the nature of any
- subsurface contaminated soil and/or groundwater);
- geotechnical properties; and
- bombs.

(ii) Reports based on fieldwork, sampling and analysis (where commissioned by the employer), including:

- environmental contamination (Phase 2 audit): and
- geotechnical properties.

(iii) Environmental risk assessment.

(iv) Advice on ground conditions.

(v) Concept design drawings to a suitable scale, comprising:

- general arrangement;
- frame configuration.
- layout of shear walls, core walls, columns and beams;
- sections;
- foundation layouts, including pile (and pile cap and ground beam) layouts;
- sections, showing ground slab construction, basement wall construction, pile caps construction and the like; and
- indicative drainage solution.

(vi) Outline specification information

(vii) Drainage (indicative solution).

(viii) Risk register/log.

Formal Cost Plan 2

The formal cost plan 2 for a new built asset or facility do not involve the preparation of a completely new cost plan, it is a progression of formal cost plan 1. They are developed through the cost checking of the renewal (R) and the maintain (M) works costs applicable to the building elements and components and cost targets, as more design and maintenance information and any further information updates about the elements and components, becomes available.

To enable preparation of Formal Cost Plan 2 (at RIBA Work Stage D; Concept or OGC Gateway 3B; Detailed Design Approval), key information will be required as follows:

(a) From the employer:

(i) Confirmation that Formal Cost Plan 1 prepared at RIBA work stage C; Concept, or OGC gateway 3A, Design Brief and Concept Approval, is acceptable

(ii) Copy of the Formal Capital Construction Cost Plan 2 (if not carried out as an integral part of this exercise)

(iii) Confirmation of any preferred alternatives given in cost report for Cost Plan 1

(iv) Confirmation of the project/design brief, including statement of quality and 'fit-out' requirements

(v) Confirmation of the programme as it relates to completion dates and required occupation dates

(vi) Confirmation of any exclusions from the scope of the maintenance and renewal cost plans

(vii) Confirmation of any non-building related maintenance or non maintenance (operation or occupancy) costs to be included in the maintain and renewal cost plans

(viii) Confirmation of project construction requirements in respect of maintain and renewal works:

- maintenance responsibilities incorporated in the initial construction contract
- procurement strategy
- contract strategy
- BIM cost information
- access, security, temporary moves and the like
- treatment of project/design and consultancy/specialist fees
- insurances
- treatment of employer's risk
- treatment of Value Added Tax; and
- other considerations (e.g. taxes, allowances and grants)

(ix) Confirmation of practical completion and post construction requirements

(x) Confirmation of the project specific 'maintain and renewal' requirements, in respect of:

- maintenance and life cycle renewal strategies and related asset management plans
- boundaries and lines of responsibilities of construct, maintain and renewal works
- treatment of end of life or period of interest – e.g. hand back obligations and liabilities.
- treatment of maintenance and renewal related specialist costs / consultant's fees
- approach to dealing with other employer definable maintenance costs – e.g. inspections
- treatment of employer's and maintenance contractors' risk, allocation / mitigation plans

- obligations for contractual unscheduled maintenance – e.g. comprehensive provisions
- treatment of inflation and basis of pricing used for the building maintenance cost plans
- treatment of Value Added Tax (VAT) and
- other considerations, such as dealing with capital allowances and taxation incentives
- treatment of wider life cycle costing elements (as agreed to be included in scope)

(xi) Confirmation of the employer's brief, – including a statement of the salient information regarding the functional usage, hours of intended occupation, space utilisation (office, stores) and performance requirements (e.g. carbon reduction commitments), as applicable to the building maintenance and life cycle renewal works

(xii) Confirmation of the period of analysis for the maintenance works and life cycle renewal forecasting, – including agreeing the base dates and critical events (i.e. required post occupation dates and schedule frequency for life cycle costing over an agreed period)

(xiii) Confirmation of the specific study rules of measurement and the level of cost planning and the method of economic evaluation to be applied (e.g. NPV analysis) , including:

- base date(s) for costs, for the maintain works and renewal works
- unit of time, i.e. the increments to which the calculations refer, e.g. yearly or cycles
- levels at which the costs are to be analysed, reported and the required format (whole building, functional unit, element unit or at detailed sub element or component level)
- method of costing the maintain and renewal works (e.g. unit cost method, floor area method, or functional unit method, annualised equivalent value for renewal works)
- source of the cost data/benchmarks available and record the cost assumptions used
- factoring methods used to prioritise and optimise the maintain and renewal cost plans
- method of economic evaluation to be used (e.g. net present value, payback etc)
- discount rates to be applied, including which costs are to be discounted

(xiv) Confirmation of the required reporting output(s) and how to express and present them and interest or discount rates to be applied, where appropriate

(xv) Confirmation of the extent of risks/mitigation treatment and cost sensitivity analysis to be used

(xvi) Confirm whether there is current building maintenance and/or life cycle renewal cost model, or a base case cost model, that is to be used as a comparator

(xvii) Obtain formal acceptance to the brief for FCP 2 including other matters within the FCP1 report

(xviii) Authority to commence he next RIBA Work Stage or process to the next OGC Gateway

(b) From the architect: (Available information from the preparation of the construction formal cost plan FCP 2)

(i) Detailed design drawings to a suitable scale, comprising:

- general arrangement plans (for all floors, including basement levels, and roofs);
- general elevations (with materials clearly annotated);
- general sections;
- external landscaping – general arrangement plan(s);
- plans of key building functions;
- detailed elevations showing construction of external walls, roofs, ground floor construction and upper floor construction;
- sketches showing key details/interfaces (e.g. interface between curtain walling system and structure, balconies and the like);
- concept design for rooms and common areas

(ii) Updated site constraints plan

(iii) Schedule of gross external areas (GEA), gross internal floor areas (GIFA), net internal areas (NIA) for clients schedule of accommodation (e.g. usable area for shops, supermarkets and offices, etc; departmental areas for hospitals) and site area (SA)

(iv) Updated outline specification information, including:

- specification/design intent for all main elements;
- statement of required quality;
- outline specification for components, materials and finishes;
- acoustics/vibration requirements;
- outline performance criteria for main element;
- schedule of finishes; and
- details of alternative specifications.

(v) Updated room data sheets.

(vi) Updated schedules of key fittings, furnishings and equipment.

(vii) Updated strategies, including:

- environmental/sustainability (in conjunction with the mechanical and electrical services engineer), including:
- measures to achieve required environmental rating;
- Building Regulations requirements;
- sustainability requirements and assumptions;
- renewable energy requirements and assumptions;
- employer's specific requirements;
- car parking, including motorcycles and bicycles;
- vertical movement (in conjunction with the mechanical and electrical services engineer);
- information technology (IT);
- fire;
- acoustics;
- security;
- DDA (Disability Discrimination Act);
- window cleaning;
- refuse/waste disposal;
- public art;
- conservation/listed buildings and the like (if applicable); and
- other important aspects of the building project.

(viii) Updated reports, including:

- archaeological assessment/report (desktop study)

(ix) Updated definition of 'fit-out'.

(x) Updated risk register/log.

(c) From the mechanical and electrical services engineer: (Available information from preparing FCP 2)

(i) Detailed design drawings to a suitable scale, comprising:

(ii) general arrangement for each main system;

(iii) schematic diagrams for each major system;

(iv) plant room layouts, including roof plant layout;

(v) single line diagrams showing primary service routes; and

(vi) typical layouts of landlord's areas, service areas and cores.

(vii) Updated outline specification information, including:

- mechanical services;
- electrical services;
- transportation systems (e.g. lifts, hoists and escalators);
- protective installations;
- communication, security and control systems;
- special installations;
- plant/equipment schedule (for primary plant/equipment);
- approximate duties, output, and sizes of primary plant/equipment;
- schedule of cost significant builder's work in connection with mechanical and
- electrical engineering services installations/ systems; and

(viii) Updated strategies, including:

- environmental/sustainability (in conjunction with the architect), including:
- measures to required environmental rating;
- Building Regulations requirements;
- sustainability requirements and assumptions;
- renewable energy requirements and assumptions;
- employer's specific requirements.
- vertical movement (in conjunction with the architect); and
- removal / decommissioning of existing plant and / or equipment

(ix) Updated reports, including:

- survey of underground services.

(x) Identification of requirements for any abnormal mechanical and electrical engineering services installations /systems.

(xi) Details of utilities services connections, including:

- connections;
- upgrading requirements; and
- diversions and
- quotes from statutory undertakers

(xii) Updated risk register/log.

(d) From the structural engineer: Available information from the preparation of the construction cost plan FCP 2)

(i) Reports based on fieldwork, sampling and analysis (where commissioned by the employer), including:

- environmental contamination (Phase 2 audit): and
- geotechnical properties.

(ii) Environmental risk assessment.

(iii) Updated advice on ground conditions.

(iv) Detailed design drawings to a suitable scale, comprising:

- general arrangement;

- frame configuration.
- layout of shear walls, core walls, columns and beams;
- sections;
- foundation layouts, including pile (and pile cap and ground beam) layouts;
- sections, showing ground slab construction, basement wall construction, pile caps construction and the like; and
- indicative drainage solution.

(v) Updated outline specification information

(vi) Drainage (indicative solution).

(vii) Risk register/log.

(e) From the specialist consultants

(i) Design development drawings

(ii) Outline specification information

Formal Cost Plan 3

Formal cost plan 3 for a new built asset or facility is a progression of formal cost plan 2. It is developed through cost checking and cost planning of the renewal (R) and maintain (M) works costs applicable to the buildings elements and components and cost targets, as the finalised design and more detailed maintenance information, becomes available.

To enable preparation of Formal Cost Plan 3 (at RIBA Work Stage E: Technical Design and F: Production Information and OGC Gateway 3B; Detailed Design Approval), key information will be required as follows:

(a) From the employer:

(i) Confirmation that Formal Cost Plan 2 prepared at RIBA work stage D; Design Development or OGC Gateway 3B; Detailed Design Approval, is acceptable

(ii) Copy of the Formal Capital Construction Cost Plan 2 (if not carried out as an integral part of this exercise)

(iii) Confirmation of any preferred alternatives given in cost report for Cost Plan 2

(iv) Confirmation of the project/design brief, including statement of quality and 'fit-out' requirements

(v) Confirmation of the programme as it relates to completion dates and required occupation dates

(vi) Confirmation of any exclusions form the scope of the maintenance costs

(vii) Confirmation of any non-building related maintenance or non maintenance (operation or occupancy) costs to be included in the cost plan

(viii) Confirmation of project construction requirements in respect of maintain and renewal works:

- maintenance responsibilities incorporated in the initial construction contract
- procurement strategy
- contract strategy
- BIM cost information
- access, security, temporary moves and the like
- treatment of project/design and consultancy/specialist fees
- insurances
- treatment of employer's risk
- treatment of Value Added Tax; and

- other considerations (e.g. taxes, allowances and grants)

(ix) Confirmation of practical completion and post construction requirements

(x) Confirmation of the project specific 'maintain and renewal' requirements, in respect of:

- maintenance and life cycle renewal strategies and related asset management plans
- boundaries and lines of responsibilities of construct, maintain and renewal works
- treatment of end of life or period of interest – e.g. hand back obligations and liabilities.
- treatment of maintenance and renewal related specialist costs / consultant's fees
- approach to dealing with other employer definable maintenance costs – e.g. inspections
- treatment of employer's and maintenance contractors' risk, allocation / mitigation plans
- obligations for contractual unscheduled maintenance – e.g. comprehensive provisions
- treatment of inflation and basis of pricing used for the building maintenance cost plans
- treatment of Value Added Tax (VAT) and
- other considerations, such as dealing with capital allowances and taxation incentives
- treatment of wider life cycle costing elements (as agreed to be included in scope)

(xi) Confirmation of the employer's brief, including a statement of the salient information regarding the functional usage, hours of intended occupation, space utilisation (office, stores) and performance requirements (e.g. carbon reduction commitments), as applicable to the building maintenance and life cycle renewal works

(xii) Confirmation of the period of analysis for the maintenance works and life cycle renewal forecasting, including agreeing the base dates and critical events (i.e. required post occupation dates and schedule frequency for life cycle costing over an agreed period)

(xiii) Confirmation of the specific study rules of measurement and the level of cost planning and the method of economic evaluation to be applied (e.g. NPV analysis) , including:

- base date(s) for costs, for the maintain works and renewal works
- unit of time, i.e. the increments to which the calculations refer, e.g. yearly or cycles
- levels at which the costs are to be analysed, reported and the required format (whole building, functional unit, element unit or at detailed sub element or component level)
- method of costing the maintain and renewal works (e.g. unit cost method, floor area method, or functional unit method, annualised equivalent value for renewal works)
- source of the cost data/benchmarks available and record the cost assumptions used
- factoring methods used to prioritise and optimise the maintain and renewal cost plans
- method of economic evaluation to be used (e.g. net present value, payback etc)
- discount rates to be applied, including which costs are to be discounted

(xiv) Confirmation of the required reporting output(s) and how to express and present them and interest or discount rates to be applied, where appropriate

(xv) Confirmation of the extent of risks/mitigation treatment and cost sensitivity analysis to be used

(xvi) Confirm whether there is current building maintenance and/or life cycle renewal cost model, or a base case cost model, that is to be used as a comparator

(xvii) Obtain formal acceptance to the brief for FCP 3 including other matters within the FCP2 report

(xviii) Authority to commence he next RIBA Work Stage or process to the next OGC Gateway

(b) From the architect: (Available information from the preparation of the construction cost plan FCP2)

(i) Final design drawings to a suitable scale, comprising:

(ii) final plans/layouts;

(iii) elevations (with materials clearly annotated):

- sections
- location drawings
- assembly drawings
- component drawings;

(iv) Schedule of gross external areas (GEA), gross internal floor areas (GIFA), net internal areas (NIA) for clients schedule of accommodation (e.g. usable area for shops, supermarkets and offices, etc; departmental areas for hospitals) and site area (SA).

(v) Final specification information, including:

- specification/design for all main elements;
- statement of required quality;
- final specification for components, materials and finishes;
- acoustics/vibration requirements;
- final performance criteria for main element;
- schedule of finishes; and
- details of alternative specifications

(vi) Final room data sheets

(vii) Final schedules of fittings, furnishings and equipment.

(viii) Final strategies, including:

- environmental/sustainability (in conjunction with the mechanical and electrical services engineer), including:
- measures to achieve required environmental rating;
- Building Regulations requirements;
- sustainability requirements and assumptions;
- renewable energy requirements and assumptions;
- employer's specific requirements;
- car parking, including motorcycles and bicycles;
- vertical movement (in conjunction with the mechanical and electrical services engineer);
- information technology (IT);
- fire;
- acoustics;
- security;
- DDA (Disability Discrimination Act);
- window cleaning;
- refuse/waste disposal;
- public art;
- conservation/listed buildings and the like (if applicable); and
- other important aspects of the building project.

(ix) Updated reports, including

- archaeological assessment/report (desktop study
- Final definition of 'fit-out'.
- Updated risk register/log.

From the mechanical and electrical services engineer: (available information from preparation of FCP 3)

(i) Detailed design drawings to a suitable scale.

(ii) Final specification information, including:

- mechanical services;
- electrical services;
- transportation systems (e.g. lifts, hoists and escalators);
- protective installations;
- communication, security and control systems;
- special installations;
- plant/equipment schedule (for primary plant/equipment);
- approximate duties, output, and sizes of primary plant/equipment;
- schedule of cost significant builder's work in connection with mechanical and
- electrical engineering services installations/systems; and

(iii) Final strategies, including:

- environmental/sustainability (in conjunction with the architect), including:
- measures to required environmental rating;
- Building Regulations requirements;
- sustainability requirements and assumptions;
- renewable energy requirements and assumptions;
- employer's specific requirements.
- vertical movement (in conjunction with the architect); and
- removal/decommissioning of existing plant and or equipment

(iv) Details of utilities services connections, including:

- connections;
- upgrading requirements; and
- diversions.
- Quotation from statutory undertakers

(v) Updated risk register/log.

(d) From the structural engineer: (available information from the preparation of the construction cost plan FCP 3)

(i) Reports based on fieldwork, sampling and analysis (where commissioned by the employer), including:

- environmental contamination (Phase 2 audit): and
- geotechnical properties.

(ii) Updated environmental risk assessment.

(iii) Updated advice on ground conditions.

(iv) Final design drawings to a suitable scale, comprising:

- general arrangement;
- frame configuration.
- layout of shear walls, core walls, columns and beams;
- sections;

- foundation layouts, including pile (and pile cap and ground beam) layouts;
- sections, showing ground slab construction, basement wall construction, pile caps
- construction and the like; and
- final drainage solution.

(v) Final specification information

(vi) Final drainage design.

(vii) Risk register/log.

(e) From the specialist consultants

(i) Final design drawings to a suitable scale

(ii) Final specification information

Formal Cost Plan 4

Formal cost plan 4 for a 'new built asset or facility', does not require the preparation of a completely new cost plan, it is a progression of the formal cost plan 3. The formal cost plan 4 (new build) is developed through the cost checking and cost planning of the renewal (R) and maintain (M) works costs applicable to 'maintainable' building elements, sub elements and components (as defined in tables in part 6 of this document), at a point where the design quality, operational and performance criteria has been fully defined and specified and is normally based on the as built information (including customised asset task schedules) becomes available.

Formal cost plan 4 for 'an existing built asset or facility' will require a new constructed formal cost plan. It is based on data derived from record drawings, asset registers and the findings and recommendations obtained from inspections (e.g. technical inspections, condition and remaining life surveys; and structural surveys etc)

To enable preparation of Formal Cost Plan 4 (at RIBA Work Stage L; Post Practical Completion and OGC Gateway 4 and 5; Readiness for Service and Benefits Evaluation; key information will be required as follows:

Formal Cost Plan 4 – for a New Built Asset or Facility:

At RIBA Work Stage L; Construction to Practical Completion; and /or Gateway 4 READINESS FOR SERVICE

(a) From the employer: (or nominated responsible persons or agency)

(i) Confirmation that Formal Cost Plan 3 prepared at RIBA work stage E; Design development, or OGC gateway 3B, Detailed design approval, is acceptable

(ii) Copy of Formal Construction Cost Plan 3 (if not carried out as an integral part of this exercise)

(iii) Post practical completion adjustment to the construction cost plans, based on agreed final costs

(iv) Confirmation of the project/design brief, including statement of quality and 'fit-out' requirements

(v) Confirmation of the programme as it relates to completion dates and required occupation dates

(vi) Confirmation of project construction requirements in respect of maintain and renewal works

(vii) Confirmation of practical completion and post construction requirements

(viii) Confirmation of any maintenance and renewal cost forecasts given in cost report for Cost Plan 3

(ix) Confirmation of the cost limits for the maintain and renewal works – (i.e. the authorised budget)

(x) Confirmation of any exclusions from the scope of the maintenance and renewal cost plans

(xi) Confirmation of any non-building related maintenance or non maintenance (operation or occupancy) costs to be included in the maintain and renewal cost plans

(xii) Confirmation of the project specific 'maintain and renewal' requirements, in respect of;

- maintenance and life cycle renewal strategies and related asset management plans
- boundaries and lines of responsibilities of construct, maintain and renewal works
- treatment of end of life or period of interest – e.g. hand back obligations and liabilities.
- treatment of maintenance and renewal related specialist costs / consultant's fees
- approach to dealing with other employer definable maintenance costs e.g. inspections
- treatment of employer's and maintenance contractors' risk, allocation / mitigation plans
- obligations for contractual unscheduled maintenance – e.g. comprehensive provisions
- treatment of inflation and basis of pricing used for the building maintenance cost plans
- treatment of Value Added Tax (VAT) and
- other considerations, such as dealing with capital allowances and taxation incentives
- treatment of wider life cycle costing elements (as agreed to be included in scope)

(xiii) Confirmation of the employer's brief, – including a statement of the salient information regarding the functional usage, hours of intended occupation, space utilisation (office, stores) and performance requirements (e.g. carbon reduction commitments)

(xiv) Confirmation of the period of analysis for the maintenance works and life cycle renewal forecasting, – including agreeing the base dates and critical events (i.e. required post occupation dates and schedule frequency for life cycle costing over an agreed period)

(xv) Confirmation of the specific study rules of measurement and the level of cost planning and the method of economic evaluation to be applied (e.g. NPV analysis) , including:

- base date(s) for costs, for the maintain works and renewal works
- unit of time, i.e. the increments to which the calculations refer, e.g. yearly or cycles
- levels at which the costs are to be analysed, reported and the required format (whole building, functional unit, element unit or at detailed sub element or component level)
- method of costing the maintain and renewal works (e.g. unit cost method, floor area method, or functional unit method, annualised equivalent value for renewal works)
- source of the cost data/benchmarks available and record the cost assumptions used
- factoring methods used to prioritise and optimise the maintain and renewal cost plans
- method of economic evaluation to be used (e.g. net present value, payback etc)
- discount rates to be applied, including which costs are to be discounted

(xvi) Confirmation of the required reporting output(s) and how to express and present them and interest or discount rates to be applied, where appropriate

(xvii) Confirmation of the extent of risks/mitigation treatment and cost sensitivity analysis to be used

(xviii) Confirm whether there is current building maintenance and/or life cycle renewal cost model, or a base case cost model, that is to be used as a comparator

(xix) Obtain formal acceptance to the brief for FCP 4 including other matters within the FCP3 report

(xx) Authority to commence he next RIBA Work Stage or process to the next OGC Gateway.

(b) From the Architect: all as defined in Formal Cost Plan 3. Based on finalised design and handover specifications

(c) From the Mechanical and electrical services engineer : all as defined in Formal Cost Plan 3 based on final as built drawings, commissioned; O&M manuals and documentation (as they

become available from the construction contractor and the installation suppliers post practical completion) – including taking account of as built variations.

(d) From the structural engineer: all as defined in Formal Cost Plan 3. Based on 'as built' drawings and the final specifications information and updated risk assessments and the like.

(e) From other specialist consultants: as defined in Formal Cost Plan 3. Other specialist/consultancy (as table 11)

Formal Cost Plan 4 for an Existing Built Asset or Facility: At RIBA Work Stage L: Post Practical Completion and/or OGC Gateway 5 Operation Review & Benefits Realisation.

(a) From the employer: (or nominated agent)

(i) The building(s) description and the site location (s)

(ii) A statement of the building use and occupancy details (e.g. in use/ sublet/vacate)

(iii) A statement of the floor areas (GIA) of each of the building(s) or function type(s)

(iv) Functional unit category (e.g. hotel – bed spaces) and a schedule of accommodation (including details by space classifications by building / blocks and naming conventions and/or numbering)

(v) Net internal NIA – if the functional unit is to be expressed in NIA (e.g. shop / retail units)

(vi) External area (SA) – if grounds maintenance and external works are required in scope

(vii) Access considerations and hours of operation, e.g. security; 24/7 for 365 days a year use

(viii) Building life (see appendix G guidance) and/or period of interest in the facility or built asset

(ix) Period of analysis for the cost (i.e. 5 years, 10 years, 30 years, 60 years or more)

(x) Maintenance procurement strategies (type of contract; packages; in house and/or outsourced)

(xi) Discount rate (which expressed simply is the difference between the interest rate and is used to convert the future payments to present value – see appendix G)

(xii) Budget /cash-flow requirements (i.e. short term and from a longer term perspective

(xiii) Requirements for refurbishments (i.e. known details of all outstanding maintenance necessary so the facility meets the defined asset performance / condition standard for a set service life period)

(xiv) Particular requirements in respect of building envelope and service installations (e.g. carbon reduction commitments, availability and critical system specific requirements – e.g. security/IT)

(xv) Salient project / design brief information (e.g. statement of quality, sustainability requirements and any specific fit out plans and responsibilities for reinstatement, etc)

(xvi) Requirements in respect of: Treatment of consultant and specialist fees; Other employer defined maintenance related costs; Treatment of risks; Treatment of value added tax and other taxation / incentives

(xvii) Other considerations (e.g. approach to dealing with capital allowance and grants).

Additional information for renewal and maintain cost planning during existing built asset's life cycle:

Asset Information and maintenance strategies:

(a) Current asset registers and/or BIM data available (which may need updating in line with NRM 3)

(b) List of applicable 'maintainable' assets – for all M&R elements and components, in scope

(c) Details of the maintenance strategies and service level regimes (e.g. compliant/fit for function)

Building/facilities details:

(a) Age of the building (i.e. measured from practical completion date of the building)

(b) Last major refurbishment date – and salient details to inform the service life planning of renewals

(c) Details of renewal works from condition surveys and predicted asset remaining life and factors

(d) Period of analysis or facility usage life (or period of interest, as defined in the brief)

(e) Specific characteristics – e.g. listed buildings; legal notices (such as dangerous structures, etc)

Appendix I: Report template for elemental cost plans for renewal (R) and maintain (M) works (condensed: based on level 1 codes)

Project Title:		Functional Unit:		Number of Storeys:	
Cost Plan No:		Level of analysis:		Floor Area (GIFA) m^2:	
Base date:		Space Usage (m^2):		Maintainable Area (NIA) m^2:	
Period of Analysis (Yrs):	X	Hours of Operation:		Location (BCIS Index):	

Cost centre	Group element/Element	£Y_1	£Y_2	£Y_3	…	£Y_n	X Year total	Cost per m^2 GIFA per annum
							£	£/m^2pa
	RENEWAL	[Insert summation of all sub-elements]						
0	Facilitating works							
1	Substructure							
2	Superstructure							
3	Internal finishes							
4	Fittings, furnishings and equipment							
5	Services							
7	Works to existing buildings							
8	External works							
	SUBTOTAL: RENEWAL	[Insert summation of all sub-elements]						
	MAINTAIN	[Insert summation of all sub-elements]						
0	Facilitating works							
1	Substructure							
2	Superstructure							
3	Internal finishes							
4	Fittings, furnishings and equipment							
5	Services							
6	Prefabricated buildings and building units	Not covered by NRM 3						
7	Works to existing buildings							
8	External works							
	SUBTOTAL: MAINTAIN							
	SUBTOTAL – MAINTAIN + RENEWAL (A)							
9	Maintenance contractor's management and administration costs (B)							
	SUBTOTAL – MAINTAIN + RENEWAL (including maintenance contractor's preliminaries (C) [C = A + B]							
10	Maintenance contractor's overheads and profit (D)							
	TOTAL – MAINTAIN + RENEWAL ESTIMATE (E) [E = C + D]							

11	Consultants' and specialists' fees (F)							
12	Employer definable costs (G)							
	TOTAL – CONSULTANTS FEES/EMPLOYER DEFINABLE COSTS (H) [H = F + G]							
	BASE ELEMENTAL COST ESTIMATE (I) [I = E + H]							
13A–B	Risk allowances – as item 3.14							
13C	Commercial and other considerations – as item 3.16 & 3.18							
	TOTAL – RISK ALLOWANCE ESTIMATE (J)							
	COST LIMIT (excluding inflation) (K) [K = I + J]							
14	Inflation/deflation – as item 3.15							
	TOTAL – INFLATION / DEFLATION (L)							
	COST LIMIT (excluding VAT assessment) (M) [M = K + L]							
	VAT assessment	Excluded (see note)						
	MAINTENANCE FUNCTIONAL UNIT RATE (FUR) £/m²pa							

1 Base date of cost plan: ……

2 All transfers are to be to/from the risk allowance cost centres and balanced by an equal but opposite adjustment to the risk allowance centres.

Note: Value Added Tax (VAT) in relation to buildings is a complex area. Therefore, it is recommended that VAT be excluded from elemental cost estimates. It is recommended that specialist advice is sought on VAT matters to ensure that the correct rates are applied to the various aspects of a building project.

Note: Refer to 4.24.4 for details of the level of analysis of maintenance costs information collected for renewal (R) and maintain (M) and how this can be expressed as unit rates, as defined in 3.5 (floor area and functional unit methods) and 3.6 (elemental method) of the NRM 3 rules.

Appendix J: Report template for elemental cost plans for renewal (R) and maintain (M) works (expanded: based on level 2 codes)

Project Title:		Functional Unit:		Number of Storeys:	
Cost Plan No:		Asset Classification:		Floor Area (GIFA m^2):	
Base date:		Space usage (m^2):		Maintainable Area (NIA) (m^2):	
Period of Analysis (Yrs)	X	Hours of Operation:		Location (BCIS index):	

Cost centre	Group element/element/sub-element	£Y_1	£Y_2	£Y_3	…	£Y_n	X Year total	Cost per m^2 GIFA per annum
							£	£/m^2pa
	RENEWAL							
0	Facilitating works	[Insert summation of all sub-elements]						
0.1	Toxic/hazardous/contaminated material treatment							
0.2	Major demolition works	Not covered by NRM 3						
0.3	Temporary support to adjacent structures	Not covered by NRM 3						
0.4	Specialist groundworks							
0.5	Temporary diversion works	Not covered by NRM 3						
0.6	Extraordinary site investigation works							
1	Substructure	[Insert summation of all sub-elements]						
1.1	Substructure							
2	Superstructure	[Insert summation of all sub-elements]						
2.1	Frame							
2.2	Upper floors							
2.3	Roof							
2.4	Stairs and ramps							
2.5	External walls							
2.6	Windows and external doors							
2.7	Internal walls and partitions							
2.8	Internal doors							
3	Internal finishes	[Insert summation of all sub-elements]						
3.1	Wall finishes							
3.2	Floor finishes							
3.3	Ceiling finishes							
4	Fittings, furnishings and equipment	[Insert summation of all sub-elements]						
4.1	Fittings, furnishings and equipment							
5	Services	[Insert summation of all sub-elements]						
5.1	Sanitary installations							
5.2	Services equipment							
5.3	Disposal installations							
5.4	Water installations							

5.5	Heat source							
5.6	Space heating and air conditioning							
5.7	Ventilation systems							
5.8	Electrical installations							
5.9	Fuel installations							
5.1	Lift and conveyor installations							
5.11	Fire and lightning protection							
5.12	Communication, security and control systems							
5.13	Special installations							
5.14	Builders' work in connection with services							
6	Prefabricated buildings and building units	Not covered by NRM 3						
6.1	Prefabricated buildings and building units	Not covered by NRM 3						
7	Works to existing buildings	[Insert summation of all sub-elements]						
7.1	Minor demolition and alteration works							
7.2	Repairs to existing services							
7.3	Damp-proof courses / fungus and beetle eradication							
7.4	Facade retention							
7.5	Cleaning existing surfaces							
7.6	Renovation works							
8	External works	[Insert summation of all sub-elements]						
8.1	Site preparation works	Not covered by NRM 3						
8.2	Roads, paths and pavings and surfacings							
8.3	Soft landscaping, planting and irrigation systems							
8.4	Fencing, railings and walls							
8.5	External fixtures							
8.6	External drainage							
8.7	External services							
8.8	Minor building works and ancillary buildings							
	SUBTOTAL: RENEWAL							
	MAINTAIN							
0	Facilitating works	[Insert summation of all sub-elements]						
0.1	Toxic/hazardous/contaminated material treatment							
0.2	Major demolition works	Not covered by NRM 3						
0.3	Temporary support to adjacent structures	Not covered by NRM 3						
0.4	Specialist groundworks							
0.5	Temporary diversion works	Not covered by NRM 3						
0.6	Extraordinary site investigation works							
1	Substructure	[Insert summation of all sub-elements]						
1.1	Substructure							
2	Superstructure	[Insert summation of all sub-elements]						
2.1	Frame							
2.2	Upper floors							
2.3	Roof							
2.4	Stairs and ramps							
2.5	External walls							
2.6	Windows and external doors							
2.7	Internal walls and partitions							
2.8	Internal doors							

3	Internal finishes	[Insert summation of all sub-elements]						
3.1	Wall finishes							
3.2	Floor finishes							
3.3	Ceiling finishes							
4	Fittings, furnishings and equipment	[Insert summation of all sub-elements]						
4.1	Fittings, furnishings and equipment							
5	Services	[Insert summation of all sub-elements]						
5.1	Sanitary installations							
5.2	Services equipment							
5.3	Disposal installations							
5.4	Water installations							
5.5	Heat source							
5.6	Space heating and air conditioning							
5.7	Ventilation systems							
5.8	Electrical installations							
5.9	Fuel installations							
5.1	Lift and conveyor installations							
5.11	Fire and lightning protection							
5.12	Communication, security and control systems							
5.13	Special installations							
5.14	Builders' work in connection with services							
6	Prefabricated buildings and building units	Not covered by NRM 3						
6.1	Prefabricated buildings and building units	Not covered by NRM 3						
7	Works to existing buildings	[Insert summation of all sub-elements]						
7.1	Minor demolition and alteration works							
7.2	Repairs to existing services							
7.3	Damp-proof courses/fungus and beetle eradication							
7.4	Facade retention							
7.5	Cleaning existing surfaces							
7.6	Renovation works							
8	External works	[Insert summation of all sub-elements]						
8.1	Site preparation works							
8.2	Roads, paths and pavings and surfacings							
8.3	Soft landscaping, planting and irrigation systems							
8.4	Fencing, railings and walls							
8.5	External fixtures							
8.6	External drainage							
8.7	External services							
8.8	Minor building works and ancillary buildings							
	SUBTOTAL: MAINTAIN							
	SUBTOTAL – MAINTAIN + RENEWAL (A)							
9	Maintenance contractor's management and administration costs (B)							
	SUBTOTAL – MAINTAIN + RENEWAL (including maintenance contractor's preliminaries (C) [C = A + B]							
10	Maintenance contractor's overheads and profit (D)							
	TOTAL – MAINTAIN + RENEWAL ESTIMATE (E) [E = C + D]							
11	Consultant's and specialist's fees (F)							

12	Employer definable maintenance related costs (G)								
	TOTAL – CONSULTANTS FEES/EMPLOYER DEFINABLE COSTS (H) [H = F + G]								
	BASE ELEMENTAL COST ESTIMATE (I) [I = E + H]								
13A–B	Risk allowances – as item 3.14								
13C	Other considerations – as item 3.16 & 3.18								
	TOTAL – RISK ALLOWANCE ESTIMATE (J)								
	COST LIMIT (excluding inflation) (K) [K = I + J]								
14	Inflation/deflation – as item 2.15								
	TOTAL – INFLATION/DEFLATION (L)								
	COST LIMIT (excluding VAT assessment) (M) [M = K + L]								
15	VAT assessment		EXCLUDED (see note)						
DISCOUNT FACTOR @	%								
NET PRESENT VALUE									
									MAINTENANCE FUNCTIONAL UNIT RATE (FUR) £/m²pa

1 Base date of cost plan: ……

2 All transfers are to be to/from the risk allowance cost centres and balanced by an equal but opposite adjustment to the risk allowance centres.

Note: Value Added Tax (VAT) in relation to buildings is a complex area. Therefore, it is recommended that VAT be excluded from elemental cost estimates. It is recommended that specialist advice is sought on VAT matters to ensure that the correct rates are applied to the various aspects of a building project.

Note: Refer to 4.24.4 for details of the level of analysis of maintenance costs information collected for renewal (R) and maintain (M) and how this can be expressed as unit rates, as defined in 3.5 (floor area and functional unit methods) and 3.6 (elemental method) of the NRM 3 rules.

Bibliography

British Standards Institute, BS 8544:2013 *Guide for life cycle costing of maintenance during the in use phases of buildings,* BSI, 2013, ISBN 978 0 580 71085 8

Building and Engineering Services Association, SFG20: *Maintenance Specification*, B&ES

Building Costs Information Service, *BMI Life Expectancy of Building Components*, BCIS, 2006, ISBN 978 1 904 82939 3

Building Costs Information Service, *Elemental Standard Form of Cost Analysis* (4th edition), BCIS 2012, ISBN 978 1 907 19629 4

Chartered Institute of Building Services Engineers, *Guide M, Maintenance and Management*, CIBSE 2008, ISBN 978 1 903 28793 4

Royal Institute of British Architects, *RIBA Outline Plan of Work 2007* (amended November 2008), RIBA 2008

Royal Institution of Chartered Surveyors, *Code of Measuring Practice* (6th edition), RICS 2007, ISBN 978 1 842 19332 7

Royal Institution of Chartered Surveyors, New Rules of Measurement: *NRM 1: Order of cost Estimating and Cost Planning for Capital Building Works*, RICS 2012, ISBN 978 1 842 19768 4

Royal Institution of Chartered Surveyors, New Rules of Measurement: *NRM 2: Detailed Measurement for Building Works*, RICS 2012, ISBN 978 1 842 1971 65

Index

A

Abbreviations 11
Accommodation *see* Site accommodation and equipment
Air conditioning
  central air conditioning systems (element 5.6) 259; 260
  central cooling (element 5.6) 252; 253
  combined central heating and cooling (element 5.6) 256
  combined local heating and cooling (element 5.6) 258
  local air conditioning (element 5.6) 261; 262
  local cooling (element 5.6) 254; 255
Air extract/supply systems *see* Ventilation
Alteration works
  minor alterations to existing buildings (element 7.1) 324–327
Ancillary buildings and structures
  external works (element 8.8) 405–408
Annualised costs
  calculating
    as-built/asset register 91; 93
    building works cost plan 91
    condition data 91
    PPM task schedule 93
Archaeological investigation works
  facilitating works (element 0.6) 116
  fees and charges (element 12.1) 433
Architects
  fees *see* Consultants'/specialists' fees
Authorised budget
  meaning 12

B

Balconies
  drainage to (element 2.2) 158
  internal and external (element 2.2) 157
Base cost estimate
  meaning 13; 18
Base date of cost data
  meaning 13
Basements
  excavation (element 1.1) 130; 131
  retaining walls (element 1.1) 131–138
Beetle eradication
  work to existing buildings (element 7.3) 330
Benchmark analysis *see* Cost analysis
Bird and vermin control
  installations and equipment (element 4.1) 223
BIM
  See Building Information Modelling
Bonds
  maintenance contractor's costs (element 9.2.14) 422
Budget/cash flow constraints
Building Information Modelling 27; 105
  definitions for 105
  NRM 3 alignment to 105

C

CROME
  meaning 23
Caissons
  foundations (element 1.1) 122–123
Capital allowances
  VAT assessments 81
Cars
  lifts/stacking systems/turntables and the like (element 5.10) 294
Catering equipment
  installations (element 5.2) 230; 231
Ceilings
  applied finishes (element 3.3) 207; 208
  demountable suspended ceilings (element 3.3) 210
  false ceilings (element 3.3) 209
Chemical waste
  disposal (element 5.3) 233; 234
COBie II data structure
  definitions 106
  NRM 3 alignment to 105
Codifying cost plans
  Method 104
Cold rooms *see* Refrigeration systems
Cold water distribution *see* Water installations
Cooling systems *see* Air conditioning; Heating systems
Comma
  use of 9
Communication systems
  external connection works (element 8.7) 392
  IT systems, site establishment (element 9.2) 414
  visual/audio and data installations (element 5.12) 302
Complete buildings and building units *see* Prefabricated buildings and units
Completion and post-completion
  employer's requirements (element 9.1) 411
  maintenance contractor's costs (element 9.2.10) 422
Compressed air systems
  specialist piped supply systems (element 5.13) 310
Concrete floors *see* Floors
Concrete frames *see* Frames
Concrete repairs
  existing buildings (element 7.6) 336
Condensate distribution *see* Water installations
Construction inflation
  cost plans

calculation of amount 59
computation of percentage 59
element 14.2 444
proposed cost limit 59
Consultants'/specialists' fees
calculation 56, 79
consultants' fees
actual fee inclusion 79
calculation 79
list of typical consultants (element 11.1) 426–427
site investigation fees (element 11.1) 430
specialist support (element 11.1) 430
cost plans 56
element 11 426–432
levels 1 to 5, logic and arrangement of 495
estimate, meaning 17
information requirements 35
maintenance contractor's design fees
list of typical consultants (element 11.3) 432
maintenance contractor's pre-contract fees
management and staff (element 11.2) 430
overheads and profit (element 11.2) 431
specialist support services fees (element 11.2) 430
temporary accommodation/services and facilities (element 11.2) 431
order of cost estimate 79
information requirements 35
percentage addition, based on 55
single allowance 55
table for group element 11 103
Contaminated material
removal (element 0.1) 108
Control systems
central control/building management systems (element 5.12) 307–308
Conveyor installations *see* Lift and conveyor installations
Cost analysis
meaning 14
unit rates 52
updating 52
Cost check/checking
meaning 13
Cost data structure
as-built/asset register/condition data 91; 94
capital building works 81
Cost control
meaning 13
Cost categories and definitions
asset information costs 498
end of life 502
maintain 499
renewal 500
Cost estimating *see* Order of cost estimate
Cost limit
meaning 13
Cost per functional unit
meaning 13
Cost plans
approving 71
building maintenance works 72; 73
capital allowances 81
codifying, method of 104; 105
constituents 67–69
consultants' fees 79
content 72
contractor designed work 74
formal cost plans
building maintenance works 72
information requirements 71; 72; 510–526
OGC Gateway 69
planning stages 69; 70
quantities 72
RIBA Work Stage 69
format 72
grants 82
inflation 59–60
information requirements 71–72
maintenance contractors
consultants'/specialists' fees 55
overheads and profit 54–55
meaning 15
multiple components/buildings, projects comprising 29–30
OGC Gateway Process 69
employer-definable costs 56–57
procurement, cost control in 71
consultants'/specialists' fees 55
purpose of cost planning 65–66
reporting 82; 83
reviewing 71
risk allowances 80–81
structure 72
tables for group elements *see* Group elements and elements
templates, examples of
level 1 codes 97; 526–527
level 2 codes 97; 528–531
unit rates 52
value added tax 60
Cost target
meaning 13
Cranes
lifting and movement of goods (element 5.10) 293
maintenance contractor's costs
mobile cranes (element 9.2.7) 420
tower cranes (element 9.2.7) 418

D

Damp-proof courses
foundations (element 1.1) 119–121
work to existing buildings (element 7.3) 330
Decimal marker
use of comma/point 9
Definitions 12–19
Demolition works

existing buildings, minor demolition works (element 7.1) 324–326
soft strip works (element 0.2) 110–111
taking down to ground level (element 0.2) 110
Design team
fees *see* Consultants' and specialists' fees
Discount
equations 504
rate
505-506
time value of money
calculating method 504–508
meaning 18
Disposal installations *see* Drainage installations
Diversion works *see* Temporary diversion works
Dock levellers
lifting systems (element 5.10) 292
Document handling systems
handling/delivery/warehouse picking systems and the like (element 5.10) 295
Doors
external (element 2.6) 190
internal (element 2.8) 199
Drainage installations
chemical/toxic and industrial liquid waste drainage (element 5.3) 233; 234
external works
ancillary drainage systems (element 8.6) 375
laboratory and industrial liquid waste (element 8.6) 370–372
land drainage (element 8.6) 378–379
surface water and foul water (element 8.6) 372
foul drainage above ground (element 5.3) 231–232
builder's work in connection with (element 5.14); (element 8.7) 315; 401
roofs 163, 164
testing and commissioning
external works (element 8.6) 372–382
foundations (element 1.1) 129
upper floors (element 2.2) 152

E

Earthing and bonding systems *see* Electrical installations
Electrical installations
builder's work in connection with (element 5.14) 315
earthing and bonding systems (element 5.8) 280–281
electrical mains and sub-mains distribution (element 5.8) 269–270
lighting installations (element 5.8) 273–274
local electricity generation systems
local generation equipment (element 5.8) 277
transformation devices (element 5.8) 278
power installations (element 5.8) 271
specialist installations (element 5.13) 309
Electricity
distribution to external plant and equipment (element 8.7) 389
mains supply (element 8.7) 386
temporary supply, maintenance contractor's costs (element 9.2) 419
transformation devices (element 5.8); (element 8.7) 278–279; 387–388
Electronic installations
specialist installations (element 5.13) 313
Element *see also* Group elements and elements
meaning 14
Elemental cost analysis *see* Cost analysis
Elemental cost planning *see* Cost plans
Elemental method
meaning 14
order of cost estimate
maintenance works estimate 39
new buildings 39
element unit quantities (EUQ) 41
external works 50
facilitating works 43
fittings/furnishings and equipment 45
gross internal floor area (GIFA) 41
group elements and elements 40
initial cost model/outline elemental cost plan 41
internal finishes 45
logic and arrangement levels 40; 464–497
maintenance contractor's management and administration costs 50
maintenance contractor's overheads and profits 50
more than one building 41
services 46–49
substructure 43
superstructure 44
work to existing buildings 49
Element unit quantity (EUQ)
meaning 14
order of cost estimate 41
Element unit rate (EUR)
cost planning 52; 53
meaning 14
order of cost estimate 41
Employer
finance costs (element 12.1) 433
meaning 14
Employer's requirements
completion and post-completion (element 9.1) 411
site accommodation (element 9.1) 410
site records (element 9.1) 410
Energy generation
wind turbines/photovoltaic devices/solar collectors (element 5.8); (element 8.7) 278–279; 387–389
Environmental protection
maintenance contractor's costs (element 9.2.5) 416–417
Environmental/sustainability strategy
information requirements 35

Escalators
conveyor systems (element 5.10) 291
Estimate base date
meaning 15
order of cost estimate 52–53
updating unit rates and other costs 75–76
Existing buildings
cleaning existing surfaces (element 7.5) 333
concrete repairs (element 7.6) 336
damp-proof courses (element 7.3) 330
elemental cost planning
element 7 323–339
levels 1 to 5, logic and arrangement of 486
elemental method of estimating 49
facade retention (element 7.4) 332
fungus/beetle eradication (element 7.3) 331
masonry repairs (element 7.6) 335
metal repairs (element 7.6) 337
minor demolition works/alteration works (element 7.1) 324–327
plastic repairs (element 7.6) 339
protective coatings (element 7.5) 334
renovation works (element 7.6) 335–339
repairs to existing services (element 7.2) 328
timber repairs (element 7.6) 329
External services *see* Services
External walls *see* Walls
External works
drainage (element 8.6) 372–382
elemental cost planning
element 8 340–408
levels 1 to 5, logic and arrangement of 487–492
elemental method of estimating 50
fencing/railings and walls (element 8.4) 359–367
irrigation systems (element 8.3) 357–358
pavings and surfacings (element 8.2) 349
roads/paths (element 8.2) 345–349
services (element 8.7) 383–408
site preparation works (element 8.1) 343–344
site/street furniture and equipment (element 8.5) 368–369
soft landscaping and planting (element 8.3) 351–358
Extraordinary site investigation works *see* Site investigation works

F

Facades
access and cleaning systems (element 2.5) 187
cleaning/coating existing surfaces (element 7.5) 333
retention (element 7.4) 332
Facilitating works
cost planning 43
levels 1 to 5, logic and arrangement of 465
table for group element 0 102; 107–117
estimate, meaning 14
extraordinary site investigation works (element 0.6) 116–117
major demolition works (element 0.2) 110–111
meaning 14
order of cost estimate 22; 23; 27
quantities, base for 22; 23
specialist groundworks (element 0.4) 113–114
temporary diversion works (element 0.5) 115
temporary supports to adjacent structures (element 0.3) 112
toxic/hazardous/contaminated material removal (group element 0.1) 108–109
Fees and charges *see also* Employer definable costs; Consultants'/specialists' fees
consultants' fees*see* consultants'/specialists' fees
maintenance contractors
building control/oversailing fees (element 9.2.12) 422
design fees 60; 61
pre-construction fee 60
rates and licences (element 9.2.12) 422
Fencing/railings and walls
barriers and guardrails (element 8.4) 366
external works (element 8.4) 359–366
prevention of access/light or noise screening (element 8.4) 359
retaining walls (element 8.4) 361
Fire protection
piped distribution systems
fire fighting systems (element 5.11) 297–298
fire suppression systems (element 5.11) 299
Fittings/furnishings and equipment
bird and vermin control (element 4.1) 223
domestic kitchen fittings and equipment (element 4.1) 214
elemental cost planning
element 4 211–223
levels 1 to 5, logic and arrangement of 470
elemental method of estimating 45
employer definable costs (element 12.1) 434
equipment, non-mechanical/non-electrical (element 4.1) 216–217
internal planting (element 4.1) 221
signs/notices (element 4.1) 218
special purpose (element 4.1) 216
works of art (element 4.1) 219
Floor area method
quantities for maintenance works 38
Floors
finishes (element 3.2) 204–205
lowest floor (element 1.1) 125–126
raised access floors (element 3.2) 207
upper floors
balconies (element 2.2) 157
concrete floors (element 2.2) 152
precast/composite decking systems (element 2.2) 153–154
structural screeds (element 2.2) 156
suspended floor slabs (element 2.2) 153
timber floors (element 2.2) 155

Formal cost plans *see* Cost plans
Foul water disposal *see* Drainage installations
Foundations *see* Substructure
Frames
  concrete casings to steel frames (element 2.1) 144–145
  concrete frames (element 2.1) 146–147
  space frames/decks (element 2.1) 143; 144
  specialist frames (element 2.1) 143
  steel (element 2.1) 141
  timber (element 2.1) 148
Fuel installations
  distribution systems (element 5.9) 283
  external storage and piped distribution systems (element 8.7) 394
  storage tanks and vessels (element 5.9) 282
Functional units
  commonly used 457
  costs
    unit rates 52
  meaning 15
  method
    meaning 15
    quantities for maintenance works 37; 38
  reporting order of cost estimate 45
Fungus eradication
  work to existing buildings (element 7.3) 332
Furnishings *see* Fittings/furnishings and equipment

G

Gas supply
  builder's work in connection with (element 5.14); (element 8.7) 309; 391
  main supply (element 8.7) 391
  piped gas supply systems (element 5.9) 309
  specialist piped supply systems (element 5.13) 310
  storage tanks and vessels (element 5.9) 282
Gas venting
  facilitating groundworks (element 0.4) 114
Giant hogweed
  eradication (element 0.1) 109
Glazed roofs *see* Roofs
Grants
  cost plans 88
  order of cost estimate 61
Gross external areas (GEA)
  meaning 15
  schedule information requirements 35
Gross internal area (GIA) *see also* Gross internal floor area (GIFA)
  core definitions 446
  examples of appropriate dimensions 448–450
  floor area method 37
  how and when to use 447
Gross internal floor area (GIFA)
  meaning 15
  quantities, determination 37
  schedule information requirements 35
Groundworks
  ground gas venting measures (element 0.4) 114
  site clearance (element 8.1) 344
  site dewatering and pumping (element 0.4) 113
  site preparation (element 8.1) 343–345
  soil stabilisation measures (element 0.4) 114
Group elements and elements
  cost planning tables 101
    building maintenance works (1 to 8) 101
    complete buildings and building units (6) *see* Prefabricated buildings and units
    external works (8) *see* External works
    facilitating works (0) *see* Facilitating works
    fittings/furnishings and equipment (4) *see* Fittings/furnishings and equipment
    internal finishes (3) *see* Internal finishes
    inflation (14) 103
    employer-definable costs (12) 103
    maintenance contractor's administration costs (9) 102
    maintenance contractor's overheads and profits (10) 103
    principal levels 102
    consultants'/specialists' fees (11) 103
    risks (13) 103
    services (5) *see* Services
    structure of 101; 102
    substructure (1) *see* Substructure
    superstructure (2) *see* Superstructure
    work to existing buildings (7) *see* Existing buildings
  group element meaning 15
  order of cost estimate elemental method tables
    complete buildings and building units 40
    external works 40
    facilitating works 40
    fittings/furnishings and equipment 40
    internal finishes 40
    services 40
    substructure 40
    superstructure 40
    works to existing buildings 40
Guarantees
  maintenance contractor's costs (element 9.2.14) 423; 424

H

Hazardous material
  removal (element 0.1) 108
Health and safety
  maintenance contractor's costs
    barriers and safety scaffolding (element 9.2.5) 417
    safety programme (element 9.2.5) 416
Heating systems *see also* Air conditioning
  builder's work in connection with (element 5.14); (element 8.7) 315; 400
  central heating (element 5.6) 249–250

combined central heating and cooling (element 5.6) 256
combined local heating and cooling (element 5.6) 258–259
heat source (element 5.5) 246–248
local/district heating installations (element 5.6); (element 8.7) 400–401
Hoists
enclosed/unenclosed (element 5.10) 285; 293
Hot water distribution *see* Water installations

I

Industrial liquid waste *see* Drainage installations
Inflation
construction inflation
calculation of amount 59
computation of percentage 59
element 14.2 444
proposed cost limit 58; 59; 81
cost plans
construction inflation 59; 444
element 14 444
levels 1 to 5, logic and arrangement of 497
tender inflation 59; 444
unit rates, percentage addition for inflation 53; 54; 55
meaning 15
order of cost estimate
construction inflation 59
tender inflation 59; 444
unit rates, percentage addition for inflation 53; 54; 55
table for group element 14 103
tendering conditions/changes in the market, taking into consideration 60
tender inflation
calculation of amount 59
computation of percentage 59
element 14.1 444
proposed cost limit 58; 59; 81
Information requirements
cost plans 71
order of cost estimate
budget/cash flow constraints 35
capital allowances 35
construction procurement options initial views 35
employer definable costs 35
grants 35
initial project/design brief 35
life span 35
consultants'/specialists' fees 35
refurbishment 35
restraints 35
statement of building use 35
statement of floor area 35
statement of quality 35
value added tax 35
Initial project/design brief
order of cost estimate information requirements 35
Inspections and monitoring
maintenance contractor's costs (element 9.2.6) 418
Insurance
employer definable costs (element 12.1) 434
maintenance contractor's costs (element 9.2.14) 423–424
Internal finishes
ceiling finishes (element 3.3) 207–210
elemental cost planning
element 3 201–210
levels 1 to 5, logic and arrangement of 469–470
elemental method of estimating 45
floor finishes (element 3.2) 204–205
wall finishes (element 3.1) 202–203
Irrigation systems
landscaped areas (element 8.3) 357
IT systems *see* Telecommunication and IT systems

J

Japanese knotweed
eradication (element 0.1) 109

K

Kitchen fittings
units/appliances and equipment (element 4.1) 214–215

L

Laboratories
external drainage (element 8.6) 378
specialist piped supply systems (element 5.13) 309–310
Labour
multi-service gang, maintenance contractor's costs (element 9.2.13) 423
Land acquisition
costs (element 12.1) 433
Land drainage
disposal systems for waterlogged ground (element 8.6)
380
Landscaping
external planting (element 8.3) 354–355
irrigation systems (element 8.3) 357–358
seeding and turfing (element 8.3) 352–354
Life cycle
meaning 15
Life cycle costing
building information modelling 105
categories 23
meaning 16
Life factor
calculation 90; 91

life expectancy of elements 90
meaning
overall life factor 99–100
Lift and conveyor installations
car lifts/car stacking systems/turntables and the like (element 5.10) 294
conveyors (element 5.10) 296
cranes and unenclosed hoists (element 5.10) 293
dock levellers and scissor lifts (element 5.10) 292
document handling systems (element 5.10) 295
enclosed hoists (element 5.10) 285
escalators (element 5.10) 287
lifts (element 5.10) 286
moving pavements (element 5.10) 288–289
other lift and conveyor installations (element 5.10) 296
powered stairlifts (element 5.10) 290
Lighting installations *see* Electrical installations; Site/street lighting
Lightning protection
installations (element 5.11) 301

M

Machinery and plant
maintenance contractor's costs
access plant (element 9.2.7) 420
common user (element 9.2.7) 418
concrete plant (element 9.2.7) 420
hoists (element 9.2.7) 420
mobile cranes (element 9.2.7) 420
small plant and tools (element 9.2.7) 420
tower cranes (element 9.2.7) 419–420
Maintenance contractors
cost items *see* Maintenance contractor's costs
list of typical consultants (element 11.3) 432
meaning 16
overheads and profit *see* Overheads and profit
management and staff (element 11.2) 432
specialist support services fees (element 11.2) 430
temporary accommodation/services and facilities (element 11.2) 431
Maintenance contractor's costs
cleaning (element 9.2.11) 422
fees and charges (element 9.2.12) 422
guarantees (element 9.2.14) 423
insurance (element 9.2.14) 423
level 1 to 3, logic and arrangement of 350
management and staff
extraordinary support costs (element 9.2.1) 413
contract specific (element 9.2.1) 412
staff travel (element 9.2.1) 413
visiting (element 9.2.1) 412
mechanical plant and equipment
access plant (element 9.2.7) 418
common user (element 9.2.7) 418
concrete plant (element 9.2.7) 420
hoists (element 9.2.7) 420
mobile cranes (element 9.2.7) 420
small plant and tools (element 9.2.7) 420
tower cranes (element 9.2.7) 419–420
safety and environmental protection
barriers and safety scaffolding (element 9.2.5) 417
environmental protection measures (element 9.2.5) 418
safety programme (element 9.2.5) 416
scaffolding (element 9.2.8) 418
security (element 9.2.4) 415
site establishment
brought in services (element 9.2.2) 415
consumables and services (element 9.2.2) 414
furniture and equipment (element 9.2.2) 413
IT systems (element 9.2.2) 414
site accommodation (element 9.2.2) 413
sundries (element 9.2.2) 415
temporary works in connection with (element 9.2.2) 413
site records (element 9.2.9) 421
site services
multi-service gang (element 9.2.13) 423
temporary works (element 9.2.13) 423
temporary works (element 9.2.8) 421
warranties (element 9.2.14) 423
Maintenance contractor's management and administration costs
calculation 53
cost items *see* Maintenance contractor's costs
cost plans 76
element 9 409–425
levels 1 to 5, logic and arrangement of 491–493
employer's requirements (element 9.1) 410–411
lump sum, assessment as 76
meaning 16
method of estimating 53; 76
order of cost estimate 53; 54
percentage addition 53; 54; 55
table for group element 9 102
Maintenance cost planning *see* Cost plans
Major demolition works *see* Demolition works
Management and staff
extraordinary support costs (element 9.2.1) 413
project specific (element 9.2.1) 412
staff travel (element 9.2.1) 413
visiting (element 9.2.1) 412
Marketing
costs (element 12.1) 435
Masonry repairs
existing buildings (element 7.6) 335
Medical and laboratory gas supply systems
specialist piped supply systems (element 5.13) 309
Metal repairs
existing buildings (element 7.6) 337
Metric units
use of 9
Minor building works

external works (element 8.8) 405–408
Moving pavements
conveyor systems (element 5.10) 288
Multiple components/buildings
cost plans 71

N

Net internal areas (NIA)
core definition 451
examples of appropriate dimensions 453–457
examples of appropriate measurement points where heating installations 457
how and when to use 452
meaning 16
schedule information requirements 35
shops, examples 460–461

O

OGC Gateways
alternative to RIBA Plan of Work 7
business justification (1) 8; 33
risk allowances 57
cost plans 65
delivery strategy (2) 8; 33
risk allowances 57
design brief and concept approval (3A) 8
order of cost estimating elemental method 45
detailed design approval (3B) 8; 66
meaning 16
operational review and benefits realisation (5) 8
readiness for services (4) 66
tender documentation preparation 8
Oil supply
storage tanks and vessels (element 5.9) 282
Operation and maintenance services
completion and post-occupancy, employer's requirements (element 9.1) 411
Order of cost estimate
accuracy of 35
base cost estimate 33
capital allowances 35
constituents 36
elemental method see Elemental method
element unit rates 52; 53
estimate base date, updating unit rates 52; 53
grants 82
inflation see Inflation
information requirements see Information requirements
maintenance contractors
management and administration costs 53; 54
overheads and profits 53
meaning 16
OGC Gateway Process see OGC Gateways
purpose of 33
quantities, determination
floor area method 37
functional unit method 37; 38
reporting 62
RIBA Work Stages see RIBA Work Stages
risk see Risk
unit rates 52
updating 52; 53
value added tax assessment 60
Other employer-definable costs
archaeological fieldwork (element 12.1) 434
charges (element 12.1) 434
cost plans 79
element 12 433–435
levels 1 to 5, logic and arrangement of 495–496
decanting and relocation (element 12.1) 434
employer finance costs (element 12.1) 435
fees (element 12.1) 435
fittings/furnishings and equipment (element 12.1) 434
insurances (element 12.1) 434
land acquisition costs (element 12.1) 433
lump sum allowances 56; 79
marketing costs (element 12.1) 435
meaning 16
order of cost estimate 56
other employer costs (element 12.1) 435
planning contributions (element 12.1) 434
specialist fieldwork (element 12.1) 434
table for group element 12 103
tenant's cost/contributions (element 12.1) 434
total estimated cost 56; 69; 70
Overheads and profit
allowances 79
amount of net profit (element 10) 425
calculation 78; 79
combined as single cost centre 57; 58
cost plans 54; 62
elemental method of estimating 36
head office set up and administration (element 10) 425
meaning 16
order of cost estimate 54
percentage addition 54; 55; 77
pre-contract fees (element 11.2) 431
separate cost centres 79
table for group element 10 103
works cost estimate 78

P

Pavings and surfacings
external works (element 8.2) 345–350
Photovoltaic devices
energy generation (element 5.8); (element 8.7) 278; 388
Piles
foundations (element 1.1) 122–124
Plant and machinery see Machinery and plant
Plant growth
eradication (element 0.1) 109

Planting
internal natural and artificial planting (element 4.1) 221
Plastic repairs
existing buildings (element 7.6) 341
Plumbing see Water installations
Powered stairlifts see Lift and conveyor installations
Power installations see Electrical installations
Predicted life
calculations 99–100
Price stability
meaning 16
Prime contractor see Maintenance contractors
Procurement
cost control 71
Protective coatings
existing buildings (element 7.5) 334

Q

Quantities
cost plans
Formal Cost Plan 1 75
Formal Cost Plan 2 73
Formal Cost Plan 3 74
method of measurement 73
nearest whole element 73
order of cost estimate
floor area method 37
functional unit method 37; 38

R

Radio and television studios
specialist electrical/electronic installations/systems (element 5.13) 313
Radon gas see Gas venting
Ramps see Stairs, ramps and landings
Records
site records
employer's requirements (element 9.1) 410
maintenance contractor's costs (element 9.2.9) 421
Reference service life
data sources 90
meaning 17
Refrigeration systems
specialist systems (element 5.13) 311
Refuse disposal
chutes/incineration plant and the like (element 5.3) 235
Refurbishments
order of cost estimate information requirements 35
Relocation
costs (element 12.1) 434
Renovation works
concrete repairs (element 7.6) 336
masonry repairs (element 7.6) 335
metal repairs (element 7.6) 337
plastic repairs (element 7.6) 339
timber repairs (element 7.6) 338
Reports
cost plans 82
order of cost estimate 62
Reptile mitigation measures
facilitating works (element 0.6) 116
Residual risk
meaning 17
Retail shops see Shops
RIBA Outline Plan of Work
meaning 18
RIBA Plan of Work
alternative to see OGC Gateways
meaning 18
RIBA Work Stages
appraisal (A) 8
concept (C) 8
order of cost estimating elemental method 41
construction to practical completion (K) 8
cost plans 33; 34
design brief (B) 8; 57; 65
design development (D) 8; 70
meaning 18
mobilisation (J) 8
Risk
allowance 56–58
calculation 80–82
cost target 80
design development risks 58; 80
employer change risks 58; 80; 81
employer other risks 58; 81
formal risk analysis 57; 80
inclusion in order of cost estimates 57
meaning 18
percentage 58
avoidance 57
cost plans 61; 63
element 13 437–443
levels 1 to 5, logic and arrangement of 495
design development risks
allowance 57; 81
typical causes, list of (element 13.1) 437
employer change risks
allowance 58; 81
typical causes, list of (element 13.3) 441
employer other risks
allowance 58; 81
typical causes, list of (element 13.4) 442; 443
maintenance contractor's design development risk 58
order of cost estimate 57–59
proposed cost limit 58
reassessment 58
reduction 57
register/log
information requirements 57
meaning 18
residual risk, meaning 17
retention 57

separate cost targets 81
sharing 57
table for group element 13 103
transfer 57
value, meaning 18
Roads and paths
cleaning, maintenance contractor's costs (element 9.2.11) 422
external works (element 8.2) 345–350
Roofs
all components (element 2.3) 159; 160
coverings (element 2.3) 160–162
drainage 163–164
features not forming part of the main roof structure (element 2.3) 166
glazed roofs (element 2.3) 162–163
rooflights/skylights and openings (element 2.3) 164

S

Safety *see* Health and safety
Sanitary installations
ancillaries, bathroom/toilet and shower fittings (element 5.1) 228–229
appliances and accessories (element 5.1) 226
Scaffolding
maintenance contractor's costs (element 9.2.8) 421
Schedules
information requirements
accommodation 35
gross external areas 35
gross internal areas 35
net internal areas 35
site area 35
Scissor lifts and levellers
systems for goods and people (element 5.10) 292
Screeds *see* Floors
Security
observation and access control installations and the like (element 5.12); (element 8.7) 306; 396
staff/equipment, maintenance contractor's costs (element 9.2.4) 415
Services
builder's work in connection with (element 5.14) 315
external services (element 8.7) 401
catering equipment (element 5.2) 230
communication/security and control systems (element 5.12) 303–308
disposal installations (element 5.3) 232–236
electrical installations (element 5.8) 269–281
electricity mains supply (element 8.7) 386
elemental cost planning
element 5 224–321
levels 1 to 5, logic and arrangement of 471–486
elemental method of estimating 46–49
fire and lightening protection (element 5.11) 297–302
fuel installations (element 5.9) 282
fuel storage and piped distribution systems (element 8.7) 394
gas mains supply (element 8.7) 391
heat source (element 5.5) 246–248
lift and conveyor installations (element 5.10) 295–296
local/district heating systems (element 8.7) 400
minor building works and ancillary buildings (element 8.8) 405–408
repairs to existing services (element 7.2) 328–329
sanitary installations (element 5.1) 226–230
security systems (element 8.7) 396
site/street lighting systems (element 8.7) 398–339
space heating and air conditioning (element 5.6) 249–262
specialist installations (element 5.13) 309–314
telecommunications and other communications systems (element 8.7) 393
ventilation (element 5.7) 263–268
water installations (element 5.4) 237–245
water mains supply (element 8.7) 384
Sewage systems *see* Drainage installations
Shops
estate agency and valuation, application 461
examples of net internal area 462; 463
special use definitions 460
Signs and notices
fittings (element 4.1) 218
Site accommodation and equipment
employer's requirements (element 9.1) 410
maintenance contractor's costs (element 9.2) 413
Site area
cleaning and tidying (element 9.2.11) 422
constraints, information requirements 35
dewatering and pumping, facilitating works (element 0.4) 113
establishment, maintenance contractor's costs *see* Maintenance contractor's costs
meaning 18
schedule information requirements 35
Site investigation works
archaeological site investigation works (element 0.6) 116
other extraordinary site investigation works (element 0.6) 117
reptile/wildlife mitigation measures (element 0.6) 116
Site preparation works
preparatory groundworks (element 8.1) 344
site clearance (element 8.1) 343
Site/street furniture and equipment
external use (element 8.5) 368–369

ornamental features (element 8.5) 370
Site/street lighting
external illumination systems (element 8.7) 398
Smoke extract/control
installations/systems (element 5.7) 267
Soft landscaping *see* Landscaping
Soil stabilisation measures
facilitating works (element 0.4) 114
Solar collectors
energy generation (element 5.8); (element 8.7) 278; 388
Space heating and air conditioning *see* Air conditioning; Heating systems
Specialist groundworks *see* Groundworks
Specialist installations
electrical/electronic installations/systems (element 5.13) 313–314
piped supply systems (element 5.13) 309
refrigeration systems (element 5.13) 311
water features (element 5.13) 314
Sports areas
surfacings and pavings (element 8.2) 349
Staff *see* Management and staff
Stairs, ramps and landings
balustrades and handrails (element 2.4) 170
finishes (element 2.4) 169
ladders/shutes/slides (element 2.4) 171
structures (element 2.4) 167
Steam distribution *see* Water installations
Steel frames *see* Frames
Street furniture *see* Site/street furniture and equipment
Subcontractors
meaning 18
Subcontractor's management and administration charges
allowance for 77
meaning 18
Sub-element
meaning 18
Substructure
basement excavation (element 1.1) 130
basement retaining walls (element 1.1) 131–138
elemental cost planning
element 1 118–138
levels 1 to 5, logic and arrangement of 466–467
elemental method of cost estimating 43
foundations (element 1.1) 119–121
lowest floor construction (element 1.1) 125–129
specialist foundations (element 1.1) 122–125
Superstructure
elemental cost planning
element 2 139–200
levels 1 to 5, logic and arrangement of 466–469
elemental method of cost estimating 44–45
external walls (element 2.5) 173–188
floors (element 2.2) 151–172
frame (element 2.1) 141–150
internal doors (element 2.8) 199–200
internal walls and partitions (element 2.7) 192–198
roofs (element 2.3) 159–167
stairs and ramps (element 2.4) 168–172
windows and external doors (element 2.6) 188–191
Surfacings and pavings
external works (element 8.2) 345–350
Surveys
maintenance contractor's costs (element 9.2.6) 418
Suspended floors *see* Floors
Swimming pools
specialist piped supply systems (element 5.13) 309
Symbols used for measurement 11

T

Tables for group elements *see* Group elements and elements
Taxation allowances and reliefs
cost planning 82
order of cost estimate 60
Telecommunication and IT systems *see also* Communication systems
employer's requirements (element 9.1) 410
Television and radio studios
specialist electrical/electronic installations/systems (element 5.13) 313
Temporary diversion works
drains/waterways and services (element 0.5) 115
Temporary supports
adjacent structures (element 0.3) 112
Temporary works
maintenance contractor's costs (element 9.2.8); (element 9.2.13) 421; 423
Tenants
costs/contributions (element 12.1) 434
Tender inflation
cost planning
calculation of amount 59
computation of percentage 59
element 14.1 444
meaning 18
order of cost estimate
calculation of amount 59
computation of percentage 59
proposed cost limit 59
Testing and commissioning
completion and post-completion requirements, maintenance contractor's costs (element 9.2.10) 422
drainage installations
external works (element 8.6) 374–382
foundations (element 1.1) 127; 129
upper floors (element 2.2) 158
external services (element 8.7) 401
irrigation systems (element 8.3) 358

Timber
existing buildings, fungus/beetle eradication (element 7.3) 330; 331
floors *see* Floors
frames *see* Frames
repairs to existing buildings (element 7.6) 338
Time value of money
discounting equations 504
meaning 18
Toxic material
disposal of waste (element 5.3) 234–235
removal (element 0.1) 108–109
Transformation devices *see* Electrical installations
Transport systems *see* Lift and conveyor installations

U

Underpinning
external site boundary walls (element 8.8) 407
foundations (element 1.1) 125
Unit rates
cost plans 75; 97
cost analyses and benchmark analyses 75; 97
equation for calculating updated rate 75
estimate base date 75
exclusions 75
inclusions 75
percentage addition for inflation 75
updating rates 75
meaning 17
order of cost estimate
applicable to measurement method used 52
cost analyses and benchmark analyses 52
costs per functional unit 52
current at time of 52
equation for calculating updated rate 53
inclusions 53
percentage addition for inflation 53
updating rates 52; 53

V

Vacuum cleaning systems
specialist piped supply systems (element 5.13) 309; 310
Value added tax assessment 60
Vehicles
lifting/storage and movement systems (element 5.10) 294
Ventilation
builder's work in connection with (element 5.14); (element 8.7) 315; 401
central ventilation systems (element 5.7) 263
local and special ventilation (element 5.7) 265–266
smoke extract/control systems (element 5.7) 267
Vermin control
installations and equipment (element 4.1) 223

W

Walls *see also* Fencing/railings and walls
external
above ground level (element 2.5) 174–178
access and cleaning systems (element 2.5) 187
balustrades/handrails/railings and proprietary balconies (element 2.5) 186
below ground level (element 2.5) 179; 183
cleaning/coating existing surfaces (element 7.5) 333–334
existing buildings, facade retention (element 7.4) 332
external soffits (element 2.5) 183
solar/rainscreen cladding (element 2.5) 182
subsidiary walls (element 2.5) 185–186
finishes (element 3.1) 202–203
internal
balustrades and handrails (element 2.7) 194–195
cubicles (element 2.7) 197
moveable room dividers (element 2.7) 197
walls and partitions (element 2.7) 192–193
Warranties
maintenance contractor's costs (element 9.2.14) 423
Waste disposal
drainage installations *see* Drainage installations
refuse disposal (element 5.3) 235
Water features
specialist piped supply systems (element 5.13) 314
Water installations
builder's work in connection with (element 5.14); (element 8.7) 315; 384
cold water distribution (element 5.4) 239–240
hot water distribution (element 5.4) 241–242
mains water supply (element 5.4) 384
specialist piped supply systems (element 5.13) 309
steam and condensate distribution (element 5.4) 244–245
Wildlife mitigation measures
facilitating works (element 0.6) 116
Windows
external (element 2.6) 188
Wind turbines
energy generation (element 5.8); (element 8.7) 278; 387
Works of art
fittings (element 4.1) 219
Works packages
Work to existing buildings *see* Existing buildings

nrm 3

RICS new rules of measurement

NRM 3: Order of cost estimating and cost planning for building maintenance works.

The *RICS new rules of measurement* (NRM) is a suite of documents issued by the RICS Quantity Surveying and Construction Professional Group.

The rules have been written to provide a standard set of measurement rules that are understandable by all those involved in a construction projects and maintenance programmes of works.

This volume NRM 3: *Order of cost estimating and cost planning for maintenance works*, provides fundamental guidance on the quantification of maintenance works for the purpose of preparing order of cost estimates and formal cost plans (pre construction) and detailed cost plans (post construction) and during the in use phases of the building life cycle. The guidance provided by the rules also aids the procurement and cost control of maintenance works.

NRM 3 follows the same structure and premise as the NRM 1: *Order of cost estimating and cost planning for capital building works*. Consequently, NRM 3 also gives direction on how to quantify other items associated with building maintenance works, which are not reflected in the measurable maintenance work items – i.e. maintenance contractor's management and administration charges, overheads and profit, consultants' fees, employer definable other maintenance-related costs; and risks allowances in connection with maintenance works.

Unlike capital building projects, maintenance works are required to be carried out from the day a building or asset is put to use until the end of its life. Accordingly, while the costs of a capital building works project are usually incurred by the building owner/developer over a relatively short-term, costs in connection with maintenance works are incurred throughout the life of the building – over the short, medium and long-term. Therefore NRM 3 also provides guidance on the measurement and calculation of the time value of money (NPV and payback methods), as well as other considerations such as taxation and other incentives.

Together, NRM 1 and NRM 3 present the basis of good life cycle cost management of capital building and maintenance works – enabling more effective and accurate cost advice to be given to clients and project team members, as well as facilitating better cost control. They can be used jointly to develop and manage life cycle cost plans (LCCPs) for construction, maintenance, renewal works, to inform investment appraisals, and selecting the best value option. NRM 3 also provides a digital cost data set and classification for the economic analysis of maintenance works in BIM solutions.

In addition, the rules can be used as a basis for capturing and analysing historical cost data in the form required for future order of cost estimates and elemental cost plans, thereby completing the 'cost management cycle' and bridging the capital and revenue divide.

The *RICS new rules of measurement* are based on UK practice, but the requirements for a coordinated set of rules and underlying philosophy behind each section have worldwide application.

ISBN 978-1-78321-024-4

RICS