



# RICS new rules of measurement

Order of cost estimating and  
cost planning for building  
maintenance works

# **RICS new rules of measurement**

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

1st edition

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## **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.

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# 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.

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- 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 of 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

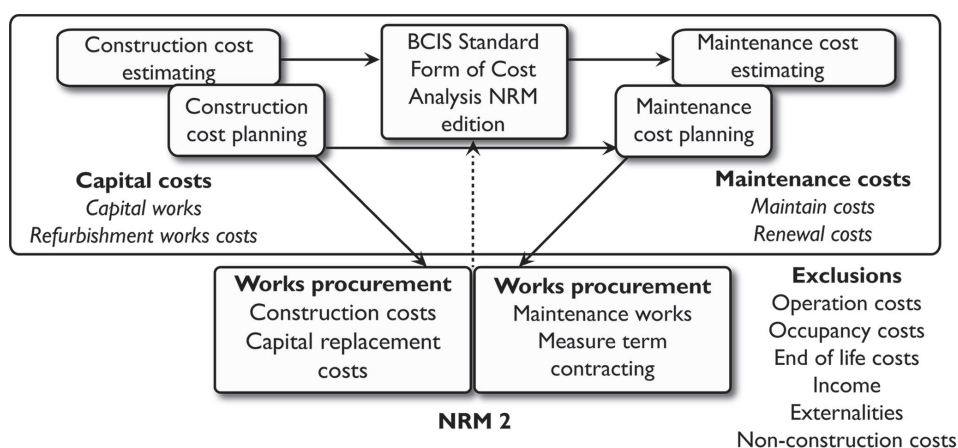
This volume provides essential guidance on the quantification and description of maintenance works for the purpose of preparing initial order of cost estimates during the preparation stages of a building project, elemental cost plans during the design development stages (pre-construction) and detailed 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.

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

# Part I: General



# Part I: 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)**'.



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

**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**

RIBA Work Stages		NRM 3: Order of cost estimating and cost planning for building maintenance works	OGC Gateways (Applicable to projects)
Preparation	A	Appraisal	Order of cost estimates (as required to set authorised budget)
	B	Design Brief	
Design	C	Concept	Formal cost plan 1 (Renewal/Maintain)
	D	Design Development	Formal cost plan 2 (Renewal/Maintain)
	E	Technical Design	Formal cost plan 3 (Renewal/Maintain)
Pre-construction	F	Production Information	Out of scope of NRM 3 Bills of Quantities
	G	Tender Documentation	
	H	Tender Action	
Construction	J	Mobilisation	Formal cost plan 4 (Renewal/Maintain)
	K	Construction to Practical Completion	
In use	L	Post Practical Completion	

OGC Gateway	Description
1	Business Justification
2	Delivery Strategy
3A	Design Brief and Concept Approval
3B	Detailed Design Approval
3C	Investment Decision
4	Readiness for Service
5	Operational Review and Benefits Realisation

**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 <sup>2</sup>	square metre
m <sup>3</sup>	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 <sup>2</sup> of GIA	Cost per square foot of gross internal area
Cost/m <sup>2</sup> of GIA	Cost per square metre of gross internal area
Cost/m <sup>2</sup> 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)

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

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 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<sup>2</sup> 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.



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

**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<sup>2</sup> or cost per m). The term also includes cost/m<sup>2</sup> of GIFA, or cost/m<sup>2</sup> 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**

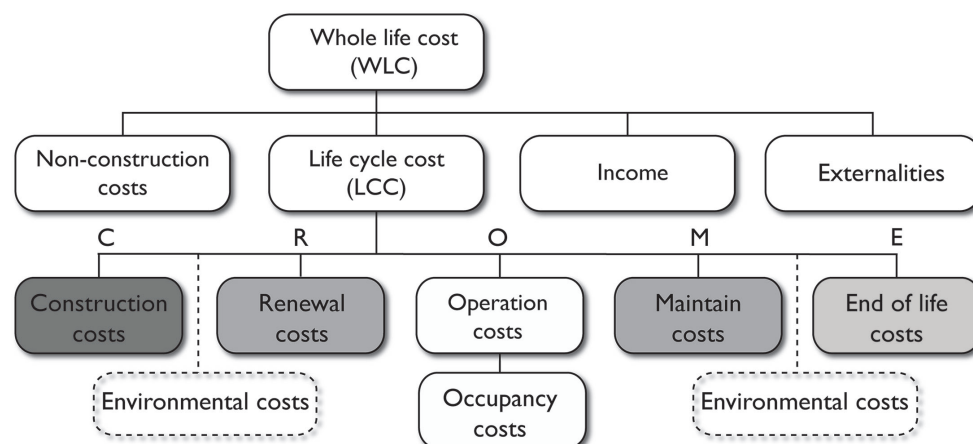
**E Environmental and/or end of life costs.**

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

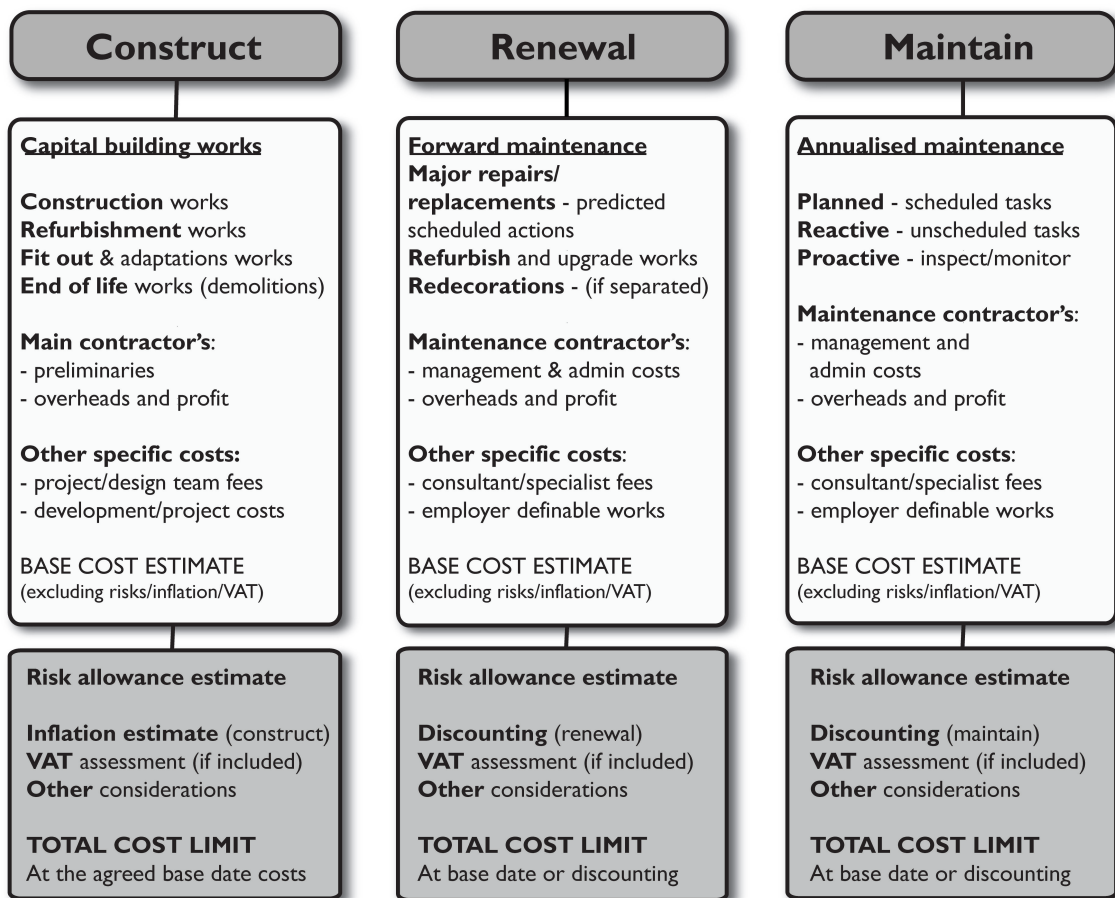




## 2.3 Scope and parameters of the renewal (R) and maintain (M) work categories

- 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 categories 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) **redecorating 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**

	Built asset (level 0)	Grouped elements (1)	Element (2)	Sub-element (3)	Component (4)
Construct	m <sup>2</sup> or function unit	Construct work cost estimates(m <sup>2</sup> )	Cost planning (concise)	Cost planning (amplified) Detailed measurement	Cost planning (specific) Detailed measurement
Renewal	m <sup>2</sup> /pa or function unit	Renewal work cost estimates (m <sup>2</sup> /pa)	Renewal work cost estimates (m <sup>2</sup> /pa)	Cost planning (various) Detailed measurement	Cost planning (various) Detailed measurement
Maintain	m <sup>2</sup> /pa or function unit	Maintain work cost estimates (m <sup>2</sup> /pa)	Cost planning (various)	Cost planning (various) Detailed measurement	Cost planning (various) Detailed measurement
Other aspects	As agreed in scope (e.g. end of interest)	Relevant maintenance considerations	Relevant maintenance considerations	Relevant maintenance considerations	Relevant maintenance considerations

*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.

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

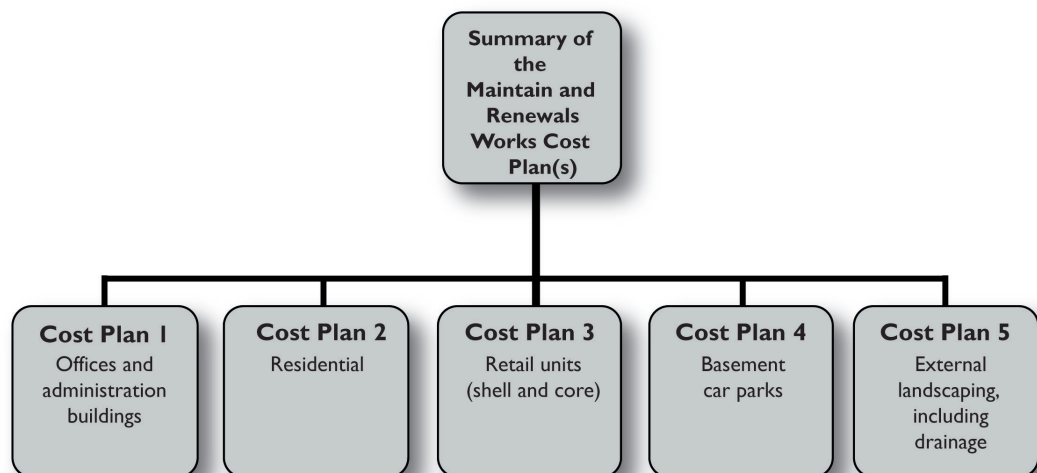
- 2.7.8** In addition, the cost manager is to ascertain:
- (1) if there is a base case, or project benchmark, to be used as a comparator
  - (2) the specific study inputs and rules of measurement to be applied.
- 2.7.9** Specific study inputs and rules of measurement comprise:
- (1) estimate base date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



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

**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<sup>2</sup> of retail area)
  - (3) elemental method.
- 3.1.2** The content and application of unit rates (i.e. cost/m<sup>2</sup> 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:

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

(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.

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

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

Constituent (Cost Centre)	£Y <sub>1</sub>	£Y <sub>2</sub>	£Y <sub>3</sub>	...	£Y <sub>n</sub>	Reference/Notes
	£k	£k	£k	£k	£k	
Net Present Value (NPV) ((Total) Cost limit) <sup>(15)</sup> [(15) = Σ(PV) <sup>(14)</sup> ]	£Y <sub>1</sub>	£Y <sub>2</sub>	£Y <sub>3</sub>	...	£Y <sub>n</sub>	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<sub>1</sub> = Year 1 costs

£Y<sub>2</sub> = Year 2 costs

£Y<sub>3</sub> = Year 3 costs

£Y<sub>n</sub> = Final year costs in which either maintenance or renewal works are to be undertaken

DF<sup>1</sup> = Year 1 discount factor

DF<sup>2</sup> = Year 2 discount factor

DF<sup>3</sup> = Year 3 discount factor

DF<sup>n</sup> = 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 built assets is measured and multiplied by an appropriate cost/m<sup>2</sup> 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<sup>2</sup> of GIFA for renewal works

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

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- (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<sup>2</sup> 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<sup>2</sup> 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<sup>2</sup> 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:

$$R = a \times b$$

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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<sup>2</sup> 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.



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**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	<i>Not covered by NRM 3 rules</i>
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 I 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:

$$a = \text{EUQ}$$

$$b = \text{EUR}$$

$$c = \text{cost target (for element)}$$

**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:

$$b = \sum (a_0 + a_1 + a_2 + a_3 + a_4 + a_5 + a_6 + a_7 + a_8 + a_X \text{ etc})$$

where:

$$a_0, a_1, a_2, a_3, \text{ etc} = \text{cost target for element}$$

$$b = \text{renewal cost estimate}$$

**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:

$$b = \sum (a_0 + a_1 + a_2 + a_3 + a_4 + a_5 + a_6 + a_7 + a_8 + a_X \text{ etc})$$

where:

$$a_0, a_1, a_2, a_3, \text{ etc} = \text{cost target for element}$$

$$b = \text{maintain cost estimate}$$

**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)).

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

Group element	Element	Unit	Measurement rules	Notes
0 Facilitating works <sup>1</sup>	1 Toxic/hazardous/contaminated material treatment	m <sup>2</sup>	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 <sup>2</sup>	1 Substructure	m <sup>2</sup>	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.	

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Group element	Element	Unit	Measurement rules	Notes
2 Superstructure	1 Frame <sup>3</sup>	m <sup>2</sup>	<p>1 The area measured is the area of the floors related to the frame.</p> <p>2 The area of the frame shall be measured in accordance with the rules of measurement for ascertaining the gross internal floor area (GIFA).</p>	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 <sup>4</sup>	m <sup>2</sup>	<p>1 The area measured is the total area of the upper floor(s).</p> <p>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).</p> <p>3 Sloping surfaces (such as galleries, tiered terraces and the like) are to be measured flat on plan.</p> <p>4 Areas for balconies, galleries, tiered terraces, service floors, walkways, internal bridges, external links and roofs to internal buildings shall be shown separately.</p>	Where balconies are included, the sum of the upper floors and lowest floor will exceed the GIFA.
	3 Roof <sup>5</sup>	m <sup>2</sup>	<p>1 The area measured is the area of the roof on plan.</p> <p>2 The area measured is the area of the roof on plan measured to the inside face of the external walls.</p>	
	4 Stairs and ramps <sup>6</sup>	nr	<p>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).</p> <p>2 The total vertical rise of each staircase or ramp is to be stated, measured from the top of structural floor level</p>	

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Group element	Element	Unit	Measurement rules	Notes
	5 External walls <sup>7</sup>	m <sup>2</sup>	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 <sup>2</sup>	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 <sup>8</sup>	m <sup>2</sup>	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 <sup>2</sup>	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 <sup>2</sup>	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.	

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Group element	Element	Unit	Measurement rules	Notes
5 Services	1 Sanitary installations	nr	<p>1 Enumerate, giving the total number of appliances.</p> <p>2 The total number of appliances enumerated is the total number of items listed below:</p> <p>(a) domestic sanitary appliances</p> <p>(b) specialist sanitary appliances</p> <p>(c) bathroom pods</p> <p>(d) toilet pods</p> <p>(e) shower room pods</p>	
	2 Services equipment		<p>1 Enumerate, giving the total number of items.</p> <p>2 The total number of items enumerated is the total number of items listed below:</p> <p>(a) commercial catering equipment</p> <p>(b) sinks supplied as an integral part of catering equipment</p> <p>(c) food storage equipment</p> <p>(d) specialist equipment</p>	
	3 Disposal installations		<p>1 Enumerate, giving the total number of above-ground waste installations to sanitary appliances and services equipment, and entry chutes to refuse disposal installation.</p> <p>2 The total number of items enumerated is the total number of items listed below (nr):</p> <p>(a) waste points to sanitary appliances</p> <p>(b) waste points to services equipment</p> <p>(c) waste points for laboratory and industrial liquid waste</p> <p>(d) entry points to rubbish chutes</p> <p>(e) entry points to chemical and industrial waste appliances</p>	

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



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

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Group element	Element	Unit	Measurement rules	Notes	
	11 Fire and lightning protection	m <sup>2</sup>	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 <sup>10</sup>	1 Minor demolition and alteration works	m <sup>2</sup>	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 <sup>2</sup>	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.

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Group element	Element	Unit	Measurement rules	Notes
8 External works	1 Site preparation works <sup>11</sup>	m <sup>2</sup>	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.

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

#### 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 an 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<sup>2</sup> 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<sup>2</sup> 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<sup>2</sup> 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).

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**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:

$$d = R_c + M_c + c$$

where:

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

$M_c$  = 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<sup>2</sup> 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:

$$e = (R_c + M_c + c) \times p$$

where:

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

$M_c$  = 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:

$$m = R_c + M_c + c + e$$

where:

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

$M_c$  = 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

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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

$$\begin{aligned} \text{Discount rate} &= \frac{1 + \text{Interest rate as a decimal}}{1 + \text{Interest rate as a decimal}} - 1 \\ &= \frac{1 + 0.04}{1 + 0.025} - 1 = 0.0146 \\ &= \frac{1.040}{1.025} - 1 = 0.0146 \\ &= 1.46\% \end{aligned}$$

**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:

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

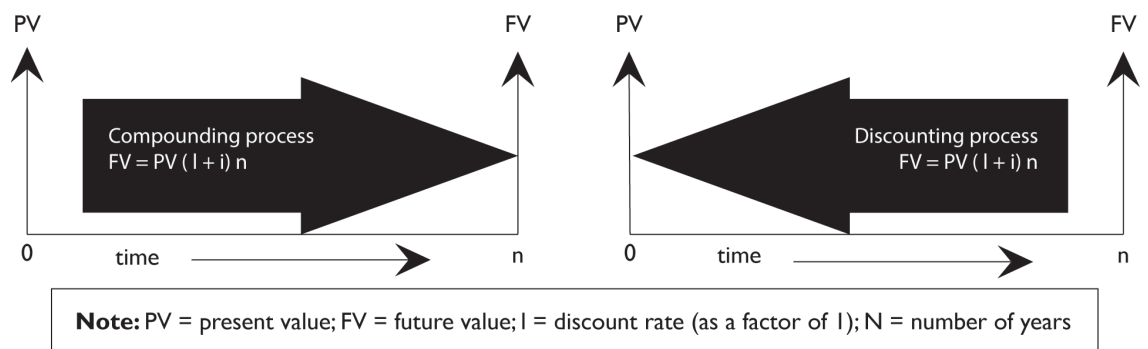
where:

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**



**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<sup>2</sup> 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<sup>2</sup> 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<sup>2</sup> 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 be 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.

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(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 <sub>1</sub>	£Y <sub>2</sub>	£Y <sub>3</sub>	...	£Y <sub>n</sub>	Reference/Notes
	£k	£k	£k	£k	£k	
<b>Renewal (R) annualised costs:</b>						
(1a) Facilitating works	£Y <sub>1</sub>	£Y <sub>2</sub>	£Y <sub>3</sub>	...	£Y <sub>n</sub>	
(1b) Substructure	£Y <sub>1</sub>	£Y <sub>2</sub>	£Y <sub>3</sub>	...	£Y <sub>n</sub>	
(1c) Superstructure	£Y <sub>1</sub>	£Y <sub>2</sub>	£Y <sub>3</sub>	...	£Y <sub>n</sub>	
(1d) Internal finishes	£Y <sub>1</sub>	£Y <sub>2</sub>	£Y <sub>3</sub>	...	£Y <sub>n</sub>	
(1e) Fittings, furniture and equipment	£Y <sub>1</sub>	£Y <sub>2</sub>	£Y <sub>3</sub>	...	£Y <sub>n</sub>	
(1f) Services	£Y <sub>1</sub>	£Y <sub>2</sub>	£Y <sub>3</sub>	...	£Y <sub>n</sub>	
(1g) Work to existing buildings	£Y <sub>1</sub>	£Y <sub>2</sub>	£Y <sub>3</sub>	...	£Y <sub>n</sub>	If not covered in 1e to 1f.
(1h) External works	£Y <sub>1</sub>	£Y <sub>2</sub>	£Y <sub>3</sub>	...	£Y <sub>n</sub>	
Total – Renewal costs estimate (1)						
[(1) = Σ (1a) + (1b) + (...) + (1h)]	£Y <sub>1</sub>	£Y <sub>2</sub>	£Y <sub>3</sub>	...	£Y <sub>n</sub>	See paragraphs 4.8 to 4.11

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

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

Constituent (Cost Centre)	£Y <sub>1</sub>	£Y <sub>2</sub>	£Y <sub>3</sub>	...	£Y <sub>n</sub>	Reference/Notes
	£k	£k	£k	£k	£k	
Discount Factor <sup>(13)</sup>	DF <sup>1</sup>	DF <sup>2</sup>	DF <sup>3</sup>	...	DF <sup>n</sup>	See paragraph 4.19
Present Value <sup>(14)</sup> [(14) = (12) × (13)]	£Y <sub>1</sub>	£Y <sub>2</sub>	£Y <sub>3</sub>	...	£Y <sub>n</sub>	See paragraph 4.19
Net Present Value (Total cost limit) <sup>(15)</sup> [(15) = Σ(PV) <sup>(14)</sup> ]	£Y <sub>1</sub>	£Y <sub>2</sub>	£Y <sub>3</sub>	...	£Y <sub>n</sub>	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<sub>1</sub> = Year 1 costs

£Y<sub>2</sub> = Year 2 costs

£Y<sub>3</sub> = Year 3 costs

£Y<sub>n</sub> = Final year costs in which either maintenance or replacement works are to be undertaken

DF<sup>1</sup> = Year 1 discount factor

DF<sup>2</sup> = Year 2 discount factor

DF<sup>3</sup> = Year 3 discount factor

DF<sup>n</sup> = 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
4 (for existing built asset or facility)	Information
	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.

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- 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:

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

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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)

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

cI = 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:

$$d = a + b + c$$

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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:

$$m = R_c + M_c + c + e$$

where:

R<sub>c</sub> = renewal (R) works estimate (i.e. the total estimated cost of renewal (R) works)

M<sub>c</sub> = 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.

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- 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<sup>2</sup> of GIFA/pa’ and in ‘functional unit cost/m<sup>2</sup>/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<sup>2</sup> of GIFA, or cost per functional unit (or functional unit cost), as an alternative, or in addition, to the cost/m<sup>2</sup> 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<sup>2</sup> 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.



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

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<sup>2</sup>, m<sup>3</sup> or item).

Column (h): Construction unit rate: Insert the unit rate for building/installing the component (i.e. cost per nr, m, m<sup>2</sup>, m<sup>3</sup> 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<sup>2</sup>, m<sup>3</sup> 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.

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

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:  
$$\text{Interval} = \text{RSL (column (o))} \times \text{Life Factor (column (p))}$$
  
For example:  
RSL = 25 years  
Life factor = 80% (or 0.80)  
Interval = 20 years (25 years  $\times$  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:  
$$\text{Renewal unit rate} = \text{Construction unit rate (column (h))} \times \text{Adjustment to construction unit rate (column r)} \times (1 + \text{Renewal uplift (column s)})$$

**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:  
$$\text{Cost per event} = \text{Renewal (R) quantity (column (m))} \times \text{Renewal (R) unit rate (column (t))}$$

**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:  
$$\text{Total renewal (R) cost} = \text{Cost per event (column (u))} \times \text{Number of occurrences during the period of analysis.}$$

## 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 years	25	Project life 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:

$$OLF = LF1 \times LF2 \times LF3 \dots \times LF_n$$

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

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

## 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.

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

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<sup>2</sup>, m<sup>3</sup> 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<sup>2</sup>, m<sup>3</sup> 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.

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

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).



**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<sup>2</sup>, m<sup>3</sup> 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.



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Column (k): Unit of measurement: Maintain (M):	Insert the unit of measurement (i.e. nr, m, m <sup>2</sup> , m <sup>3</sup> 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.
<b>Event cycle:</b>	
Column (p): Task frequency:	Specify how often the maintain (M) task is required to be carried out (e.g. weekly, monthly, yearly).
<b>Notes on column (p):</b>	
(1) Sources of data for frequencies include:	
(1) B&ES (SFG20 standard task schedules)	
(2) BCIS <i>Occupancy cost plans</i>	
(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.
<b>Task Skilling by Trade:</b>	
Column (r): Trade description:	Insert the type of maintenance contractor that is to complete the maintain (M) task.
<b>Annual Labour Hours Calculated by Trade:</b>	
Column headed: Trade I:	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.
<b>Results:</b>	
<b>Net Total Annual Labour Hours by Trade:</b>	Calculate the sum of the working hours (both normal and out of hours) for each trade
<b>Reactive Hours Annualised (if in scope):</b>	Insert the hours (annualised) for unscheduled maintenance work by trade (if in scope).
<b>Site Adjustment/Access Factor (%):</b>	Insert the project-specific allowances for site-wide adjustments, such as access.
<b>Gross Total Labour Hours by Trade:</b>	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 (%))
<b>Trade Labour Rate:</b>	Insert the estimated/agreed hourly labour rates (normal working hours and out of working hours for each trade).
<b>Total Annualised Trade Labour Cost:</b>	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.
<b>Annualised Consumables/Plant and Equipment:</b>	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<sup>2</sup>/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.

$$\text{Functional maintenance index (FMI)} = \frac{\text{Total cost of annualised maintain (M) works}}{\text{Capital reinstatement value (or rebuild cost)}} = \frac{\text{FMI}(\%)}{(100)}$$

$$\text{Functional condition index (FCI)} = \frac{\text{Total cost of life cycle renewal (R) works}}{\text{Capital reinstatement value (or rebuild cost)}} = \frac{\text{FCI}(\%)}{(100)}$$

**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

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**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 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 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 used 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 I data structure to COBie is included in BS 8544:2013; guide for life cycle costing of maintenance during the in use phases of building).

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**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, minor 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	<p><b>Toxic or hazardous material removal</b></p> <p><b>Definition:</b> Removal, employing special safety measures of toxic or hazardous material prior to demolition – for maintenance or renewal works.</p>	item	<p>1 Removal of toxic or hazardous building parts of building fabric (e.g. asbestos containing materials).</p> <p>2 Removal of toxic or hazardous insulating materials or components from existing services installations, including storage tanks and vessels.</p>	Toxic or hazardous material e.g. asbestos	Toxic or hazardous material – (THM)	<p><b>Renewal Actions</b> <b>Removal</b> – To include removal of affected area or item and safe disposal.</p> <p><b>Maintain Actions</b> <b>Proactive</b> – Visual inspections and specialist surveys. <b>Excluded</b> – Asbestos survey fees and the like are to be included in group element 1.1; Consultants' and specialists' fees.</p> <p><b>Note 1:</b> Control of toxic or hazardous materials regulations e.g. Control of asbestos regulations 2012 and the like. <b>Note 2:</b> 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).</p> <p>M1 – Cost-significant components are to be described and identified and itemised separately. Such components are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) as appropriate. M2 – Works undertaken by a specialist contractor are to be described and identified separately.</p>
		item	<p>3 Removal of toxic or hazardous chemicals from existing services installations, storage tanks and vessels.</p> <p>4 Safe disposal (included with items 1 to 3).</p>	Chemically hazardous material	THM	
		item	5 Sundry items.	Safe disposal	N/A	
		note	6 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	
		m <sup>3</sup> /m <sup>3</sup>	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)	
		m <sup>2</sup>	2 Contaminated ground material treatment using in-situ methods.	Contaminated land (not part of NRM 3)	Contaminated land (not part of NRM 3)	
0.1.2	<p><b>Contaminated land</b></p> <p><b>Definition:</b> Removal and/or treatment of contaminated ground material.</p>	<p>1 Contaminated ground material removal: details to be stated.</p> <p>2 Contaminated ground material treatment: details to be stated.</p>	<p>1 Contaminated ground material removal using 'dig and dump' strategy and safe disposal to licensed tip (tipping charge).</p> <p>2 Contaminated ground material treatment using in-situ methods.</p>	<p>Contaminated land (not part of NRM 3)</p> <p>Contaminated land (not part of NRM 3)</p>	<p>Covered in NRM 1 for Contaminated land in group element 0: Facilitating works element 0.1.2.</p>	

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
0.1.3	1 Eradication by 'dig and dump' strategy: details to be stated.	m <sup>3</sup> /m <sup>3</sup>	1 Eradication by 'dig and dump' strategy.	Eradication of plant growth	N/A	<p>Applying herbicides taken with external works item 8.3.2.1.</p> <p><b>Renewal Actions</b></p> <p><b>Eradication of plant growth</b> – By 'dig and dump' strategy.</p> <p><b>Eradication by chemical treatment</b> – To be described.</p> <p><b>Maintain Actions</b></p> <p>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.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M2 – The area measured is the area designated as infected by the plant growth (in m<sup>2</sup>).</p> <p>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<sup>3</sup>).</p> <p>M4 – Quantities given for disposal of contaminated ground material are the bulk before excavating.</p> <p>M5 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately.</p>
	2 Eradication by chemical treatment: details to be stated.	nr/m <sup>2</sup>	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	<p><b>Demolition works</b></p> <p><b>Definition:</b> Taking down to ground level and removing complete buildings/structures or parts of buildings /structures (including services, fittings and finishes).</p>	1 Demolition works of entire buildings.	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.				
		4 Extra over temporary propping for providing wallings.				
		5 Periodic technical inspections of temporary propping.				
		6 Returning to site to reposition temporary props.				
		7 Removal of temporary props.				
		8 Removal of wallings.				
		9 Grubbing-up of anchor blocks/ foundations to temporary props and infilling voids.				

Sub-element	Component	Unit	Included (aligned to NRM I structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
0.2.2	<p>Preparatory to demolition: extent of works to be stated.</p> <p>Preparatory to refurbishment: extent of works to be stated.</p>	item/m <sup>2</sup>	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 I for Major demolition works in group element 0: Facilitating works 0.2.1.
	<p><b>Soft strip works</b></p> <p><b>Definition:</b> Stripping out building components, services, fittings and finishes from a building as preparatory works to demolition or refurbishment.</p>					



### 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	<p>1 Support structures; details to be stated.</p> <p>2 Taking down and repositioning support structures; details to be stated.</p> <p>3 Periodic technical inspections of temporary support structures; details to be stated.</p> <p>4 Removing support structures; details to be stated.</p> <p><b>Definition:</b> Temporary or semi-permanent support for unstable structures (i.e. structures not to be demolished) adjacent to the building being built.</p>	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.
<p><b>Note:</b> Works arising from party wall awards/agreements are to be described and identified separately (see group element 7: Work to existing buildings).</p> <p><b>Excluded:</b> 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).</p>						

## 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	<p>1 Site dewatering and pumping: details to be stated.</p> <p><b>Definition:</b> Temporarily lowering the groundwater level to facilitate maintenance and renewal works.</p>	item/m <sup>2</sup>	1 Forming well points, including well pointing equipment and well point installation.	N/A	N/A	<p><b>Renewal Actions</b> Repairs to drainage to include clearing obstructions, flushing out and applicable removal, repairs and replacement work actions.</p> <p>Replace sump pumps at end of life.</p> <p>Running costs – site dewatering costs over service life period.</p> <p><b>Maintain Actions</b> 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).</p> <p>Running costs – off site water disposal charges and the like.</p> <p><b>Unit of measurement</b> – The same as NRM 1 except for the pumps, which are to be enumerated (state type and capacity).</p> <p>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.</p> <p>M2 – The area measured is the area affected by the dewatering system employed.</p> <p>M3 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately.</p> <p><b>Note:</b> Offsite disposal of site water by tankerage and by other means, is to be included in running costs.</p>
		item/m <sup>2</sup>	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	

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
0.4.2	<p>1 Soil stabilisation measures: details to be stated.</p> <p><b>Soil stabilisation measures</b>  <b>Definition:</b>                      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.</p>	m <sup>2</sup>	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	<p>1 Ground gas venting measures: details to be stated.</p> <p><b>Ground gas venting measures</b>  <b>Definition:</b>                      Systems to prevent accumulation of radon or landfill gases.</p>	m <sup>2</sup>	<p>1 Ground gas venting measures, including:</p> <ul style="list-style-type: none"> <li>– gas-proof membranes</li> <li>– perforated collection pipes</li> <li>– proprietary gas dispersal fin layers.</li> </ul> <p>2 Radon sumps.</p> <p>3 Vent pipes, including vertical risers to vent at high level.</p>	Ground gas venting measures	Ground gas venting measures	<p><b>Renewal Actions</b>                      Remedial actions to gas venting measures in order to keep operational are to be identified and described.</p> <p><b>Maintain Actions</b>                      Planned and proactive monitoring regimes are to be stated.</p> <p>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<sup>2</sup>), linear measurement (m) and enumerated (nr) separately</p>
		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	<b>Temporary diversion works</b> <b>Definition:</b> Temporary diversion of existing drainage systems, existing services installations and systems, rivers, streams and the like.	item	1 All works in connection with temporary diversion of drains.	Drains diversion – temporary works	N/A	<b>Renewal Actions</b> Temporary diversion works are to be itemised and described as applicable. <b>Maintain Actions</b> Not applicable M1 – Works are to be itemised and described. <b>Note:</b> Where insufficient information is available, such works are to be included in group element 13: Risks, as appropriate. <b>Note:</b> 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	item	1 Physical archaeological investigation works. 2 Provision for temporary screens. 3 Attendance by archaeologists.	Excluded (taken elsewhere)	Excluded (taken elsewhere)	Taken elsewhere (covered by other cost elements in group element 11: Consultants and specialists' fees).
	<b>Definition:</b> Site-based archaeological investigation works.	nr				
	1 Excavation works; details to be stated. 2 Temporary screens and the like; details to be stated. 3 Attendance by archaeologist	per week				
0.6.2	Reptile/wildlife mitigation measures	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.
	<b>Definition:</b> Relocation of reptiles/wildlife and provision of fences/barriers to cordon off the working area.	nr/m				
	1 Physical reptile/wildlife mitigation measures; details to be stated. 2 Temporary fences, barriers and the like; details to be stated. 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	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.
	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	<b>Renewal works</b> Physical works arising from extraordinary site measures. <b>Maintain Actions</b> 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. <b>Excluded</b> 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.
	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:**

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 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)	
I.1.1	<p><b>Standard foundations Definition:</b> Standard foundations up to and including the damp-proof course.</p> <p>1 Strip foundations: details, including depth of foundation, to be stated (if known).</p>	m	<p>1 Wall and column foundations.</p> <p>2 Foundation walls to underside of damp-proof course (to both perimeter and internal load-bearing walls).</p> <p>4 Trench and pit excavations, including earthwork support (including insertion and extraction of steel sheet piling, if used).</p> <p>5 Excavating below groundwater level.</p> <p>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.</p> <p>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.</p>	<p>Standard foundations</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>	<p>Standard foundations</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>	<p><b>Scope covered by NRM 3</b>                      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.  <b>Note</b> – Structural survey and inspection fees and the like are to be included in group element 1.1: Consultants' and specialists' fees.  <b>N/A</b> – Not applicable to renewal and/or maintain work  <b>Note:</b> Evidence of subsidence will become apparent above ground, hence monitoring and inspections taken with superstructure elements, not in substructures.  <b>Renewal Actions</b>  <b>Replacement</b> – Not applicable for maintenance works  <b>Remedial works</b>– underpinning/damp proofing works  <b>Major repairs</b> – To standard foundation systems arising from identified actions from visual inspections and specialist surveys/ investigations.</p>



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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	<p><b>Maintain Actions</b>  <b>Planned</b> – N/A (inspections taken with superstructures)  <b>Proactive</b> – Monitoring cracks (e.g. install tell tales)  <b>Reactive</b> – N/A (physical investigation taken in element 11)</p> <p>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<sup>2</sup>), 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.</p>
			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 <sup>3</sup> ) 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 <sup>2</sup>	(Covered in item 7 included above).	N/A	N/A	

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance Descriptor		Measurement Rules For Maintenance Works
				Renewal (R)	Maintain (M)	
1.1.2 <b>Specialist foundation systems</b> <b>Definition:</b> 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 <sup>2</sup>	4 Piling mats and platforms (installing, moving, modifying and removing on completion).	N/A	N/A	<p><b>Scope covered by NRM 3</b> 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.</p> <p>For large-scale and cost-significant repairs it will be necessary to seek advice from a structural specialist.</p> <p><b>Note</b> – Structural survey and inspection fees and the like are to be included in group element 1: Consultants' and specialists' fees.</p> <p><b>Renewal Actions</b> <b>Replacement</b> – Not applicable to maintenance works <b>Major repairs</b> – To specialist foundation systems arising from identified actions from visual inspections and specialist surveys/ extra ordinary site investigations.</p>
	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. <b>Note</b> – Where information about ground strata is unknown, an allowance is to be made within the construction risk allowance for breaking through obstructions. (See item 5 included above).	N/A	N/A	
	3 Moving piling rig to pile position.	nr		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 piles, timber-bearing piles and mini piles. 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)	
			<p>14 Trench and pit excavations for pile caps and ground beams, including earthwork support (including insertion and extraction of steel sheet piling if used).</p> <p>17 Consolidating and compacting formation level to receive pile caps and ground beams.</p> <p>18 Blinding.</p> <p>19 Protection boarding to underside of pile caps and ground beams (e.g. to provide heave protection).</p> <p>20 Concrete, reinforcement, formwork (temporary and permanent) and excavating and backfilling of working space required to facilitate placement of formwork.</p> <p>21 Specialist concrete grades, including waterproof concrete and additives.</p> <p>22 Sundry items – details to be stated.</p>	N/A	N/A	<p><b>Maintain Actions</b>  <b>Planned</b> – N/A (inspections taken with superstructures)  <b>Proactive</b> – not applicable to piling and associated works  <b>Reactive</b> – 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<sup>2</sup>), 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.</p>
		item	23 Subcontractor on costs (where applicable) (Covered with item included in component 4: Piles).	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. 6 Caissons: details, including type, diameter (mm) and depth (m) of caisson, to be stated.	note	2 Permanent caissons.	N/A	N/A	
				N/A	N/A	

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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 <sup>3</sup>	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						
								(Covered with item 14 included above).	N/A	N/A					
									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			
											11 Pile tests (e.g. load tests and integrity tests).	N/A	N/A		
												3 Vibro-compacted columns.	N/A	N/A	
													8 Extra for breaking through obstructions.	nr/m <sup>3</sup>	
														9 Cutting off tops of concrete piles and preparing pile heads.	nr
10 Pile tests: details, including type of test, pile type, diameter of pile and number of piles, to be stated.	item														
	11 Vibro-compacted columns: details, including size (mm) and length (m) of column, 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)	
I.1.3	12 Pile caps: details, including size of and reinforcement rate (kg/m <sup>3</sup> ) to pile cap, to be stated.	m	12 Pile caps.	N/A	N/A	<p><b>Maintain Actions</b>  <b>Note:</b> Monitoring subsidence to include fixing 'tell tales' on cracks in the structures in excess of 5mm</p>
	13 Ground beams: details, including size of and reinforcement rate (kg/m <sup>3</sup> ) 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 Lowest floor construction: details to be stated. <b>Note</b> – Reinforcement rate (kg/m <sup>3</sup> or kg/m <sup>2</sup> , as appropriate) for concrete slabs and beds to be stated.	m <sup>2</sup>	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). 2 Thickening to slabs/beds for load-bearing walls, machine bases and the like. 4 Inclined and stepped slabs/beds. 9 Surface area excavations (i.e. to remove topsoil and to reduce levels), including earthwork support.	N/A	N/A	

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance Descriptor		Measurement Rules For Maintenance Works
				Renewal (R)	Maintain (M)	
			<p>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). <b>Note</b> – 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.</p> <p>12 Disposal of surface water and groundwater, where dewatering techniques are not employed.</p> <p>13 Consolidating and compacting formation level to receive floor construction.</p> <p>14 Concrete, reinforcement, formwork (temporary and permanent) and working space for formwork.</p> <p>15 Specialist concrete grades, such as waterproof concrete.</p> <p>16 Filling to make up levels.</p> <p>17 Blinding beds.</p>	N/A	N/A	<p><b>Maintain Actions</b>  <b>Planned</b> – N/A (inspections taken with superstructures)  <b>Proactive</b> – Monitoring damp and inspection of manholes  <b>Reactive</b> – N/A (physical investigations taken with element 11)  <b>Excludes</b> – 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  <b>N/A</b> – 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.</p>

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance Descriptor		Measurement Rules For Maintenance Works
				Renewal (R)	Maintain (M)	
			<p>18 Protection boarding to underside of floor/base slabs (e.g. to provide heave protection).</p> <p>19 Damp-proof membranes, including gas-proof membranes serving as a damp-proof membrane.</p> <p>20 Service ducts and the like below the lowest floor construction.</p> <p>21 Fixing devices cast into concrete (i.e. dowels, anchor bolts, anchor boxes, anchor fixing slots and the like).</p> <p>23 Worked finishes (i.e. in-situ surface treatments), including the application of surface hardeners and power-floated finishes.</p> <p>24 Structural screeds, including reinforcement.</p> <p>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).</p> <p>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.</p> <p>31 Trenches for pipework, including excavation, earthwork support, backfilling and disposal of surplus material.</p>	N/A	N/A	<p>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.</p> <p>M7 – The length of linear components measured is their extreme length, over all obstructions.</p> <p>M8 – The length of below-ground drainage pipelines measured is their extreme length, over all fittings, branches and the like.</p> <p>M9 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M10 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately.</p> <p>M11 – Curved work is to be described and identified separately.</p> <p>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.</p> <p>M13 – Contractor-designed work is to be described and identified separately.</p> <p>(TE) – Taken elsewhere. Refer to group element 7.3 for works to existing damp proof courses.</p>
				N/A	N/A	
				(T/E)	N/A	
				N/A	N/A	
				N/A	N/A	
				N/A	N/A	
				N/A	N/A	
				N/A	N/A	
				N/A	N/A	
				N/A	N/A	



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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 <sup>2</sup>	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. 7 Lift pits and the like below the lowest floor, including waterproofing. 10 Pit excavations, including earthwork support.	N/A N/A N/A	N/A 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 <sup>3</sup> ), 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	

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance Descriptor		Measurement Rules For Maintenance Works
				Renewal (R)	Maintain (M)	
I.1.4	<p><b>Basement excavation</b>  <b>Definition:</b>                      Bulk excavation required for construction of floors below ground level.</p>	m <sup>3</sup>	1 Bulk excavation to form basements and the like. 4 Excavating below groundwater level. 6 Disposal of surface water and groundwater, where dewatering techniques are not employed. 7 Consolidating and compacting formation level to receive base slab/bed construction. 8 Sundry items – details to be stated.	N/A	N/A	N/A – Not applicable to renewal and/or maintain work.
				N/A	N/A	
		item	9 Subcontractor on costs (where applicable).	N/A	N/A	
	2 Disposal of excavated material: details to be stated.	m <sup>3</sup>	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). <b>Note</b> – 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. <b>Note</b> – 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. See item 5 above.	N/A	N/A	
	3 Extra for disposal of contaminated excavated material: 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)	
1.1.5	4 Earthwork support: details to be stated.	m <sup>2</sup>	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 <sup>3</sup>	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	
	<p><b>Basement retaining walls</b>  <b>Definition:</b>                      External basement retaining walls in contact with earthwork up to and including the damp-proof course.</p> <p><b>Basement retaining walls:</b>                      1 Basement retaining wall: details to be stated. <b>Note</b> – Reinforcement rate (kg/m<sup>3</sup>) and formwork finish for in-situ concrete walls to be stated.</p>	m/m <sup>2</sup>	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	<p><b>Scope covered by NRM 3</b>                      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.  <b>Note</b> – Structural survey and inspection fees and the like are to be included in group element 11: Consultants' and specialists' fees.  <b>Renewal Actions</b>  <b>Replacement</b> – Not applicable to maintenance works.  <b>Major repairs</b> – To basement retaining walls arising from identified actions from visual inspections and specialist surveys/investigations.</p>

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance Descriptor		Measurement Rules For Maintenance Works
				Renewal (R)	Maintain (M)	
			<p><b>Note</b> – 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.</p> <p>5 Fixings cast into/ fixed to concrete retaining walls to retain masonry walls (e.g. brickwork, blockwork and stonework) facing wall.</p> <p>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.</p> <p>7 Waterproof tanking to walls.</p> <p>8 Applied protection to external tanking (e.g. protection boards) – details to be stated.</p> <p>9 Thermal insulation, damp-proof membranes, vapour barriers and the like.</p> <p>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.</p>	N/A	N/A	<p><b>Maintain Actions</b></p> <p><b>Planned</b> – N/A (inspections taken with superstructures)</p> <p><b>Proactive</b> – Monitoring of movement and water ingress.</p> <p><b>Reactive</b> – Minor isolated repairs to basement retaining walls.</p> <p>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.</p> <p>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).</p> <p>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.</p> <p>M4 – Where more than one type of retaining wall construction is employed, each type of retaining wall construction is to be stated separately.</p>
				N/A	N/A	
				N/A	N/A	
				Waterproof tanking	N/A	
				Protective external tanking	N/A	
				Damp proofing and vapour barriers	N/A	
				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	<p>M5 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately.</p> <p>M6 – Curved work is to be described and identified separately.</p> <p>M7 – Work within existing buildings is to be described and identified separately.</p> <p>M8 – Contractor-designed work is to be described and identified separately.</p> <p>This section of NRM 3 only includes for isolated repair. Embedded basement retaining wall full replacement is excluded.</p> <p>For large-scale and cost-significant repairs it will be necessary to seek advice from a structural specialist.</p> <p><b>Note</b> – Structural survey and inspection fees and the like are to be included in group element 11: Consultants' and specialists' fees.</p>
		note	12 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance Descriptor		Measurement Rules For Maintenance Works
				Renewal (R)	Maintain (M)	
	<b>Embedded basement retaining walls:</b> 2 Piling mats/platforms: details, including thickness of mat/platform (mm), to be stated.	m <sup>2</sup>	6 Piling mats and platforms (installing, moving and removing on completion).	Embedded basement retaining walls	N/A	<b>Scope covered by NRM 3</b> 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. <b>Note</b> – Structural survey and inspection fees and the like are to be included in group element 1: 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		
	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	<p><b>Renewal Actions</b>  <b>Replacement</b> – not applicable to maintenance works.  <b>Major repairs</b> – To embedded basement retaining walls arising from identified actions from visual inspections and specialist surveys/investigations.  <b>Maintain Actions</b>  <b>Planned</b> – N/A (inspections taken with superstructures)  <b>Pro-active</b> – Monitoring subsidence and water ingress  <b>Reactive</b> – Minor isolated repairs to embedded basement retaining walls.  <b>N/A</b> – 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.</p>
	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. <b>Note</b> – 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 <sup>3</sup>	See item 1 above and item 3 included below.	N/A	N/A	



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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.	
	10 Steel sheet piling: details, including total area (m <sup>2</sup> ) and total driven area (m <sup>2</sup> ) to be stated.	m <sup>2</sup>	2 Steel sheet piling, including extensions and cutting off surplus lengths.	N/A	N/A	M8 – Quantity given for disposal is the bulk before excavating and no allowance is made for subsequent variations to bulk.	
	11 Cutting off surplus lengths of steel sheet piling.	nr	See item 2 included above.	N/A	N/A	M9 – The area measured for trimming and cleaning faces of walls is the surface area of the exposed piled or diaphragm wall.	
	12 Pile tests: details to be stated.	item	8 Pile tests (e.g. load tests and integrity tests).	N/A	N/A	M10 – The linear length of capping beams is measured on the centre line of the capping beam.	
	13 Diaphragm walls: details, including depth of excavation (m), thickness (mm) of wall reinforcement rate (kg/m <sup>3</sup> ), to be stated.	m <sup>2</sup>	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	M11 – The area measured for each basement retaining wall component is the area of the component, measured on the centre line of the component.	
	14 Ground anchors: details, including type, to be stated.	nr	4 Ground anchors.	N/A	N/A	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.	
	15 Trimming and cleaning faces of piled and diaphragm walls.	m <sup>2</sup>	See items 1 and 3 included above.	N/A	N/A	M13 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m <sup>2</sup> ), linear measurement (m) or enumerated (nr) separately.	
	16 Temporary works: details to be stated.	item	13 Temporary works (e.g. props and wallings to support contiguous bored piled walls) and removal, including any necessary temporary anchors, foundations and the like.	N/A	N/A	M14 – Curved work is to be described and identified separately.	
	17 Removal of temporary works: details to be stated.			See item 13 included above.	N/A	N/A	M15 – Work within existing buildings is to be described and identified separately.
							M16 – Contractor-designed work is to be described and identified separately.
					N/A	N/A	M6 – The area measured for diaphragm walls is the area of the diaphragm wall, measured on the centre line of the diaphragm wall.



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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:

Works (action required):

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:

**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

The planned inspections of the superstructures elements, includes for identifying problems with substructures (e.g. foundations subsidence).

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 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	<p><b>Steel frames</b></p> <p><b>Definition:</b> Structural steelwork in frames, including all fittings, fixings and components.</p> <p>1 Structural steel frame including fittings and fixings: details, including size of column grid (m), to be stated.</p>	t/(item)	<p>1 Structural steel frame, including all components (e.g. columns, beams, composite columns and beams, lattice beams, braces, struts and the like).</p> <p>2 Fittings and fixings.</p> <p>3 Roof trusses, where an integral part of the frame and cannot be separated from the frame.</p> <p>4 Floor and roof members or decks forming an integral part of the frame, which cannot be separated from the frame.</p> <p>5 Fabrication, trial erection and permanent erection on-site (including holding-down bolts, assemblies, grouting under base plates and the like).</p>	Frame – Steel (SF)	Frame – Steel (SF)	<p><b>Scope covered by NRM 3</b></p> <p>This section of NRM 3 only includes for isolated repairs. Steel frames full replacement excluded in NRM 3.</p> <p>For large-scale and cost-significant repairs it will be necessary to seek advice from a structural specialist.</p> <p><b>Note</b> – 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</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Not applicable to maintenance works.</p> <p><b>Major repairs</b> – To steel frames arising from identified actions from visual inspections and specialist surveys/investigations (e.g. repairing connections and fixings).</p> <p><b>Fire-protective painting</b> – In situ re-coating or painting as appropriate (details to be stated) by specialist contractor.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – Inspections of frames (non invasive)</p>

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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	<p><b>Proactive</b> – (taken with group element 0 or 11 surveys)</p> <p><b>Reactive</b> – Minor isolated repairs to steel frames.</p> <p><b>N/A</b> – Not applicable to renewal and/or maintain work.</p> <p>M1 – Works identified by a structural survey or specialist inspection are to be described and itemised separately.</p> <p>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<sup>2</sup>), linear measurement (m) or enumerated (nr) and the number and sizing of each component is to be stated, as appropriate.</p> <p>M3 – Planned inspection of frames is to be itemised.</p>
	3 Factory applied paint systems: details to be stated.	item	7 Sundry items – planned inspection of frames.	Fire protective coating	N/A	
		item		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/deck, including structural support framework, fittings and fixings: details to be stated.	m <sup>2</sup> /(item)	1 Space frames/decks, including fittings and fixings. 2 Structural support framework. 3 Fittings and fixings. 4 Fabrication, trial erection and permanent erection on-site (including holding-down bolts, assemblies, grouting under base plates and the like).	Frame – Space deck (SDF)	Frame – Space desk (SDF)	<p><b>Scope covered by NRM 3</b> 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. <b>Note</b> – 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</p> <p><b>Renewal Actions</b> <b>Replacement</b> – Not applicable to maintenance works. <b>Major repairs</b> – To steel frames arising from identified actions from visual inspections and specialist surveys/investigations (e.g. repairing connections and fixings). <b>Fire-protective painting</b> – In situ re-coating or painting as appropriate (details to be stated) by specialist contractor.</p>
	2 Fire protection to steel frame: details to be stated. 3 Factory applied paint systems: details to be stated.			Actions arising from planned inspections. Subcontractor on costs	Planned inspection Subcontractor on costs	



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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
				Renewal (R)	Maintain (M)	
2.1.3	<p><b>Concrete casings to steel frames</b>  <b>Definition:</b>                      Protective casings to columns and beams for structural or protective purposes, including fire protection.</p>	m/(item)	<p>1 Concrete.                       2 Specialist concrete grades and additives.</p>	<p>Frame concrete casings (CC)</p> <p>N/A</p>	<p>Frame concrete casings (CC)</p> <p>N/A</p>	<p><b>Maintain Actions</b>  <b>Planned</b> – Inspections of frames (non invasive)  <b>Proactive</b> – (taken with group element 0 or 11 surveys)  <b>Reactive</b> – Minor isolated repairs to steel frames.  <b>N/A</b> – 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<sup>2</sup>), 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</p> <p><b>Scope covered by NRM 3</b>                      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.  <b>Note</b> – 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</p>

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works	
				Renewal (R)	Maintain (M)		
	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).	N/A	N/A	<p><b>Renewal Actions</b>  <b>Replacement</b> – Not applicable to maintenance works.  <b>Major repairs</b> – To steel frames arising from identified actions from visual inspections and specialist surveys/investigations (e.g. repairing connections and fixings).  <b>Fire-protective painting</b> – In situ re-coating or painting as appropriate (details to be stated) by specialist contractor.  <b>Maintain Actions</b>  <b>Planned</b> – Inspections of frames (non invasive)  <b>Proactive</b> – (taken with group element 0 or 11 surveys)  <b>Reactive</b> – Minor isolated repairs to steel frames.  <b>N/A</b> – 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<sup>2</sup>), 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</p>	
				3 Formwork.			
				4 Special formed finishes to in-situ concrete.	(CC)		(CC)
				5 Sundry items – planned inspection of frames.	Actions arising from planned inspections		Planned inspection
				6 Subcontractor on costs.	Subcontractor on costs		Subcontractor on costs
					Concrete casings		Concrete casings

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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 <b>Concrete frames</b> <b>Definition:</b> Concrete columns and beams.	1 Columns: details, including number (nr) of columns, column size (mm), concrete grade, reinforcement rate (kg/m <sup>3</sup> ) and type of formwork finish, to be stated.	m/(item)	2 Columns, blade columns and the like.  4 Concrete.  5 Specialist concrete grades and additives.  6 Reinforcement, including starter bars, punching shear reinforcement and the like.  7 Reinforcement for precast, prestressed and post-tensioned concrete, including stressing cables, applying stressing and the like.  8 Formwork.  10 Worked finishes (i.e. in-situ surface treatments), including the application of surface hardeners.  11 Special formed finishes to in-situ concrete.  12 Grouting-up of frame components.  13 Forming openings for doors, windows, screens and the like.	Frame – Concrete (FC)	Frame – Concrete (FC)	<p><b>Scope covered by NRM 3</b> 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. <b>Note</b> – 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</p> <p><b>Renewal Actions</b> <b>Replacement</b> – Not applicable to maintenance works. <b>Major repairs</b> – To concrete frames arising from identified actions from visual inspections and specialist surveys/investigations (e.g. repairing connections and fixings). <b>Fire-protective painting</b> – In situ re-coating or painting as appropriate (details to be stated) by specialist contractor. <b>Maintain Actions</b> <b>Planned</b> – Inspections of frames (non invasive) <b>Proactive</b> – (taken with group element 0 or 11 surveys) <b>Reactive</b> – Minor isolated repairs to steel frames. <b>N/A</b> – 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.</p>
				item	Actions arising from planned inspections	
		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 <sup>3</sup> ) 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 <sup>2</sup> ), 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 <sup>3</sup> ) 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	

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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	<p><b>Timber frames</b>  <b>Definition:</b>                      Timber frame systems, including all components.</p>	m <sup>2</sup> /(item)	<ol style="list-style-type: none"> <li>1 Complete timber frame systems, including all components and fixings.</li> <li>2 Panel systems, such as off-site manufactured timber frames.</li> <li>3 Laminated timber structures and the like.</li> <li>4 Roof trusses, where an integral part of the frame and cannot be separated from the frame.</li> <li>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.</li> <li>6 Specialist subcontractor/supplier design of timber frame.</li> <li>7 Trial erection and permanent erection on-site of timber frame (when required).</li> <li>8 Treatments to timber.</li> </ol>	Frame – Timber (TF)  (TF)  (TF)  (TF)  (TF)  (TF)  (TF)  (TF)	Frame – Timber (TF)  (TF)  (TF)  (TF)  (TF)  (TF)  (TF)	<p><b>Scope covered by NRM 3</b>                      This section of NRM 3 only includes for isolated repairs. Components full replacement is excluded from NRM 3.</p> <p><b>Note 1</b> – For large-scale and cost-significant major repairs and replacement works it will be necessary to seek advice from a structural specialist.</p> <p><b>Note 2</b> – Structural survey and inspection fees and the like are to be included in group element 11: Consultants' and specialists' fees.</p> <p>TF – To be included as part of timber frames.</p> <p><b>N/A</b> – Not applicable to renewal and/or maintain work.</p> <p><b>Renewal Actions</b>  <b>Replacement</b> – partial replacement of timber frames  <b>Major repairs</b> – describe identified actions from inspections and specialist surveys/extra investigations to timber frames.  <b>Maintain Actions</b>  <b>Planned</b> – inspections of timber frames (non invasive)  <b>Proactive</b> – timber treatment (localised or extensive)  <b>Reactive</b> – Minor repairs to timber frames and the like</p>

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	<p>M1 – Works identified by a structural survey or specialist inspection are to be described and itemised separately.</p> <p>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).</p> <p>M3 – Area measured to include area of roof where roof structure (including roof trusses) is an integral part of the frame.</p> <p>M4 – Details of floor roof (including trussed roofs) and wall members or decks, which cannot be separated from the frame, are to be stated.</p> <p>M5 – Cost-significant components are to be described and identified separately. Such components are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) and the number and sizing of each component is to be stated, as appropriate.</p> <p>M6 – Planned inspections to be itemised</p>
		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	

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

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 <b>Specialist frames</b> <b>Definition:</b> Specialist structural frame systems, including all components.	1 Specialist frames: details to be stated.	m <sup>2</sup> /(item)	1 Portal frames and similar individual structural units (e.g. steel, concrete, timber or other material). 2 Specialist, proprietary and modular lightweight steel-frame systems. 3 Cellular construction, such as tunnel (slip) form. 4 Components, fittings and fixings. 5 Roof trusses, where an integral part of the frame and cannot be separated from the frame. 6 Floor and roof members or decks forming an integral part of the frame, which cannot be separated from the frame. 7 Fabrication, trial erection and permanent erection on-site (including holding-down bolts, assemblies, grouting under base plates and the like). 8 Factory applied coatings, including fire-protective coatings and paint systems. 9 Sundry items – planned inspection of frames 10 Subcontractors on costs (where applicable).	Frames – Specialist (SF)	Frames – Specialist (SF)	<p><b>Scope covered by NRM 3</b> 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.</p> <p><b>Note</b> – Structural survey and inspection fees and the like are to be included in group element 11: Consultants' and specialists' fees.</p> <p>SF – To be included as part of specialist frames. (item) – unit of measurement for maintain</p> <p><b>Renewal Actions</b> <b>Replacement</b> – not applicable for maintenance works <b>Major repairs</b> – To specialist frames arising from identified actions from visual inspections and specialist surveys/investigations. <b>Maintain Actions</b> <b>Planned</b> – inspections to frames (non invasive) <b>Proactive</b> – protective treatment (localised or extensive) <b>Reactive</b> – 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.</p>		
				(SF)	(SF)		(SF)	(SF)
				(SF)	(SF)		(SF)	(SF)
				(SF)	(SF)		(SF)	(SF)
				(SF)	(SF)		(SF)	(SF)
				(SF)	(SF)		(SF)	(SF)
				(SF)	(SF)		(SF)	(SF)
				N/A	N/A		N/A	N/A
				Protective treatment	Protective treatment		Protective treatment	(SF)
				Actions arising from planned inspections	Planned inspection		Planned inspection	Planned inspection
Subcontractor on cost	Subcontractor on cost	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

The planned inspections of the superstructures elements, includes for identifying problems with substructures (e.g. foundations subsidence).

**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.



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

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	<p><b>Floors</b></p> <p><b>Definitions:</b></p> <ul style="list-style-type: none"> <li>– reinforced and post-tensioned concrete</li> <li>– floor decks consisting of proprietary precast units, a combination of in-situ concrete with filler units of other material</li> <li>– structural timber floor construction, including floor boards</li> <li>– structural screeds.</li> </ul>	m <sup>2</sup> /(item)	<p>1 Concrete suspended floors, including:</p> <ul style="list-style-type: none"> <li>– upper floors</li> <li>– podium slabs forming roofs to basements</li> <li>– transfer structures</li> <li>– balconies (internal and external) that are an integral part of the suspended floor construction</li> <li>– mezzanine floors</li> <li>– service floors and the like</li> <li>– galleries, tiered terraces and the like</li> <li>– walkways, internal bridges and the like</li> <li>– external corridors/bridges forming links between buildings, including supporting frames</li> <li>– roofs to internal buildings, where an integral part of the upper floor construction.</li> </ul> <p>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).</p> <p>3 Post-tensioned concrete floors, including concrete, reinforcement, (i.e. stressing cables), formwork, applying stressing and grouting-up) and formwork.</p>	Upper floor – Concrete (CUF)	Upper floor – Concrete (CUF)	<p><b>Scope covered by NRM 3</b></p> <p>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.</p> <p><b>Note</b> – Structural survey and inspection fees and the like are to be included in group element 1: Consultants' and specialists' fees.</p> <p>CUF – To be included as part of concrete upper floors.</p> <p>(item) – unit of measurement for maintain.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – not applicable for maintenance works</p> <p><b>Major repairs</b> – Identified actions from the inspections and specialist surveys/Investigations to floors.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – inspections of upper floors (non invasive)</p> <p><b>Proactive</b> – (taken with group element 11 – surveys)</p> <p><b>Reactive</b> – Minor repairs to upper floors (details to be stated).</p> <p>M1 – Works relating to a structural survey or specialist inspection are to be described and itemised separately.</p> <p>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.</p> <p>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.</p>
				item	7 Sundry items – planned inspection of floors	
		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
	3 Designed joints: details to be stated.	m	6 Designed joints.	Designed joints	(CUF)	M5 – Sloping surfaces to be measured flat on plan. M6 – The length of linear components measured is their extreme length.
	4 Surface treatment: details to be stated.	m <sup>2</sup>	Worked finishes (i.e. in-situ surface treatments), including tamped finish, power-float finish and the application of surface hardeners.	N/A	N/A	M7 – Curved work is to be described and identified separately. M8 Planned inspections of upper floors to be itemised
	<b>Precast/composite decking systems:</b> 5 Suspended floor slab: details, including type, thickness (mm), span (m) and loading (kN/m <sup>2</sup> ), to be stated.	m <sup>2</sup> /(item)	1 Suspended floors, including: <ul style="list-style-type: none"> <li>– upper floors</li> <li>– podium slabs forming roofs to basements</li> <li>– balconies (internal and external) that are an integral part of the suspended floor construction</li> <li>– mezzanine floors</li> <li>– service floors and the like</li> <li>– galleries, tiered terraces and the like</li> <li>– walkways, internal bridges and the like</li> <li>– external corridors/bridges forming links between buildings, including supporting frames</li> <li>– roofs to internal buildings, where an integral part of the upper floor construction.</li> </ul>	Upper floor – precast concrete (PCDS)	Upper floor – Precast concrete (PCDS)	<b>Scope covered by NRM 3</b> 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. <b>Note</b> – 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. <b>Major repairs</b> – Identified actions from inspections and specialist surveys/investigations to floors. <b>Maintain Actions</b> <b>Planned</b> – inspections to upper floors (non invasive)

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

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)	<p><b>Proactive</b> – (taken with group element 11 – surveys)</p> <p><b>Reactive</b> – Minor repairs to upper floors (details to be stated).</p> <p><b>N/A</b> – Not applicable to renewal and/or maintain work.</p> <p>M1 – Works relating to a structural survey or specialist inspection are to be described and itemised separately.</p> <p>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.</p> <p>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.</p> <p>M4 – Areas for balconies, galleries, tiered terraces, service floors, walkways, internal bridges, external links and roofs to internal buildings shall be shown separately.</p> <p>M5 – Sloping surfaces to be measured flat on plan.</p> <p>M6 – Planned inspections to upper floors to be itemised.</p>
			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 <sup>2</sup> /(item)	<ul style="list-style-type: none"> <li>1 Timber suspended floors, including:                             <ul style="list-style-type: none"> <li>– upper floors</li> <li>– balconies (internal and external) that are an integral part of the suspended floor construction</li> <li>– mezzanine floors, service floors and the like</li> <li>– galleries, tiered terraces and the like</li> <li>– walkways, internal bridges and the like</li> <li>– external corridors/bridges forming links between buildings, including supporting frames</li> <li>– roofs to internal buildings, where an integral part of the upper floor construction.</li> </ul> </li> <li>2 Structural floor members, including joists, struts, trimmers, plates and the like.</li> </ul>	<ul style="list-style-type: none"> <li>Upper floors – Timber (TUF)</li> </ul>	<ul style="list-style-type: none"> <li>Upper floors –timber (TUF)</li> </ul>	<p><b>Scope covered by NRM 3</b></p> <p>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.</p> <p><b>Note</b> – Structural survey and inspection fees and the like are to be included in group element 1: Consultants' and specialists' fees.</p> <p>TUF – to be included as part of timber upper floors.</p> <p>SS – to be included as part of structural screeds.</p> <p>(item) – unit of measurement for maintain.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – replacement of timber floors agreed in scope</p> <p><b>Major repairs</b> – Identified actions from inspections and specialist surveys/investigations to timber floors.</p> <p>Timber treatment – Eradication of infested timbers.</p>

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
				Renewal (R)	Maintain (M)	
			<p>3 Carpenter's metalwork, including strutting, joist hangers, straps, bolts and the like.</p> <p>4 Floor surface where construction does not provide a platform (e.g. floor boarding to joisted floors).</p> <p>5 Thermal insulation.</p>	(TUF)	(TUF)	<p><b>Maintain Actions</b>  <b>Planned</b> – As the scoping note statement above.  <b>Proactive</b> – Visual inspections or structural surveys of floors.  <b>Reactive</b> – Minor repairs to upper floors.  <b>N/A</b> – 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.</p>
		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 <sup>2</sup> ) and surface treatments, to be stated.	m <sup>2</sup> /(item)	<p>1 Screed.</p> <p>2 Reinforcement.</p> <p>3 Worked finishes.</p> <p>4 Surface treatments (e.g. surface hardeners and non-slip inserts).</p>	Structural screeds (SS)	Structural screeds (SS)	
				N/A	N/A	
				N/A	N/A	
				(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	<p><b>Balconies</b>  <b>Definition:</b>                      Internal and external balconies that are not an integral part of the upper floor construction.</p>	nr/(item)	<p>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.</p> <p>2 Protective coatings and paint systems.</p> <p>3 Surface treatments (e.g. surface hardeners and non-slip inserts).</p> <p>4 Fittings and fixings.</p>	<p>Balconies – purpose made</p>	<p>Balconies – purpose made</p>	<p><b>Renewal Actions</b>  <b>Replacement</b> – To include removal of existing, preparation and replacement of balconies, as appropriate.  <b>Major repairs</b> – To include preparation, repair and making good of balconies, as appropriate.  <b>Refurbish</b> – To include removal of existing, preparation and refurbishment of balconies, as appropriate.  <b>Maintain Actions</b>  <b>Planned</b> – included as a proactive tasks.  <b>Proactive</b> – Visual inspections of balconies (non invasive)  <b>Reactive</b> – 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)</p>
				<p>Protective coating</p> <p>N/A</p> <p>N/A</p>	<p>N/A</p> <p>N/A</p> <p>N/A</p>	
		nr	5 Sundry items – planned inspection of balconies.			
		note	6 Subcontractor on costs (where applicable).			

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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 <b>Drainage to balconies</b> <b>Definition:</b> 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	<p><b>Renewal Actions</b>  <b>Replacement</b> – To include removal of existing, preparation and replacement of drainage to balconies, as appropriate.  <b>Major repairs</b> – To include preparation, repair and making good of drainage to balconies, as appropriate.  <b>Refurbish</b> – To include removal of existing, preparation and refurbishment of drainage to balconies, as appropriate.                      (nr) – unit of measurement for maintain.  <b>Maintain Actions</b>  <b>Planned</b> – PPM on drainage downpipes/outlets to balconies.  <b>Proactive</b> – visual inspections of drainage to balconies.  <b>Reactive</b> – 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.</p>
	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	





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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
				Renewal (R)	Maintain (M)	
2.3.2	<p>Roof coverings, non-structural screeds, thermal insulation and surface treatments: details to be stated.</p> <p>3 Prefabricated dormers: details to be stated.</p> <p>4 Roof structure – flat roofs: details, including design loads (kN/m<sup>2</sup>) and spans (m), to be stated.</p>	<p>note</p> <p>nr</p> <p>m<sup>2</sup>/(item)</p>	<p>20 Subcontractor on costs (where applicable).</p> <p>20 Prefabricate dormers.</p> <p>(See items 1, 2, 5 to 16, and 18 to 20 included above).</p>	Subcontractor on costs	Subcontractor on costs	<p>M2 – The area measured for pitched roofs is the area of the roof on plan, to the extremities of the eaves.</p> <p>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.</p> <p>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. <b>Note</b> – 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.</p> <p>M5 – Contractor-designed work is to be described and identified separately</p> <p>M6 – Planned inspections of roofs is to be itemised.</p>
				Roof covering – (RC) (state type and related specification)	Roof covering – (RC) (state type and related specification)	

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 dormers, including cladding to dormer cheeks.	m <sup>2</sup> /(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	<p><b>Renewal Actions</b>  <b>Replacement</b> – To include removal of existing, preparation and replacement of roof coverings (specific areas or in full).  <b>Major repairs</b> – To include preparation, repair and making good of roof coverings, as appropriate.  <b>Refurbish</b> – To include removal of existing, preparation and refurbishment of roof coverings, as appropriate.  <b>Maintain Actions</b>  <b>Planned</b> – PPM on applicable motorised photovoltaic solar and thermal devices.  <b>Proactive</b> – inspections of roof coverings (non invasive)  <b>Reactive</b> – Minor repairs to roof coverings.  <b>N/A</b> – Not applicable to renewal and/or maintain work.</p> <p>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<sup>2</sup>.  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<sup>2</sup>.  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.</p>
		m <sup>2</sup> /(nr)	3 Photovoltaic devices.	Photovoltaic device	Photovoltaic device	
		nr	4 Roof ventilation tiles.	(RC)	N/A	
		m <sup>2</sup> /(nr)	5 Non-structural screed.	(RC)	N/A	
		m <sup>2</sup> /(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 <sup>2</sup> /(nr)	7 Surface treatments to roof coverings (e.g. solar reflective painting, chippings, etc).	Surface treatment (state type)	Surface treatment (state type)	
		m <sup>2</sup> /(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	

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works	
				Renewal (R)	Maintain (M)		
2.3.3	Specialist roof systems  Definition: Glazed roofing systems.	m <sup>2</sup> /(nr)	9 Green roofs and roof gardens, including protection layer, drainage layer, filter membranes and growing medium. 10 Planting to green roofs/roof garden.	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	
				Roof planting	Roof planting		
		item	11 Sundry items – planned inspection of roofs. 12 Subcontractor on costs (where applicable).	Actions arising from planned inspections	Planned inspection		
				Subcontractor on costs	Subcontractor on costs		
				(RC)	N/A		
		m	(Items are included in items 1 and 2 above).	(RC)	N/A		
				(RC)	N/A		
				Flashings	Roof covering		
		m <sup>2</sup> /(nr)	Specialist roof systems: details to be stated.	1 Patent glazing. 2 Glazed roofing systems. 3 Perspex roofing systems.	Patent glazing	Specialist roof system (SRS)	<b>Specification</b> – 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 systems. <b>Renewal Actions</b> <b>Replacement</b> – To include removal of existing, preparation and replacement of specialist roof systems, as appropriate. <b>Major repairs</b> – To include preparation, repair and making good of specialist roof systems, as appropriate.
					Glazed roofing system	(SRS)	
Perspex roofing systems	(SRS)						
Roof components – details to be stated	(SRS)						
Actions arising from planned inspections	Planned inspection						
m <sup>2</sup> /m	4 Roof components, including flashings, cover strips, integral drainage channels, perimeter treatments and the like.	5 Sundry items – planned inspections of roofs.					



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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	<p><b>Major repairs</b> – To include preparation, repair and making good of roof drainage, as appropriate.</p> <p><b>Refurbish</b> – To include removal of existing preparation and refurbishment of roof drainage, as appropriate.</p> <p><b>Redecorations</b> – To gutters and downpipes, as appropriate.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – PPM on applicable motorised roof systems and drainage channels.</p> <p><b>Proactive</b> – Visual inspections of roof drainage.</p> <p><b>Reactive</b> – Minor repairs to roof drainage.</p> <p>M1 – The length of linear components measured is their extreme length, over all fittings, branches and the like.</p> <p>M2 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately.</p> <p>M3 – Curved work is to be described and identified separately.</p> <p>M4 – Contractor-designed work is to be described and identified separately</p> <p>M5 – Planned inspections of roofs, is to be itemised</p>
		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 <b>Roof lights, skylights and openings</b> <b>Definition:</b> 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 <sup>2</sup>	1 Roof lights, skylights and the like.	Skylights	Skylights	<p><b>Specification</b> – 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.</p> <p>RLSO – To be included as part of roof lights</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of roof lights, skylights and openings, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of roof lights, skylights and openings, as appropriate.</p> <p><b>Refurbish</b> – To include removal of existing, preparation and refurbishment of roof lights, skylights and openings, as appropriate.</p> <p><b>Redecoration</b> – To roof lights and skylights, as appropriate.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – PPM on the motorised roof lights and openings.</p> <p><b>Proactive</b> – Inspections of roof lights, skylights and openings.</p> <p><b>Reactive</b> – Minor repairs to roof lights, skylights and openings.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M2 – The area measured is the area of rooflights, skylights and openings.</p> <p>M3 – Curved work is to be described and identified separately.</p>
		nr	2 Opening gear, frames, kerbs and glazing.	Opening gear	(inc. skylights)	
		nr	3 Sun pipes/tubes.	Sun pipes/tubes	(inc. skylights)	
		nr/m <sup>2</sup>	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	

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
				Renewal (R)	Maintain (M)	
2.3.6	<p><b>Roof features Definition:</b> Roof features not forming part of the roof structure.</p> <p>1 Roof features: details to be stated.</p>	nr/(item)	<p>1 Turrets.</p> <p>2 Wind vanes.</p> <p>3 Spires.</p> <p>4 False chimneys.</p> <p>5 Enclosures designed solely to conceal plant, rooflines, and the like (complete structure, including wall louvres).</p> <p>6 Fall arrest systems.</p> <p>7 Access systems for cleaning roof.</p> <p>8 Roof edge protection (permanent).</p>	<p>Turret</p> <p>Wind vanes</p> <p>Spires</p> <p>False chimney</p> <p>Roof enclosure</p> <p>Fall arrest system</p> <p>Roof access system</p> <p>Roof edge protection</p>	<p>Roof features (RF)</p> <p>(RF)</p> <p>(RF)</p> <p>(RF)</p> <p>(RF)</p> <p>(RF)</p> <p>(RF)</p> <p>(RF)</p> <p>(RF)</p>	<p>M4 – Contractor-designed work is to be described and identified separately</p> <p>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.</p> <p>M6 – Planned inspections are to be itemised.</p> <p><b>Specification</b> – To be described for each item I–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.</p> <p>RF – To be included as part of roof features. (item) – unit of measurement for maintain</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of roof features and openings, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of roof features, as appropriate.</p> <p><b>Refurbish</b> – To include removal of existing, preparation and refurbishment of roof features, as appropriate.</p> <p><b>Redecoration</b> – To roof features, as appropriate.</p>

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)	<p><b>Maintain Actions</b>  <b>Planned</b> – PPM on applicable roof features.                      Proactive – Visual inspections of roof features.  <b>Reactive</b> – 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.</p>
		item  note	11 Sundry items – planned inspection of roofs  12 Subcontractor on costs (where applicable)	Actions arising from planned inspections  Subcontractor on costs	Planned inspection  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	<p><b>Stair/ramp structures</b>  <b>Definition:</b>                      Construction of staircases, ramps and landings.</p>	nr/(item)	<p>1 Staircases, including spiral staircases and the like.                       3 Landings between floor levels.                      4 Fire escape staircases.                      5 In-situ and precast concrete stair/ramps structures including concrete, reinforcement, formwork, worked finishes and grouting (of precast units).                      6 Staircases fabricated from steel, timber or other material, including off-site applied coatings and paint systems.</p>	Staircases (SC) structures	Stair/ramps (SR) structures	<p><b>Specification</b> – 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.  <b>Renewal Actions</b>  <b>Replacement</b> – Removal of existing structure and replace with equivalent stair/ramp structures and landings.  <b>Major repairs</b> – Arising from identified actions from inspections and specialist surveys/investigations.  <b>Refurbish</b> – N/A  <b>Redecoration</b> – Of stair/ramp structures, as appropriate.  <b>Maintain Actions</b>  <b>Planned</b> – Normally covered by visual inspections.  <b>Proactive</b> – Visual inspections of stair/ramp structures.  <b>Reactive</b> – 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.</p>
				Ramps	(SR)	
	2 Ramp structures; details, including vertical rise of ramp, to be stated.	nr/(item)	2 Access ramps			
		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)	
2.4.2	<p>Stair/ramp finishes</p> <p><b>Definition:</b> Finishes to stairs, ramps and landings.</p> <p>Stair finishes: details, including vertical rise of staircase, to be stated.</p>	nr/(item)	<p>1 Finishes to treads and risers.</p> <p>2 Finishes to landings between floor levels.</p> <p>4 Finishes to strings.</p> <p>5 Finishes to the soffits of staircase.</p> <p>5 Sundry items – planned inspection of stairs and ramp finishes.</p> <p>6 Subcontractor on costs (where applicable).</p>	<p>Stair finishes (SF)</p> <p>(SF)</p> <p>(SF)</p> <p>(SF)</p> <p>Planned inspection</p> <p>Subcontractor on costs</p>	<p>Stair finishes (SF)</p> <p>(SF)</p> <p>(SF)</p> <p>(SF)</p> <p>Planned inspection</p> <p>Subcontractor on costs</p>	<p>M4 – Contractor-designed work is to be described and identified separately</p> <p>M5 – Planned inspections to stairs and ramps are to be itemised – stating the number of stairs and ramps</p> <p><b>Specification</b> – 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</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of stair/ramp finishes, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of stair/ramp finishes, as appropriate.</p> <p><b>Refurbish</b> – To include removal of existing, preparation and refurbishment of stair/ramp finishes, as appropriate.</p> <p><b>Redecoration</b> – To stair/ramp finishes, as appropriate.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – Normally covered by visual inspections.</p> <p><b>Proactive</b> – Visual inspections of stair/ramp finishes.</p> <p><b>Reactive</b> – Minor repairs to stair/ramp finishes.</p> <p>M1 – Number of storey flights (i.e. the number of floors served (excluding the lowest floor served in each case).</p>

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
				Renewal (R)	Maintain (M)	
2.4.3	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
	1 Wall handrails: details, including vertical rise of staircase or ramp, to be stated.  2 Combined balustrades and handrails: details, including vertical rise of staircase or ramp, to be stated.	nr/(item)	1 Balustrades and handrails to stairs.  2 Balustrades and handrails to landings between floor levels.  3 Balustrades and handrails to landings.  4 Applied coatings and paint systems.	Balustrades and handrails (SRBH)  (SRBH)  (SRBH)  Decoration	Stair/ramp balustrades and handrails (SRBH)  (SRBH)  (SRBH)  N/A	<b>Specification</b> – 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.  <b>Renewal Actions</b> <b>Replacement</b> – To include removal of existing preparation and replacement of stair/ramp balustrades and handrails, as appropriate. <b>Major repairs</b> – To include preparation, repair and making good of stair/ramp balustrades and handrails, as appropriate. <b>Refurbishment</b> – To include removal of existing preparation and refurbishment of stair/ramp balustrades and handrails, as appropriate. <b>Redecoration</b> – To stair/ramp balustrades and handrails, as appropriate. <b>Maintain Actions</b> <b>Planned</b> – Normally covered by visual inspection.
		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)	
						<p><b>Proactive</b> – Visual inspections of stair/ramp balustrades and handrails.</p> <p><b>Reactive</b> – Minor repairs to stair/ramp balustrades and handrails.</p> <p>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).</p> <p>M2 – The vertical rise of stairs or ramps is the distance measured from top of structural floor level to top of structural floor level.</p> <p>M3 – Curved work is to be described and identified separately.</p> <p>M4 – Contractor-designed work is to be described and identified separately.</p> <p>M5 Planned inspection to stairs and ramps to be itemised.</p>

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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 <b>Ladders/chutes/slides</b> <b>Definition:</b> Access and escape ladders and the like.	1 Ladders: details to be stated.	nr	1 Fire escape ladders.  2 Access ladders.  3 Loft ladders, including hatch doors where an integral part of the loft ladder.  4 Applied coatings and paint systems.	Ladders, chutes and slides (LCS)	Ladders, chutes and slides (LCS)	<p><b>Specification</b> – 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</p> <p>LCS – To be included as part of ladders/chutes/slides.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of ladders/chutes/slides, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of ladders/chutes/slides, as appropriate.</p> <p><b>Refurbish</b> – To include removal of existing, preparation and refurbishment of ladders/chutes/slides, as appropriate.</p> <p><b>Decorations</b> – detail the specifications as appropriate</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – Safety checks on ladders/chutes/slides.</p> <p><b>Proactive</b> – Visual inspections of ladders/chutes/slides.</p> <p><b>Reactive</b> – Minor repairs to ladders/chutes/slides</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M2 – Contractor-designed work is to be described and identified separately.</p> <p>M3 – Planned inspections to be itemised.</p>	
				(LCS)	(LCS)		(LCS)
				(LCS)	(LCS)		(LCS)
				Decoration	N/A		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

The planned inspections of the superstructures elements, includes for identifying problems with substructures (e.g. foundations subsidence).

**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.

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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	<p>1 External walls: details, to be stated.  <b>Note:</b> Reinforcement rate (kg/m<sup>3</sup>) and formwork finish for in-situ concrete walls to be stated.</p> <p><b>External enclosing walls above ground-floor level</b>  <b>Definition:</b> External enclosing walls above ground floor level.</p>	m <sup>2</sup> /(nr)	<p>1 External enclosing walls (i.e. both internal and external skins).</p> <p>2 Underside of returns in external walls.</p> <p>3 Parapet walls, including copings and cappings, to roofs formed as part of the external walls.</p> <p>4 Gable walls formed as part of the wall construction.</p> <p>5 Chimneys – formed as part of external walls.</p> <p>6 Columns and beams in unframed structures.</p> <p>7 Curtain walling (designed and fixed as an integrated assembly – complete with opening lights, doors, ventilators, and the like).</p> <p>8 Structural glazing assemblies and the like (i.e. glazing that forms an integral part of a cladding system).</p> <p>9 Profiled sheet cladding systems, including cladding rails and the like.</p>	<p>External walls (EW)</p> <p>N/A</p> <p>Parapet walls</p> <p>(EW)</p> <p>Chimneys</p> <p>(EW)</p> <p>Curtain walling</p> <p>(EW)</p> <p>(EW)</p>	<p>External walls (EW)</p> <p>N/A</p> <p>(EW)</p> <p>(EW)</p> <p>Chimneys</p> <p>(EW)</p> <p>Curtain walling</p> <p>(EW)</p> <p>(EW)</p>	<p><b>Specification</b> – 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.  <b>Renewal Actions</b>  <b>Replacement</b> – To include removal of existing, preparation and replacement of external enclosing walls above ground, as appropriate.  <b>Major repairs</b> – To include preparation, repair and making good of external enclosing walls above ground, as appropriate.  <b>Refurbish</b> – To include removal of existing, preparation and refurbishment of external enclosing walls above ground, as appropriate.  <b>Redecoration</b> – To external wall, to be described and identified separately, as appropriate.  <b>Maintain Actions</b>  <b>Planned</b> – PPM on applicable motorised opening vents, integral blinds and photovoltaic glazing.  <b>Proactive</b> – Visual inspections of external enclosing walls above ground.  <b>Reactive</b> – 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.</p>

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
				Renewal (R)	Maintain (M)	
			<p>11 Opening vents and panels to curtain walling system, or structural glazing assemblies or profiled sheet cladding systems.</p> <p>12 Integral blinds to windows curtain walling system or structural glazing assemblies.</p> <p>14 Rigid sheet cladding systems, including support framework.</p> <p>16 Panelled walling systems, including panels to a frame structure.</p> <p>17 Internal skins/backing walls to curtain walling systems, cladding systems, walling systems and the like, including window boards, cover strips and the like.</p> <p>18 Concrete walls including reinforcement and formwork.</p> <p>19 Masonry walls (i.e. brickwork, blockwork and stonework), including forming cavities, wall ties, thermal insulation and the like.</p> <p>21 Lightweight steel-frame systems, including cladding and insulation.</p>	<p>Opening vents (EW)</p> <p>Integral blind (EW)</p> <p>(EW)</p> <p>(EW)</p> <p>(EW)</p> <p>(EW)</p> <p>(EW)</p> <p>(EW)</p> <p>(EW)</p>	<p>(EW)</p> <p>(EW)</p> <p>(EW)</p> <p>(EW)</p> <p>(EW)</p> <p>(EW)</p> <p>(EW)</p> <p>(EW)</p>	<p>M2 – Where more than one type of external wall system is employed, the area measured for each external wall system is measured separately.</p> <p>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.</p> <p>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.</p> <p>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<sup>2</sup>), linear measurement (m) or enumerated (nr) and identified separately.</p> <p>M6 – The length of linear components measured is their extreme length, over all obstructions.</p> <p>M7 – Descriptions shall include the amount of any PC Sum included in the unit rates applied to the item.</p> <p>M8 – Curved work is to be described and identified separately.</p> <p>M9 – Contractor-designed work is to be described and identified separately.</p> <p>M10 – Planned inspections to external walls are to be itemised.</p> <p><b>Note</b> – 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.</p>



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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
				Renewal (R)	Maintain (M)	
			<p>22 Thermal insulation, membranes and the like.</p> <p>23 Timber and plastic cladding systems (e.g. weatherboarding).</p> <p>24 Insulating render systems.</p> <p>25 Finishes applied to external wall (e.g. paint systems, coating systems, ceramic/stone cladding, tiling and other materials).</p> <p>26 Finishes to underside of returns in external walls.</p> <p>27 Planted 'green' walls, including protection layer, drainage layer, filter membranes and growing medium.</p> <p>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.</p>	(EW)	(EW)	
		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 <sup>2</sup>	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 <sup>2</sup>	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)	

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
				Renewal (R)	Maintain (M)	
2.5.2	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 faceted glazing or cladding systems: details to be stated.	nr/m	13 Safety barriers, handrails or combined balusters and handrails to faceted 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 <sup>2</sup>	25 Finishes applied to external walls (e.g. paint systems, coating systems, ceramic/stone cladding, tiling and other materials).	(EW)	(EW)	
	<p><b>External enclosing walls below ground-level</b></p> <p><b>Definition:</b> External enclosing walls below ground-floor level that are not formed by retaining walls.</p>	m <sup>2</sup> /(nr)	<p>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).</p> <p>2 External enclosing walls (i.e. both internal and external skins).</p> <p>3 Underside of returns in external walls.</p> <p>4 Parapet walls, including copings and cappings, to roofs formed as part of external walls.</p> <p>5 Gable walls formed as part of wall construction.</p> <p>6 Chimneys forming part of external walls.</p> <p>7 Columns and beams in unframed structures.</p>	External basement walls (EBW)	External basement walls (EBW)	<p><b>Specification</b> – 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.</p> <p>EBW – To be included as part of external enclosing walls.</p> <p>(nr) – unit of measurement for maintain.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing preparation and replacement of external enclosing walls below ground, as appropriate.</p> <p><b>Major repairs</b> – 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.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – Normally covered by visual tours/surveys.</p>

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
				Renewal (R)	Maintain (M)	
			<p>8 Curtain walling (designed and fixed as an integrated assembly – complete with opening lights, doors, ventilators, and the like).</p> <p>9 Structural glazing assemblies and the like (ie, glazing that forms an integral part of a cladding system).</p> <p>10 Profiled sheet cladding systems, including cladding rails and the like.</p> <p>11 Photovoltaic glazing or cladding panels where an integral part of a curtain walling system, or structural glazing assemblies or profiled sheet cladding systems.</p> <p>12 Rigid sheet cladding systems, including support framework.</p> <p>13 Panelled walling systems, including panels to a frame structure.</p> <p>14 Internal skins/backing walls to curtain walling systems, cladding systems, walling systems and the like, including window boards, cover strips and the like.</p> <p>15 Concrete walls, including reinforcement and formwork.</p>	<p>Curtain walling (EBW)</p> <p>Structural glazing (EBW)</p> <p>(EBW)</p> <p>(T/E) – with curtain walling (EBW)</p> <p>(EBW)</p> <p>(EBW)</p> <p>(EBW)</p> <p>(EBW)</p>	<p>(EBW)</p> <p>(EBW)</p> <p>(EBW)</p> <p>N/A</p> <p>(EBW)</p> <p>(EBW)</p> <p>(EBW)</p> <p>(EBW)</p>	<p><b>Proactive</b> – Visual inspections of external enclosing walls below ground.</p> <p><b>Reactive</b> – Minor repairs to external enclosing walls below ground.</p> <p>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.</p> <p>M2 – Where more than one type of external wall system is employed, the area measured for each external wall system is measured separately.</p> <p>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.</p> <p>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.</p> <p>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<sup>2</sup>), linear measurement (m) or enumerated (nr) and identified separately.</p> <p>M6 – The length of linear components measured is their extreme length, over all obstructions.</p> <p>M7 – Curved work is to be described and identified separately.</p> <p>M8 – Contractor-designed work is to be described and identified separately.</p>

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
				Renewal (R)	Maintain (M)	
			<p>16 Masonry walls (i.e. brickwork, blockwork and stonework), including forming cavities, wall ties, thermal insulation and the like.</p> <p>18 Lightweight steel-frame systems, including cladding and insulation.</p> <p>19 Thermal insulation, membranes, and the like.</p> <p>20 Timber and plastic cladding systems (e.g. weatherboarding).</p> <p>21 Insulating render systems.</p> <p>23 Finishes to underside of returns in external walls.</p> <p>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.</p>	(EBW)	(EBW)	
		m <sup>2</sup> (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 <sup>2</sup> / (nr)	22 Finishes applied to external wall (e.g. paint systems, coating systems, ceramic/stone cladding, tiling and other materials.	External decoration	N/A	

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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	<p><b>Solar/rain screening</b></p> <p><b>Definition:</b> Cladding systems and the like attached to the exterior of the building to protect the external walls.</p>	m <sup>2</sup> /(nr)	<p>1 Vertical and horizontal exterior over cladding systems, including support systems.</p>	Solar/rain screening	Solar/rain screening	<p><b>Specification</b> – 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.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of solar/rain screening, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of solar/rain screening, as appropriate.</p> <p><b>Refurbish</b> – To include removal of existing, preparation and refurbishment of solar/rain screening, as appropriate.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – PPM on amotorised solar/rain screen cladding.</p> <p><b>Proactive</b> – Visual inspections of solar/rain screening.</p> <p><b>Reactive</b> – Minor repairs to solar/rain screening.</p> <p>M1 – The area measured is the area of the over cladding system.</p> <p>M2 – Where more than one type of over cladding system is employed, the area for each over cladding system is measured.</p> <p>M3 – The length of linear components measured is their extreme length, over all obstructions.</p> <p>M4 – Curved work is to be described and identified separately.</p> <p>M5 – Contractor-designed work is to be described and identified separately.</p> <p>M6 – Planned inspections to be itemised</p>
		item	<p>2 Sundry items – planned inspection of external walls</p>	Actions arising from planned inspections	Planned inspection	
		note	<p>3 Subcontractor on costs (where applicable)</p>	Subcontractor on costs	Subcontractor on costs	
	<p>2 Horizontal solar/rain screening: details to be stated.</p>	m <sup>2</sup> /(nr)	<p>4 Brise soleil and the like, including supporting system.</p>	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	<b>External soffits</b> <b>Definition:</b> External false ceilings and demountable suspended ceilings that form an integral part of a building envelope.	m <sup>2</sup> /(nr)	1 In-situ/board ceilings – including soffit linings and battens, fixed direct to underside of upper floor construction.  2 Demountable suspended ceiling systems, including suspension systems.  3 Insulation fixed direct to underside of upper floor construction or laid on soffit construction/soffit.  4 In-situ coatings applied to false ceilings (e.g. plaster skim coats, render, roughcast and specialist coatings).	External soffits (ESF)	External soffits (ESF)	<b>Specification</b> – 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. <b>Renewal Actions</b> <b>Replacement</b> – To include removal of existing preparation and replacement of external soffits, as appropriate. <b>Major repairs</b> – To include preparation, repair and making good of external soffits, as appropriate. <b>Refurbish</b> – To include removal of existing, preparation and refurbishment of external soffits, as appropriate. <b>Maintain Actions</b> <b>Planned</b> – Normally covered by visual checks/surveys. <b>Proactive</b> – Visual inspections of external soffits, cornices, covings and access hatches. <b>Reactive</b> – Minor repairs to external soffits, cornices, covings and access hatches.
				Action arising from planned inspections	Planned inspection	
		item	9 Sundry items – planned inspection of external walls.			
		note	10 Subcontractor on costs (where applicable)			



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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)	<p>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.</p> <p>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.</p> <p>M3 – The length of linear components measured is their extreme length, over all obstructions.</p> <p>M4 – Other cost-significant components are to be described and measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately, as appropriate.</p> <p>M5 – Curved work is to be described and identified separately.</p> <p>M6 – Contractor-designed work is to be described and identified separately.</p> <p>M7 – Planned inspection of external walls to be itemised.</p>
	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 <sup>2</sup>	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	<p><b>Subsidiary walls, balustrades and proprietary balconies</b></p> <p><b>Definition:</b> Subsidiary components that form an integral part of the building envelope.</p>	1 Walls: details to be stated.	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.	Subsidiary walls (SW)	Subsidiary walls (SW)	<p><b>Specification</b> – 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.</p> <p>SW – To be included as part of subsidiary walls.</p> <p>(nr) – unit of measurement for maintain.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of subsidiary walls, balustrades and proprietary balconies, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of subsidiary walls, balustrades and proprietary balconies, as appropriate.</p> <p><b>Refurbish</b> – To include removal of existing, preparation and refurbishment of external soffits, as appropriate.</p> <p><b>Redecoration</b> – To subsidiary walls, balustrades and the like, to be described, as appropriate.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – Normally covered by visual checks/surveys.</p> <p><b>Proactive</b> – Visual inspections of subsidiary walls, balustrades and proprietary balconies.</p> <p><b>Reactive</b> – Minor repairs to subsidiary walls, balustrades and proprietary balconies.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M2 – The length of linear components measured is their extreme length, over all obstructions.</p>
		2 Walls forming planters: details to be stated.	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.	8 Floor outlets.	Floor outlets	Floor outlets	

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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).	<p>M3 – Where more than one type of component is employed, each component is measured.</p> <p>M4 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately.</p> <p>M5 – Work to existing buildings is to be described and identified separately.</p> <p>M6 – Curved work is to be described and identified separately.</p> <p>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.</p> <p>M8 – Contractor-designed work is to be described and identified separately.</p> <p>M9 – Planned inspections to external walls to be itemised.</p>
	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	<p>1 Facade cleaning systems: details to be stated</p> <p><b>Definition:</b> Systems for accessing and cleaning facades.</p>	nr	<p>1 Window and facade cleaning trolley/cradles (including twin track, manual and automatic systems).</p> <p>2 Combined facade and roof cleaning system.</p> <p>3 Building maintenance units.</p> <p>4 Other facade access systems.</p> <p>5 Builder's work in connection with facade access/cleaning systems.</p>	Window/facade cleaning cradles	Window/facade cleaning cradles	<p><b>Specification</b> – 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.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of facade access/cleaning systems, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of facade access/cleaning systems, as appropriate.</p> <p><b>Refurbish</b> – To include removal of existing preparation and refurbishment of facade access/cleaning systems, as appropriate.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – Normally covered by visual checks/surveys.</p> <p><b>Proactive</b> – Visual inspections of facade access/cleaning systems. Reactive – Minor repairs to facade access/cleaning systems</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M2 – Contractor-designed work is to be described and identified separately</p>
				Combined facade/roof cleaning system	Combined facade/roof cleaning system	
				Building maintenance units	Building maintenance units	
		item	Other facade access system	Other facade access system	Other facade access system	
		note	6 Testing and commissioning of facade access/cleaning systems.	Included with all above items	N/A	
		%	1 Sundry items – planned inspection of facade/access cleaning systems.	Actions arising from planned inspections	Planned inspection	
			2 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	
	2 Testing of installations.			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	<p><b>External windows</b></p> <p>Windows and openings in external walls for ventilation and light.</p>	m <sup>2</sup> /(nr)	<p>1 Windows, including opening lights, fixed lights, frames, linings, window boards, cover trims, ironmongery and glazing.</p> <p>2 Windows to dormers.</p> <p>8 Solar/rain screen over cladding systems to window.</p> <p>9 Photovoltaic glazing where an integral part of window system.</p> <p>10 Canopies and the like providing protection to windows and shop fronts, including any associated surface water drainage</p> <p>11 Protective film applied to windows.</p> <p>13 Window boards, trims and the like, including those that are not an integral part of the window.</p> <p>14 Painting and decorating.</p>	<p>External windows (EW)</p> <p>(EW)</p> <p>Solar/rain screening</p> <p>Photovoltaic glazing</p> <p>Canopies</p>	<p>External windows (EW)</p> <p>(EW)</p> <p>Solar/rain screening</p> <p>(EW)</p> <p>Canopies</p>	<p><b>Specification</b> – 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.</p> <p>EW – included as part of external windows (nr) – unit of measurement for maintain</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of external windows (nr), or areas (m<sup>2</sup>).</p> <p><b>Major repairs</b> – To include preparation, repair and making good of external windows (nr) as appropriate.</p> <p><b>Refurbish</b> – To include removal of existing, preparation and refurbishing the external windows, (nr) as appropriate.</p> <p><b>Redecoration</b> – To external windows and the like, to be described and identified with the renewal actions, or stated separately if part of decoration regime.</p> <p>(nr) – unit of measurement for renewal</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – PPM on motorised solar/rain screening, photovoltaic glazing, canopies roller shutters and integral blinds.</p> <p>Proactive – Visual inspections of external windows.</p> <p>Reactive – Minor repairs to external windows</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M2 – Where the area of the component is to be measured, the area measured is the area of the component measured over frames.</p>
	<p>2 Louvres: details, including overall size of opening (mm), to be stated.</p> <p>3 Shop fronts: details, including overall size of opening (mm), to be stated.</p> <p>4 Roller shutters, sliding shutters, grilles and the like to window openings: details, including overall size of opening (mm), to be stated.</p>	<p>m<sup>2</sup>/(nr)</p> <p>m<sup>2</sup></p> <p>nr</p>	<p>3 Louvered windows and panels.</p> <p>4 External shop fronts – including temporary shop fronts</p> <p>5 Roller shutters, sliding shutters, grilles and the like providing security or protection to windows and shop fronts.</p> <p>6 Fly screens and storm windows.</p> <p>7 Integral blinds to windows.</p>	<p>Louvered windows (EW)</p> <p>Shop front (EW)</p> <p>Roller/sliding door</p> <p>Screen/Shutters</p> <p>Integral blinds (SS)</p>	<p>(EW)</p> <p>(EW)</p> <p>Roller/sliding door</p> <p>Screens/shutters (SS)</p> <p>(SS)</p>	

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	<p>M3 – Where more than one type of component is employed, each component is measured.</p> <p>M4 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately.</p> <p>M5 – Curved work is to be described and identified separately.</p> <p>M6 – Contractor-designed work is to be described and identified separately.</p> <p>M7 – Planned inspection of external windows to be itemised.</p>
		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	

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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 <b>External doors</b> <b>Definition:</b> 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). 2 Entrance screens and doors, including frames. 4 Patio doors. 8 Manual and automatic doors. 11 Fanlights, sidelights/side panels – integral to the door. 13 Ironmongery, including door closers, panic locks and the like. 14 Glazed vision panels. 15 Painting and decorating 16 Fly screens and storm doors. 17 Integral blinds to doors. 18 Solar/rain screen over cladding to doors.	External doors (ED)	External doors (ED)	<p><b>Specification</b> – 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</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of external doors, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of external doors, as appropriate.</p> <p><b>Refurbish</b> – 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.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – PPM on applicable motorised doors, blinds and screens.</p> <p><b>Proactive</b> – Visual inspections of external doors.</p> <p><b>Reactive</b> – Minor repairs to external doors.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M2 – Where the area of component is to be measured, the area measured is the area of the component measured over frames.</p> <p>M3 – The length of linear components measured is their extreme length.</p> <p>M4 – Where more than one type of component is employed, each component is measured.</p>	
				(ED)	(ED)		(ED)
				(ED)	(ED)		(ED)
		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 <sup>2</sup> ), 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.			Roller/sliding shutter	Roller/sliding shutter	
	5 Garage doors: details, including overall size of opening (mm), to be stated.			Garage doors	Garage doors	
	6 Canopies: details to be stated.			Canopies	Canopies	
	7 Grilles: details, including overall size of opening (mm), to be stated.			Grilles (fixed and folding)	Grilles (fixed and folding)	
	8 Architraves: details to be stated.			(ED)	(ED)	
	9 Canopies and the like, providing protection to external doors, including any associated surface water drainage.			Canopies	Canopies	
	10 Grilles (fixed and folding) and the like providing security or protection to doors.			Grilles (fixed and folding)	Grilles (fixed and folding)	
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	<p><b>Walls and partitions</b></p> <p><b>Definition:</b> Internal walls and fixed partitions.</p>	m <sup>2</sup>	<p>1 Internal walls, including full height and low level walls.</p> <p>3 Internal shop fronts and the like, including temporary shop fronts.</p> <p>4 Columns and beams that are not an integral part of a frame structure.</p> <p>5 Internal walls in roof formed as part of the wall construction.</p> <p>6 Walls forming chimneys, stairwells and lift shafts.</p> <p>7 Walls forming cubicles.</p> <p>8 Walls forming planters, including protection layer, drainage layer, filter membranes and growing medium.</p> <p>9 Borrowed lights, glazed screens and the like that are an integral part of internal walls and partitions.</p> <p>10 Concrete walls, including reinforcement and formwork that are not an integral part of the structural frame.</p> <p>11 Masonry walls (i.e. brickwork, blockwork and stonework), including floor and head support systems.</p> <p>15 Thermal insulation and membranes.</p> <p>16 Cappings to low-level internal walls, including timber, stone, tiles and other materials.</p> <p>17 Blinds, where an integral part of a proprietary partitioning system.</p>	<p>Walls and partitions (WAL)</p> <p>Shop fronts (WAL)</p> <p>(WAL)</p> <p>(WAL)</p> <p>(WAL)</p> <p>(WAL)</p> <p>Planters (WAL)</p> <p>Borrowed lights/screens and the like (WAL)</p> <p>(WAL)</p> <p>(WAL)</p> <p>(WAL)</p> <p>(WAL)</p> <p>Integral blind in partitions</p>	<p>Walls and partitions (WAL)</p> <p>(WAL)</p> <p>N/A</p> <p>(WAL)</p> <p>(WAL)</p> <p>(WAL)</p> <p>(WAL)</p> <p>(WAL)</p> <p>(WAL)</p> <p>(WAL)</p> <p>(WAL)</p> <p>(WAL)</p> <p>N/A</p>	<p><b>Specification</b> – 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.</p> <p><b>WAL</b> – included with walls and partitions (item) – unit of measurement for maintain</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of walls and partitions, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of walls and partitions, as appropriate.</p> <p><b>Refurbish</b> – To include removal of existing, preparation and refurbishing of walls and partitions, as appropriate.</p> <p><b>Redecoration</b> – To walls and partitions, is to be described and identified with the renewal works, as appropriate.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – PPM on the applicable motorised blinds.</p> <p><b>Proactive</b> – Visual inspections of walls and partitions.</p> <p><b>Reactive</b> – Minor repairs to walls and partitions.</p> <p>MI – 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.</p>

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. 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	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 <sup>2</sup> ), 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.
				20 Sundry items – planned inspection of internal walls and partitions 21 Subcontractor on costs (where applicable).	Actions arising from planned inspections 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. 3 Fixed partitions: details, including thickness (mm), to be stated.	nr/(item)  m <sup>2</sup> /(item)	Included in works.  Fixed partitions, including demountable partition systems. Timber stud partitions, including cavity insulation, board linings, filling lining joints. Metal stud partitioning systems, including cavity insulation, board linings, filling lining joints. Glazed partitioning.	(WAL)  (WAL) (WAL) (WAL)	N/A  (WAL) (WAL) (WAL) (WAL)	

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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	<p><b>Balustrades and handrails</b></p> <p><b>Definition:</b> Internal balustrades, handrails and other fixed non-storey height divisions.</p>	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	<p><b>Specification</b> – 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.</p> <p>(item) – unit of measurement for maintain</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of balustrades and handrails, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of balustrades and handrails, as appropriate.</p>
		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	<p><b>Refurbish</b> – To include removal of existing, preparation and refurbishing the balustrades and handrails, as appropriate.</p> <p><b>Redecoration</b> – To balustrades and handrails to be described and identified with the renewal works items.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – Normally covered by visual surveys.</p> <p><b>Proactive</b> – Visual inspections of balustrades and handrails.</p> <p><b>Reactive</b> – Minor repairs to balustrades and handrails.</p> <p>M1 – The length of linear components measured is their extreme length.</p> <p>M2 – Where more than one type of component is employed, each component is measured.</p> <p>M3 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately.</p> <p>M4 – Curved work is to be described and identified separately.</p> <p>M5 – Contractor-designed work is to be described and identified separately.</p> <p>M6 – Planned inspection of balustrades/handrails to be itemised.</p>

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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	<p><b>Moveable room dividers</b></p> <p><b>Definition:</b> Moveable partitions intended to divide rooms into smaller spaces.</p>	m	<p>1 Moveable room dividers and partitions, including frames, linings, ironmongery, architraves, cover trims and the like (proprietary and purpose made).</p> <p>2 Off-site and on-site applied coating and paint systems.</p>	Moveable room dividers	Moveable room dividers	<p><b>Specification</b> – 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</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of moveable room dividers, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of moveable room dividers, as appropriate.</p> <p><b>Refurbish</b> – To include removal of existing, preparation and refurbishing the moveable room dividers, as appropriate.</p> <p><b>Redecoration</b> – To moveable room dividers is to described and identified with the renewal work items, Maintain Actions</p> <p><b>Planned</b> – PPM on applicable motorised room dividers.</p> <p><b>Proactive</b> – Visual inspections of moveable room dividers. Reactive – Minor repairs to moveable room dividers.</p> <p>M1 – The length of linear components measured is their extreme length.</p> <p>M2 – Where more than one type of component is employed, each component is measured.</p> <p>M3 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately.</p>
				Internal decoration	N/A	
		item	3 Sundry items – planned inspection of internal walls and partitions.			
		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)	
2.7.4	<p><b>Cubicles</b></p> <p><b>Definition:</b> Proprietary pre-finished panels, assembled to form cubicles, complete with doors.</p>	nr/m/m <sup>2</sup> / (item)	<p>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.</p>	Cubicles	Cubicles	<p>M4 – Curved work is to be described and identified separately.</p> <p>M5 – Contractor-designed work is to be described and identified separately. M6 Planned inspection of internal walls to be itemised.</p>
	<p>1 Cubicles: details to be stated.</p> <p>2 Fixed partitions: details, including thickness (mm), to be stated.</p>	<p>item</p> <p>note</p> <p>nr/m/m<sup>2</sup>/ (item)</p>				<p><b>Specification</b> – 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.</p> <p>(item) – unit of measurement for maintain</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of cubicles, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of cubicles, as appropriate.</p> <p><b>Refurbish</b> – To include removal of existing, preparation and refurbishing the cubicles, as appropriate.</p> <p><b>Redecoration</b> – To cubicles to be described and identified with the renewal work items, as appropriate.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – Normally covered by visual checks/surveys.</p> <p><b>Proactive</b> – Visual inspections of cubicles.</p> <p><b>Reactive</b> – Minor repairs to cubicles.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M2 – The length of linear components measured is their extreme length.</p> <p>M3 – The area measured is the area of moveable room dividers and partitions.</p>

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules applicable for maintenance works
				Renewal (R)	Maintain (M)	
						<p>M4 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately.</p> <p>M5 – Curved work is to be described and identified separately.</p> <p>M6 – Contractor-designed work is to be described and identified separately</p> <p>M7 – Planned inspections of internal walls are to be itemised</p>

## 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	<p><b>Internal doors</b></p> <p><b>Definition:</b> Doors, hatches, shutters and grilles and other openings in internal walls and partitions.</p>	nr	<p>1 Doors, including standard doors, purpose-made doors, full-height doors and fire-resisting doors.</p> <p>2 Frames, linings, architraves, stops and the like.</p> <p>5 Glazed vision panels and the like.</p> <p>6 Sliding and folding doors in fixed partitions.</p> <p>7 Hatches, including doors, frames, linings, architraves, stops and the like.</p> <p>8 Ironmongery.</p>	Internal doors – standard or purpose made	Internal doors – standard or purpose made	<p><b>Specification</b> – 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.</p> <p>IDR – To be included as part of internal doors.</p> <p>N/A – Not applicable to renewal and/or maintain work.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – 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).</p> <p><b>Major repairs</b> – To include preparation, repair make good of internal doors, as appropriate (e.g. re-glazing panels).</p> <p><b>Refurbish</b> – To include removal of existing preparation and refurbishing the internal doors, as appropriate.</p> <p><b>Redecoration</b> – To be described and identified with the renewal work items, as appropriate.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – PPM on applicable motorised doors, hatches, shutters and grilles and the like; including security checks.</p> <p><b>Proactive</b> – Visual inspections of internal doors and the like, including protective measures (e.g. fix extra security and kick plates).</p> <p><b>Reactive</b> – Minor repairs to internal doors (e.g. overhaul ironmongery, ease/adjust doors, replacing glazing).</p>	
				Frames, linings and architraves, stops	Doors – fire resisting		Doors – fire resisting
	<p>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.</p> <p>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.</p>	nr	<p>10 Painting and decorations.</p> <p>1A – Fire resisting doors (See door description included in item 1 above).</p> <p>3 Door sets.</p>	Internal decoration	Doors – fire resisting	Doors – fire resisting	(IDR)



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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 <sup>2</sup> ), linear measurement (m) or enumerated (nr) separately.
	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	M6 – Contractor-designed work is to be described and identified separately. M7 – Planned inspection of internal doors to be itemised
	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: <b>Renewal (R)</b> – Replacement, Major repairs, Refurbishment, Upgrade work and Removals – plus Redecoration works (if measured separately) <b>Maintain (M)</b> – Planned, Proactive and Reactive/Minor Repair works <b>Note</b> – 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	1 Finishes to walls and columns: details to be stated.  <b>Definition:</b> Applied finishes to internal wall surfaces, including specialist wall finishes for sports, public amenities and the like.	m <sup>2</sup>	1 In-situ coatings applied to walls (e.g. plaster, render and roughcast).  2 Sprayed monolithic coatings to columns and walls (i.e. to provide fire protection, thermal insulation, condensation control and acoustic control).  3 Plasterboard or other sheet linings, including fixing systems, joint reinforcing scrim, plaster skim coats and the like.  4 Ceramic wall tiling.  5 Decorative sheet coverings, including lining paper, decorative paper, vinyl and plastic wall covering, and textile wall covering.  6 Painting and decorating.  9 Insulation that provides a wall finish.  10 Applied finishes to columns.	Wall finishes – (WF) In-situ	Walls finishes (WF)	<p><b>Specification</b> – to be stated, in order to apply the appropriate reference service life (RSL) as appropriate to included item.</p> <p><b>WF</b> – included as part of the wall finishes.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing preparation and replacement of wall finishes, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of wall finishes, as appropriate.</p> <p><b>Refurbish</b> – To include removal of existing, preparation and refurbishing the wall finishes, as appropriate, with modern equivalent components.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – Normally covered by visual surveys.</p> <p><b>Proactive</b> – Visual inspections of wall finishes.</p> <p><b>Reactive</b> – Isolated patch repairs to wall finishes.</p> <p>MI – Where components are to be enumerated, the number of components is to be stated.</p>
				WF – sprayed coating	(WF)	
				WF – plasterboard	(WF)	
				WF – ceramic tiling	(WF)	
				WF – decorative sheet covering	(WF)	
				WF – decorations	N/A	
				WF – insulation board	(WF)	
				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. 12 Specialist wall finishes.			WF – to staircases /stairwell	(WF)	<p>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).</p> <p>M3 – The length of linear components measured is the extreme length over all obstructions.</p> <p>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.</p> <p>M5 – Other cost-significant components are to be described and measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately, as appropriate.</p> <p>M6 – Curved work is to be described and identified separately.</p> <p>M7 – Planned inspection of wall finishes to be itemised.</p>
				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	
		m	7 Picture rails, dado rails and the like.	Picture and dado rails	(WF)	
		nr/m	8 Proprietary impact and bumper guards, protection strips, corner protectors and the like.	Wall protection	(WF)	
			2 Picture rails, dado rails and the like: details to be stated.			
			3 Proprietary impact and bumper guards, protection strips, corner protectors and the like: details to be stated.			

## 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	<p>1 Finishes to floors: details to be stated.</p> <p><b>Definition:</b> Applied finishes to floor surfaces, including specialist floors to sports facilities, public amenities and the like.</p>	m <sup>2</sup> /(item)	<p>1 Non-structural screeds, including under-screed damp-proof membranes.</p> <p>2 Latex screeds (ie. levelling screeds).</p> <p>3 Chemical surface hardeners and sealers applied to screeds.</p> <p>4 Floating floors.</p> <p>5 Resin-bonded resilient layers.</p> <p>6 In-situ floor finishes (e.g. granolithic and terrazzo).</p> <p>7 Tiled floor finishes (e.g. stone, quarry, ceramic and mosaic tiles).</p> <p>8 Woodblock flooring, composition block flooring, parquet flooring and the like.</p> <p>9 Proprietary thin-tiled and strip flooring, blockwood flooring and the like.</p>	<p>Floor finishes (FF) screed</p> <p>FF – screed</p> <p>FF – surface hardener</p> <p>FF – floating floor</p> <p>FF – resin</p> <p>FF – in-situ</p> <p>FF – hard tile</p> <p>FF – wood block</p> <p>FF – proprietary types</p>	<p>Floor finishes (FF)</p> <p>(FF)</p> <p>(FF)</p> <p>(FF)</p> <p>(FF)</p> <p>(FF)</p> <p>(FF)</p> <p>(FF)</p> <p>(FF)</p>	<p><b>Specification</b> – to be stated, in order to apply the appropriate reference service life (RSL) to the included items in scope.</p> <p><b>FF</b> – included as part of floor finishes. (item) – unit of measurement for maintain</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of floor finishes, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of floor finishes, as appropriate.</p> <p><b>Refurbish</b> – To include removal of existing, preparation and refurbishing the floor finishes, as appropriate, with modern equivalent components.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – Normally covered by surveys.</p> <p><b>Proactive</b> – Visual inspections of floor finishes.</p> <p><b>Reactive</b> – Isolated repairs to specialist flooring systems.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M2 – The length of linear components measured is the extreme length over all obstructions.</p>

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
			<p>10 Floor painting and sealing.</p> <p>11 Edge-fixed carpeting, including underlay, rods, grippers, edgings, and cover and threshold strips.</p> <p>12 Fixed-flexible and semi-flexible tile and sheet coverings (e.g. carpet, vinyl, rubber, PVC, thermoplastic, cork, linoleum and antistatic flooring).</p> <p>13 Timber-sprung floors to sports halls, squash courts and the like.</p> <p>14 Specialist floor covering systems.</p> <p>16 Floor finishes to internal and external balconies.</p> <p>20 Sundry items – planned inspection of floor finishes.</p> <p>21 Subcontractor on costs.</p>	<p>FF – painted floors</p> <p>FF – carpets</p> <p>FF – tile/sheet</p>	<p>(FF)</p> <p>(FF)</p> <p>(FF)</p>	<p>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.</p> <p>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.</p> <p>M5 – Other cost-significant components are to be described and measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately, as appropriate.</p> <p>M6 – Curved work is to be described and identified separately.</p> <p>M7 – Planned inspection of floor finishes to be itemised.</p>
	2 Specialist flooring systems: details to be stated.	m <sup>2</sup>		Timber-sprung floors	(FF)	
		item		Specialist floor covering systems	(FF)	
		note		Floor finishes to balconies	(FF)	
				Actions arising from planned inspections	Planned inspection	
				Subcontractor on costs	Subcontractor on costs	
	3 Skirtings and the like: details to be stated.	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 <sup>2</sup>	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				

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
3.2.2	<p>1 Raised access floor systems: details to be stated.</p> <p><b>Definition:</b> Platform floors or dry construction, raised above the structural floor to create space for the distribution of services.</p>	m <sup>2</sup>	<p>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.</p> <p>2 Floor coverings/finishes (where factory-bonded or mechanically fixed on-site).</p>	Raised access floor system	Raised access floor system	<p><b>Refurbish</b> – To include removal of existing, preparation and refurbishing the floor finishes, as appropriate, with modern equivalent components.</p> <p><b>Redecoration</b> – To be described and identified with the renewal work items, as appropriate, and/or measured separately if part of decoration programme of works.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – Normally covered by surveys.</p> <p><b>Proactive</b> – Visual inspections of floor finishes.</p> <p><b>Reactive</b> – Isolated repairs to specialist flooring systems</p> <p>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.</p> <p>M2 – The length of linear components measured is their extreme length, over all obstructions.</p> <p>M3 – Curved work is to be described and identified separately.</p> <p>M4 – Planned inspections of floor finishes to be itemised</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of floor finishes, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of floor finishes, as appropriate.</p>
				<p>3 Sundry items – planned inspections of access flooring systems.</p> <p>4 Subcontractor on costs.</p>	<p>Actions arising from planned inspections</p> <p>Subcontractor on costs</p>	
	<p>2 Skirtings and the like: details to be stated.</p>	m	(Included in item 1 above).	Raised access floor system	Raised access floor system	<p>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.</p> <p>M2 – The length of linear components measured is their extreme length, over all obstructions.</p> <p>M3 – Curved work is to be described and identified separately.</p> <p>M4 – Planned inspections of floor finishes to be itemised</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of floor finishes, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of floor finishes, as appropriate.</p>
		item		<p>3 Sundry items – planned inspections of access flooring systems.</p> <p>4 Subcontractor on costs.</p>	<p>Actions arising from planned inspections</p> <p>Subcontractor on costs</p>	
		note				

## 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	<p><b>Finishes to ceilings</b></p> <p><b>Definition:</b></p> <p>Applied finishes to ceiling surfaces, including specialist ceiling finishes to sports facilities, public amenities and the like.</p>	m <sup>2</sup> /(item)	<p>1 Linings to ceilings (e.g. dry-lined plasterboard ceilings, pre-finished sheets, timber boarding and the like).</p> <p>2 Linings to sides and soffits of beams, bulkheads and the like.</p> <p>3 In-situ coatings applied to ceilings (e.g. plaster skim coat, render, roughcast and specialist coatings).</p> <p>4 Sprayed monolithic coatings to beams and ceilings (ie. to provide fire protection, thermal insulation, condensation control and acoustic control).</p> <p>5 Painting and decorating to ceilings.</p> <p>7 Specialist ceiling finishes.</p>	<p>Ceiling finishes (state type of linings) (CF)</p> <p>CF – linings</p> <p>CF – plaster in-situ</p> <p>CF – sprayed coating</p> <p>CF – decorations</p> <p>CF – specialist</p>	<p>Ceiling finishes (CF)</p> <p>(CF)</p> <p>(CF)</p> <p>(CF)</p> <p>(CF)</p> <p>(CF)</p> <p>(CF)</p>	<p><b>Specification</b> – to be stated in order to apply the appropriate reference service life (RSL) to the components included</p> <p><b>CF</b> – included as part of the ceiling finishes (item) – unit of measurement for maintain</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of ceiling finishes, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of ceiling finishes, as appropriate.</p> <p><b>Refurbish</b> – To include removal of existing, preparation and refurbishing the ceiling finishes, as appropriate.</p> <p><b>Redecoration</b> – To ceiling finishes is to be described and identified with the renewal work item, or separately if part of redecoration programme of works.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – Normally covered by visual checks.</p> <p><b>Proactive</b> – Visual inspections of ceiling finishes.</p> <p><b>Reactive</b> – Isolated patch repairs, as appropriate.</p> <p>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.</p> <p>M2 – The length of linear components measured is the extreme length over all obstructions.</p>
				<p>Cornices and coverings</p> <p>8 Sundry items – planned inspection of ceiling finishes.</p>	<p>(CF)</p> <p>(CF)</p> <p>(CF)</p> <p>Planned inspection</p>	



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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	<p>M3 – Other cost-significant components are to be described and measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately, as appropriate.</p> <p>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.</p> <p>M5 – Curved work is to be described and identified separately.</p> <p>M6 – Contractor-design work is to be described and identified separately</p> <p>M7 – Planned inspections to ceiling finishes to be itemised.</p>

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
3.3.2	<p>1 False ceilings: details to be stated.</p> <p><b>Definition:</b> 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.</p>	m <sup>2</sup> /(item)	<p>1 In-situ/board ceilings, including soffit linings, battens, support framework or suspension system, fixed direct to underside of upper floor construction.</p> <p>2 Insulation fixed direct to underside of upper floor construction or laid on false ceiling.</p> <p>3 In-situ coatings applied to false ceilings (e.g. plaster skim coats, render, roughcast and specialist coatings).</p> <p>4 Painting and decorating to false ceilings.</p> <p>6 Shadow gaps and the like, including painting.</p>	False ceilings (FCF)	False ceilings (FCF)	<p><b>Specification</b> to be stated in order to appropriate apply the reference service life (RSL) to the included components. <b>FCF</b> – included as part of the false ceiling finishes (item) – unit of measurement for maintain <b>Renewal Actions</b> <b>Replacement</b> – To include removal of existing, preparation and replacement of ceiling finishes, as appropriate. <b>Maintain Actions</b> <b>Planned</b> – Normally covered by visual checks. <b>Proactive</b> – Visual inspections of ceiling finishes. <b>Reactive</b> – 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<sup>2</sup>), 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.</p>
				<p>8 Sundry items – planned inspection of ceiling finishes.</p> <p>9 Subcontractor on costs.</p>	<p>Actions arising from planned inspections</p> <p>Subcontractor on costs</p>	
	<p>2 Cornices, covings and the like: details to be stated.</p> <p>3 Access hatches and the like: details to be stated.</p>	<p>m/(item)</p> <p>nr/(item)</p>	<p>5 Cornices, covings and the like.</p> <p>7 Access hatches and the like in false ceilings.</p>	<p>Cornices and covings</p> <p>Access hatches</p>	<p>(FCF)</p> <p>(FCF)</p>	

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
3.3.3 <b>Demountable suspended ceilings</b> <b>Definition:</b> 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 <sup>2</sup> /(item)	1 Proprietary suspended ceiling systems, including suspension systems.  2 Integrated ceiling systems, including suspension systems.  3 Acoustic suspended ceiling systems, including suspension systems.  4 Specialist suspended ceiling systems, including suspension systems.  5 Insulation fixed direct to underside of upper floor construction or laid on suspended ceiling system.  6 Shadow gaps and the like, including painting.  7 Access hatches in suspended ceilings and the like.	Demountable suspended ceiling (DSC)	Demountable suspended ceiling (DSC)	<b>Major repairs</b> – To include preparation, repair and making good of demountable suspended ceiling, as appropriate. <b>Proactive</b> – Visual inspections of demountable suspended ceilings. <b>Specification</b> – to be stated, in order to apply the appropriate reference service life to the components included in scope. (item) – unit of measurement for maintain <b>Renewal Actions</b> <b>Replacement</b> – To include removal of existing, preparation and replacement of demountable suspended ceiling, as appropriate. <b>Reactive</b> – Isolated patch repairs, as appropriate.
				DSC – state type	(DSC)	
				DSC – acoustic type	(DSC)	
				DSC – specialist	(DSC)	
				N/A – Included in suspended ceilings if replaced	N/A	
				N/A	N/A	
				Access hatches	(DSC)	
				Actions arising from planned inspections	Planned inspection	
				Subcontractor on costs	Subcontractor on costs	
2 Shadow gaps and the like: details to be stated	m/(item)	8 Sundry items – planned inspection of ceiling finishes. 9 Subcontractor on costs.				
3 Access hatches and the like: details to be stated.	m/(item)					
	item					
	note					

# 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.

<b>Subcontractor on costs:</b>	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.
<b>Descriptors:</b>	Maintain and renewal works descriptors – for applicable included components in the tabulated tables
<b>Not applicable:</b>	In the following tabulated tables, 'N/A' means not applicable to renewal or maintain works.
<b>Works (action required):</b>	The work items, or actions required, within each section of the building element have been categorised into the following: <b>Renewal (R):</b> Replacement, major repairs, refurbishment, upgrade work and removals <b>Maintain (M):</b> Planned, proactive and reactive/minor repair works <b>Note:</b> The required work actions included in the measurement rules is not an exhaustive list and is for guidance only.
<b>Planned inspections</b>	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 are 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	<p>1 Fittings: details to be stated.</p> <p><b>Definition:</b> Furnishings, fittings and equipment fixed to the building fabric or provided loose within the building.</p>	nr	<p>1 Counters, desks, benches and worktops.</p> <p>2 Mirrors, which are not an integral part of wall finishes, furnishings, fittings and equipment.</p> <p>3 Curtains, curtain track rails, pelmets and the like.</p> <p>5 Fireplace surrounds and hearths.</p> <p>8 Storage racks, shelves, shelving support systems and the like.</p> <p>10 Fitted seating, upholstery.</p>	<p>Counter, desks, benches and worktops</p> <p>Mirrors (FFE)</p> <p>Curtains and rails (FFE)</p> <p>Fireplace and hearths (FFE)</p> <p>Storage racks and shelving (FFE)</p> <p>Fitted seating (FFE)</p>	<p>General fittings, furnishings and equipment (FFE)</p>	<p><b>Specification</b> – 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.</p> <p>FFE – included in fittings, furnishings and equipment.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of general fittings, furnishings and equipment, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of general fittings, furnishings and equipment, as appropriate.</p> <p><b>Refurbish</b> – To include removal of existing, preparation and refurbishing of general fittings, furnishings and equipment, as appropriate.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – Normally covered by visual checks.</p> <p><b>Proactive</b> – Visual inspection of general fittings, furnishings and equipment.</p>

Group element 4: 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)	
			<p>12 Bathroom furniture, including vanity units, cupboards and the like.</p> <p>21 Other general purpose fittings and furnishings.</p> <p>22 Delivery, unpacking, sorting, checking all components, assembling, fixing in position (including all bolts and other fixing devices).</p> <p>4 Blinds and blind boxes, which are not an integral part of the window system.</p> <p>6 Wall hangings.</p> <p>7 Loose carpets.</p> <p>9 Tables and chairs.</p> <p>11 Bedroom furniture, including beds, divans, wardrobes, dressers, vanity units, cupboards, cabinets, drawer units and the like.</p> <p>13 Lockers, hat and coat rails and the like.</p> <p>14 Hand-held firefighting equipment, including fire extinguishers, fire blankets and the like (including backboards, fixings and the like).</p> <p>15 Bins, wheelie bins, continental bins and the like.</p> <p>16 Safes, including building into structure.</p> <p>17 Vacuum cleaners and cleaning equipment.</p> <p>18 Televisions, hi-fis and computers.</p> <p>19 Vending machines.</p>	<p>Bathroom furniture (FFE)</p> <p>Other general FFE (FFE)</p> <p>(*included with all above items) N/A</p> <p>Blinds (FFE)</p> <p>Wall hangings (FFE)</p> <p>Loose carpets (FFE)</p> <p>Table /chairs (FFE)</p> <p>Bedroom furniture (FFE)</p> <p>Lockers, hat/coat rails (FFE)</p> <p>Firefighting equipment – state type (FFE)</p> <p>Bins N/A</p> <p>Safes (if in scope) N/A</p> <p>Cleaning equipment N/A</p> <p>Televisions and the like N/A</p> <p>Vending machines N/A</p>	<p><b>Reactive</b> – Minor repairs identified by inspections or arising from reactive requests.</p> <p>N/A – Not applicable to renewal and/or maintain work.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M2 – Descriptions shall include the amount of any PC sum included in the unit rates applied to the item.</p> <p>M3 – Contractor-designed work is to be described and identified separately</p> <p>M4 – Planned inspections of FF&amp;E are to be itemised.</p>	
	<p>2 Furnishings: details to be stated.</p> <p>3 Equipment: details to be stated.</p>					

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
4.1.2	Domestic kitchen fittings and equipment <b>Definition:</b> Domestic kitchen units and equipment of all kinds.		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	
		nr	1 Kitchen units, including base units, drawer units, worktops, cupboards and the like. 2 Sinks, taps, waste fittings and waste disposal units where supplied as part of the kitchen fitting installation. 8 Kitchen equipment suites (i.e. comprising any combination of kitchen appliances items 3 to 7). 9 Other kitchen fittings and equipment. 10 Delivery, unpacking, sorting, checking all components, assembling and fixing into position (including all bolts and other fixing devices).	Domestic kitchen units (DKU)  Sinks, taps and the like  (Covered in 4.1.2.3 to 7)  Other kitchen fittings and equipment  (included with all above items)	Domestic kitchen units  Sinks, taps and the like  T/E  Other kitchen fittings and equipment  N/A	<p><b>Specification</b> – 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.</p> <p><b>Renewal Actions</b>  <b>Replacement</b> – To include removal of existing preparation and replacement of domestic kitchen fittings and equipment, as appropriate.  <b>Major repairs</b> – To include preparation, repair and making good of domestic kitchen fittings and equipment, as appropriate.  <b>Refurbish</b> – To include removal of existing preparation and refurbishing of domestic kitchen fittings and equipment, as appropriate.  <b>Maintain Actions</b>  <b>Planned</b> – Applicable kitchen appliance checks and health and safety assessments and the like.  <b>Proactive</b> – Visual inspection of domestic kitchen fittings and equipment.  <b>Reactive</b> – Minor repairs identified by inspections or reactive requests.</p>

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.		7 Waste bins, towel rails, storage rails and other accessories.	Waste bins, towel rails and the like	N/A	
		item	11 Sundry items – planned inspection of domestic kitchen fittings and equipment	Actions arising from planned inspections	Planned inspection	
		note	12 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on cost	



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

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
4.1.3	<p>1 Fittings: details to be stated.</p> <p>2 Furnishings: details to be stated.</p> <p>3 Equipment: details to be stated.</p>	nr/(item)	<p>1 Furnishings, fittings and non-mechanical or non-electrical equipment designed specifically for a particular type of building, such as:</p> <ul style="list-style-type: none"> <li>– agricultural, fishing and forestry buildings</li> <li>– communications, power supply, mineral supply and water supply buildings</li> <li>– defence, police, prison and fire service buildings</li> <li>– educational buildings, including workbenches, blackboards and gymasia equipment</li> <li>– entertainment buildings, community centres and clubs, including bars</li> <li>– factories, industrial buildings for food, drink, chemicals, engineering, textiles and the like</li> <li>– hospitals, dentist, medical, welfare and animal welfare buildings</li> </ul>	<p>Special-purpose fittings, furnishings and equipment (SFFE)</p> <p><b>Note</b> – state specific FFE types for each particular building function</p>	<p>Special-purpose fittings, furnishings and equipment (SFFE)</p>	<p><b>Specification</b> – 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</p> <p>SFFE – included in special purpose fittings, furnishings and equipment.</p> <p><b>Note 1</b> – 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).</p> <p>(item) – unit of measurement for maintain</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of special-purpose fittings, furnishings and equipment, as appropriate.</p>

Group element 4: 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)	
			<ul style="list-style-type: none"> <li>- laundry</li> <li>- rail, road, water and air transport buildings and terminals</li> <li>- record offices, museums, galleries and zoos</li> <li>- religious and funerary buildings, including seating</li> <li>- restaurants, snack bars and public houses, and libraries</li> <li>- scientific research buildings, including laboratory workbenches</li> <li>- shops, showrooms, stores and shopping centres</li> <li>- special residential buildings, hotels and elderly care homes</li> <li>- sports buildings, swimming pools, marinas and stadia</li> <li>- warehouses.</li> </ul>	Other SFFE – state types	(SFFE)	<p><b>Major repairs</b> – To include preparation, repair and making good of special-purpose fittings, furnishings and equipment, as appropriate.</p> <p><b>Refurbish</b> – To include removal of existing, preparation and refurbishing of special-purpose fittings, furnishings and equipment, as appropriate.</p> <p><b>Redecoration</b> – To be described and identified with the renewal work item, as appropriate.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – In accordance with special-purpose fittings, furnishings or equipment manufacturer's recommendations.</p> <p><b>Proactive</b> – Visual inspection of special-purpose fittings, furnishings and equipment.</p> <p><b>Reactive</b> – Minor repairs identified by visual checks or arising from reactive requests.</p> <p>N/A – Not applicable to renewal and/or maintain work.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M2 – Descriptions shall include the amount of any PC Sum included in the unit rates applied to the item.</p> <p>M3 – Contractor-designed work is to be described and identified separately.</p> <p>M4 – Planned inspection of specialist FF&amp;E to be itemised.</p>
			2 Other special-purpose fittings, furnishings and equipment.	Included with all above items	N/A	
		item	3 Delivery, unpacking, sorting assembling and fixing into position (including all bolts and other fixing devices).	Actions arising from planned inspections	Planned inspection	
		note	4 Sundry items – planned inspections of SFF&E.	Subcontractor on costs	Subcontractor on costs	
			5 Subcontractor on costs (where applicable).			

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
4.1.4	<p>1 Component: details to be stated.</p> <p><b>Signs/notices</b>  <b>Definition:</b>                      Directories, notice boards, letters, signs, plaques, symbols and emblems of all kinds for identification and directional purposes within or attached to the building.</p>	nr/(item)	<p>1 Directional signboards.</p> <p>2 Notice boards, white boards and the like.</p> <p>3 Sign writing.</p> <p>4 Shop front lettering, emblems and symbols.</p> <p>5 Door or floor numbering or lettering.</p> <p>6 Nameplates, plaques and identification symbols.</p> <p>7 Lettering emblems and other identification/directional symbols carved into stone.</p> <p>8 Delivery unpacking, sorting, checking all components, assembling and fixing into position (including all bolts and other fixing devices).</p> <p>9 Sundry items – planned inspection of S&amp;Ns.</p>	<p>Directional signboards (SN)</p> <p>Notice/white boards (SN)</p> <p>Sign writing (SN)</p> <p>Shop front lettering (SN)</p> <p>Door/floor numbering (SN)</p> <p>Nameplates, plaques and the like (SN)</p> <p>Lettering emblems (SN)</p> <p>(Included with all above items) N/A</p> <p>Actions arising from planned inspections</p> <p>Planned inspection</p>	<p><b>Component Specifications</b> – 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.  <b>SN</b> – included in signs and notices.                      (item) – unit of measurement for maintain</p> <p><b>Renewal Actions</b>  <b>Replacement</b> – To include removal of existing, preparation and replacement of signs/notices, as appropriate.  <b>Major repairs</b> – To include preparation, repair and making good of signs/notices, as appropriate.  <b>Refurbish</b> – To include removal of existing, preparation and refurbishing of signs/notices, as appropriate.  <b>Maintain Actions</b>  <b>Planned</b> – Normally covered by safety checks.  <b>Proactive</b> – Visual inspection of signs/notices.  <b>Reactive</b> – 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</p> <p>M4 – Planned inspection of signs and notices to be itemised                      N/A – Not applicable to renewal and/or maintain work.</p>	

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	<p><b>Works of art</b></p> <p><b>Definition:</b> Objects d'art and other ornamental and decorative features within or attached to the building.</p>	nr	<p>1 Objects d'art and other ornamental features.</p> <p>3 Fish tanks, including fish tanks set into internal walls and partitions.</p> <p>4 Delivery unpacking, sorting, checking all components, assembling and fixing into position (including all bolts and other fixing devices).</p>	<p>Excluded from NRM 3</p> <p>Fish tanks</p> <p>Included with all above items</p>	<p>Excluded from NRM 3</p> <p>fish tanks</p> <p>N/A</p>	<p><b>Excluded</b> – Objects d'art and other ornamental features (as not normally a maintained or renewal work item).</p> <p><b>Renewal actions</b> N/A – works if art are excluded from NRM 3 as they are not normally part of building maintenance works.</p> <p><b>Maintain Actions</b> 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.</p>
	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	

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

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
4.1.6	<p><b>Non-mechanical and non-electrical equipment</b></p> <p><b>Definition:</b> Non-mechanical and non-electrical equipment for use within or to enter the building.</p>	nr/(item)	<p>1 Removable disabled access equipment.</p> <p>3 Other non-mechanical and non-electrical equipment.</p>	Disabled access equipment	Disabled access equipment	<p><b>Specification</b> – 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.</p> <p><b>Note</b> – Other non-mechanical and non-electrical equipment – types to be stated. (item) – unit of measurement for maintain</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of non-mechanical and electrical equipment, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of non-mechanical and electrical equipment, as appropriate.</p> <p><b>Refurbish</b> – To include removal of existing, preparation and refurbishing of non-mechanical and electrical equipment, as appropriate.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – PPM on applicable non-mechanical and electrical equipment.</p> <p><b>Proactive</b> – Visual inspection of non-mechanical and electrical equipment.</p> <p><b>Reactive</b> – Minor repairs identified by inspections or reactive requests.</p> <p>MI – Where components are to be enumerated, the number of components is to be stated.</p>
				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	

Group element 4: 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)	
	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	1 Plant and shrub beds: details to be stated.	nr/m <sup>2</sup>	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	Internal planting (IP) (IP) (IP)	<b>Note</b> – may be part of a soft landscaping work package IP – included as part of internal planting. <b>Renewal Actions</b> <b>Replacement</b> – To include removal of existing, preparation and replacement of internal planting, as appropriate. <b>Major repairs</b> – Not applicable to internal planting. <b>Maintain Actions</b> <b>Planting</b> – Covered by internal planting regime. <b>Proactive</b> – Visual inspection of internal planting. <b>Reactive</b> – Minor repairs identified by inspections or reactive requests.

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works			
				Renewal (R)	Maintain (M)				
			8 Replacement planting.  9 Artificial plants, preserved plants and the like, including fixing medium and covering medium for artificial plants.  10 Sundry items – planned inspection of planting.	IP – replacement plants  IP – artificial plants	N/A  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 <sup>2</sup> ), 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.			
							item	Actions arising from planned inspections	Planned inspection
								Subcontractor on costs	Subcontractor on cost
							note	Subcontractor on costs	Subcontractor on cost
								Plant containers	(IP)
							nr	Plant containers	(IP)
								Plant containers	(IP)
							2 Plant containers: details to be stated.	Plant containers	(IP)
								Plant containers	(IP)
							3 Trees: details to be stated	Trees	(IP)
Trees	(IP)								
4 Tree planters: details to be stated.	Tree planting containers to roof gardens	(IP)							
	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	<p><b>Bird and vermin control</b></p> <p><b>Definition:</b> Installations and equipment to repel or trap or otherwise control birds or vermin, which may be a nuisance or danger to health</p>	nr	1 Wires, nets, traps and the like.	Bird and vermin control	Bird and vermin control	<p><b>Component Specifications</b> – 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.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of bird and vermin control, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of bird and vermin control, as appropriate.</p> <p><b>Refurbish</b> – To include removal of existing, preparation and refurbishing of bird and vermin control, as appropriate.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – Normally covered by pest control programme of works, as appropriate.</p> <p><b>Proactive</b> – Visual inspection of bird and vermin control.</p> <p><b>Reactive</b> – Minor repairs identified by inspections or reactive requests.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M2 – The area measured is the surface area to which the coating is to be applied.</p> <p>M3 – Other cost-significant components are to be described and measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately, as appropriate.</p> <p>M4 – Contractor-designed work is to be described and identified separately.</p> <p>M5 – Planned inspection of bird and vermin control to be itemised.</p>	
				2 Electronic and sonic systems.	Bird and vermin control		Bird and vermin control
			3 Bird repellent coatings and the like.	Bird repellent coatings	Bird repellent coatings		Bird repellent coatings
			4 Sundry items – planned inspection of bird control.	item	Actions arising from planned inspections		Planned inspection
			5 Subcontractor on costs (where applicable).	note	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

<b>Subcontractor on costs</b>	<p>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</p> <p>Where testing and commissioning is required to be measured under elements 5.1–5.13, the terms shall include the following works:</p> <p>(1) Testing includes:</p> <ul style="list-style-type: none"> <li>(a) testing, equipment and consumables</li> <li>(b) calibration</li> <li>(c) site installation tests</li> <li>(d) static testing, including testing records</li> <li>(e) performance testing, including performance test records</li> <li>(f) fuels required for testing</li> </ul> <p>(2) Commissioning includes:</p> <ul style="list-style-type: none"> <li>(a) commissioning, including preliminary checks, setting systems and installations to work and regulation thereof, and commissioning records</li> <li>(b) temporary operation of equipment to employer's requirements</li> <li>(c) fuels required for commissioning</li> </ul> <p>(3) Setting all mechanical and electrical services and installations to work after completion of testing and commissioning (following repairs, replacement and fitting new works).</p>
<b>Not applicable</b>	<p>In the following pages 'N/A' means not applicable to renewal and/or maintain works</p>
<b>Works (action required)</b>	<p>The work items, or actions required, within each section of the building element have been categorised into the following:</p> <p><b>Renewal (R)</b> – Replacement, Major repairs, Refurbishment, Upgrade work and Removals – plus Redecoration works (if measured separately)</p> <p><b>Maintain (M)</b> – Planned, Proactive and Reactive/Minor Repair works</p> <p><b>Note</b> – The required work actions included in the measurement rules are not an exhaustive list and is for guidance only</p>
<b>Planned inspections</b>	<p>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.</p>

**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	<b>Sanitary appliances</b> <b>Definition:</b> Appliances for health, hygiene and personal washing, together with their accessories.	nr	1 WC pans and cisterns, WC suites, slop hoppers, urinals and cisterns. 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. 3 Wash basins, hand rinse basins, wash fountains. 4 Bidets. 5 Baths, including bath panels and trims. 6 Shower trays. 7 Shower unit, including shower head and hose. 8 Shower booster pumps. 9 Shower valves. 10 Drinking fountains. 11 Taps and waste fittings. 12 Water-saving devices.	WC and cisterns, urinals and the like	Sanitary appliances	<p><b>Component Specifications</b> – 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.</p> <p><b>Excluded</b> – 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  <b>Note:</b> state the types of taps and valves etc., as the supplementary list at the end of this group element.  <b>Renewal Actions</b>  <b>Replacement</b> – Remove sanitary appliances and replace with new modern equivalent in position; including taps, wastes, plugs, etc.  <b>Major repairs</b> – Overhauling sanitary appliances, cleaning, carrying out repairs on the appropriate component or sub-component parts.  <b>Removal</b> – Remove sanitary appliances, seal off services.  <b>Note:</b> sanitary appliances are part of SFG20 48-05 task schedule (which also includes disposal and plumbing task activities).</p>
				Sinks	Sanitary appliances	
				Wash hand basins	Sanitary appliances	
				Bidets	Sanitary appliances	
				Bath	Sanitary appliances	
				Shower tray	Showers	
				Shower unit	Showers	
				Shower booster pump	Shower booster pump	
				Shower valve	Shower valve	
				Drinking fountains	Drinking fountains	
				Tap and outlet fittings	Tap and outlet fittings	
				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	<p><b>Maintain Actions</b>  <b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.  <b>Planned</b> – PPM on applicable sanitary appliances items  <b>Proactive</b> – Visual inspection of sanitary appliances.  <b>Reactive</b> – 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.</p>	
		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	3 Commissioning of installations	%	16 Testing and commissioning.	Setting to work		Setting to work
					Setting to work		Setting to work
			note	17 Subcontractor on costs (where applicable).	Subcontractor on costs		Subcontractor on costs

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewals (R)	Maintain (M)	
5.1.2	<p><b>Sanitary ancillaries</b></p> <p><b>Definition:</b> Bathroom, toilet and shower ancillaries.</p>			<p>Shower cubicles</p> <p>Curtain rail/screens</p> <p>Grab/support rails</p> <p>Towel rails</p> <p>Hand dryers</p> <p>Paper towel dispensers</p> <p>Sanitary incinerators</p> <p>Macerators</p>	<p>(P)</p> <p>(P)</p> <p>(P)</p> <p>(P)</p> <p>Hand dryers</p> <p>Paper towel dispensers</p> <p>Sanitary incinerators</p> <p>Macerators</p>	<p><b>Component Specifications</b> – 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.</p> <p><b>Included</b></p> <p><b>Item 6</b> – Paper towel dispensers need to be identified as electrical or manual. Manual dispensers are covered by visual inspection.</p> <p><b>Excluded</b> – Heated towel rails are covered in section 5.6.1.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove sanitary fittings and replace with new modern equivalent in position (including taps, wastes, plugs etc.).</p> <p><b>Major repairs</b> – Overhaul sanitary fittings, cleaning, carrying out repairs on the appropriate component or sub-component parts.</p> <p><b>Refurbish</b> – Existing sanitary ancillaries, as appropriate.</p> <p><b>Removal</b> – Remove sanitary fittings/ancillaries and make good.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments; obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable sanitary ancillaries</p> <p><b>Proactive</b> – Visual inspection of sanitary ancillaries; various.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p> <p>(P) – Included with planned visual inspections of sanitary ancillaries.</p>

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	<p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M2 – Contractor-designed work is to be described and identified separately.</p> <p>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.</p> <p>M4 – Planned inspection of SA to be itemised.</p>
		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	<p>1 Services equipment: details to be stated.</p> <p><b>Definition:</b> Services equipment designed for use on a communal or commercial scale.</p>	nr	<p>1 Catering equipment – designed for use in provision of food and drink on a communal or commercial scale.</p> <p>2 Sinks – supplied as an integral part of catering equipment.</p> <p>3 Food storage equipment.</p> <p>4 Other free-standing/fixed mechanical and electrical equipment in:</p> <ul style="list-style-type: none"> <li>– hospitals, dentist, medical, welfare and animal welfare buildings</li> <li>– entertainment buildings, community centres and clubs</li> <li>– sports buildings, swimming pools, marinas and stadia</li> <li>– religious and funerary buildings</li> <li>– educational buildings</li> <li>– scientific research buildings</li> <li>– rail, road, water and air transport buildings and terminals</li> <li>– special residential buildings, hotels and elderly care homes</li> <li>– agricultural, fishing and forestry buildings</li> </ul>	<p>Catering equipment</p> <p>Sinks – (part of CE)</p> <p>Food storage equipment</p> <p>Other service equipment (to be stated)</p>	<p>Catering equipment (CE)</p> <p>(CE)</p> <p>Food storage equipment</p> <p>Other service equipment (to be stated)</p>	<p><b>Component Specifications</b> – 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.</p> <p>CE – To be included as part of catering equipment.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – 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.</p> <p><b>Major repairs</b> – Overhaul services equipment cleaning, carrying repairs on the appropriate component or sub-component parts.</p> <p><b>Refurbish</b> – overhaul and refurbish component parts.</p> <p><b>Removal</b> – Remove sanitary equipment and make good.</p> <p><b>Maintain actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p>

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewals (R)	Maintain (M)	
			<ul style="list-style-type: none"> <li>- communications, power, mineral and water supply buildings</li> <li>- laundry (including ironing machines, steam presses, tumble driers, washer extractors and washing machines)</li> <li>- factories and industrial buildings for food, drink, chemicals, engineering, textiles and the like</li> <li>- shops, showrooms, stores, shopping centres and warehouses</li> <li>- defence, police, prison and fire service buildings</li> <li>- restaurants, snack bars and public houses</li> <li>- libraries, record offices, museums, galleries and zoos.</li> </ul>			<p><b>Planned</b> – PPM on applicable services equipment  <b>Proactive</b> – Visual inspection of services equipment; various.  <b>Reactive</b> – 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.</p>
		item	5 Sundry items – planned inspection of service equipment	Actions arising from servicing and planned inspections (include in item)	Planned inspection (include in item)	
	2. Testing of installations. 3. Commissioning of installations.	%	6 Testing and commissioning/set to works	(include in item)		
		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 <b>Foul drainage above-ground</b> <b>Definition:</b> 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)	<p><b>Component Specifications</b> – 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.</p> <p>(FD) – included in foul drainage.</p> <p><b>Note:</b> state types of pumps and valves, etc. as the supplementary listing at the end of the Services group element.</p> <p><b>Renewal actions</b></p> <p><b>Replacement</b> – Remove soil and vent pipe work (including all fittings and connections) and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, stating size, type and materials used.</p> <p><b>Minor new works</b> – To be described and identified separately.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable Foul drainage above-ground components</p> <p><b>Proactive</b> – Visual inspection of Foul drainage above-ground</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p>
				2 Discharge stacks and waste pipes.	(FD)	
	3 Ventilating stacks and pipes.	nr	(FD)	(FD)		
	4 Traps, access points, rodding eyes, collars and the like.	nr	Traps, access points and the like	(FD)		
	5 Prefabricated pipeline assemblies.	nr	Pipeline assemblies	(FD)		
	6 Prefabricated floor channels and gratings, and drains in upper floor construction.	nr	Floor channels/gratings	Floor channels/gratings		
	7 Sump pumps – type to be stated.	nr	Sump pumps	Sump pumps		
	8 Sundry items – planned inspection of disposal installations.	item	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)	<p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M2 – Contractor-designed work is to be described and identified separately.</p> <p>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.</p> <p>M4 – Planned inspections of disposal systems to be itemised.</p>
	4 Commissioning of installations.					
		note	10 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	
5.3.2	<p><b>Chemical, toxic and industrial liquid waste drainage</b></p> <p><b>Definition:</b> 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.</p>	nr	<p>1 Distribution pipelines and fittings, including glass drainage.</p> <p>2 Traps, access points, rodding eyes, collars and the like.</p> <p>3 Gullies.</p> <p>4 Connections to tanks and the like.</p> <p>5 Storage tanks and vessels.</p>	<p>Pipework systems</p> <p>Traps, access points and rodding eyes</p> <p>Gullies</p> <p>Connections to tanks</p> <p>Storage tanks and vessels</p>	<p>Pipework systems</p> <p>Traps, access points and rodding eyes</p> <p>Gullies</p> <p>N/A</p> <p>Storage tanks and vessels</p>	<p><b>Component Specifications</b> – 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.</p> <p><b>Note:</b> state the types of pumps, valves and controls, as the supplementary listing at the end of the Services group element.</p> <p>N/A – Not applicable to renewal and/or maintain work.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove CTIL waste drainage, including all fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, stating size, type and materials used.</p> <p><b>Minor new works</b> – To be described and identified separately.</p>

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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	<p><b>Maintain Actions</b>  <b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.  <b>Planned</b> – PPM on applicable disposal components.  <b>Proactive</b> – Visual inspection of CTIL installations; various.  <b>Reactive</b> – 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.</p>
		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 <b>Refuse disposal</b> <b>Definition:</b> 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)	<p><b>Component Specifications</b> – 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.</p> <p>(RCDE) – included in refuse collection and disposal equipment</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove refuse disposal, including all fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, stating size, stating type and materials.</p> <p><b>Minor new works</b> – To be described and identified separately.</p> <p><b>Maintain Actions</b></p> <p><b>Note</b> – Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable disposal components</p> <p><b>Proactive</b> – Visual inspection of disposal installation; various.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p>	
				2 Refuse chutes and ducts.	Refuse chutes and ducts		(RCDE)
				3 Plant for the compacting/macerating of refuse ready for collection.	Plant for compacting/macerating of refuse		(RCDE)
				4 Refuse collection equipment, including bins and continental bins.	Refuse collection equipment		(RCDE)
				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
				6 Paper shredders.	Paper shredders		(RCDE)

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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 <b>Mains water supply</b> <b>Definition:</b> 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/m <sup>2</sup>	1 Pipelines and pipeline fittings.	Pipework systems	Pipework systems	<p><b>Component Specifications</b> – 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.</p> <p><b>Note:</b> state specific types of pumps and valves as the supplementary listing at the end of this group element.</p> <p>N/A – Not applicable to renewal and/or maintain work.</p> <p><b>Included</b> – Rising mains may require a booster pump, pumps to be measured under the sundry items.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installations, including all fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, stating size, stating type and materials.</p> <p><b>Minor new works</b> – To be described and identified separately.</p> <p><b>Proactive</b> – Visual inspection of water installations.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on the applicable water installations.</p>
		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/m <sup>2</sup>	6 Trace heating.	Trace heating	Trace heating	
		nr/m <sup>2</sup>	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	

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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)	<p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>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.</p> <p>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.</p> <p>M4 – Contractor-designed work is to be described and identified separately</p> <p>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.</p> <p>M6 – Planned inspections of water systems to be itemised.</p>
	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	<p><b>Cold water distribution</b></p> <p><b>Definition:</b> 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.</p>	nr/m <sup>2</sup>	<p>1 Cold water distribution pipelines to sanitary appliances, sinks, equipment and the like, including fittings.</p> <p>2 Valves.</p> <p>3 Water-saving devices.</p> <p>4 Taps, where not part of a sanitary appliance or services equipment.</p> <p>5 Pumps – type to be stated.</p> <p>6 Pressurisation expansion units (expansion vessels).</p> <p>7 Pressure booster sets.</p> <p>8 Water storage tanks and cisterns (details of tank size and capacity (litres) to be stated).</p> <p>9 Trace heating.</p> <p>10 Instrumentation and control components to cold water distribution systems.</p>	Cold water distribution pipelines	Pipework systems	<p><b>Component Specifications</b> – 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.</p> <p><b>Note:</b> state specific types of pumps and valves, etc. as the supplementary listing at the end of this group element</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Minor new works</b> – To be described and identified separately.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable water installation components.</p> <p><b>Proactive</b> – Visual inspection of water installations.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p>						
				Valves	Valves		Water-saving devices	Water-saving devices	Taps	Taps	Pumps	Pumps



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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewals (R)	Maintain (M)	
		nr/m <sup>2</sup>	11 Thermal insulation.	Thermal insulation	Thermal insulation	M1–M5 measurement rules are the same as item 5.4.1. <b>Note:</b> Sprinkler booster sets are covered in sections 5.1.1 and 5.1.2. <b>Note:</b> Water meters and cisternisers 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	<p><b>Hot water distribution</b></p> <p><b>Definition:</b> 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.</p>	nr/m <sup>2</sup>	<p>1 Hot water distribution pipelines to sanitary appliances, sinks, equipment and the like, including fittings.</p> <p>2 Valves – type to be stated.</p> <p>3 Water-saving devices.</p> <p>4 Taps, where not part of a sanitary appliance or services equipment (see the supplementary listing).</p> <p>5 Pumps – type to be stated.</p> <p>6 Heat exchangers – state type.</p> <p>7 Storage cylinders and calorifiers.</p> <p>8 Trace heating – pipework.</p> <p>9 Hot water storage vessels and expansion vessels (including domestic hot water system calorifiers).</p> <p>10 Immersion heaters – state type.</p>	Hot water distribution pipelines	Hot water systems (vented or unvented)	<p><b>Component Specifications</b> – 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.</p> <p><b>Note</b> – State specific types of pumps, taps and valves, etc. as the supplementary listing at the end of this group element.</p> <p><b>Included</b> Trace heating to include frost protection. Water softeners should state relevant type.</p> <p><b>Renewal Actions</b> <b>Replacement</b> – Remove installation, including all fittings and connections, and replace with new modern equivalent in position. <b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. <b>Minor new works</b> – To be described and identified separately. <b>Maintain Actions</b> <b>Note 1</b> – Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. <b>Note 2</b> – Hot water storage vessels and expansion vessels include expansion vessels and combination units and load levellers.</p>
				Valves	Valves	
				Water-saving devices	Water-saving devices	
				Taps	Taps	
				Pumps	Pumps	
				Heat exchangers	Heat exchangers	
				Storage cylinders and calorifiers	Storage cylinders and calorifiers	
				Trace heating	Trace heating	
				Hot water storage vessels	Hot water storage vessels	
				Immersion heaters	Immersion heaters	

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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	<p><b>Planned</b> – PPM on applicable water system components.</p> <p><b>Proactive</b> – Visual inspection of water installations.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p> <p><b>Unit of measurement</b> – The same as NRM 1 rules, except where specific variances are included in unit column (m<sup>2</sup> and nr).</p> <p>MI-M5 measurement rules are the same as per item 5.4.1.</p>
		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 <sup>2</sup>	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.			Subcontractor on costs	Subcontractor on costs	
		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	<p><b>Local hot water distribution</b></p> <p><b>Definition:</b> Systems where hot water is generated in the vicinity of the appliance being served.</p>	nr	<p>1 Instantaneous water heaters (including shower heaters) and storage water heaters, including flue pipes and terminals.</p> <p>2 Wall- or floor-mounted, under-sink multipoint and over-sink units.</p>	Instantaneous water heaters	Instantaneous water heaters	<p><b>Component Specifications</b> – 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.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Minor new works</b> – To be described and identified separately.</p>
				Under-sink multipoint and over-sink units	Under-sink, multipoint and over-sink units	
	2 Testing of installations.	item	3 Sundry items – planned inspection of local hot water distribution systems.	Actions arising from servicing and planned inspections		
	3 Commissioning of installations.	%	4 Testing and commissioning; set to works.	(include in item)	(Include in item)	

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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	<p><b>Maintain Actions</b>  <b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.  <b>Planned</b> – PPM on applicable water system components  <b>Proactive</b> – Visual inspection of water installations;  <b>Reactive</b> – 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.</p>
5.4.5	Steam and condensate distribution	m <sup>2</sup>	1 Steam distribution pipelines to, and condensate return pipelines from, services equipment, including fittings.	Steam distribution pipelines system	Steam services pipework systems	<p><b>Component Specifications</b> – 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.</p>

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewals (R)	Maintain (M)	
<p><b>Definition:</b> Steam distribution and condensate return pipelines to and from services equipment within the building.</p>		nr	2 Valve, strainers pressure-reducing sets and the like.	Valve, strainers, pressure reducing sets	Valves	<p><b>Note</b> – state specific types of pump sets, taps and valves as the supplementary listing at the end of this group element.</p> <p><b>Renewal Actions</b>  <b>Replacement</b> – Remove installation, including all fittings and connections, and replace with new modern equivalent in position.  <b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.  <b>Minor new works</b> – To be described and identified separately.  <b>Maintain Actions</b>  <b>Note</b> – Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.  <b>Planned</b> – PPM on applicable water system components  <b>Proactive</b> – Visual inspection of water installations; various.  <b>Reactive</b> – Response and carry out unscheduled minor repairs.                      MI-M5 measurement rules, all the same as 5.4.1.  <b>Included</b> – Hot wells and Safety Valves under sundry items.  <b>Note:</b>                      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.</p>
		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 <sup>2</sup>	11 Thermal insulation.	Thermal insulation	Thermal insulation	
		item	12 Sundry items – planned inspection of system.	Actions arising from servicing and planned inspections	Planned inspection	
		%	13 Testing and commissioning; set to works	(include in item)	(include in item)	
			3 Commissioning of installations.	Subcontractor on costs (where applicable)	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	<p>Heat source</p> <p><b>Definition:</b> A heat source supplying heat to one or more heating systems.</p> <p>1 Heat source: details, including output of heat source (kW), to be stated.</p>	nr	1 Biomass fuel boiler plant and ancillary items.	Boiler – biomass	Boiler – biomass	<p><b>Component Specifications</b> – 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.</p> <p>For example: Boiler gas/oil – Gas fired boiler MTHW up to 120°C or LTHW up to 95°C.</p> <p><b>Note 1:</b> See the list of standard boiler types (included in the B&amp;ES SFG20 core library of maintenance schedules)</p> <p><b>Note 2:</b> State the specific types of pumps, valves and controls; see the supplementary listing at the end of this group element.</p> <p>Item 11 – Step down calorifiers is also included by either Storage Vessel or Exchanger in section 5.4.3.</p> <p>Item 20 – Forced draft extract is a duplication of item 17.</p>
		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)	
				6 Wood pellet boiler plant and ancillary items.	Boiler – wood pellet	<b>Renewal Actions</b> <b>Replacement</b> – Remove heat source, including all ancillary fittings and connections, and replace with new modern equivalent in position. <b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. <b>Minor new works</b> – To be described and identified separately. <b>Maintain Actions</b> <b>Note:</b> Include for undertaking introductory site risk assessments; obtaining permits to work and complying with written procedures.
		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	<b>Planned</b> – PPM on applicable heat source types, as per applicable items 1–19. <b>Proactive</b> – Visual inspection of heat source items; various.
		nr	8 Heat pumps, including domestic air-to-water heat pumps – type to be stated (see the supplementary listing).	Heat pumps	Heat pumps	<b>Reactive</b> – Response and carry out unscheduled minor repairs. M1 – Where components are to be enumerated, the number of components is to be stated.
		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	M2 – Contractor-designed work is to be described and identified separately
		nr	10 Water or steam mains, pumps, valves and other equipment from district heating systems.	Pumps, valves	Pumps, valves	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	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	



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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. 3 Commissioning of installations.	%	22 Testing and commissioning; set to works.	(include in item)	(include in item)	
		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	<p><b>Central heating</b></p> <p><b>Definition:</b> Systems where heating is generated at a central point and distributed to the spaces and/or locations being treated.</p>		<p>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).</p> <p>2 Heat distribution pipelines from heat source to heat emitter or other equipment.</p> <p>3 Heating emission units, such as:</p> <ul style="list-style-type: none"> <li>– heat emitters</li> <li>– skirting heaters (e.g. natural convectors and perimeter skirting heaters)</li> <li>– radiant strip heater systems</li> <li>– radiator systems</li> <li>– natural convectors</li> <li>– fan convectors</li> <li>– unit heaters</li> <li>– radiators</li> <li>– convector heaters</li> <li>– continuous convectors.</li> </ul> <p>4 In-screed embedded pipelines (i.e. under-floor heating).</p> <p>5 Heated ceiling panels.</p> <p>6 Warm-air heating.</p> <p>7 Convection systems.</p> <p>8 Fan-assisted convection systems, including under-floor systems.</p> <p>9 Cable-heating systems.</p>	<p>Central heating system</p> <p>Pipework systems</p> <p>Heat emission units</p> <p>Under-flooring heating</p> <p>Heated ceiling panels</p> <p>Warm-air heating</p> <p>Convection systems</p> <p>Convection systems</p> <p>Cable-heating systems</p>	<p>Central heating system</p> <p>Pipework systems</p> <p>Heat emission units</p> <p>Under-floor heating</p> <p>Heat emitters</p> <p>Heat emitters</p> <p>Heat emitters</p> <p>Heat emitters</p> <p>Cable-heating systems</p>	<p><b>Component Specifications</b> – 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.</p> <p><b>Note:</b> state specific types of pumps, valves, ductwork etc as the supplementary listing at the end of this group element.</p> <p>Item 12: Distribution pipelines and fittings; and item 16; AHU, are excluded as these items are covered by section 5.7.1.</p> <p>CS – included in convection systems.</p> <p>(nr) – unit of measurement for maintain systems.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Minor new works</b> – To be described and identified separately.</p> <p><b>Maintain Actions</b></p> <p><b>Note 1:</b> include for undertaking introductory site risk assessments; obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable central heating systems.</p>

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewals (R)	Maintain (M)	
		m <sup>2</sup> /(nr)	10 Plenum air-heating system.	Plenum air-heating system	Plenum air-heating system	<p><b>Proactive</b> – Visual inspection of central heating systems; various.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p> <p>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.</p> <p>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.</p> <p>M3 – Where components are to be enumerated, the number of components is to be stated.</p> <p>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.</p> <p>M5 – Contractor-designed work is to be described and identified separately.</p> <p>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.</p> <p>M7 – Planned procedures to be itemised.</p>
		m <sup>2</sup> /(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 <sup>2</sup> /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 <sup>2</sup> /(nr)	21 Cables.	Cables	Cables	
		nr	22 Instrumentation and control components to heating systems.	Instrumentation and control components	Instrumentation and controls	
		m <sup>2</sup> /(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	<b>Local heating</b> <b>Definition:</b> Systems where heating is generated in or adjacent to the spaces or locations being treated.	nr	1 Room heaters or fires, with or without boilers.  2 Chimneys and flues, where not part of the building structure (e.g. proprietary chimneys and flue pipes).  3 Instrumentation and control components to heating systems.	Room heaters or fires	Heat emitters	<p><b>Component Specifications</b> – 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.</p> <p><b>Note:</b> State specific types of controls components, as the supplementary listing at the end of this group element table.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Minor new works</b> – To be described and identified separately.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable local heating systems</p> <p><b>Proactive</b> – Visual inspection of local heating systems</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>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.</p>			
				Chimneys and flues	Flues				
				Instrumentation and control	Instrumentation and controls				
		%	2 Testing of installations.  3 Commissioning of installations.		4 Sundry items – planned procedures for local heating.  5 Testing and commissioning: set to works.		Actions arising from servicing and planned inspections	Planned procedures	
							(include in item)	(include in item)	
		note	6 Subcontractor on costs (where applicable)	Subcontractor on costs	Subcontractor on costs				

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewals (R)	Maintain (M)	
5.6.3	<p><b>Central cooling</b></p> <p><b>Definition:</b> Systems where cooling is performed at a central plant and distributed to the spaces and/or locations being treated.</p>		<ol style="list-style-type: none"> <li>1 Chilled beams.</li> <li>2 Fan coil systems for cooling only.</li> <li>3 Air-based systems – variable air volume (VAV) for cooling only.</li> <li>4 Variable refrigerant volume (VRV) systems.</li> <li>5 Chillers and packaged chillers.</li> <li>6 Central refrigeration plant.</li> <li>7 Cooling towers – including adiabatic coolers.</li> <li>8 Distribution pipelines and pipeline fittings.</li> <li>9 Cold and treated water feeds.</li> <li>10 Valves – type to be stated.</li> <li>11 Pumps – type to be stated.</li> </ol>	<ol style="list-style-type: none"> <li>Chilled beams</li> <li>Fan coil systems</li> <li>VAV cooling systems</li> <li>VRV systems</li> <li>Chillers</li> <li>Central refrigeration plant</li> <li>Cooling towers</li> <li>Pipework systems</li> <li>Cold and treated water feeds</li> <li>Valves</li> <li>Pumps</li> </ol>	<ol style="list-style-type: none"> <li>Chilled beams</li> <li>Terminal units – Fan coils</li> <li>Terminal units – VAV</li> <li>Terminal units – VRV</li> <li>Chillers</li> <li>Refrigeration distribution system</li> <li>Cooling towers</li> <li>Pipework systems</li> <li>Pipework systems</li> <li>Valves</li> <li>Pumps</li> </ol>	<p>M3 – Contractor-designed work is to be described and identified separately.</p> <p>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.</p> <p>M5 – Planned procedures to be itemised.</p> <p><b>Component Specifications</b> – 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.</p> <p><b>Note:</b> State types of pumps, valves and ductwork etc, as the supplementary listing at the end of this group element.</p> <p>(nr) – unit of measurement for maintain systems.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Minor new works</b> – To be described and identified separately.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable central cooling systems</p>

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewals (R)	Maintain (M)	
		m <sup>2</sup> /(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	<p><b>Proactive</b> – Visual inspection of central cooling systems;  <b>Reactive</b> – Response and carry out unscheduled minor repairs.</p> <p>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.</p> <p>M2 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M3 – Contractor-designed work is to be described and identified separately</p> <p>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.</p>
	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 <sup>2</sup> /(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)		
	3. Commissioning of installations.					
		note	20 Subcontractor on costs (where applicable)	Subcontractor on costs	Subcontractor on costs	

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewals (R)	Maintain (M)	
5.6.4	<b>Local cooling</b> <b>Definition:</b> Systems where cooling is performed in or adjacent to the spaces or locations to be treated.	nr	1 Local cooling units, including those with remote condensers.  2 Distribution pipelines and pipeline fittings.  3 Valves – type to be stated.	Local cooling units	Air conditioning units	<p><b>Component Specifications</b> – 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.</p> <p><b>Note</b> – State types of pumps, valves, fans and ductwork etc, as the supplementary listing at the end of this group element.</p> <p>(m<sup>2</sup>) – unit of measure for some maintain items.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable local cooling systems</p> <p><b>Proactive</b> – Visual inspection of local cooling systems</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p>
				Pipework systems	Pipework systems	
				Valves	Valves	
				Ductwork system	Ductwork system	
				Grilles, fans, filters and diffusers and the like	Grilles and diffusers Fans	
				Instrumentation and control components	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 <sup>2</sup> )	7 Thermal insulation.	Thermal insulation	Thermal insulation	<p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>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.</p> <p>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.</p> <p>M4 – Contractor-designed work is to be described and identified separately</p> <p>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.</p>
	item	8 Sundry items – planned procedures for system	Actions arising from servicing and planned inspections	Planned procedures		
	%	9 Testing and commissioning – resetting to work.	(setting to work include in items)	(include in item)		
	2 Testing of installations.					
	3 Commissioning of installations.					
		note	10 Subcontractor on costs (where applicable)	Subcontractor on costs	Subcontractor on costs	



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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewals (R)	Maintain (M)	
5.6.5	<p>1 Combined central heating and cooling systems: details to be stated.</p> <p><b>Definition:</b> Combined systems where heating and cooling are performed at a central point and distributed to the spaces and locations being treated.</p>	m <sup>2</sup> /(nr)	<p>1 Fan coil systems for heating and cooling.</p> <p>2 Air based systems – variable air volume (VAV) for heating and cooling.</p> <p>3 Reverse-cycle heat pump systems.</p> <p>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.</p> <p>5 Distribution pipelines and pipeline fittings.</p> <p>6 Valves – type to be stated.</p> <p>7 Pumps – type to be stated.</p> <p>8 Distribution ductwork and ductwork fittings and ancillaries, e.g. supports, hangers, access openings and dampers (control, fire and smoke).</p> <p>9 Grilles, fans, filters and other ancillary components of central heating and cooling systems.</p>	<p>Fan coil units 1</p> <p>VAV systems</p> <p>Reverse-cycle heat pump systems</p> <p>Chillers</p> <p>Pipework systems</p> <p>Valves</p> <p>Pumps</p> <p>Distribution ductwork and fittings</p> <p>Grilles, diffusers, fans and filters</p>	<p>Termination units – fan coil units 1</p> <p>Termination units – VAV systems</p> <p>Reverse-cycle heat pump systems</p> <p>Chillers</p> <p>Pipework systems</p> <p>Valves</p> <p>Pumps</p> <p>Ductwork systems</p> <p>Grilles and diffusers</p> <p>Fans</p>	<p><b>Component Specifications</b> – 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.</p> <p><b>Note 1:</b> State types of pumps, valves, fans and ductwork etc, as the supplementary listing at the end of this group element.</p> <p><b>Note 2:</b> Item 1 and 11 – are alternative types of fan coil systems (denoted fan coil units 1 and 2).</p> <p>(nr) – unit of measure for maintaining systems.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable central heating and cooling systems, as per items 1–14.</p> <p><b>Proactive</b> – Visual inspection of central heating and cooling systems.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p>

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	<p>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.</p> <p>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.</p> <p>M3 – Where components are to be enumerated, the number of components is to be stated.</p> <p>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.</p> <p>M5 – Contractor-designed work is to be described and identified separately.</p> <p>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.</p>
		m/(nr) <sup>2</sup>	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 <sup>2</sup> /(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	

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewals (R)	Maintain (M)	
5.6.6 <b>Local heating and cooling</b> <b>Definition:</b> 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	<p><b>Component Specifications</b> – 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.</p> <p><b>Note:</b> state specific types of pumps and valves; ductwork as the supplementary listing at the end of this group element.</p> <p>(m<sup>2</sup>) – unit of measure for specific maintain items.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Minor new works</b> – To be described and identified separately.</p> <p><b>Maintain Actions</b></p> <p><b>Note</b> — Include for undertaking introductory work and complying with written procedures, site risk assessments; obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable local heating and cooling systems</p> <p><b>Proactive</b> – Visual inspection of local heating and cooling systems;</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p>
		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 <sup>2</sup> )	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)	
5.6.7	<b>Central air conditioning</b> <b>Definition:</b> Systems where air treatment is performed at a central point and air is distributed to the spaces and locations being treated.	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 <sup>2</sup> )	9 Thermal insulation.	Thermal insulation	Thermal insulation	
		item	10 Sundry items – planned procedures for system.	Actions arising from servicing and planned inspections	Planned procedures	
		%	11 Testing and commissioning; set to work.	(include in item)	(include in item)	
		Note	12 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	
	1 Central air conditioning systems: details to be stated.  2 VAV (variable air volume) and constant volume air conditioning systems.  3 Dual-duct and induction air conditioning systems.  4 Multi-zone air conditioning systems.	m <sup>2</sup> /(nr)	1 Plenum air-heating systems.	Plenum air-heating systems	Plenum air-heating systems	<b>Component Specifications</b> – 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. <b>Note:</b> 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. <b>Renewal Actions</b> <b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.
		m <sup>2</sup> /(nr)	2 VAV (variable air volume) and constant volume air conditioning systems.	VAV systems	Central air conditioning systems (CACS)	
		m <sup>2</sup> /(nr)	3 Dual-duct and induction air conditioning systems.	Dual-duct air induction conditioning systems	(CACS) Humidifiers	
		m <sup>2</sup> /(nr)	4 Multi-zone air conditioning systems.	Multi-zone conditioning systems	(CACS)	

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewals (R)	Maintain (M)	
		m <sup>2</sup> /(nr)	5 Induction air conditioning systems.	Induction air conditioning systems	(CACS)	<p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments; obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable central air conditioning systems.</p> <p><b>Proactive</b> – Visual inspection of central air conditioning systems.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p> <p>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.</p> <p>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.</p> <p>M3 – Where components are to be enumerated, the number of components is to be stated.</p>
		m <sup>2</sup> /(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 <sup>2</sup> /(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 <sup>2</sup> /(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)				
5.6.8	<p><b>Local air conditioning</b></p> <p><b>Definition:</b> Systems where air treatment is performed in or adjacent to the space to be treated.</p>	m <sup>2</sup> /(nr)	16 Thermal insulation.	Thermal insulation	Thermal insulation	<p>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.</p> <p>M5 – Contractor-designed work is to be described and identified separately.</p>			
			item	17 Sundry items – planned procedures for air conditioning system.	Actions arising from servicing and planned inspections		Planned procedures		
		%	18 Testing and commissioning – reset to work.	(included in item)	(included in item)		(included in item)		
			19 Work undertaken by subcontractors; on costs.	Subcontractor on costs	Subcontractor on costs		Subcontractor on costs		
		nr	1 Self-contained air conditioning units: details to be stated.	Self-contained air conditioning units	Separate clean-room or other local air conditioning systems		Room air conditioning units	<p><b>Component Specifications</b> – 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.</p> <p><b>Note</b> – For pumps, valves, ductwork and controls etc see the supplementary listing at the end of this group element; 5.</p> <p>ACU – To include air conditioning unit types, in-room and clean-room local air conditioning systems.</p> <p>(m<sup>2</sup>) – unit of measure for maintain.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p>	
			2 Other local air condition systems: details to be stated.	Separate clean-room or other local air conditioning systems	Pipework systems		Room air conditioning units		
			nr/(m <sup>2</sup> )	3 Distribution pipelines and pipeline fittings.	Pipework systems		Valves		Pipework systems
			nr	4 Valves – type to be stated.	Valves		Pumps		Valves
			nr	5 Pumps – type to be stated.	Pumps		Ductwork system		Pumps
			nr/(m <sup>2</sup> )	6 Distribution ductwork and ductwork fittings and ancillaries; e.g. supports, hangers, access openings and dampers (control, fire and smoke).	Ductwork system		Ductwork system		Ductwork system

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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	<p><b>Maintain actions</b>  <b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.  <b>Planned</b> – PPM on applicable local air conditioning systems  <b>Proactive</b> – Visual inspection of local air conditioning systems.  <b>Reactive</b> – 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.</p>
		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 <sup>2</sup> )	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.			Subcontractor on costs	Subcontractor on costs	
		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	<p><b>Central ventilation</b></p> <p><b>Definition:</b> 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.</p>	m <sup>2</sup> /(nr)	<p>1 Air extract systems.</p> <p>2 Air supply and extract systems.</p> <p>3 Extract units/terminal units.</p> <p>4 Fan units.</p> <p>5 Distribution ductwork and ductwork fittings and ancillaries, e.g. supports, hangers, access openings and dampers (control, fire and smoke).</p> <p>6 Grilles, fans, filters and other ancillary components of central ventilation systems.</p> <p>7 Distribution pipelines and pipeline fittings.</p> <p>8 Valves – type to be stated</p>	<p>Air extract systems</p> <p>Air supply and extract systems</p> <p>Extract units/terminal units</p> <p>Fan units</p> <p>Ductwork systems</p> <p>Grilles, diffusers, fans and filters</p> <p>Pipelines system</p> <p>Valves</p>	<p>Fans</p> <p>Fans</p> <p>Terminal units</p> <p>Fans</p> <p>Ductwork systems</p> <p>Grilles and diffusers Fans</p> <p>Pipelines system</p> <p>Valves</p>	<p><b>Component Specifications</b> – To be described for each item  –  to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules.</p> <p><b>Note:</b> state types of pumps, fans and valves, as the supplementary listing at the end of this group element.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments; obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable ventilation systems</p> <p><b>Proactive</b> – Visual inspection of ventilation system types.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p> <p><b>Note:</b> state types of pumps, valves and controls, as the supplementary listing at the end of this group element.</p>



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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	<p>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.</p> <p>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.</p> <p>M3 – Where components are to be enumerated, the number of components is to be stated.</p> <p>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.</p> <p>M5 – Contractor-designed work is to be described and identified separately.</p> <p>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.</p> <p>M7 – Planned procedures to be itemised.</p>
		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	<p>1 Toilet/bathroom ventilation units: details to be stated.</p> <p>2 Kitchen ventilation units: details to be stated.</p> <p>3 Safety cabinet and fume cupboard extracts: details to be stated.</p> <p>4 Fume extracts: details to be stated.</p> <p>5 Dust collection units: details to be stated.</p> <p>6 Anaesthetic gas extracts: details to be stated.</p>	nr	<p>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).</p> <p>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.</p> <p>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.</p> <p>4 Fume extracts (air movement systems for collecting, containing, cleaning and removing smells, fumes and other unwanted contaminants), including hoods, canopies and valances.</p> <p>5 Dust collection, including dust and particle extraction or separation equipment, discharge stacks, hoods and collection equipment.</p> <p>6 Anaesthetic gas extracts (i.e. scavenging systems for the removal of anaesthetic gases).</p>	Toilet/bathroom ventilation extract fans	Fans	<p><b>Component Specifications</b> – 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.</p> <p><b>Note:</b> State the types of pumps, fans and valves etc. as the supplementary listing at the end of this group element.</p> <p>(m<sup>2</sup>) – unit of measure for maintaining systems.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable ventilation systems</p> <p><b>Proactive</b> – Visual inspection of ventilation system types.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>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).</p>
				Kitchen ventilation	Kitchen ventilation (ductwork cleaning)	
				Safety cabinet and fume cupboard extracts	Safety cabinet and fume cupboard extracts	
				Fume extracts	Fume extracts	
				Dust collection unit	Dust collection unit	
				Anaesthetic gas extracts	Anaesthetic gas extract	

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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 <sup>2</sup>	12 Distribution ductwork and ductwork fittings and ancillaries, e.g. supports, hangers, access openings and dampers (control, fire and smoke).	Ductwork systems	Ductwork systems	
		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	<p><b>Smoke extract/Control</b></p> <p><b>Definition:</b> 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.</p>	m <sup>2</sup> /(nr)	<p>1 Automatic smoke extract systems.</p> <p>2 Automatic smoke compartmentalisation systems.</p> <p>3 Fan units – type to be stated.</p> <p>4 Distribution ductwork and ductwork fittings and ancillaries, e.g. supports, hangers, access openings and dampers (control, fire and smoke).</p> <p>5 Grilles, fans, filters and other ancillary components of smoke ventilation systems.</p> <p>6 Vibration isolation mountings.</p>	Automatic smoke extract systems	Smoke extract/controls	<p><b>Component Specifications</b> – To be described for each item 1–7, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules.</p> <p><b>Note:</b> State types of fans, grilles and controls etc – as the supplementary listing at the end of this group element.</p> <p><b>Renewal Actions</b> <b>(nr)</b> – unit of measure for maintain.</p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Maintain Actions</b> <b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable smoke extract systems</p> <p><b>Proactive</b> – Visual inspection of ventilation system types.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p>
				Fan units	Fans	
				Ductwork systems	Ductwork systems	
				Grilles, diffusers, fans and filters	Grilles and diffusers Fans	
				Vibration isolation mountings	N/A	

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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	<p>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.</p> <p>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.</p> <p>M3 – Where components are to be enumerated, the number of components is to be stated.</p> <p>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.</p> <p>M5 – Contractor-designed work is to be described and identified separately.</p> <p>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.</p> <p>M7 – Planned procedures to be itemised.</p>	
		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	<p>1 Electrical mains and sub-mains LV distribution: details to be stated.</p> <p><b>Definition:</b> The distribution of LV electricity from (and including) the building main switchgear panel to (and including) the area distribution boards.</p>	m <sup>2</sup> /(nr)	<p>1 Distribution of LV electricity from (and including) the building main switchgear panel to (and including) the area distribution boards.</p> <p>2 HV switchgear.</p>	LV distribution	LV distribution	<p><b>Component Specifications</b> – 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.</p> <p><b>Note:</b> State the types of ancillary electrical components, as the supplementary listing at the end of this group element.</p> <p>(nr) – unit of measurement for maintain systems.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable electrical mains and sub-mains systems.</p> <p><b>Proactive</b> – Visual inspection of electrical mains and sub-mains system types.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p>
		m <sup>2</sup> /(nr)	3 LV switchgear and distribution boards.	LV switchgear and distribution boards	LV switch gear and distribution boards	
		m <sup>2</sup> /(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 <sup>2</sup> /(nr)	5 Conduits and cable trunking, including all fittings and support components.	Conduits and cable trunking	Conduits and cable trunking	
		m <sup>2</sup> /(nr)	6 Busbar trunking.	Busbar trunking	Busbar trunking	

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewals (R)	Maintain (M)	
		m <sup>2</sup> /(nr)	7 Earthing and bonding components.	(Covered in 5.8.6)	(Covered in 5.8.6)	<p>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.</p> <p>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.</p> <p>M3 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M4 – Contractor-designed work is to be described and identified separately.</p> <p>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.</p>
		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	<p><b>Power installations</b>  <b>Definition:</b>                      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.</p>	m <sup>2</sup> /(nr)	<p>1 General low voltage (LV) power installations.</p> <p>2 Extra LV supply installations.</p> <p>3 Direct current (DC) installations.</p> <p>4 LV switchgear and distribution boards, where not included as part of the sub-mains distribution.</p> <p>5 Uninterruptible power supply (UPS) installations and the like (capacity kW duty to be stated).</p>	General LV power installations	General LV power installations	<p>(nr) – unit of measurement for maintain systems.</p> <p><b>Renewal Actions</b>  <b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts; stating sizing, type and materials.</p> <p><b>Maintain Actions</b>  <b>Note:</b> include for undertaking introductory site risk assessments; obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable power installations</p> <p><b>Proactive</b> – Visual inspection of power installation types.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p> <p><b>Component Specifications</b> – 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.</p> <p><b>Note:</b> For specific types of electrical ancillaries, see the supplementary listing at the end of this group element 5.</p> <p>(nr) – unit of measure for maintain system.</p>	
				General LV power installations	Extra LV supply installations		Extra LV supply installations
				DC installations	DC installations		DC installations
				LV switchgear Distribution board	LV switchgear Distribution board		LV switchgear Distribution board
				UPS system	UPS system		UPS system



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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewals (R)	Maintain (M)	
			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	<p>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.</p> <p>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.</p> <p>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.</p> <p>M4 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M5 – Contractor-designed work is to be described and identified separately.</p> <p>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.</p> <p>Socket outlets testing to be included as part of PAT testing and electrical fixing wiring tests. <b>Note:</b> include reset to works in with respective item.</p>
		m <sup>2</sup> /(nr)	7 Conduits and cable trunking, including all fittings and support components.	Conduits and cable trunking and the like	Wiring and components	
		m <sup>2</sup> /(nr)	8 Earthing and bonding components.	(Covered in 5.8.6)	N/A	
		m <sup>2</sup> /(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 <sup>2</sup>	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 <sup>2</sup> /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)	
5.8.3	<p><b>Lighting installations</b></p> <p><b>Definition:</b> Sub-circuit installations from sub-distribution boards to provide lighting.</p>	note	15 Subcontractor on costs (where applicable)	Subcontractor on costs	Subcontractor on costs	
	1 Lighting installations: details to be stated.	m <sup>2</sup> /(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	<p><b>Component Specifications</b> – 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.</p> <p><b>Note:</b> State types of electrical ancillaries components, as the supplementary listing at the end of this group element.</p> <p>(nr) – unit of measure for maintain system.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable lighting installations – including re-lamping of lighting fittings (according to lamp life hours).</p> <p><b>Proactive</b> – Visual inspection of lighting installations types.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p> <p>MI – The area measured is the total gross internal floor area (GIFA) of the building, measured using the rules of measurement for ascertaining the GIFA.</p>
	2 Emergency lighting.	m <sup>2</sup> /(nr)	2 Emergency lighting.	Emergency lighting	Emergency lighting	
	3 Lighting fixed to the exterior of the building supplied as part of the interior system.	m <sup>2</sup> /(nr)	3 Lighting fixed to the exterior of the building supplied as part of the interior system.	External lighting	External lighting	
	4 Low voltage (LV) switchgear and distribution boards, where not included as part of the sub-mains distribution.	m <sup>2</sup> /(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	
	5 Cables and wiring, including support components from sub-distribution boards to lighting points, switches and the like.	m <sup>2</sup> /(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	
	6 Conduits and cable trunking, including fittings and support components.	m <sup>2</sup> /(nr)	6 Conduits and cable trunking, including fittings and support components.	Conduits and cable trunking	Conduits and cable trunking	
	7 Earthing and bonding.	nr	7 Earthing and bonding.	(Covered in 5.8.6)	(Covered in 5.8.6)	
	8 Fittings to lighting points, including roses, pendants and the like	nr	8 Fittings to lighting points, including roses, pendants and the like	Fittings to lighting points	Fittings to lighting points	
	9 Switches, including pull cords.	nr	9 Switches, including pull cords.	Lighting switches	Lighting switches	

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewals (R)	Maintain (M)	
		m <sup>2</sup> /hr	10 Luminaires and lamps.	Luminaires/lamps	Luminaires/lamps	<p>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.</p> <p>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.</p> <p>M4 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M5 – Contractor-designed work is to be described and identified separately</p> <p>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.</p>
		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 <b>Specialist lighting installations</b> <b>Definition:</b> 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	<p><b>Component Specifications</b> – 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.</p> <p><b>Note:</b> For types of electrical ancillaries – see the services supplementary listing at the end of this group element 5.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable specialist lighting, – including re-lamping of lighting (according to lamp life hours).</p> <p><b>Proactive</b> – Visual inspection of specialist lighting system types.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p>
		nr/m <sup>2</sup>	2 Studio lighting.	Studio lighting	Studio Lighting	
		nr/m <sup>2</sup>	3 Auditorium lighting, theatre lighting, stage lighting and the like.	Auditorium lighting	Auditorium lighting	
		nr/m <sup>2</sup>	4 Arena lighting.	Arena lighting	Arena lighting	
		nr/m <sup>2</sup>	5 Operating theatres and other specialist lighting installations.	Operating theatre and other specialist lighting	Operating theatre and other specialist lighting	
		nr/m <sup>2</sup>	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 <sup>2</sup>	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 <sup>2</sup>	8 Conduits and cable trunking, including all fittings and support components.	Conduits and cable trunking	Conduits and cable trunking	
		nr/m <sup>2</sup>	9 Earthing and bonding.	(Covered in 5.8.6)	(Covered in 5.8.6)	

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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	<p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>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.</p> <p>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.</p> <p>M4 – Contractor-designed work is to be described and identified separately.</p> <p>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.</p>
		nr	11 Switches, including pull cords.	Switches	Switches	
		nr/m <sup>2</sup>	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	
		%	16 Testing and commissioning; reset to works.	(include in item)	(include in item)	
			2 Testing of installations.			
			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	<p><b>Local electricity generation systems</b></p> <p><b>Definition:</b> Local generation equipment for the production of electrical energy, including emergency and/or standby generator plant.</p>	nr	<p>1 Emergency/standby generator plant (gas, oil and dual fuel).</p> <p>2 Ancillary cables and wiring, conduits and cable trunking, and controls required to connect local electricity generation systems to other systems.</p>	Standby generator	Standby generator	<p><b>Components Specifications</b> – 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.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable local generation systems.</p> <p><b>Pro-active</b> – Visual inspection of local generation systems.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M2 – Contractor-designed work is to be described and identified separately</p> <p>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.</p>
				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	

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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: 4 Wind turbines: details, including output (kW), to be stated.			Wind turbines	Wind turbines	<p><b>Component Specifications</b> – 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.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p>
		nr	1 Wind turbines, including rooftop wind energy systems.	Photovoltaic devices	Photovoltaic devices	
	nr	5 Photovoltaic devices: details, including surface area of units (m <sup>2</sup> ) and output (kW), to be stated.	2 Photovoltaic devices, including cells, panels, modules and the like.	Solar collectors devices and the like	Solar collectors devices and the like	
			3 Solar collectors, including supporting framework (including fish plate collectors, evacuated tube collectors and the like).	Other transformation devices	Other transformation devices	
	nr					

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	
	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.	(included in item)	(included in item)		
7 Testing of installations.	%	8 Testing and commissioning: reset to works.	(included in item)	(included in item)		
8 Commissioning of installations.		9 Work undertaken by subcontractors; on costs.	Subcontractor on costs	Subcontractor on costs		
	Note					



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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewals (R)	Maintain (M)	
5.8.6	<p><b>Earthing and bonding systems</b></p> <p><b>Definition:</b> 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.</p>	<p>m<sup>2</sup>/(nr)</p> <p>m<sup>2</sup>/(nr)</p>	<p>1 Earthing and bonding cables.</p> <p>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.</p>	<p>Earthing and bonding cables</p>	<p>Earthing and bonding cables</p>	<p><b>Component Specifications</b> – 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. <b>Renewal Actions</b> <b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. <b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. <b>Maintain Actions</b> <b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. <b>Planned</b> – PPM on applicable earthing and bonding systems. <b>Proactive</b> – Visual inspection of earthing and bonding system types. <b>Reactive</b> – Response and carry out unscheduled minor repairs.</p>
				<p>Actions arising from servicing and planned inspections</p>	<p>Planned procedures</p>	
		<p>Item</p>	<p>3 Sundry items – planned procedures for earthing and bonding system.</p>	<p>Hazardous area (electrics) earthing</p>	<p>Hazardous area (electrics) earthing</p>	
		<p>m<sup>2</sup>/(nr)</p>	<p>3a Other sundry items – i.e. Hazardous area (electrics) earthing.</p>	<p>Hazardous area (electrics) earthing</p>	<p>Hazardous area (electrics) earthing</p>	

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)	<p>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.</p> <p>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.</p> <p>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.</p> <p>M4 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M5 – Contractor-designed work is to be described and identified separately.</p> <p>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.</p>
	3 Commissioning of installations.		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	<p>1 Fuel storage: details to be stated.</p> <p><b>Definition:</b> Storage tanks and vessels for storage of oil, petrol, diesel or liquefied petroleum gas (LPG)</p>	nr	<p>1 Oil, petrol, diesel and liquefied petroleum gas (LPG), biomass and other fuel systems.</p> <p>2 Storage tanks and vessels not supplied in connection with heat source installations.</p> <p>3 Proprietary supports forming an integral part of the storage tank/vessel unit.</p> <p>4 Off-site painting/anti-corrosion treatments.</p> <p>5 Thermal insulation.</p>	<p>Fuel systems – (type)</p> <p>Fuel storage tanks and vessels</p> <p>Proprietary supports</p> <p>Anti – corrosion paint</p> <p>Thermal insulation</p>	<p>Fuel systems – (type)</p> <p>Fuel storage tanks and vessels</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>Thermal insulation</p> <p>Planned procedures</p>	<p><b>Component Specifications</b> – 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.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable fuel storage systems</p> <p><b>Proactive</b> – Monitor and inspect fuel storage systems.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>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.</p>
		nr	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)	<p>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.</p> <p>M4 – Contractor-designed work is to be described and identified separately.</p> <p>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.</p> <p>N/A – Not applicable to renewal and/or maintain work.</p>
	3 Commissioning of installation.	note	8 Work undertaken by subcontractors; on costs.	Subcontractor on costs	Subcontractor on costs	
5.9.2	<p>1 Piped distribution systems: detailed to be stated.</p> <p><b>Definition:</b> 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.</p>	<p>m<sup>2</sup>/(nr)</p> <p>m<sup>2</sup>/(nr)</p> <p>m<sup>2</sup>/(nr)</p>	<p>1 Gas, oil, petrol, diesel and liquefied petroleum gas (LPG), and other fuel systems.</p> <p>2 Distribution pipelines from point of mains connection within building to user points, including pipeline ancillaries and fittings.</p> <p>3 Pipeline components/ancillaries (e.g. valves and pumps – see the supplementary listing).</p>	<p>Fuel systems – (type)</p> <p>Pipeworks systems</p> <p>Pipeworks systems</p> <p>Pumps Valves</p>	<p><b>Component Specifications</b> – 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.</p> <p>(nr) – unit of measurement for maintain systems.</p> <p><b>Note:</b> state types of pumps and valves as the supplementary listing at the end of this group element 5: Services.</p> <p><b>Renewal Actions</b> <b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. <b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p>	

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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	<p><b>Maintain Actions</b>  <b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.  <b>Planned</b> – PPM on applicable fuel distribution systems  <b>Proactive</b> – Monitor and inspect fuel distribution systems.  <b>Reactive</b> – 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.</p>
		nr	5 Manifolds, local meters, gas governors, gas boosters and gas connection outlets.	Manifolds, local meters and the like	Gas distribution components	
		m <sup>2</sup> /(nr)	6 Terminal control equipment.	Terminal control equipment	Terminal control equipment	
		m <sup>2</sup> /(nr)	7 Thermal insulation.	Thermal insulation	Thermal insulation	
		m <sup>2</sup> /(nr)	8 Off-site painting/anti-corrosion treatments.	Anti-corrosion paint	N/A	
		m <sup>2</sup> /(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	<p><b>Lifts and enclosed hoists</b></p> <p><b>Definition:</b> Electro-mechanical or electro-hydraulic installations for the conveyance of persons, goods or equipment from one level to another in a vertical plane.</p>	nr	<p>1 Complete lift installation, including lift cars, doors and equipment, guides and counter balances, hydraulic and lifting equipment, emergency lighting, lift alarms and telephones.</p>	Lifts (state type)	Lifts (state type)	<p><b>Component Specifications</b> – 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.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable lifts and enclosed hoists.</p> <p><b>Proactive</b> – Monitor and inspect lifts and hoists.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M2 – Contractor-designed work is to be described and identified separately.</p>
				Firefighting lifts	Firefighting lifts	
				Wall-climbing lifts	Wall-climbing lifts	
	<p>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.</p>	nr	<p>2 Firefighting lifts.</p>	Gantries, trolleys blocks and the like	Gantries, trolley blocks and the like	
	<p>3 Goods lifts: details, including the capacity (in kg), number of doors, (nr), door heights and number of levels served (nr), to be stated.</p>	nr	<p>4 Gantries, trolleys, blocks, hooks and ropes, down-shop leads, pendants and the like.</p>	Controls and electrical works	Controls and electrical works	
		item	<p>6 Sundry items – planned procedures for lifts and enclosed hoists.</p>	Actions arising from servicing and planned inspections	Planned procedures	

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewals (R)	Maintain (M)	
Lifts	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	
	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	<p><b>Escalators</b></p> <p><b>Definition:</b> Permanently fixed lifting equipment, either electro-mechanical or hydraulically operated, for the raising or lowering of persons, goods or equipment.</p> <p>1 Escalators: details, including number of flights served (nr), angle of rise (in degrees), rise (m) and step width (mm), to be stated.</p>	nr	<p>1 Escalators.</p> <p>2 Ancillary components, including under-step lighting, under-handrail lighting, balustrades, cladding to sides and soffits, and chairs.</p> <p>3 Controls and electrical work from, and including, the isolator where supplied with installation.</p>	Escalator	Escalator	<p><b>Component Specifications</b> – 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.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable escalators</p> <p><b>Proactive</b> – Monitor and inspect escalators.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p>



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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	<p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>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.</p> <p>M3 – Contractor-designed work is to be described and identified separately.</p> <p>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.</p>
	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	<p><b>Moving pavements</b></p> <p><b>Definition:</b> Electro-mechanical systems for the conveyance of persons from one level to another by means of a continually moving stairway.</p>	nr	1 Moving pavements.	Moving pavements	Moving pavements	<p><b>Component Specifications</b> – 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.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p>
		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.
		nr	4 Controls and electrical work from, and including, the isolator where supplied with installation.	Controls and electrical works	Controls/ electrical works	M2 – The linear length measured is the extreme length. M3 – Contractor-designed work is to be described and identified separately.
		item	5 Sundry items – planned procedures for systems.	Actions arising from servicing and planned inspections	Planned procedures	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.	%	6 Testing and commissioning; reset to works.	(include in item)	(include in item)	<b>Maintain Actions</b> <b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.
	3 Commissioning of installations.					<b>Planned</b> – PPM on applicable moving pavements. <b>Proactive</b> – Monitor and inspect moving pavements. <b>Reactive</b> – Response and carry out unscheduled minor repairs.
		note	7 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewals (R)	Maintain (M)	
5.10.4	<p><b>Powered stairlifts</b></p> <p><b>Definition:</b> 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.</p>	nr	<p>1 Complete stairlift installations, including rails, folding rails, carriages, hinged bridging platforms, guards, drive units and signage.</p> <p>2 Controls and electrical work from, and including, the isolator where supplied with installation.</p>	Powered stairlifts	Powered stairlifts	<p><b>Component Specifications</b> – 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.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable powered stairlifts.</p> <p><b>Proactive</b> – Monitor and inspect powered stairlifts.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M2 – Contractor-designed work is to be described and identified separately</p> <p>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.</p>
				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 work.	(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 <b>Conveyors</b> <b>Definition:</b> 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	<p><b>Maintain Actions</b> <b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. <b>Planned</b> – PPM on applicable conveyors. <b>Proactive</b> – Monitor and inspect conveyors. <b>Reactive</b> – Respond 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. <b>Component Specifications</b> – 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. <b>Renewal Actions</b> <b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. <b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p>
	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.  3 Controls and electrical work from, and including, the isolator where supplied with installation.	Specialist systems (e.g. Baggage handling system)  Controls and electrical work	Specialist systems (e.g. Baggage handling system)  Controls and electrical works	
	3 Setting to work.	%	item	4 Sundry items – planned procedures for conveyors.  5 Testing and commissioning; reset to works.	Actions arising from servicing and planned inspections  (include in item)	
		note	6 Work undertaken by subcontractors (where applicable).	Subcontractor on costs	Subcontractor on costs	

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewals (R)	Maintain (M)	
5.10.6 <b>Dock levellers and scissor lifts</b> <b>Definition:</b> 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	<p><b>Component Specifications</b> – 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.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable dock levellers and scissor lifts.</p> <p><b>Proactive</b> – Monitor and inspect dock levellers and scissor lifts.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M2 – Contractor-designed work is to be described and identified separately.</p> <p>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.</p>
	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 <b>Cranes and unenclosed hoists</b> <b>Definition:</b> 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	<p><b>Component Specifications</b> – 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.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable cranes and hoists items.</p> <p><b>Proactive</b> – Monitor and inspect cranes and hoists.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M2 – Contractor-designed work is to be described and identified separately.</p> <p>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.</p>	
	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)		
	5 Commissioning of installations.						
		note	7 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs		

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewals (R)	Maintain (M)	
5.10.8 <b>Car lifts, car stacking systems, turntables and the like</b> <b>Definition:</b> 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	<p><b>Component Specifications</b> – 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.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable car lifts and car stacking systems</p> <p><b>Proactive</b> – Monitor and inspect car lifts and stacking systems.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p> <p>M1–M3 measurement rules are the same as sub-element 5.10.7.</p>
	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	
	%	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	<p><b>Document handling systems</b></p> <p><b>Definition:</b> Specialist document handling/delivery systems, warehouse picking systems and the like.</p>	nr	<p>1a Document handling/delivery systems.</p> <p>1b Warehouse picking systems and the like.</p> <p>2 Controls and electrical work from, and including, the isolator where supplied with installation.</p>	Document handling systems	Document handling systems	<p><b>Component Specifications</b> – 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.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable document handling system.</p> <p><b>Proactive</b> – Monitor and inspect document handling systems.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p> <p>MI-M3 measurement rules are same as sub-element 5.10.7.</p>
				Warehouse picking systems	Warehouse picking systems	
				Controls and electrical work	Controls and electrical work	
		item	3 Sundry items – planned procedures.	Actions arising from servicing and planned inspections	Planned procedures	
				(include in item)	(include in item)	
%	4 Testing and commissioning – reset to work.					
note	5 Commissioning of installations.	5 Work undertaken by subcontractors; on costs.	Subcontractor on costs			



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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewals (R)	Maintain (M)	
5.10.10 <b>Other transport systems</b> <b>Definition:</b> Transport systems not covered by sub-elements 5.10.1–5.10.9.	1 Other lift and conveyor installations: details to be stated.  2 Testing of installations. 3 Commissioning of installations.	nr	1 Paternoster lifts.  2 Hoists for moving people with disability.  3 Other transport systems.  4 Controls and electrical work from and including isolator where supplied with installation.  5 Sundry items – planned procedures for systems.  6 Testing and commissioning – reset to work.  7 Work undertaken by subcontractors; on costs.	Paternoster lifts	Paternoster lifts	<p><b>Component Specifications</b> – 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.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable other lift and conveyor systems, as per items 1–4.</p> <p><b>Proactive</b> – Monitor and inspect lift and conveyor systems.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p> <p>MI–M3 measurement rules are same as sub-element 5.10.9.</p>
		nr		Hoists for moving people with disability	Hoists for moving people with disability	
		nr		Other transport systems	Other transport systems	
		nr		Controls and electrical work	Controls and electrical work	
		item		Actions arising from servicing and planned inspections	Planned procedures	
		%		(include in item)	(include in item)	
		note		Subcontractor on costs	Subcontractor on costs	

## Element 5.1.1: 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)	
5.1.1.1	<b>Firefighting systems</b> <b>Definition:</b> Piped distribution systems within the confines of the building for firefighting purposes.	nr	1 Fire hose reels, including hose reels and pressure booster sets.	Fire hose reel systems	Fire hose reel system	<p><b>Component Specifications</b> – 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.</p> <p>(nr) – unit of measurement for maintain systems.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable fire-fighting systems</p> <p><b>Proactive</b> – Visual inspection of firefighting systems.</p>
				Dry risers	Dry risers	
		nr	2 Dry risers, including inlet breechings, inlet boxes, landing valves, outlet boxes and drain valves.	Wet risers	Wet risers	
				4 Fire and oxide protection curtains: details of each type of system to be stated.		
		nr/m <sup>2</sup>	5 Other firefighting systems: details of each type of system to be stated.	Pipework systems	Pipework systems	
nr/m <sup>2</sup>		Thermal insulation	Thermal insulation			
nr		6 Control components.	Control components			

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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	<p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>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.</p> <p>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.</p> <p>M4 – Contractor-designed work is to be described and identified separately.</p> <p>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.</p>
		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 <b>Fire suppression systems</b> <b>Definition:</b> 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 <sup>2</sup> /(nr)	1 Sprinklers, including reaction and control devices and sprinkler heads.	Sprinkler system	Sprinkler system	<p><b>Component Specifications</b> – 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.</p> <p><b>Note:</b> state types of pumps, tanks, controls etc, as the supplementary listing at the end of this group element.</p> <p>(nr) – unit of measurement for maintain systems.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable fire suppression system.</p> <p><b>Proactive</b> – Visual inspection of fire suppression systems.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p>
	2 Deluge systems: details of each type of system to be stated.	m <sup>2</sup> /(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 <sup>2</sup> /(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 <sup>2</sup> /(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 <sup>2</sup> /(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	

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works	
				Renewals (R)	Maintain (M)		
		m <sup>2</sup> /(nr)	7 Thermal insulation.	Thermal insulation	Thermal insulation	<p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>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.</p> <p>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.</p> <p>M4 – Contractor-designed work is to be described and identified separately.</p> <p>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.</p>	
		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.	7 Commissioning of installations.	%	10 Testing and commissioning; reset to works.	(include in item)		(include in item)
			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 <b>Lightning protection</b> <b>Definition:</b> Lightning protection installations.	1 Lightning protection installations (details of each type of system to be stated.	m <sup>2</sup> /(nr)	1 Bonded steel-frame and tape-based systems.	Lightning protection	Lightning protection	<p><b>Component Specifications</b> – 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.</p> <p>LP – included in lightning protection. (nr) – unit of measurement for maintain systems.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable lightning protection.</p> <p><b>Proactive</b> – Visual inspection of lightning protection installations.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p>
		(nr)	2 Finales.	Finales	(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.			Subcontractor on costs	Subcontractor on costs	
		note	7 Work undertaken by subcontractors; on costs.	Subcontractor on costs	Subcontractor on costs	

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewals (R)	Maintain (M)	
						<p>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.</p> <p>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.</p> <p>M3 – Contractor-designed work is to be described and identified separately</p> <p>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.</p>

## 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	<p><b>Communication systems</b></p> <p><b>Definition:</b> Systems for communicating, including visual, audio and data installations.</p>	m <sup>2</sup> (nr)	<p>1 Telecommunication systems, including wiring, handsets and equipment, telex equipment, facsimile equipment, combined systems (e.g. PAX, PAXB and PMBX systems) and the like.</p> <p>2 Data transmission systems, including wiring, computer networking, modems, multiplexers, data terminals and data-bus systems.</p> <p>3 Paging and emergency call systems, including emergency call buttons, pull cords and the like.</p> <p>4 Public address and conference audio facilities, including public address facilities, hospital radio, conference audio facilities, audio frequency induction loop systems, background noise systems (including microphones, amplifiers, and speakers).</p> <p>5 Radio systems, including cable and satellite systems (including receivers).</p> <p>6 Projection systems (e.g. cinematographic equipment, fixed or portable projection equipment, screens, back-projection equipment, sound equipment).</p>	Telecommunication systems	Telecommunication systems	<p><b>Note:</b> Television systems includes TV monitors.</p> <p><b>Component Specifications</b> – 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.</p> <p>(nr) – unit of measurement for maintain systems.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable communication systems.</p> <p><b>Proactive</b> – Monitor and inspect communication systems.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p>
				1 Telecommunication systems	1 Telecommunication systems	
				2 Data transmission systems	2 Data transmission systems	
				3 Paging and emergency call systems	3 Paging and emergency call systems	
				4 Public address and conference audio system	4 Public address and conference audio system	
				5 Radio systems	5 Radio systems	
6 Projection systems	6 Projection systems					



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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 <sup>2</sup> /(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 <sup>2</sup> /(nr)	8 Smoke detection and alarm systems.	Smoke detection and alarm system	Smoke detection	
	9 Liquid detection systems.	m <sup>2</sup> /(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	<p>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.</p> <p>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.</p> <p>M5 – Contractor-designed work is to be described and identified separately.</p> <p>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.</p>	
	11 Door entry systems.	m <sup>2</sup> /(nr)	19 Door entry systems.	Door entry systems	Door entry systems		
	12 Radio and televisions.	m <sup>2</sup> /(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 <sup>2</sup> /(nr)	14 Pneumatic message systems.	Message systems	Pneumatic message systems		
	16 Other communication systems.	m <sup>2</sup> /(nr)	15 Other communication system.	Other communication systems	Other communication systems		
	17 Testing of installations.	%	16 Sundry items – planned procedures for systems.	Actions arising from servicing and planned inspections	Planned procedures		
	18 Commissioning of installations.		17 Testing and commissioning; set to works.	(include in item)	Testing/set to work		
				18 Subcontractor on costs (where applicable).	Subcontractor on costs		Subcontractor on costs

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewals (R)	Maintain (M)	
5.12.2 <b>Security systems</b> <b>Definition:</b> Observation and access control installations and the like.	Details of each type of system to be stated: 1 Surveillance equipment.	nr/m <sup>2</sup>	1 Surveillance equipment.	Surveillance equipment	Surveillance equipment	<p><b>Component Specifications</b> – 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.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable security systems.</p> <p><b>Proactive</b> – Visual inspection of security systems.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>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.</p> <p>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.</p>
	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 <sup>2</sup>	7 Security lights and lighting systems.	Security lights and lighting systems	Security lights and lighting systems	
	8 Other security systems.	nr/m <sup>2</sup>	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.
				(include in item)	(include in item)	
				Subcontractor on costs	Subcontractor on costs	
5.12.3	<p><b>Central control/building management systems</b></p> <p><b>Definition:</b> 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.</p>	note	<p>11 Subcontractor on costs (where applicable).</p> <p>1 Control panels for mechanical and electrical equipment.</p> <p>2 Building management systems (BMS), including central and satellite computer terminal software.</p>	Subcontractor on costs	Control panels	<p><b>Component Specifications</b> – 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. <b>Renewal Actions</b> <b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. <b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p>
				Subcontractor on costs	BMS and central operating station systems	
				BMS and central operating station systems	BMS and central operating station systems	

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works	
				Renewals (R)	Maintain (M)		
		m <sup>2</sup> /(nr)	4 Controlling terminal units and switches.	Controlling terminal units and switches	Controlling terminal units and switches	<p><b>Maintain actions</b>  <b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.  <b>Planned</b> – PPM on applicable central control/BMS.  <b>Proactive</b> – Visual inspection of central control/BMS installations.  <b>Reactive</b> – Response and carry out unscheduled minor repairs.                      M1 – The area measured is the area served by the system (ie. 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.</p>	
		m <sup>2</sup> /(nr)	5 Control cabling and containment.	Control cabling and containment	Control cabling and containment		
		m <sup>2</sup> /(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)		Computer-aided facilities management systems (CAFM)
				7 Sundry items – planned procedures for systems.	Actions arising from servicing and planned inspections		
	3 Testing of installations.	%	8 Testing and commissioning: set to works.	(include in item)	(include in item)		(include in item)
				4 Commissioning of installations.	Subcontractor on costs		
		note	9 Subcontractor on costs (where applicable).	Subcontractor on costs	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	<p><b>Specialist piped supply systems</b></p> <p><b>Definition:</b></p> <ul style="list-style-type: none"> <li>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.</li> <li>Piped distribution systems providing suction for vacuum cleaning and collection facilities.</li> <li>Piped water supply systems where the water is treated to obtain a high degree of purity for special use and application.</li> <li>Systems for the treatment and circulation of water for swimming pools.</li> </ul>	nr/m <sup>2</sup>	<p>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.</p> <p>2 Centralised vacuum cleaning systems, including vacuum pumps, blowers and vacuum connection units.</p> <p>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.</p> <p>4 Swimming pool water treatment, including filter vessels, chemical storage vessels, chemical dosing equipment, ozone generation and injection equipment, de-ozoneing vessels, electrolytic chlorine ion generation equipment, pool inlet jets, scum channels, perimeter draw-off grilles and the like.</p>	<p>Medical and laboratory gas supply systems</p> <p>Medical and laboratory gas supply systems</p> <p>Centralised vacuum cleaning systems</p> <p>Treated water systems</p> <p>Swimming pool water treatment</p>	<p>Medical and laboratory gas supply systems</p> <p>Centralised vacuum cleaning systems</p> <p>Treated water systems</p> <p>Swimming pool water treatment</p>	<p><b>Component Specifications</b> – 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.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable specialist piped systems</p> <p><b>Proactive</b> – Visual inspection of specialist piped systems.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>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.</p>

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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 <sup>2</sup>	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	<p>M4 – Contractor-designed work is to be described and identified separately.</p> <p>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.</p> <p>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.</p>
				Vacuum systems	Vacuum systems	
	6 Vacuum installations.	nr/m <sup>2</sup>	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 <sup>2</sup>	7 Other specialist piped supply systems.	Other specialist piped supply systems	Other specialist piped supply systems	
				Pipework system	Pipework system	
	8 Pipelines, pipeline ancillaries and fittings.	m	8 Pipelines, pipeline ancillaries and fittings.	Pipework system	Pipework system	
				Air duct lines, duct line ancillaries and fittings	Air duct lines, duct line ancillaries and fittings	
	9 Air duct lines, duct line ancillaries and fittings.	m	9 Air duct lines, duct line ancillaries and fittings.	Thermal insulation	Thermal insulation	
				Silencers and acoustic treatment	Silencers and acoustic treatment	
	10 Thermal insulation.	m <sup>2</sup> /(nr) item	10 Thermal insulation.	Control components	Control components	
				Actions arising from servicing and planned inspections	Planned procedures	
	11 Silencers and acoustic treatment.	nr	11 Silencers and acoustic treatment.	Control components	Control components	
				(include in item)	(include in item)	
	12 Control components.	nr	12 Control components.	Control components	Control components	
				Subcontractor on costs	Subcontractor on costs	
13 Sundry items – planned procedures for systems.	item	13 Sundry items – planned procedures for systems.	Control components	Control components		
			Subcontractor on costs	Subcontractor on costs		
14 Testing and commissioning: set to works.	%	14 Testing and commissioning: set to works.	Control components	Control components		
			Subcontractor on costs	Subcontractor on costs		
8 Testing of installations.						
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 <b>Specialist refrigeration systems</b> <b>Definition:</b> Specialist refrigeration systems.	1 Cold rooms: details of each type of system to be stated.	nr/m <sup>2</sup>	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	<p><b>Component Specifications</b> – 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.</p> <p><b>Renewal Actions</b>  <b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.  <b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.  <b>Maintain Actions</b>  <b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures.  <b>Planned</b> – PPM on applicable refrigeration systems.  <b>Proactive</b> – Monitor and inspect refrigeration systems.  <b>Reactive</b> – Response and carry out unscheduled minor repairs.                      M1-M5 measurement rules are the same as sub-element 5.13.1.</p>
	2 Ice pads: details to be stated.	nr/m <sup>2</sup>	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 <sup>2</sup>	3 Other specialist refrigeration systems.	Other specialist refrigeration systems	Other specialist refrigeration systems	
	4 Testing of installations.	item	4 Sundry items – planned procedures for specialist refrigerator systems.	Actions arising from servicing and planned inspections	Planned procedures	
	5 Commissioning of installations.	%	5 Testing and commissioning: set to works.	(include in item)	(include in item)	
			6 Work undertaken by subcontractors.	Subcontractor on costs	Subcontractor on costs	



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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewals (R)	Maintain (M)	
5.13.3	<b>Specialist mechanical installations</b> <b>Definition:</b> Specialist installations not covered by elements 5.1-5.12 or sub-elements 5.13.1 and 5.13.2.	nr/m <sup>2</sup>	1 Wave machines.	Wave machines	Wave machines	<b>Component Specifications</b> – 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. <b>Renewal Actions</b> <b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position. <b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials. <b>Maintain Actions</b> <b>Note:</b> Include for undertaking introductory site risk assessments, obtaining permits to work and complying with written procedures. <b>Planned</b> – PPM on applicable specialist mechanical systems <b>Proactive</b> – Monitor and inspect specialist mechanical systems. <b>Reactive</b> – Response and carry out unscheduled minor repairs. M1-M5 measurement rules are the same as sub-element 5.13.1.
		nr/m <sup>2</sup>	2 Saunas.	Saunas	Saunas	
		nr/m <sup>2</sup>	3 Jacuzzis.	Jacuzzis	Jacuzzis	
		nr/m <sup>2</sup>	4 Swimming pools.	Swimming pools	Swimming pools	
		nr/m <sup>2</sup>	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 <b>Specialist electrical/electronic installations</b> <b>Definition:</b> 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	<p><b>Component Specifications</b> – 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.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments; obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable special electrical systems</p> <p><b>Proactive</b> – Monitor and inspect special electrical systems.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M2 – Contractor-designed work is to be described and identified separately</p> <p>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</p>
		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	

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewals (R)	Maintain (M)	
5.13.5	<p><b>Water features</b></p> <p><b>Definition:</b> Water systems for display or decorative purposes involving the movement of water.</p>	nr	<p>1 Water features, including ornamental fountains and waterfalls.</p> <p>2 Water filtration equipment.</p> <p>3 Nutrient treatment and equipment.</p> <p>4 Final electrical connections.</p> <p>5 Control components.</p> <p>6 Sundry items – planned procedures for water feature.</p> <p>7 Testing and commissioning; set to works.</p> <p>8 Subcontractor on costs (where applicable).</p>	Water features	Water features	<p><b>Component Specifications</b> – 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.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – Remove installation, including all ancillary fittings and connections, and replace with new modern equivalent in position.</p> <p><b>Major repairs</b> – Carry out repairs on the appropriate component or sub-component parts, any size, stating type and materials.</p> <p><b>Maintain Actions</b></p> <p><b>Note:</b> Include for undertaking introductory site risk assessments; obtaining permits to work and complying with written procedures.</p> <p><b>Planned</b> – PPM on applicable water features</p> <p><b>Proactive</b> – Monitor and inspect water features.</p> <p><b>Reactive</b> – Response and carry out unscheduled minor repairs.</p> <p>M1 – Where components are to be enumerated, the number of water features components is to be stated.</p> <p>M2 – Contractor-designed work is to be described and identified separately</p> <p>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.</p>
				Water features	Water features	
				Water filtration equipment	Water filtration equipment	
				Nutrient treatment and equipment	Nutrient treatment and equipment	
				N/A	N/A	
				Control components	Control components	
				Actions arising from servicing and planned inspections	Planned procedures	
				(include in item)	(include in item)	
Subcontractor on costs	Subcontractor on costs					
Subcontractor on costs	Subcontractor on costs					
Subcontractor on costs (where applicable).	Subcontractor on costs (where applicable).					
note	note					

## 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	<p><b>Builder's work in connection with services</b></p> <p><b>Definition:</b> 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.</p>	m <sup>2</sup> /nr/ m/%	<p>1 General builder's work associated with the installation of water, gas, electrical, heating, ventilation above-ground drainage, telecommunications and other services.</p>	General builder's works	BWIC with services	<p><b>Renewal and Maintain – BWIC with services</b> to be measured as M1–M8 above.</p> <p>M1 – Where quantifiable, cost-significant builder's work in connection with services shall be separately identified and measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr).</p> <p>M2 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M3 – Where the length of a component is to be measured, the length of linear components measured is their extreme length, over all obstructions.</p> <p>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.</p> <p>M5 – The area measured is the floor area relating to each builder's work classification. The area is measured using the rules of internal floor area (GIFA).</p> <p>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).</p> <p>M7 – Other cost-significant items are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) and identified separately.</p> <p>M8 – Contractor-designed work is to be described and identified separately.</p>
				Builder's work to landlord areas	(included above)	
				Builder's work to plant rooms	(included above)	
				Large plant and equipment bases	(included above)	
				Builder's work to fuel bunds	(included above)	
	2 Builder's work to landlord areas.	m <sup>2</sup> /nr/ m/%		Builder's work to landlord areas	(included above)	
	3 Builder's work to plant rooms: details to be stated.	m <sup>2</sup> ,nr	3 Builder's work to plant rooms.	Builder's 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 <sup>2</sup> /m	5 Builder's work to fuel bunds.	Builder's 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
	<b>Actuators</b>	
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
	<b>Compressors</b>	
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 <sup>2</sup>
	<b>Controllers and sensors</b>	
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 <sup>2</sup>
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

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ID	Included components – Supplementary List of Ancillaries Components	Unit
42	Occupancy and light sensors	nr
43	Control valves	m <sup>2</sup>
	Ductwork	
44	Ductwork system – general galvanised (rectangular and circular) plastic flexible (circular)	m <sup>2</sup>
45	Ductwork ancillaries – various	m <sup>2</sup>
46	Ducting – volume control dampers and fire/smoke dampers	m <sup>2</sup>
47	Ducting – attenuators and acoustics	m <sup>2</sup>
48	Ductwork – cleaning hygiene, inspections and monitoring	m <sup>2</sup>
	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



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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 <sup>2</sup>
100	Valves – float-operated	m <sup>2</sup>
101	Valves – automatic control	m <sup>2</sup>
102	Rotary valves – shoe or slipper	m <sup>2</sup>
103	Butterfly and ball valves	m <sup>2</sup>
104	Self-acting and thermal valves	m <sup>2</sup>
105	Solenoid valves	m <sup>2</sup>

ID	Included components – Supplementary List of Ancillaries Components	Unit
106	Pressure-control valves	m <sup>2</sup>
107	Seat valves	m <sup>2</sup>
	Water treatment	
108	Ultraviolet disinfection unit	nr
109	Ozonation plant	nr
110	Chlorine dioxide low-dosing domestic water systems	nr

**Note:** 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: <b>Renewal (R)</b> – Replacement, Major repairs, Refurbishment, Upgrade work and Removals – plus Redecoration works (if measured separately) <b>Maintain (M)</b> – Planned, Proactive and Reactive/Minor Repair works <b>Note</b> – 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	<p>Minor demolition works and alteration works</p> <p><b>Definition:</b> 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.</p>	item	<p>15 Repairs to external wall cladding and covering systems.</p> <p>16 Repairs to roof coverings (e.g. tiles, slates, sheet coverings, flexible sheet coverings and asphalt).</p> <p>17 Repairs to existing rainwater installations.</p> <p>22 Repairs to sheet linings (e.g. plasterboard and timber sheeting to walls, floors and ceilings).</p> <p>26 Re-glazing.</p> <p>27 Repairs to screeds.</p> <p>28 Repairs to toppings (e.g. granolithic).</p> <p>29 Repairs to latex screeds (i.e. to existing floors).</p> <p>30 Repairs to plastered, rendered and roughcast coatings (including lathing and baseboards).</p> <p>31 Repairs to tiled finishes – walls and floors (e.g. quarry tiles, ceramic tiles, etc.).</p>	<p>Repairs to external wall coverings</p> <p>Repairs to roof coverings</p> <p>Repairs to rainwater installations</p> <p>Repairs to sheet linings</p> <p>Re-glazing</p> <p>Repairs to screeds</p> <p>Repairs to toppings</p> <p>Repairs to latex screed</p> <p>Repairs to coatings</p> <p>Repairs to tiled finishes</p>	<p>Minor demolition works and alteration works</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>	<p><b>Component Specifications</b> – To be described for each item 1–43, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules.</p> <p><b>Renewal Actions</b></p> <p><b>Major repairs</b> – To include preparation, repair and making good, as appropriate.</p> <p><b>Refurbish</b> – To include removal of existing, preparation and refurbishing, as appropriate.</p> <p><b>Maintain Actions</b></p> <p>Planned procedures for undertaking inspections and for safety performing the works.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M2 – Where the length of a component is to be measured, the length of linear components is their extreme length, over all obstructions.</p> <p>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.</p> <p>M4 – Work arising out of party wall awards/agreements is to be described and identified separately.</p> <p>M5 – Contractor-designed work is to be described and identified separately.</p>

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 <sup>2</sup>	1 Stripping out existing services installations, including pipe casings and the like. 2 Stripping out fixtures and fittings.	Stripping out services	Minor demolition works and alteration works	
				Stripping out fixtures and fittings	N/A	

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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.  5 Removing shelves, work benches and the like.  6 Removing sanitary appliances and fittings.  7 Removing parts of existing buildings.  11 Removing wall, floor and ceiling finishes.  12 Removing internal walls and partitions, including making good.  13 Removing floor construction.  14 Removing existing roof coverings.	Stripping out skirtings, dado rails, picture rails, architraves and the like  Removing shelves, work benches and the like  Removing sanitary appliances and fittings  Removing parts of existing buildings  Removing wall, floor and ceiling finishes  Removing internal walls and partitions  Removing floor construction  Removing roof coverings	N/A  N/A  N/A  N/A  N/A  N/A  N/A	
	3 Removals.	item/hr/m /m <sup>2</sup>	4 Removing kitchen fittings and appliances.	Removals	Minor demolition works and alteration works	
	4 Alteration works.		8 Cutting openings in existing work.  9 Strutting and supports to openings in walls or after removal of walls.  10 Inserting tie beams, tie rods and the like.  18 Rebuilding chimney stacks.	Cutting openings in existing work  Strutting and supports  Inserting tie beams/tie rods  Chimney stacks	Minor demolition works and alteration works  N/A  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)	
			19 Cutting back chimney breasts. 20 Rebuilding piers and columns. 21 Rebuilding walls and partitions (where not included in element 2.7: Internal walls and partitions). 23 Removing windows, doors, frames, linings, screens and the like preparatory to filling openings and/or taking down wall or partition. 24 Filling in or covering over existing openings. 25 Inserting new windows, doors, stairs, rooflights and the like into the existing building fabric. 43 Temporary screens required for alteration works.	Chimney breasts Piers and columns Walls and partitions  Windows, doors, frames, linings, screens etc.  Filling in or covering over existing openings Inserting new windows, doors, stairs, rooflights Temporary screens	N/A N/A N/A  N/A  N/A  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	1 Equipment/plant repairs.  <b>Definition:</b> Refurbishment of existing services installations, systems, equipment and plant.	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.  3 Fault finding (not part of consultant/specialist fees).  6 Renewing flue pipes.	Equipment/plant repairs	Repairs to existing services	<p><b>Component Specifications</b> – To be described for each item 1–6, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules.</p> <p><b>Renewal Actions</b></p> <p><b>Refurbishment</b> – To include removal of existing, preparation and refurbishment of existing services, as appropriate.</p> <p><b>Maintain Actions</b></p> <p><b>Reactive</b> – Minor repairs to existing services.</p> <p><b>Proactive</b> – Visual inspection of existing services.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>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).</p> <p>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.</p>
				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 <sup>2</sup>	1 Repairs to existing sanitary appliances (including clearing blockages).	Repairs to sanitary appliances	Repairs to existing services	<p>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.</p> <p>M5 – Other cost-significant items are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) and identified separately.</p> <p>M6 – Work arising out of party wall awards/agreements is to be described and identified separately.</p> <p>M7 – Contractor-designed work is to be described and identified separately.</p> <p>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.</p>
			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			
	8 Testing and commissioning; reset to works.	(included in item)	(included in item)			
	3 Testing of equipment/plant and/or installations.	%				
	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	<b>Damp-proof courses</b> <b>Definition:</b> Preventing rising damp in existing masonry walls.	m <sup>2</sup> /(item)	1 Chemical damp-proof courses, including drilling holes, injecting chemicals and making good holes.  2 Injection of mortar damp-proof courses.	Damp-proof courses	Damp-proof courses	<b>Component Specifications</b> – 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 <b>Renewal Actions</b> <b>Damp-proof courses</b> – state type and specification. <b>Maintain Actions</b> <b>Reactive</b> – Minor repairs to damp-proof courses. <b>Proactive</b> – 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.
				DPC	N/A	
			3 Inserting mechanical damp-proof courses.  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	



## 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	<p><b>Facade retention</b></p> <p><b>Definition:</b> Temporary or semi-permanent support for unstable structures or facades (i.e. structures not to be demolished).</p>	nr	<p>1 Facade retention works where existing facade is to be integrated into new building.</p> <p>2 Location surveys.</p> <p>3 Commencement and completion condition surveys.</p> <p>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).</p> <p>5 Foundations for shores.</p> <p>6 Cutting holes in existing structures for needles and the like.</p> <p>7 Design, erection, maintenance, reposition and removal of support structures.</p>	Facade retention	Facade inspection	<p><b>Component Specifications</b> – To be described for each item 1–7, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules.</p> <p><b>(FR)</b> – included as part of facade retention works</p> <p><b>Renewal Actions</b> As identified by inspection.</p> <p><b>Maintain Actions</b> <b>Reactive</b> – Minor repairs to facades. <b>Proactive</b> – Visual inspection of facades.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M2 – Work arising out of party wall awards/agreements is to be described and identified separately.</p> <p>N/A – Not applicable to renewal and/or maintain work.</p>
				(group element 11)	N/A	
				(group element 11)	N/A	
				(FR)	N/A	
				(FR)	N/A	
				(FR)	N/A	
				(FR)	N/A	
				(FR)	N/A	
				Actions arising from planned inspections	Planned procedures	
				N/A	Subcontractor on costs	
8 Periodic technical inspections.	N/A	Facade inspection				
3 Removing support structures.	nr	Included in item 7 above.	(FR)	N/A	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	<b>Cleaning</b> <b>Definition:</b> Cleaning and removing stains and deposits from existing surfaces.	m <sup>2</sup>	1 Removing efflorescence, stains, soot, graffiti, vegetation, algae, bird droppings and the like.  2 Cleaning by washing, abrasive blasting chemical treatment or other methods.  3 Artificial weathering.	N/A	Cleaning surfaces	<b>Component Specifications</b> – To be described for each item 1–3 to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. <b>Renewal Actions</b> None. <b>Maintain Actions</b> <b>Reactive</b> – Minor repairs to damp-proof courses. <b>Proactive</b> – 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.
				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	

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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	<b>Protective coatings</b> <b>Definition:</b> Coatings to protect existing surfaces, including bird/vermin-repellent coatings.	m <sup>2</sup>	1 Internal and external surfaces. 2 Specialist painting/coating systems (i.e. designed for use on concrete, masonry, steelwork or the like). 3 Lime washing, colourless waterproofers, anti-graffiti colourless coatings and the like. 4 Bird-repellent coatings and the like.	N/A	Protective coatings	<b>Component Specifications</b> – To be described for each item 1–7, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. <b>Renewal Actions</b> Actions arising from inspection <b>Maintain Actions</b> <b>Reactive</b> – Minor repairs to protective coatings. <b>Proactive</b> – 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.
				N/A	(PS)	
		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	<b>Masonry repairs</b> <b>Definition:</b> Local cutting out and reinstatement of existing brick, block or stonework and re-pointing defective joints.	nr/m/m <sup>2</sup>	1 Cutting out decayed, defective and cracked bricks, blocks or stones and inserting new (including isolated repairs, stitching and the like).  2 Plastic stone repairs.  3 Re-dressing stonework to new profiles.  4 Inserting new wall ties (without demolition).  5 Grouting.  6 Rejointing/repointing existing masonry.	Masonry repairs	Masonry inspections	<b>Component Specifications</b> – To be described for each item 1–6, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. <b>Renewal Actions</b> Actions arising from inspection. <b>Maintain Actions</b> <b>Reactive</b> – Minor repairs to masonry. <b>Proactive</b> – 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.	
				MR	MI		MR
		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		



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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	<b>Concrete repairs</b> <b>Definition:</b> Cutting out, repairing, partially replacing, resurfacing and rehabilitating eroded and defective concrete.	nr/m/m <sup>2</sup>	1 Cutting out defective concrete and replacing with new. 2 Cutting out defective reinforcement and replacing with new. 3 Cleaning and rust-proofing existing rusted reinforcement. 4 Concrete and resin/cement mixes in repairs and resurfacing, including spray-applied concrete. 5 Anchored mesh reinforcement. 6 Resin or cement impregnation/injection.	Concrete repairs	Concrete inspections	<b>Component Specifications</b> – To be described for each item 1–6, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. <b>Renewal Actions</b> Actions arising from inspection. <b>Maintain Actions</b> <b>Reactive</b> – Minor repairs to concrete. <b>Proactive</b> – 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.
				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	<b>Metal repairs</b> <b>Definition:</b> Repairing, renovating and conserving existing architectural metalwork, metal components and finishes.	nr/m/m <sup>2</sup>	1 Taking down metalwork.  2 Cleaning and restoring surface finishes.  3 Straightening. 4 Rust-proofing.  5 Metalwork repairs (e.g. welding, riveting and bolting), rejoining, reassembling and refixing.  6 Renewing surface finishes off-site.  7 Repairs to structural members (e.g. roof members and structural beams).  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)).  9 Repairs to staircases, including handrails and balustrades.	Metal repairs  MR	Metal inspections  MI	<p><b>Component Specifications</b> – To be described for each item 1–10, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules.</p> <p><b>Renewal Actions</b>                      Actions arising from inspection.</p> <p><b>Maintain Actions</b>  <b>Reactive</b> – Minor repairs to metalwork.  <b>Proactive</b> – Visual inspection of metalwork.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>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.</p>
				Actions arising from planned inspections N/A	Planned procedures Subcontractor on costs	

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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	<b>Timber repairs</b> <b>Definition:</b> Repairing, renovating and conserving existing timber structures, components and finishes.	nr/m/m <sup>2</sup>	1 Taking down existing work, cleaning and resurfacing, cutting out defective or decayed timber; piecing-in new timber; rejoining and refixing work.  2 Resin repairs to timbers.  3 Preservative/fire-retardant treatments.  4 Repairs to structural members (eg roof members and structural beams).  5 Repairs to existing windows, doors, hatches, rooflights, frames, linings and the like (including overhauling/renewing ironmongery, sash cords, opening gear and the like).  6 Repairs to staircases, including handrails and balustrades.	Timber repairs	Timber inspections	<b>Component Specifications</b> – To be described for each item 1–6, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. <b>Renewal Actions</b> Actions arising from inspection. <b>Maintain Actions</b> <b>Reactive</b> – Minor repairs to timber structures. <b>Proactive</b> – 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.
				TR	TR	
		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	<b>Plastic repairs</b> <b>Definition:</b> Repairs to plastic windows, roof lights, doors, cladding and the like.	nr/m/m <sup>2</sup>	1 Renewing domed rooflights.  2 Overhauling of windows, rooflights, doors and the like.  3 Repairs to rooflights, doors and the like.  4 Sundry items – planned procedures for the works.  5 Subcontractor on costs (where applicable).	Plastic repairs	Plastic inspections	<b>Component Specifications</b> – To be described for each item 1-3, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules. <b>Renewal Actions</b> Actions arising from inspection. <b>Maintain Actions</b> <b>Reactive</b> – Minor repairs to plastic windows, rooflights, doors and cladding. <b>Proactive</b> – Visual inspection of plastic windows, rooflights, doors and cladding.  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.
				PR	PI	
				PR	PI	
				Actions arising from planned inspections	Planned procedures	
				Subcontractor on costs	Subcontractor on costs	
note						

# 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:

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- (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	<p><b>Site clearance</b></p> <p><b>Definition:</b> 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</p>	m <sup>2</sup>	1 Clearing existing site vegetation (e.g. shrubs and undergrowth), including disposing of arisings.	N/A	N/A	<p>N/A – Not applicable to renewal and/or maintain work.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>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</p> <p>M3 – The area measured is the surface area to which the work applies.</p> <p>M4 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element.</p> <p>M5 – Work outside the curtilage of the site is to be described and identified separately.</p> <p>M6 – Contractor-designed work is to be described and identified separately. <b>Note:</b> 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).</p>		
				item	6 Sundry items – details to be stated.		N/A	N/A
					7 Subcontractor on costs (where applicable).		N/A	N/A
		nr	2 Taking down trees: details to be stated.	2 Taking down trees, including grubbing-up tree stumps and roots and disposing of arisings.	N/A		N/A	
					See item 2 above.		N/A	
							3 Protection of trees.	N/A
item	4 Tree protection: details to be stated.	3 Protection of trees.	N/A	N/A				
item/hr	5 Minor demolition works: details to be stated.	4 Minor demolition works (e.g. to outbuildings and the like).	N/A	N/A				
m <sup>2</sup>	6 Applying herbicides: details to be stated.	5 Applying herbicides before commencement of excavation works.	N/A	N/A				



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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
8.1.2 <b>Preparatory groundworks</b> <b>Definition:</b> Preparatory earthworks to form new contours	1 Forming new site contours and adjusting existing site levels: details to be stated.	m <sup>2</sup>	1 Excavation and earthworks to form new site contours and adjust existing site levels.  3 Extracting old piles, including disposal.	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 <sup>2</sup> ), 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. <b>Note:</b> 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 Breaking out existing substructures: details to be stated.	m <sup>2</sup>	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	
		8 Sundry items – details to be stated.	N/A	N/A		

Sub-element	Component	Unit	Included (aligned to NRM   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   structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
8.2.1	<p>1 Roads: details, including width (m), to be stated.</p> <p><b>Definition:</b> 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.</p>	m	<p>1 Excavation and earthworks associated with the construction of roads, paths and pavings.</p> <p>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). <b>Note:</b> 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.</p> <p>3 Disposal of surface water and groundwater.</p> <p>4 Preparation of subgrades, including applying herbicides, levelling, grading, rolling, subgrade improvement layers and geotextile membranes.</p> <p>5 Sub-bases to roads, paths and pavings (e.g. granular and soil-cement), including laying, levelling, grading and compacting.</p>	<p>Roads, paths and pavings – condition inspections</p> <p>N/A</p>	<p>Roads, paths and pavings (RPP)</p> <p>(RPP)</p> <p>(RPP)</p> <p>(RPP)</p> <p>(RPP)</p>	<p><b>Component Specifications</b> – 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.</p> <p><b>RPP</b> – included in roads, paths and pavings</p> <p><b>PPS</b> – included in paths – paving slabs</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of roads, paths and pavings, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of roads, paths and pavings, as appropriate.</p> <p><b>Refurbish</b> – To include removal of existing, preparation and refurbishing of roads, paths and pavings, as appropriate.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – Normally covered by site tours and checks; remedial works to surfacings.</p> <p><b>Proactive</b> – Visual inspection of roads, paths and pavings; design joints, etc.</p> <p><b>Reactive</b> – Minor repairs to roads, paths and pavings. <b>Note:</b> Snow clearance excluded as part of excavation works.</p>

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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.
			7 In-situ concrete to roads, paths and pavings, including formwork, reinforcements, joints, worked finishes and the like.	(RPP)	(RPP)	M2 – The length of linear components measured is their extreme length, over all obstructions.
			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)	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.
			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)	M4 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m <sup>2</sup> ), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element.
			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)	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.
			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)	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. <b>Note:</b> Applies only when the contractor is responsible for designing specific elements and/or components of the building project (ie. not the entire building project). N/A – not applicable to renewal and/ or maintain work.
			16 Uncoated stone chipping surfacings to roads, paths and pavings, including treating base with weedkiller, binders and the like.	Uncoated stone chipping surfacings	(RPP)	<b>Note:</b> Snow clearance excluded from NRM 3 (part of operation costs).

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
			<p>17 Hoggin and woodchip surfacings to roads, paths and pavings, including treating base with weedkiller, binders and the like.</p> <p>18 Perforated units as protection to grassed areas (e.g. to form roads, paths and car parking areas).</p> <p>19 Kerbs, kerb channels and the like, including concrete foundations, haunchings, kerbs and kerb accessories (standard and purpose-made kerbs).</p> <p>25 Paving accessories, including cat's eyes, tree grilles, traffic calming accessories and the like.</p> <p>30 Sundry items – details to be stated</p>	<p>Hoggin and woodchip surfacings (RPP)</p> <p>Perforated units as protection to grassed areas (RPP)</p> <p>Kerbs, kerb channels (RPP)</p> <p>Pavings accessories (RPP)</p>		
		item		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	<p>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).</p> <p>11 Frangible smoke outlet paving panels to basements.</p> <p>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.</p>	<p>Paths – paving slabs (PPS)</p> <p>Frangible smoke outlets</p> <p>Path – brick paving</p>	<p>Paths – paving slabs (PPS)</p> <p>(PPS)</p> <p>(PPS)</p>	

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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 <sup>2</sup>	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 <sup>2</sup>	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	<p><b>Special surfacings and pavings</b></p> <p><b>Definition:</b> Surfacings and pavings specially and specifically for outdoor sporting activities and general amenities.</p>	m <sup>2</sup>	<p>1 Surfacings and pavings designed specially and specifically for sports and general amenities, such as:</p> <ul style="list-style-type: none"> <li>– sheet and liquid-applied surfacings (e.g. synthetic rubber, granulated rubber, plastics and fibre)</li> <li>– synthetic tufted surfacings for ski slopes</li> <li>– proprietary coloured no-fines concrete and clay/shale surfacings and pavings.</li> </ul> <p>2 Excavation and earthworks associated with the construction of surfacings and pavings for sporting activities and general amenities.</p> <p>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).</p> <p><b>Note:</b> 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.</p>	Special surfacings and paving (SSP)	Special surfacings and pavings	<p><b>Component Specifications</b> – 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.</p> <p><b>SSP</b> – included in special surfacing and pavings.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing preparation and replacement of special surfacings and pavings, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of special surfacings and pavings, as appropriate.</p> <p><b>Refurbish</b> – To include removal of existing preparation and refurbishing of special surfacings and pavings, as appropriate.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – Normally covered by site tours/surveys.</p> <p><b>Proactive</b> – Visual inspection of special surfacings and pavings.</p> <p><b>Reactive</b> – Minor repairs to special surfacings and pavings.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p>

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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 <sup>2</sup> ), 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.
			8 Markings to surfacings and pavings.	Markings	Markings	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. <b>Note:</b> 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.



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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
8.3.1	<p><b>Seeding and turfing</b></p> <p><b>Definition:</b> Preparing soil and seeding or turfing to form lawns, parklands and other general grassed areas.</p>	m <sup>2</sup>	<p>1 Applying herbicides.</p> <p>2 Topsoil, including transporting from stockpiles or importing topsoil and spreading</p> <p>3 Cultivating topsoil, including removing stones and weeds.</p> <p>4 Fine-grading of topsoil.</p> <p>5 Providing, spreading and working in manure, compost, mulch, fertiliser, soil ameliorants and the like.</p> <p>6 Light mesh reinforcement.</p>	N/A	<p>Seeding and turfing (ST) as part of grounds maintenance, if in scope</p> <p>(ST)</p> <p>Topsoil</p> <p>(ST)</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>(ST)</p>	<p><b>Component Specifications</b> – 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.</p> <p>ST – included in seeding and turfing.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of seeding and turfing, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of seeding and turfing, as appropriate.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – PPM on applicable seeding and turfing, as applicable if a ground maintenance regime.</p> <p><b>Proactive</b> – Visual inspection of seeding and turfing.</p> <p><b>Reactive</b> – Minor repairs to seeding /turfing as appropriate.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M2 – The length of linear components measured is their extreme length, over all obstructions.</p> <p>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.</p>

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)	<p>M4 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element.</p> <p>M5 – Descriptions shall include the amount of any PC Sum included in the unit rates applied to the item.</p> <p>M6 – Work outside the curtilage of the site is to be described and identified separately.</p> <p>M7 – Contractor-designed work is to be described and identified separately. <b>Note:</b> 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).</p> <p>N/A – Not applicable to renewal and/or maintain work.</p>
			8 Turfing.	N/A	(ST)	
			10 Seeding and turfing to retaining structures.	N/A	(ST)	
			11 Initial grass cutting.	N/A	(ST)	
			13 Watering, before end of defects liability period, period for rectifying defects or maintenance period.	N/A	(ST)	
			14 Replacement seeding and turfing.	N/A	(ST)	
	2 Reinforced grass proprietary systems: details to be stated.	m <sup>2</sup>	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 <sup>2</sup>	16 Work to existing grassed areas, including scarifying, forking, fertilising, applying weedkillers, local reseeded or re-turfing, etc.	N/A	N/A	

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
8.3.2	5 Maintenance of grassed areas: details, including time period (weeks), to be stated.	m <sup>2</sup>	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	<p><b>Component Specifications</b> – 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.</p> <p>EP – included in external planting</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing preparation and replacement of external planting, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of external planting, as appropriate.</p> <p><b>Replace trees</b> – arising from storm damage /vandal damage</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – PPM on applicable external planting.</p> <p><b>Proactive</b> – Visual inspection of external planting.</p> <p><b>Reactive</b> – Minor repairs to external planting.</p>
		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	
	1 Planting: details to be stated.	m <sup>2</sup>	1 Applying herbicides. 2 Topsoil, including transporting from stockpiles or importing topsoil and spreading. 3 Cultivating topsoil, including removing stones and weeds. 4 Fine-grading of topsoil. 5 Forming raised and sunken beds, borders and the like. 6 Providing spreading and working in manure, compost, mulch, fertiliser, soil ameliorants and the like.	N/A	External planting (EP) as part of grounds maintenance, if in scope  (EP)  (EP)  N/A  (EP)  (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 <sup>2</sup> ), 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. <b>Note:</b> 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. <b>Excluded</b> – tress and woodland are not in scope of NRM 3. Refer to NRM 2 for rules of measurement for these items.

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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 <sup>2</sup>	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)	
	5 Woodland planting: details to be stated.	m <sup>2</sup>	14 Excavating and backfilling tree pits.	Trees pits	N/A	
	6 Tree surgery, thinning and pruning: details to be stated	nr	18 Woodland planting.	Excluded from NRM <sup>3</sup>	(EP)	
	7 Maintenance work to plants, shrubs and planting beds: details including time period (weeks), to be stated.	m <sup>2</sup>	19 Tree surgery, thinning and pruning.	N/A	(EP)	
	8 Maintenance work to trees: details, including time period (weeks), to be stated.	nr	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)	
			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)	
8.3.3	<p>9 Maintenance work to hedges; details, including time period (weeks), to be stated.</p> <p>1 Irrigation systems: details to be stated.</p> <p><b>Definition:</b> Piped water supply systems to landscape-planted areas or crop-planted areas providing a water supply for growing purposes.</p>	m	Maintenance works to hedges.	Hedges	Hedge maintenance	<p><b>Component Specifications</b> – 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.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing preparation and replacement of irrigation systems, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of irrigation systems, as appropriate.</p> <p><b>Refurbish</b> – To include removal of existing preparation and refurbishing of irrigation systems, as appropriate.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – PPM on applicable irrigation systems.</p> <p><b>Proactive</b> – Visual inspection of irrigation systems.</p> <p><b>Reactive</b> – Minor repairs to irrigation systems.</p> <p>MI – The area measured for irrigation systems is the surface area of land serviced by the system.</p>
		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	
		m <sup>2</sup>	1 Pipelines, including pipeline fittings and ancillaries.	Pipelines	Irrigation system (S)	
			2 Storage tanks and vessels.	Storage tanks	(S)	
			3 Chemical storage vessels.	Chemical storage vessels	(S)	
			4 Chemical dosing equipment.	Chemical dosing equipment	(S)	
	5 Nutrient treatment and equipment.	Nutrient treatments	(S)			
	6 Outlet pipes and nozzles.	Outlet pipes	(S)			
	7 Painting, anti-corrosion treatments and coating systems to storage tanks and vessels, pipelines and the like.	Painting and preservative treatments	N/A			

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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	<p>M2 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element.</p> <p>M3 – Work outside the curtilage of the site is to be described and identified separately.</p> <p>M4 – Contractor-designed work is to be described and identified separately. <b>Note:</b> 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).</p> <p>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.</p> <p>N/A – Not applicable to renewal and/or maintain work.</p>
		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		
	%	10 Testing and commissioning: reset to works.	(included in item)	(included in item)		
	2 Testing of installations.					
	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	<p><b>Fencing and railings</b></p> <p><b>Definition:</b> Fencing and railings and the like to prevent access to or from an area, or to provide light or noise screening, with associated gates.</p>	m	<p>1 Timber, metal and concrete fencing systems, including all system components.</p> <p>3 Noise/light screening, including systems applied to fencing.</p> <p>7 Fencing to provide light or noise screening, including systems attached to fencing (as item 3).</p> <p>8 Excavating, concreting and backfilling holes for posts and the like.</p> <p>9 Fixing railings to concrete and masonry</p> <p>10 Painting, coating and preservative treatments.</p>	<p>Fencing system</p> <p>Noise/light screening</p> <p>Noise light screening</p> <p>Excavating, concreting and backfilling</p> <p>Fixing railings</p> <p>Painting, coating and preservative treatments</p>	<p>Fencing (F)</p> <p>(F)</p> <p>(F)</p> <p>(F)</p> <p>(F)</p> <p>(F)</p>	<p><b>Component Specifications</b> – 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</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of fencing and railings, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of fencing and railings, as appropriate.</p> <p><b>Refurbish</b> – To include removal of existing, preparation and refurbishing of fencing and railings, as appropriate.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – PPM regime applied to fencing and railings.</p> <p><b>Proactive</b> – Visual inspection of fencing and railings.</p> <p><b>Reactive</b> – Minor repairs to fencing and railings.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M2 – The length of linear components measured is their extreme length, over all obstructions.</p>



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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	<p>M3 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element.</p> <p>M4 – Descriptions shall include the amount of any PC Sum included in the unit rates applied to the item.</p> <p>M5 – Curved work is to be described and identified separately.</p> <p>M6 – Work outside the curtilage of the site is to be described and identified separately.</p> <p>M7 – Contractor-designed work is to be described and identified separately.</p> <p><b>Note:</b> 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).</p>
	3 Gates: details to be stated.	nr	4 Gates and gate posts associated with fencing and railings.  5 Security gates and gate posts associated with fencing and railings, including mechanical and electrical operating equipment, guide rails and the like.  6 Ironmongery for gates.	Gates  Security gates	Gates  Security gates	
				Ironmongery	Ironmongery	
				Actions arising from maintenance and planned inspections	Planned inspections	
				Subcontractor on costs	Subcontractor on costs	
				Subcontractor on costs (where applicable)		

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
8.4.2	<p><b>Walls and screens</b></p> <p><b>Definition:</b> 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.</p>	m	<p>1 Masonry walls and screens (e.g. brickwork, blockwork and stonework) including foundations, reinforcement and design joints.</p> <p>3 Trench and pit excavations.</p> <p>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). <b>Note:</b> 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.</p> <p>5 Disposal of surface water and groundwater.</p> <p>6 Consolidating and compacting formation level to receive foundations.</p> <p>7 Blinding.</p>	<p>Walls (state type)</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>	<p>Walls (state type)</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>	<p><b>Component Specifications</b> – 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. <b>W</b> – included in walls and screens. <b>Renewal Actions</b> <b>Replacement</b> – To include removal of existing, preparation and replacement of walls and screens, as appropriate. <b>Major repairs</b> – To include preparation, repair and making good of walls and screens, as appropriate. <b>Refurbish</b> – To include removal of existing, preparation and refurbishing of walls and screens, as appropriate. <b>Redecoration</b> – 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. <b>Maintain Actions</b> <b>Planned</b> – PPM on applicable walls and screens. <b>Proactive</b> – Visual inspection of walls and screens. <b>Reactive</b> – Minor repairs to walls and screens. Re-pointing and rebidding pier caps and copings as necessary</p>

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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. 9 Pier caps. 10 Copings and the like.	(W) Pier caps Copings	N/A Pier caps Copings	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 <sup>2</sup> ), 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.
	2 Screens: details, including height (m), to be stated. 3 Gates: details to be stated.	m nr	2 Masonry walls and screens with timber infill panels, including foundations. 11 Gates and gate posts associated with walls and screens. 12 Security gates and gate posts associated with walls and screens, including mechanical and electrical operating equipment, guide rails and the like. 13 Ironmongery for gates.	Screens Gates Security gates	Screens Gates Security gates	<b>Note:</b> 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.
		item note	14 Sundry items – details to be stated. 15 Subcontractor on costs (where applicable).	Ironmongery Actions arising from maintenance and planned inspections Subcontractor on cost	(G&SG) Planned inspections 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	<p><b>Retaining walls</b></p> <p><b>Definition:</b> Retaining walls that are not an integral part of the building.</p>	m	<p>1 Concrete retaining walls, including reinforcement, formwork and design joints.</p> <p>2 Fixings cast into or fixed to concrete retaining walls to retain masonry facing wall (e.g. brickwork, blockwork and stonework).</p> <p>3 Masonry facing walls to concrete retaining walls (e.g. brickwork, blockwork and stonework), including reinforcement and design joints.</p> <p>4 Masonry retaining walls (e.g. brickwork, blockwork and stonework), including reinforcement and design joints.</p> <p>5 Crib walls, including timber (and preservative treatment) and precast concrete headers and stretchers, combined units, and sand and gravel filling.</p>	<p>Retaining walls – concrete (RWC)</p> <p>(RWC)</p> <p>Masonry facing walls</p> <p>Retaining walls – masonry</p> <p>Crib walls</p>	<p>Retaining walls (RW)</p> <p>(RW)</p> <p>(RW)</p> <p>(RW)</p> <p>(RW)</p>	<p><b>Component Specifications</b> – 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.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of retaining walls, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of retaining walls, as appropriate.</p> <p><b>Refurbish</b> – To include removal of existing, preparation and refurbishing of retaining walls, as appropriate.</p> <p><b>Redecoration</b> – 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.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – PPM on applicable retaining walls.</p> <p><b>Proactive</b> – Visual inspection of retaining walls.</p> <p><b>Reactive</b> – Minor repairs to retaining walls.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p>

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
			<p>6 Gabions, including steel mesh cages/mattresses and wiring together, graded stone filling and filter membranes.</p> <p>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.</p> <p>8 Other types of retaining structure.</p> <p>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.</p> <p>10 Trench and pit excavations, including earthwork support (including insertion and extraction of steel sheet piling, if used).</p> <p>11 Excavating below groundwater level.</p> <p>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).</p> <p><b>Note:</b> 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.</p>	<p>Gabions (RW)</p> <p>(RW)</p> <p>Other types of retaining structure (RW)</p> <p>Piles associated with external retaining walls N/A</p> <p>(RW)</p> <p>(RW) (RW)</p>	<p>(RW)</p> <p>(RW)</p> <p>(RW)</p> <p>N/A</p> <p>N/A</p> <p>N/A N/A</p>	<p>M2 – The length of linear components measured is their extreme length, over all obstructions.</p> <p>M3 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element.</p> <p>M4 – Descriptions shall include the amount of any PC Sum included in the unit rates applied to the item.</p> <p>M5 – Work outside the curtilage of the site is to be described and identified separately.</p> <p>M6 – Contractor-designed work is to be described and identified separately.</p> <p><b>Note:</b> 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).</p> <p>N/A – Not applicable to renewal and/or maintain work.</p>

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	

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
8.4.4	<p><b>Barriers and guardrails</b></p> <p><b>Definition:</b> External vehicle and pedestrian barriers and guardrail systems with associated gates.</p>	m	<p>1 Vehicle restraint systems including parapets.</p> <p>4 Excavating, disposal of excavated material, concreting and backfilling holes for posts and the like.</p> <p>5 Fixing barriers and guardrails to concrete and masonry.</p> <p>6 Painting, coating and the like.</p>	Vehicle restraint (VS)	Barriers and guardrails (BG)	<p><b>Component Specifications</b> – 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.</p> <p>VRS – included in vehicle restraint systems</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of barriers and guardrails, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of barriers and guardrails, as appropriate.</p> <p><b>Refurbish</b> – To include removal of existing, preparation and refurbishing of barriers and guardrails, as appropriate.</p> <p><b>Redecoration</b> – 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.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – PPM on applicable barriers and guardrails.</p> <p><b>Proactive</b> – Visual inspection of barriers and guardrails.</p> <p><b>Reactive</b> – Minor repairs to barriers and guardrails.</p>
				(VR)	(BG)	
				Redecoration works (BG)		
	<p>2 Pedestrian restraint systems: details to be stated.</p>	m	<p>2 Pedestrian restraint systems, including parapets.</p>	Pedestrian restraint systems	Barriers and guardrails	<p><b>Maintain Actions</b></p> <p><b>Planned</b> – PPM on applicable barriers and guardrails.</p> <p><b>Proactive</b> – Visual inspection of barriers and guardrails.</p> <p><b>Reactive</b> – Minor repairs to barriers and guardrails.</p>
	<p>3 Vehicle and pedestrian control barriers and gates: details to be stated.</p>	nr		<p>3 Vehicle and pedestrian control barriers and gates not associated with fencing.</p>	Control barriers and gates	

Sub-element	Component	Unit	Included (aligned to NRM I 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 <sup>2</sup> ), 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. <b>Note:</b> 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	<p><b>Site/street furniture and equipment (SSFE)</b></p> <p><b>Definition:</b> Furniture and equipment designed for use externally, but excluding items provided by a statutory undertaker.</p>	nr	<p>1 Gates – where not part of fencing railings, walls, screens, barriers or guardrails.</p> <p>2 Turnstiles.</p> <p>3 Bollards, including removable and collapsible.</p> <p>4 Seats, benches and tables.</p> <p>5 Litter bins, grit bins and dustbins (including continental bins).</p> <p>6 Poster display units and notice boards.</p>	<p>Gates</p> <p>Turnstiles</p> <p>Bollards</p> <p>Seats and benches</p> <p>Litter bins</p> <p>Poster display units/notice boards</p>	<p>Gates</p> <p>Turnstiles</p> <p>Bollards</p> <p>N/A</p> <p>N/A</p> <p>Poster display units/notice boards</p>	<p><b>Renewal Actions</b>  <b>Replacement</b> – To include removal of existing, preparation and replacement of site/street furniture and equipment, as appropriate.  <b>Major repairs</b> – To include preparation, repair and making good of site/street furniture and equipment, as appropriate.  <b>Refurbish</b> – To include removal of existing, preparation and refurbishing of site/street furniture and equipment, as appropriate.  <b>Redecoration</b> – 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.  <b>Component Specifications</b> – 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  <b>Maintain Actions</b>  <b>Planned</b> – PPM on applicable site/street furniture and equipment.  <b>Proactive</b> – Visual inspection of site/street furniture and equipment.  <b>Reactive</b> – Minor repairs to site/street furniture and equipment.</p>

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.
			8 Directional signs, including reflective traffic signs.	Directional signage	Directional signage	M2 – Work outside the curtilage of the site is to be described and identified separately.
			9 Flagpoles.	Flagpoles	Flagpoles	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).
			10 Sports and playground equipment to be used externally.	Sports/playground equipment	Sports/playground equipment	N/A – Not applicable to renewal and/or maintain work.
			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	(SFE)	
			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	(SFE)	
		item	20 Sundry items – details to be stated	Actions arising from maintenance and planned inspections	Planned inspections	

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
8.5.2	<b>Ornamental features</b> <b>Definition:</b> Ornamental water features and the like.	note	2   Subcontractor on costs (where applicable)	Subcontractor on costs	Subcontractor on costs	<p><b>Component Specifications</b> – To be described for each item, to determine the appropriate reference service life and to assign the applicable planned maintenance task schedules.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of ornamental features, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of ornamental features, as appropriate.</p> <p><b>Refurbish</b> – To include removal of existing, preparation and refurbishing of ornamental features, as appropriate.</p> <p><b>Redecoration</b> – 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.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – PPM on applicable ornamental features.</p> <p><b>Proactive</b> – Visual inspection of ornamental features.</p> <p><b>Reactive</b> – Minor repairs to ornamental features.</p> <p>MI – Where components are to be enumerated, the number of components is to be stated.</p>
		nr	1   Water features and the like.	Water features	Water features	
			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. <b>Note:</b> 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	<p>1 Connections to statutory undertaker's sewers: details to be stated.</p> <p>2 Drainage runs, below ground: details, including depth of trench (m) and nominal pipe size (mm), to be stated.</p>	nr	<p>1 Connection to statutory undertaker's sewer or sewers.</p>	N/A	N/A	<p><b>Component Specifications</b> – 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.</p> <p>GG – included in gullies and gratings</p> <p>SWFWD – included in surface water and foul water drainage</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of surface water and foul water drainage, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of surface water and foul water drainage, as appropriate.</p> <p><b>Refurbish</b> – To include removal of existing, preparation and refurbishing of surface water and foul water drainage, as appropriate.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – PPM on applicable surface water and foul water drainage.</p> <p><b>Proactive</b> – Visual inspection of surface water and foul water drainage.</p> <p><b>Reactive</b> – Minor repairs to surface water and foul water drainage.</p> <p>MI – Where components are to be enumerated, the number of components is to be stated.</p>
		m	<p>2 Trenches for pipework, including excavation, earthwork support, backfilling and disposal of surplus material.</p> <p>3 Pipeline and pipeline fittings.</p> <p>4 Granular beds and surrounds, concrete beds, cradles, haunchings and surrounds, and foamed concrete backfill.</p> <p>6 Connections to manholes and the like.</p> <p>7 Connections to above-ground soil stacks, sanitary appliances and wastes.</p> <p>8 Connections to ancillary equipment and systems (e.g. pumping stations and sewage treatment vessels).</p>	<p>(Taken with pipeline)</p> <p>Pipeline and pipeline fittings</p> <p>Pipeline bedding, haunching and surrounds</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>	<p>N/A</p> <p>Surface water and foul water drainage (SWFWD)</p> <p>(SWFWD)</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>	

Subelement	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
			<p>9 Gullies and gratings, including road gullies and gratings.</p> <p>10 Rodding and access points.</p> <p>20 Connections to sewers, where not statutory undertaker's sewers.</p> <p>21 Connections to ancillary drainage systems.</p>	<p>Gullies and gratings</p> <p>Rodding and access points</p> <p>N/A</p> <p>N/A</p>	<p>Gullies and gratings (G&amp;G)</p> <p>(G&amp;G)</p> <p>N/A</p> <p>N/A</p>	<p>M2 – The length of linear components measured is their extreme length, over all branches fittings and the like.</p> <p>M3 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element.</p> <p>M4 – Work outside the curtilage of the site is to be described and identified separately.</p> <p>M5 – Contractor-designed work is to be described and identified separately. <b>Note:</b> 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).</p>
	<p>3 Drainage runs, above ground: details, including height above-ground (m) and nominal size of pipe (mm), to be stated.</p>	m	<p>5 Supports for above-ground drainage, including earth embankments.</p> <p>18 Packaged pumping stations.</p> <p>19 Outfalls/outlet headwalls.</p> <p>22 Painting, anti-corrosion treatments and coating systems to drainage above ground.</p> <p>23 Builder's work in connection with external surface water and foul water drainage.</p>	<p>Supports for above-ground drainage</p> <p>Packaged pumping stations</p> <p>Outfalls/outlet headwalls</p> <p>Painting, anti-corrosion treatments and coating systems</p> <p>N/A</p>	<p>N/A</p> <p>Packaged pumping stations (SWFWD)</p> <p>(SWFWD)</p> <p>N/A</p>	<p>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.</p> <p>N/A – Not applicable to renewal and/or maintain work.</p>

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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. 13 Inspection chambers, manholes and catch pits, including channels, benchings, step irons, access covers and other accessories. 14 Soakaways. 15 Retention/storage tanks and vessels. 16 Cesspools and septic tanks. 17 Petrol interceptor units.	Interceptor traps and fresh air inlets  Inspection chambers, manholes and catch pits  Soakaways Retention/storage tanks and vessels Cesspools and septic tanks Petrol interceptor units	(SWFWD)  (SWFWD)  (SWFWD) N/A Septic tanks 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	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	N/A	
	8 Clearing existing drains: details to be stated.	nr/m	26 Clearing existing drains.	N/A	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	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	



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Subelement	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
8.6.2	<p>1 Pumping stations: details to be stated.</p> <p><b>Definition:</b> 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.</p>	nr	<p>1 Pumping stations.</p> <p>7 Control components located externally.</p> <p>8 Monitoring equipment located externally.</p> <p>9 Painting, anti-corrosion treatments and coating systems to ancillary drainage systems.</p> <p>10 Builder's work in connection with the provision of ancillary drainage equipment and systems.</p>	<p>Pumping stations</p> <p>Control components</p> <p>Monitoring equipment</p> <p>Painting, anti-corrosion treatments and coating systems</p> <p>N/A</p>	<p>Ancillary drainage systems (ADS)</p> <p>(ADS)</p> <p>(ADS)</p> <p>(ADS)</p> <p>N/A</p> <p>Planned inspections</p>	<p><b>Component Specifications</b> – 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.</p> <p>ADS – included in ancillary drainage systems</p> <p><b>Renewal Actions</b> <b>Replacement</b> – To include removal of existing, preparation and replacement of ancillary drainage systems, as appropriate. <b>Major repairs</b> – To include preparation, repair and making good of ancillary drainage systems, as appropriate. <b>Refurbish</b> – To include removal of existing, preparation and refurbishing of ancillary drainage systems, as appropriate.</p> <p><b>Maintain Actions</b> <b>Planned</b> – PPM on applicable ancillary drainage systems. <b>Proactive</b> – Visual inspection of ancillary drainage systems. <b>Reactive</b> – Minor repairs to ancillary drainage systems.</p> <p>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.</p>
		item	<p>11 Sundry items associated with the provision of ancillary drainage equipment: details to be stated.</p>	<p>Actions arising from maintenance and planned inspections</p>	<p>Planned inspections</p>	

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	<p>M4 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element.</p> <p>M5 – Work outside the curtilage of the site is to be described and identified separately.</p> <p>M6 – Contractor-designed work is to be described and identified separately. <b>Note:</b> 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).</p> <p>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.</p>
	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 <sup>2</sup>	6 Sustainable urban drainage schemes (SUDS).	Sustainable urban drainage schemes	Ancillary Drainage Systems	
	7 Testing of installations.	%	12 Testing and commissioning: set to works	(included in item)	(included in item)	
	8 Commissioning of installations.					

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Subelement	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
8.6.3	<p>1 Drainage runs, below ground: details, including depth of trench (m) and nominal size of pipe (mm), to be stated.</p> <p><b>Definition:</b> Laboratory/industrial waste drainage, from the external face of the external wall to the point of disposal.</p>	m	<p>1 Trenches for pipework, including excavation, earthwork support, backfilling and disposal of surplus material.</p> <p>2 Pipework and pipework fittings.</p> <p>3 Granular beds and surrounds, concrete beds, cradles, haunchings and surrounds, and foamed concrete backfill.</p> <p>5 Connections, tanks and the like.</p> <p>11 Connections to equipment</p> <p>14 Painting anti-corrosion treatment and coating systems to drainage pipelines.</p> <p>15 Builder's work in connection with external laboratory and industrial liquid waste drainage.</p>	N/A	External chemical, toxic and industrial liquid waste drainage	<p><b>Component Specifications</b> – 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.</p> <p>ECTILWD – included in external chemical, toxic and industrial liquid waste drainage</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing preparation and replacement of external laboratory and industrial liquid waste drainage, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of external laboratory and industrial liquid waste drainage, as appropriate.</p> <p><b>Refurbish</b> – To include removal of existing preparation and refurbishing of external laboratory and industrial liquid waste drainage, as appropriate.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – PPM on applicable external laboratory and industrial liquid waste drainage.</p> <p><b>Proactive</b> – Visual inspection of external laboratory and industrial liquid waste drainage.</p> <p><b>Reactive</b> – Minor repairs to external laboratory and industrial liquid waste drainage.</p>
				<p>11 Connections to equipment</p> <p>14 Painting anti-corrosion treatment and coating systems to drainage pipelines.</p> <p>15 Builder's work in connection with external laboratory and industrial liquid waste drainage.</p>	<p>(ECTILWD)</p> <p>(ECTILWD)</p> <p>(ECTILWD)</p> <p>N/A</p> <p>N/A</p> <p>(ECTILWD)</p> <p>N/A</p>	
		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)	
				Subcontractor on costs	Subcontractor on costs	M1 – Where components are to be enumerated, the number of components is to be stated.
	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)	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 <sup>2</sup> ), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element.
	3 Equipment and plant: details to be stated.	nr	6 Storage tanks and vessels.  7 Settlement tanks.  8 Effluent treatment plant.  9 Dosing equipment.  10 Sterilisation equipment.  12 Control components located externally. 13 Monitoring equipment located externally.	Storage tanks	Storage tanks	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. <b>Note:</b> 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.

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Subelement	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
8.6.4	4 Testing of installations.	%	17 Testing and commissioning; set to works	(include in item)	(include in item)	
	5 Commissioning of installations.					
	<p><b>Land drainage</b></p> <p><b>Definition:</b> Disposal systems for drainage of waterlogged ground.</p>	m	<p>1 Filter drains, with or without pipes.</p> <p>2 Fin drains, with or without pipes.</p> <p>3 Mole drains.</p> <p>4 Trenchless drains.</p> <p>5 Pipe drains, including fittings.</p> <p>7 Trenches for pipework, including excavation, earthwork support, backfilling and disposal of surplus material.</p> <p>8 Pipework and pipework fittings (to point of disposal).</p>	<p>Filter drains</p> <p>Fin drains</p> <p>Mole drains</p> <p>Trenchless drains</p> <p>Pipe drains</p> <p>Trenches for pipework</p> <p>Pipework and pipework fittings</p>	<p>Land drainage (LD)</p> <p>(LD)</p> <p>(LD)</p> <p>(LD)</p> <p>(LD)</p> <p>(LD)</p> <p>(LD)</p>	<p><b>Component Specifications</b> – 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.</p> <p>LD – included in land drainage</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of land drainage, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of land drainage, as appropriate.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – PPM on applicable land drainage.</p> <p><b>Proactive</b> – Visual inspection of land drainage.</p> <p><b>Reactive</b> – Minor repairs to land drainage.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M2 – The length of linear components measured is their extreme length, over all branches fittings and the like.</p> <p>M3 – The area measured for drainage blankets is the surface area of land serviced by the blanket.</p> <p>M4 – The area measured for land drainage to parklands is the surface area of parkland.</p>

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 <sup>2</sup> ), 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.																				
											11 Silt traps, silt trap manholes and the like.	Silt traps/silt trap manholes	(LD)	M7 – Work outside the curtilage of the site is to be described and identified separately.																
															14 Outfalls/outlet headwalls.	Outfalls	(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.												
																			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. <b>Note:</b> 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).				
																											17 Sundry item – details to be stated.	Actions arising from maintenance and planned inspections	Planned inspections	
																											2 Manholes and the like: details, including depth (m), to be stated.	Soakaways	Land drainage	
																											6 Drainage blankets (e.g. comprising layer of aggregate, porous pipes and upper/lower geotextile pipes).	Drainage blanket	N/A	

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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.



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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
8.7.1	<p>Connections to statutory undertaker's water main; details to be stated.</p> <p><b>Water mains supply</b>  <b>Definition:</b>                      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.</p>	nr	<p>1 Connections to statutory undertaker's water main.</p> <p>5 Water meters, where not provided by the statutory undertaker, including chambers and enclosures.</p> <p>6 Fire hydrants.</p> <p>7 Trace heating – pipeworks.</p> <p>8 Thermal insulation.</p>	<p>Connections to water mains</p> <p>Meters</p> <p>Hydrants</p> <p>Trace heating</p> <p>Thermal insulation</p>	<p>Water mains supply (WMS)</p> <p>(WMS)</p> <p>Hydrants</p> <p>Trace heating</p> <p>Thermal insulation</p>	<p><b>Renewal Actions</b>  <b>Replacement</b> – To include removal of existing, preparation and replacement of water mains supply, as appropriate.  <b>Major repairs</b> – To include preparation, repair and making good of water mains supply, as appropriate.  <b>Maintain Actions</b>  <b>Planned</b> – PPM on applicable water mains supply.  <b>Proactive</b> – Visual inspection of water mains supply.  <b>Reactive</b> – 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.  <b>Component Specifications</b> – 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</p>

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)	<p>M3 – The length of linear components measured is their extreme length, over all branches fittings and the like.</p> <p>M4 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element.</p> <p>M5 – Work outside the curtilage of the site is to be described and identified separately.</p> <p>M6 – Contractor-designed work is to be described and identified separately. <b>Note:</b> 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).</p> <p>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.</p>
	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.		12 Sundry items – details to be stated.	Actions arising from maintenance and planned inspections	Planned inspections	

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
8.7.2	Electricity mains supply <b>Definition:</b> 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.	note	14 Subcontractor on costs (where applicable).	Subcontractor on cost	Subcontractor on costs	
		nr	1 Connections to statutory undertaker's electricity main. 2 Distribution of HV electricity to on-site transformer, including cables, excavating and backfilling trenches and the like. 4 Distribution of LV electricity to main switchgear panel within the building, including excavating and backfilling trenches and the like. 5 Constructing draw pits, including access covers. 6 Marker tape, cover tiles and other special protection for electrical cables.	N/A	Electricity mains supply	<p><b>Component Specifications</b> – 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.</p> <p><b>EMS</b> – included in electricity mains supply</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of electricity mains supply, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of electricity mains supply, as appropriate.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – PPM on applicable electricity mains supply.</p> <p><b>Proactive</b> – Visual inspection of electricity mains supply.</p> <p><b>Reactive</b> – Minor repairs to electricity mains supply.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M2 – The length of linear components measured is their extreme length, over all obstructions.</p>

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
8.7.3	<p><b>External transformation devices</b></p> <p><b>Definition:</b> Systems using the natural elements (i.e. wind turbines and sun) to generate energy.</p>	item	8 Sundry items – details to be stated.	Actions arising from maintenance and planned inspections	Planned inspections	<p>M3 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element.</p> <p>M4 – Work outside the curtilage of the site is to be described and identified separately.</p> <p>M5 – Contractor-designed work is to be described and identified separately. <b>Note:</b> 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).</p> <p>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.</p> <p><b>Component Specifications</b> – 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.</p> <p><b>ETD</b> – included in external transformation devices</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of external transformation devices, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of external transformation devices, as appropriate.</p>
		nr	4 External electricity generation installation/plant: details to be stated.	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	
		nr	1 Wind turbines: details to be stated.	Wind turbines	External transformation devices (ETD)	
			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)	

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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)	<p><b>Maintain Actions</b>  <b>Planned</b> – PPM on applicable external transformation devices.  <b>Proactive</b> – Visual inspection of external transformation devices.  <b>Reactive</b> – Minor repairs to external transformation devices.</p> <p>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. <b>Note:</b> 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.</p>
		nr	9 Sundry items – details to be stated	Actions arising from maintenance and planned inspections	Planned inspections	
		note	10 Subcontractor on costs (where applicable)	Subcontractor on costs	Subcontractor on costs	
	2 Photovoltaic devices: details, including surface area of units (m <sup>2</sup> ), to be stated.	nr	2 Photovoltaic devices where external to the building.	Photovoltaic devices	(ETD)	
	3 Other transformation devices: details to be stated.		3 Solar collectors where external to the building. See item 6 above.	Solar collectors	(ETD)	
			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.	%	1   Testing and commissioning: set to work.	(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	<p>1 Connections to external plant or equipment: details to be stated.</p> <p><b>Definition:</b> Subcircuit power installations from the subdivision 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.</p>	nr	<p>1 General low voltage (LV) power installations to external plant and equipment, including cables, excavating and backfilling trenches and the like.</p> <p>2 LV switchgear and distribution boards, where not included as part of the submain distribution.</p> <p>3 Uninterruptible power supply (UPS) installations and the like, specific to external plant and equipment.</p> <p>4 Cables and wiring, including support components from subdivision boards to fuse connection units and the like.</p> <p>5 Conduits and cable trunking, including all fittings and support components.</p> <p>6 Earthing and bonding components.</p> <p>7 Constructing draw pits, including access covers.</p>	<p>LV power installations</p> <p>LV switchgear and distribution board</p> <p>UPS</p> <p>LV cables and wiring</p> <p>Conduits, cable trunking and supports</p> <p>Earthing and bonding</p> <p>Draw pits</p>	<p>Electricity distribution</p> <p>(EDEPE)</p> <p>(EDEPE)</p> <p>UPS</p> <p>(EDEPE)</p> <p>(EDEPE)</p> <p>Earthing and bonding</p>	<p><b>Component Specifications</b> – 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.</p> <p>EDEPE – included in electrical distribution external plant and equipment</p> <p>UPS – uninterruptible power supply</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of electricity distribution to external plant and equipment, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of electricity distribution to external plant and equipment, as appropriate.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – PPM on applicable electricity distribution to external plant and equipment.</p> <p><b>Proactive</b> – Visual inspection of electricity distribution to external plant and equipment.</p> <p><b>Reactive</b> – Minor repairs to electricity distribution to external plant and equipment.</p> <p>M1 – Where components are to be enumerated, the number of components is to be stated.</p>

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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)	<p>M2 – The length of linear components measured is their extreme length, over all obstructions.</p> <p>M3 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element.</p> <p>M4 – Work outside the curtilage of the site is to be described and identified separately.</p> <p>M5 – Contractor-designed work is to be described and identified separately. <b>Note:</b> 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).</p> <p>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.</p> <p>N/A – Not applicable to renewal and/or maintain work.</p>
			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	<b>Gas mains supply</b> <b>Definition:</b> 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).	nr	1 Connections to statutory undertaker's gas main. <b>Note:</b> Items numbered 5 to 9 below are numbered 3 to 7 in NRM 1.	N/A	Gas mains supply	<b>Component Specifications</b> – 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. <b>Renewal Actions</b> <b>Replacement</b> – To include removal of existing, preparation and replacement of gas mains supply, as appropriate. <b>Major repairs</b> – To include preparation, repair and making good of gas mains supply, as appropriate. <b>Maintain Actions</b> <b>Planned</b> – PPM on applicable gas mains supply. <b>Proactive</b> – Visual inspection of gas mains supply. <b>Reactive</b> – 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	



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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
			<p>3 Connections to external plant and equipment.</p> <p>4 Mains gas supply and distribution of gas supply to external plant and equipment, including pipelines and fittings, excavation and backfilling trenches.</p>	N/A		<p>M3 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element.</p> <p>M4 – Work outside the curtilage of the site is to be described and identified separately.</p> <p>M5 – Contractor-designed work is to be described and identified separately. <b>Note:</b> 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).</p> <p>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</p>
	<p>3 Governing stations: details to be stated.</p> <p>4 Testing of installations.</p> <p>5 Commissioning of installations.</p>	nr	<p>5 Governing stations.</p> <p>6 LPG installations, including storage bottles and containers, pipelines and fittings to gas distribution points in building.</p> <p>8 Testing and commissioning: set to works</p>	<p>Governing stations</p> <p>LPG installations</p> <p>(include in item)</p>	<p>Gas mains supply</p> <p>(include in item)</p>	

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
8.7.6	<p>1 Telecommunication system connections: details to be stated.</p> <p><b>Definition:</b> 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.</p>	nr	<p>1 Connections to statutory undertaker's or service provider's supply.</p> <p>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.</p> <p>3 Constructing draw pits, including access covers.</p> <p>4 Marker tape, cover tiles and other special protection for electrical cables.</p> <p>5 Sundry items – details to be stated.</p>	<p>N/A</p> <p>Telecomm distribution systems</p> <p>Draw pits</p> <p>Marker tape</p>	<p>Telecommunications and other communication system connections (TOCSC)</p> <p>(inc.)</p> <p>(inc.)</p> <p>(inc.)</p> <p>Planned inspections</p>	<p><b>Component Specifications</b> – 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.</p> <p><b>TOCSC</b> – telecommunication and other communication systems connections.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of TOCSC, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of TOCSC, as appropriate.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – PPM on applicable TOCSC.</p> <p><b>Proactive</b> – Visual inspection of TOCSC.</p> <p><b>Reactive</b> – Minor repairs to TOCSC.</p>
	<p>2 Cable television connections: details to be stated.</p>	nr	<p>Cable television connections.</p>	<p>N/A</p>	<p>(TOCSC)</p>	<p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M2 – The length of linear components measured is their extreme length, over all obstructions.</p> <p>M3 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element.</p>

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
8.7.7	3 Other communication system connections; details to be stated.		Other communication systems.	N/A	(TOCSC)	<p>M4 – Work outside the curtilage of the site is to be described and identified separately.</p> <p>M5 – Contractor-designed work is to be described and identified separately. <b>Note:</b> 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).</p> <p>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.</p> <p><b>Component Specifications</b> – 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.</p> <p><b>FSPD</b> – included in fuel storage and piped distribution system.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of fuel storage and piped distribution systems, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of fuel storage and piped distribution systems, as appropriate.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – PPM on applicable fuel storage and piped distribution systems.</p> <p><b>Proactive</b> – Visual inspection of fuel storage and piped distribution systems.</p> <p><b>Reactive</b> – Minor repairs to fuel storage and piped distribution systems.</p>
	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)		
	6 Commissioning of installations.					
	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)	
	<b>External fuel storage and piped distribution systems</b> <b>Definition:</b> 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.	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 <sup>2</sup> ), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element.
		nr/(m <sup>2</sup> )	8 Thermal insulation.	Thermal insulation	Thermal insulation	M4 – Work outside the curtilage of the site is to be described and identified separately.
		nr/(m <sup>2</sup> )	9 Off-site painting/anti-corrosion treatments.	(Taken in item 4)	(FSPD)	M5 – Contractor-designed work is to be described and identified separately. <b>Note:</b> 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	

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
8.7.8	2 Service runs: details to be stated.	m	See item 5-11 above.	Service runs	(FSPD)	<p><b>Component Specifications</b> – 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</p> <p><b>Renewal Actions</b> <b>Replacement</b> – To include removal of existing, preparation and replacement of external security systems, as appropriate. <b>Major repairs</b> – To include preparation, repair and making good of external security systems, as appropriate.</p> <p><b>Maintain Actions</b> <b>Planned</b> – PPM on applicable external security systems. <b>Proactive</b> – Visual inspection of external security systems. <b>Reactive</b> – Minor repairs to external security systems.</p>
	3 Testing of installations.	%	13 Testing and commissioning: set to works.	(include in item)	(include in item)	
	4 Commissioning of installations.					
	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)	
			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	<p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>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.</p> <p>M3 – The length of linear components measured is their extreme length, over all obstructions.</p> <p>M4 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element.</p> <p>M5 – Work outside the curtilage of the site is to be described and identified separately.</p> <p>M6 – Contractor-designed work is to be described and identified separately. <b>Note:</b> 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).</p> <p>M7 – State if external security systems are included with building security systems (cross-reference to sub-element 5.12.2: Security systems).</p> <p>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.</p>
		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)	

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
8.7.9	7 Other security systems: details of each type of system to be stated.		7 Other security systems.	Other security systems	(ESS)	<p><b>Component Specifications</b> – 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.</p> <p><b>SSS</b> – included in sites/ street lighting systems</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of site/street lighting systems, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of site/street lighting systems, as appropriate.</p> <p><b>Maintain Actions</b></p> <p><b>Planned</b> – PPM on applicable site/street lighting systems.</p> <p><b>Proactive</b> – Visual inspection of site/street lighting systems.</p> <p><b>Reactive</b> – Minor repairs to site/street lighting systems.</p>
	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.					
	<b>Site/street lighting systems</b>		1 External lighting, columns, poles, bollards, masts, luminaires and lamps, cables and lighting to external surfaces/areas.	External lighting	Site/street lighting systems (SSLS)	
	<b>Definition:</b> External illumination systems, including lighting to pedestrian areas, paths and roads, and illuminated traffic signs.	nr	2 Fixing luminaires and lamps to building fabric.	Luminaires and lamps	(SSLS)	
			4 General power installations to external illumination systems, including cables, excavating and backfilling trenches and the like.	General power installations	(SSLS)	
			5 Constructing draw pits, including access covers.	Draw pits	(SSLS)	
			6 Marker tape, cover tiles and other special protection for electrical cables.	Marker tape	(SSLS)	

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)	<p>M1 – Where components are to be enumerated, the number of components is to be stated.</p> <p>M2 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element.</p> <p>M3 – Work outside the curtilage of the site is to be described and identified separately.</p> <p>M4 – Contractor-designed work is to be described and identified separately. <b>Note:</b> 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).</p> <p>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.</p>
			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)	
		nr	See items in component 1 – External lighting to pedestrian areas, as appropriate.	Site/street lighting systems		
	2 External lighting to paths: details to be stated.		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.		3 Illuminated traffic signs.	Illuminated traffic signs		
	4 Illuminated traffic signs: details to be stated.		1   Testing and commissioning: set to works.	(include in item)		
	5 Testing of installations.	%	10 Sundry items – details to be stated.	Actions arising from maintenance and planned inspections	Planned inspections	
	6 Commissioning of installations.	item	12 Subcontractor on costs (where applicable).	Subcontractor on costs	Subcontractor on costs	



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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
8.7.10	<b>Local/district heating installations</b> <b>Definition:</b> Local/district heating installations, including heat source.	item/nr	1 Externally located heat source (e.g. boiler plant), including ancillary plant and equipment.  2 Instrumentation and control components to heat source.  5 Instrumentation and control components to heating systems.  6 Thermal insulation.	Heat source, associated plant and equipment	Local/district heating installations (LDHI)	<b>Component Specifications</b> – 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. <b>LDHI</b> - included in local district heating installations <b>Renewal Actions</b> <b>Replacement</b> – To include removal of existing, preparation and replacement of local/district heating systems, as appropriate. <b>Major repairs</b> – To include preparation, repair and making good of local/district heating systems, as appropriate. <b>Maintain Actions</b> <b>Planned</b> – PPM on applicable local/district heating systems. <b>Proactive</b> – Visual inspection of local/district heating systems. <b>Reactive</b> – 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
				Instrumentation and control components	(LDHI)	
				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)	<p>M3 – The length of linear components measured is their extreme length, over all obstructions.</p> <p>M4 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element.</p> <p>M5 – Work outside the curtilage of the site is to be described and identified separately.</p> <p>M6 – Contractor-designed work is to be described and identified separately. <b>Note:</b> 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).</p> <p>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.</p>
	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	
8.7.1.1	<p>1 Ducts and the like: details to be stated.</p> <p><b>Builder's work in connection with external services</b></p> <p><b>Definition:</b> Sundry builder's work associated with the installation of water, gas, electricity, heating, ventilation, above-ground drainage, telecommunications and other services.</p>	nr/m	<p>1 Ducts and the like for external mains services.</p> <p>7 On-site painting or anti-corrosion treatments of mechanical services equipment, including fuel storage tanks and vessels, pipelines and the like.</p> <p>8 Forming/cutting holes, mortices, sinkings, chases and the like, including making good.</p>	Ducts	<p>Builder's work in connection with external services (BWIC)</p> <p>(BWIC)</p> <p>N/A</p>	<p><b>Component Specifications</b> – 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.</p> <p><b>Renewal Actions</b></p> <p><b>Replacement</b> – To include removal of existing, preparation and replacement of builder's work in connection with external services, as appropriate.</p> <p><b>Major repairs</b> – To include preparation, repair and making good of builder's work in connection with external services, as appropriate.</p>

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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)	<p><b>Maintain Actions</b>  <b>Planned</b> – PPM on applicable builder's work in connection with external services.  <b>Proactive</b> – Visual inspection of builder's work in connection with external services.  <b>Reactive</b> – 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.</p>
			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	<p>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.</p> <p>M5 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element.</p> <p>M6 – Work to existing buildings is to be described and identified separately.</p> <p>M7 – Work outside the curtilage of the site is to be described and identified separately.</p> <p>M8 – Contractor-designed work is to be described and identified separately. <b>Note</b> – 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).</p> <p>N/A – Not applicable to renewal and/or maintain work.</p>
		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)	

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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	<p><b>Minor building works</b></p> <p><b>Definitions:</b>                      Refurbishment of and alteration to existing separate external small ancillary buildings, including overhauling existing mechanical and electrical plant and equipment</p>	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 <sup>2</sup> ), 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. <b>Note:</b> 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	

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Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works
				Renewal (R)	Maintain (M)	
8.8.2	<p><b>Ancillary buildings and structures</b></p> <p><b>Definition:</b> Separate external small ancillary building and structures, including specialist structures</p>	nr	<p>1 Boiler houses.</p> <p>2 Substation buildings or housings, where not supplied and installed by the statutory undertaker.</p> <p>3 Fuel storage buildings and the like.</p> <p>4 Specialist structures (e.g. external cooling towers).</p> <p>5 Bicycle stores.</p> <p>6 Prefabricated/timber workshops, sheds, stores and the like.</p> <p>7 Guard huts and the like.</p> <p>8 Canopies to external areas.</p>	<p>Boiler houses</p> <p>Substation buildings or housings</p> <p>Fuel storage buildings</p> <p>Specialist structures</p> <p>Bicycle stores</p> <p>Prefabricated/timber workshops, sheds, stores</p> <p>Guard huts</p> <p>Canopies to external areas</p>	<p>Ancillary buildings and structures (ABS)</p> <p>(ABS)</p> <p>(ABS)</p> <p>(ABS)</p> <p>(ABS)</p> <p>(ABS)</p> <p>(ABS)</p> <p>(ABS)</p>	<p><b>Renewal Actions</b> <b>Replacement</b> – To include removal of existing preparation and replacement of ancillary buildings and structures, as appropriate. <b>Major repairs</b> – To include preparation, repair and making good of ancillary buildings and structures, as appropriate. <b>Component Specifications</b> – 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.</p> <p><b>Maintain Actions</b> <b>Planned</b> – PPM on applicable ancillary buildings and structures. <b>Proactive</b> – Visual inspection of ancillary buildings and structures. <b>Reactive</b> – Minor repairs to ancillary buildings and structures</p> <p>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.</p>

Sub-element	Component	Unit	Included (aligned to NRM 1 structure)	Maintenance descriptor		Measurement rules for maintenance works	
				Renewal (R)	Maintain (M)		
8.8.3	2 Minor ancillary buildings – prefabricated.	nr	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 <sup>2</sup> ), 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. <b>Note:</b> Applies only when the contractor is responsible for designing specific elements and/or components of the building project (ie. not the entire building project).	
				Sundry items	Sundry items		Sundry items
				Subcontractor on costs	Subcontractor on costs		Subcontractor on costs
				Underpinning	N/A		N/A
				(included)	(included)		(included)
Underpinning to external site boundary walls and the like.	m	1 Underpinning to external site boundary walls. 2 Preliminary trenches and underpinning pits, excavation and earthwork support. 3 Temporary supports. 4 Disposal of excavated material.	Underpinning	N/A	<p><b>Component Specifications</b> – 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.</p> <p><b>Renewal Actions</b> <b>Underpinning works</b> – As per rule M1 to M5 above.</p> <p><b>Maintain Actions</b> – Covered by structural surveys included in group element 1: Consultants' and specialists' fees.</p> <p>M1 – The length of underpinning measured is the extreme length.</p>		



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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	<p>M2 – Other cost-significant components are to be described and identified separately. Such components are to be measured by area (m<sup>2</sup>), linear measurement (m) or enumerated (nr) separately in accordance with the rules of measurement for this sub-element.</p> <p>M3 – Curved work is to be described and identified separately.</p> <p>M4 – Work arising out of party wall awards/agreements is to be described and identified separately.</p> <p>M5 – Contractor-designed work is to be described and identified separately. <b>Note:</b> Applies only when the contractor is responsible for designing specific elements and/or components of the building project (ie. not the entire building project).</p> <p>N/A – Not applicable to renewal and/or maintain work.</p>
			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.

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

**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	1 Site accommodation.	T/E	May be included in section 1.2.	Employer's site accommodation is not part of NRM 3.
	2 Furniture and equipment.	T/E	May be included in section 1.2.	Employer's furniture and equipment are not part of NRM 3.
	3 Telecommunications and IT systems.	T/E	May be included in section 1.2.	Employer's telecommunications and IT systems are not part of NRM 3.
9.1.2	1 Site records.	T/E	Updating O+M manuals – include with section 1.2.	1 Operation and maintenance manuals (paper and electronic copies on CD ROM/DVD/USB).
			Updating CDM files include in section 1.2.	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).

Group element 9: Maintenance contractor's management and administration costs

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 1.2.	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	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).  2 Security staff (included in sub-element 9.2.4: Security).
			1 Maintenance contractor's account manager.  2 Maintenance manager.  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.	

Group element 9: Maintenance contractor's management and administration costs

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.	
			5 Day transport.	
			6 Personnel transport (i.e. transportation of work operatives to site).	
			7 Temporary living accommodation (e.g. long/medium term accommodation costs).	
			8 Subsistence payments.	
			9 Out-of-hours provision.	
			4 Staff travel.	
1 Visits to employer and consultants' office.				
2 Visits to subcontractor's office/works.				
3 Overseas visits.				
9.2.2	Site establishment	T/E	4 Accommodation charges and overnight expenses.	
			May be included in section 1.2.	Site accommodation for site establishment is not part of NRM 3.
			May be included in section 1.2.	Temporary works for site establishment is not part of NRM 3.
			May be included in section 1.2.	Furniture and equipment for temporary site accommodation is not part of NRM 3.

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Subelement	Component	Unit	Included (aligned to NRM 1 structure)	Excluded
	4 IT systems.	per person (nr)	<ol style="list-style-type: none"> <li>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.</li> <li>2 Software and software licences.</li> <li>3 Internet lines, modems, routers and connections (i.e. email and internet capability).</li> <li>4 Wide area network (WAN lines and connections (if on WAN).</li> <li>5 Line rental charges.</li> <li>6 Internet/website addresses.</li> <li>7 Internet service provider (ISP) charges.</li> <li>8 Line calls charges.</li> <li>9 IT support and maintenance.</li> </ol>	<ol style="list-style-type: none"> <li>1 Computer and printer consumables (included in component 9.2.2.5: Consumables and services).</li> <li>2 Document management, including electronic data management systems (included in component 9.2.2.6: Bought-in services).</li> </ol>
	5 Consumables and services.	per week (number of staff by number of weeks)  per person (nr)  quantity per week	<ol style="list-style-type: none"> <li>1 Stationery.</li> <li>2 Computer and printer consumables (e.g. ink cartridges).</li> <li>3 Postage.</li> <li>4 Courier charges.</li> <li>5 Tea, coffee, water bottles and the like.</li> <li>6 First aid consumables.</li> <li>7 Photocopier consumables (e.g. paper and toners).</li> <li>8 Fax consumables (e.g. paper and toners).</li> </ol>	

Group element 9: Maintenance contractor's management and administration costs

Subelement	Component	Unit	Included (aligned to NRM 1 structure)	Excluded
9.2.3	6 Bought-in services. <b>Definition:</b> Services outsourced by the maintenance contractor.  7 Sundries.	T/E	9 Drawing printer consumables (e.g. ink cartridges).	
			May be included in section 12: Employer definable maintenance related costs.	Bought-in services are not part of NRM 3.
			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.	
9.2.4	1 Security staff.  2 Security equipment.  3 Hoardings, fences and gates.	T/E	Taken with work item costs.	Temporary services are not part of NRM 3.
			Security staff is covered by security (part of operations costs – if part of wider LCC).	Security staff are not part of NRM3.
			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
		n/r/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.
		n/r/m/item	See element 8.4: Fencing, railings and walls for permanent provision.	



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Subelement	Component	Unit	Included (aligned to NRM 1 structure)	Excluded	
9.2.5	<p><b>Safety and environmental protection</b></p> <p><b>Definition:</b> Works required to satisfy requirements of CDM Regulations.</p>		<p>Works required to satisfy requirements of CDM Regulations.</p> <p>1 Health and safety manager/officers.</p> <p>2 Safety audits, including safety audits carried out by external consultant.</p> <p>3 Staff safety training.</p> <p>4 Site safety incentive scheme</p> <p>5 Notices and information to neighbours.</p> <p>6 Personal protective equipment (PPE), including those for the employer and consultants.</p> <p>7 Personal protective equipment (PPE) for multi-service gangs.</p> <p>8 Fire points.</p> <p>9 Temporary fire alarms.</p> <p>10 Fire extinguishers.</p> <p>11 Statutory safety signage.</p>	<p>1 Health and safety manager/officers (included in sub-element 9.2.1: Management and staff).</p> <p>2 Welfare facilities (included in sub-element 9.2.2: Site establishment).</p>	
					per week (number of staff by number of man hours per week by number of weeks)
					nr
					item
					per set (nr)
					nr
					item
					per week /number of weeks
					nr
					nr
					nr
					nr
					nr
					nr

Group element 9: Maintenance contractor's management and administration costs

Subelement	Component	Unit	Included (aligned to NRM 1 structure)	Excluded
	2 Barriers and safety scaffolding.	per week/item	<p>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.</p> <p>2 Temporary staircase balustrades (ie. to new staircases during construction), including supply, erection, maintenance and dismantling on completion of the works.</p> <p>3 Lift shaft protection, including supply, erection, maintenance and dismantling on completion of the works.</p> <p>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.</p> <p>5 Debris netting/plastic sheeting, including supply, erection, maintenance and dismantling on completion of the works.</p> <p>6 Fan protection, including supply, erection, maintenance and dismantling on completion of the works.</p> <p>7 Scaffold inspections.</p> <p>8 Hoist run-offs, including supply, erection, maintenance and dismantling on completion of the works.</p> <p>9 Protective walkways, including supply, erection, maintenance and dismantling on completion of the works.</p> <p>10 Other safety measures, including supply, erection, maintenance and dismantling on completion of the works.</p>	<p>1 Debris netting/plastic sheeting provided as part of access scaffolding (included in sub-element 9.2.8: Temporary works).</p> <p>2 Fan protection provided as part of access scaffolding (included in sub-element 9.2.8: Temporary works).</p>

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Subelement	Component	Unit	Included (aligned to NRM 1 structure)	Excluded	
9.2.6	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).	
	<b>Control and protection</b>	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	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 9.2.1.1.2: Maintenance of roads, paths and pavings). 5 Access scaffolding (included in sub-element 9.2.8: Temporary works).	
	2 Tower cranes.	per week	Type of craneage to be provided shall be stated (each type separately quantified). 1 Hire charges (type of tower crane to be stated, including type and length of jib, and lifting capacity).	1 Temporary electrical supply to tower crane (included in sub-element 9.2.3: Temporary services).	

Group element 9: Maintenance contractor's management and administration costs

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.	
		nr (number of bases)	3 Overtime for crane and operator.	
		m <sup>2</sup>	4 Piles for tower crane bases, including installation and removal on completion of the works (size of base in m <sup>2</sup> , and number of piles supporting base, to be stated).	
		per week	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 <sup>2</sup> to be stated).	
		nr	6 Ties.	
		nr	7 Connections to temporary electrical supply.	
		per week	8 Bring to site, erection, test and commission.	
		nr	9 Periodic safety checks/inspections.	
		item	10 Dismantling and removing from site.	
			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. <b>Note:</b> 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).	

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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 to 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.	
	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.	

Group element 9: Maintenance contractor's management and administration costs

Subelement	Component	Unit	Included (aligned to NRM 1 structure)	Excluded
9.2.8	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	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).				
2 Attendance on system provider.				
22 Web-based facilities management systems.	per week (number of operators by number of man hours per week by number of weeks)			

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

Subelement	Component	Unit	Included (aligned to NRM 1 structure)	Excluded
9.2.10	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	1 Site tidy.		Site tidy.	
	2 Maintenance of roads, paths and pavings.		Maintenance of roads, paths and pavings.	
9.2.12	1 Fees.	item	1 Building control fees, where not paid by the employer. 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.	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 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).

Group element 9: Maintenance contractor's management and administration costs

Subelement	Component	Unit	Included (aligned to NRM 1 structure)	Excluded
9.2.13	1 Temporary works.	taken with work item elsewhere	Temporary works are not part of NRM 3.	<p>2 Statutory undertaker's charges in connection with temporary services (included in sub-element 9.2.3: Temporary services).</p> <p>1 Temporary screens (included in sub-element 7.1.1: Minor demolition works and alteration works).</p> <p>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).</p> <p>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).</p>
9.2.14	2 Multi-service gang.	per week (number of staff by number of man hours per week by number of weeks)	<p>1 Ganger.</p> <p>2 Labour.</p> <p>3 Fork lift driver.</p> <p>4 Service gang plant and transport.</p>	
	1 Works insurances.	item	<p>1 Contractor's 'all risks' (CAR) insurance.</p> <p>2 Contractor's plant and equipment insurance.</p> <p>3 Temporary buildings insurance.</p> <p>4 Terrorism insurance.</p> <p>5 Other insurances in connection with the works.</p> <p>6 Insurance premium tax (IPT).</p> <p>7 Allowance for recovery of all or part of insurance premium excess.</p>	
	2 Public liability insurances.	item	<p>1 Non-negligence insurance.</p> <p>2 Professional indemnity insurance.</p> <p>3 Insurance premium tax (IPT).</p>	



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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	<ul style="list-style-type: none"> <li>1 Generally, the costs of head office set up and administration proportioned to each contract by the maintenance contractor.</li> </ul>	<ul style="list-style-type: none"> <li>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).</li> <li>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).</li> </ul>
2 Maintenance contractor's profit	<ul style="list-style-type: none"> <li>1 The amount of net profit that the maintenance contractor needs to achieve.</li> </ul>	

# Group element 11: Consultants' and specialists' fees

Group element 11 comprises the following elements:

## 11.1 Consultants' fees

### 11.1.1 Maintenance contractor's pre-contract fees and transition mobilisation costs

### 11.1.2 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
11.1.1 Project team and design team consultants' fees	% or item	<p><b>Note:</b> Percentage applied to the 'Works Cost Estimate' or item if actual fees known)</p> <p>1 Professional advisers.</p> <p>2 Project managers.</p> <p>3 Contract administrators.</p> <p>4 Employer's agents.</p> <p>6 Quantity surveyor/cost managers.</p> <p>7 Building services engineer(s).</p> <p>8 Structural engineers.</p> <p>9 CDM co-ordinators.</p> <p>10 Interior designers.</p> <p>11 Landscape architects.</p> <p>12 Infrastructure engineers.</p> <p>13 Drainage engineers.</p>	<p>Excluded from NRM 3 as not normally required for maintenance works</p> <p>5 <i>Architect</i></p> <p>14 Construction/logistics/sequencing advisers.</p>

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	<p><b>Note:</b> Percentage applied to the 'Works Cost Estimate'; or item if actual fees known)</p> <ol style="list-style-type: none"> <li>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).</li> <li>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).</li> <li>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).</li> <li>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).</li> <li>5 Ecologists.</li> <li>6 Arboriculturists (to survey and provide advice on trees and the like).</li> <li>7 Party wall surveyor (to prepare party wall notices and awards/agreements).</li> <li>8 Rights of light surveyors (rights of light agreements).</li> <li>9 Asbestos consultants.</li> </ol>	

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Component	Unit	Included	Excluded
		<p>10 Acoustics consultants.</p> <p>11 Facade consultants.</p> <p>12 Facade access consultants</p> <p>13 Lift consultants.</p> <p>14 Fire consultants.</p> <p>15 Building control consultants.</p> <p>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).</p> <p>17 Invasive weeds consultants.</p> <p>18 Sustainability consultants (to advise on renewable technologies and sustainability issues).</p> <p>19 Archaeologists (to examine existing records and archaeological remains – desktop study, etc.).</p> <p>20 Environmental assessment method assessors (e.g BREEAM or Code for Sustainable Homes).</p> <p>21 Facilities manager (to advise on operational and maintenance matters).</p> <p>22 Value engineering facilitators.</p> <p>23 Risk management facilitators.</p> <p>24 Building surveyors (to carry out structural/dilapidations survey of adjoining buildings; and carry out condition surveys).</p> <p>25 Unexploded devices consultant (to research and advise on possibility of unexploded bombs on site, etc).</p> <p>26 Photographers (to carry out a photographic survey of the site).</p> <p>27 Specialist contractors/consultants (to provide early advice on viability of ground source heating).</p> <p>28 Other specialist consultants (to be stated).</p>	

Component	Unit	Included	Excluded
I.1.1.3 Site investigation fees	item	<ol style="list-style-type: none"> <li>1 Site investigation.</li> <li>2 Geotechnical investigation.</li> <li>5 Intrusive investigations for toxic or hazardous materials (for asbestos-containing materials).</li> <li>6 Other site investigations (to be stated).</li> </ol>	<ol style="list-style-type: none"> <li>1 Removal of toxic or hazardous materials, e.g. asbestos (included in sub-element 0.1.1: Toxic or hazardous material removal).</li> <li>3 Trial pits.</li> <li>4 Pile probing.</li> </ol>
I.1.1.4 Specialist support consultants' fees	item	<ol style="list-style-type: none"> <li>1 Planning consultants (to advise on planning matters and facilitate planning process).</li> <li>2 Political consultants (to assist with planning application).</li> <li>3 Letting agents (advice on market needs, advice on design proposals and selling).</li> <li>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).</li> <li>5 Legal advice – construction (to advise on construction contracts, warranties, financial protection measures and the like).</li> <li>6 Legal advice – environmental.</li> <li>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).</li> <li>8 Grants advice (to advise on availability of grants for construction works).</li> <li>9 Other specialist support consultants (to be stated).</li> </ol>	

## 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. <b>Note:</b> 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
<p>1 Main contractor's design consultants' fees</p> <p><b>Note:</b> 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.</p>	<p>% or item</p>	<p><b>Note:</b> Percentage applied to the 'Building Works Estimate'; or item if actual fees known</p> <ol style="list-style-type: none"> <li>1 Architect.</li> <li>2 Building services engineers.</li> <li>3 Structural engineers.</li> <li>4 Interior designers.</li> <li>5 Landscape architects.</li> <li>6 Infrastructure engineers.</li> <li>7 Drainage engineers.</li> <li>8 Site investigation services (by specialist subcontractor or consultant).</li> <li>9 Other design consultants or specialist services.</li> </ol> <p><b>Note:</b> 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.</p>	
	<p>Sum</p>	<ol style="list-style-type: none"> <li>10 Building services engineers.</li> <li>11 Drainage engineers.</li> <li>12 Landscape architects.</li> <li>13 Interior designers.</li> </ol>	

# 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	<ol style="list-style-type: none"> <li>1 Planning fees.</li> <li>2 Building control fees, where not paid by the main contractor.</li> <li>3 Oversailing fees, where not paid by the main contractor.</li> <li>4 Fees in connection with party wall awards.</li> <li>5 Fees in connection with rights of light agreements.</li> <li>6 Building scheme registration fees (e.g. NHBC Buildmark) or similar fees, where not paid by the main contractor.</li> <li>7 Fees in connection with other agreements between the employer and neighbours to facilitate the building project.</li> <li>8 Other fees in connection with licences, permits and agreements, where not paid by the main contractor.</li> </ol>	<ol style="list-style-type: none"> <li>1 Building control fees, where paid by the maintenance contractor (included in sub-element 9.2.12: Fees and charges).</li> <li>2 Oversailing fees, where paid by the maintenance contractor (included in sub-element 9.2.12: Fees and charges).</li> <li>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).</li> <li>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).</li> <li>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).</li> </ol>

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Component	Unit	Included	Excluded
12.1.4 Charges		Excluded from scope of NRM 3.	<ol style="list-style-type: none"> <li>1 Adoption charges in connection with highways.</li> <li>2 Maintenance costs in connection with highways.</li> <li>3 Adoption charges in connection with services (e.g. sewers, water, electricity and gas).</li> <li>4 Maintenance costs in connection with services.</li> </ol>
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.	<ol style="list-style-type: none"> <li>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).</li> <li>2 Direct financial contributions in connection with planning consent (e.g. Section 106 and section 278 contributions in the UK).</li> <li>3 Environmental improvement works.</li> </ol>
12.1.6 Insurances	item	<ol style="list-style-type: none"> <li>1 Insurance for the works – existing buildings.</li> <li>3 Other insurances in connection with the works.</li> <li>4 Insurance premium tax (IPT).</li> </ol>	<ol style="list-style-type: none"> <li>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).</li> <li>2 Insurance for the works – buildings; where insurance taken out by the employer.</li> </ol>
12.1.7 Archaeological fieldwork	item	Fees and charges in connection with fieldwork carried out by an archaeologist.	<ol style="list-style-type: none"> <li>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.</li> </ol>
12.1.8 Other specialist fieldwork	item	<ol style="list-style-type: none"> <li>1 Fees and charges in connection with fieldwork carried out by a specialist</li> </ol>	<ol style="list-style-type: none"> <li>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).</li> </ol>
12.1.9 Decanting and relocation costs	item per week	<ol style="list-style-type: none"> <li>1 Temporary relocation costs.</li> <li>2 Fit-out of temporary accommodation.</li> <li>3 Rents and other running costs.</li> </ol>	
12.1.10 Fittings, furnishings and equipment	item	<ol style="list-style-type: none"> <li>1 Fittings, furnishings and equipment which do not form part of a building contract.</li> </ol>	<ol style="list-style-type: none"> <li>1 Fittings, furniture and equipment which form part of a building contract (included in group element 4: Fittings, furnishings and equipment).</li> </ol>
12.1.11 Tenant's costs/contributions	item	<ol style="list-style-type: none"> <li>1 Tenant's costs.</li> <li>2 Tenant's contributions.</li> </ol>	

Group element 12: Employer-definable maintenance-related costs

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.

<p><b>13.1.2 Construction – installation legacy issues</b></p> <ul style="list-style-type: none"> <li>– adjacent structures (i.e. requiring special precautions)</li> <li>– geotechnical problems (e.g. mining and subsidence)</li> <li>– groundwater</li> <li>– asbestos and other hazardous materials</li> <li>– tree preservation orders</li> <li>– ecological issues (e.g. presence of endangered species)</li> <li>– environmental impact</li> <li>– physical access to site (i.e. restrictions and limitations)</li> <li>– appropriateness of specification</li> <li>– incomplete design</li> <li>– competence of contractor and subcontractor</li> <li>– health and safety considerations</li> <li>– ineffective quality management procedure</li> <li>– impact of construction using substandard materials and workmanship</li> <li>– ineffective testing and commissioning</li> <li>– latent defects.</li> </ul>
<p><b>13.1.3 Handover:</b></p> <ul style="list-style-type: none"> <li>– ineffective handover procedures</li> <li>– accuracy and completeness of operation and maintenance manuals and CAD information</li> <li>– occupancy of facilities significantly different to original design parameters</li> <li>– reliability of estimating data, e.g. changes in labour, materials, equipment and plant costs</li> <li>– insurance and inspection implications, e.g. inadequate policies put into practice.</li> </ul>
<p><b>13.1.4 Legislation and changing future regulations – e.g. health and safety at work; Part L</b></p>

## Element 13.2: Maintenance risks

<p><b>13.2.1 Procurement</b></p> <ul style="list-style-type: none"> <li>– quality of brief</li> <li>– information to cost maintenance</li> <li>– contract terms (allocation of risks)</li> <li>– work packages (boundaries and interfaces)</li> <li>– resources and competence</li> <li>– budget constraints</li> <li>– mobilisation.</li> </ul>	<p><b>13.2.2 Maintenance delivery:</b></p> <ul style="list-style-type: none"> <li>– maintenance strategy not deliverable</li> <li>– scope of service provided (not in accordance with fit-for-function maintenance standards)</li> <li>– non-compliance with statutory/legal and regulatory requirements</li> <li>– system failure</li> <li>– organisation and staffing arrangements; e.g. agility and adequacy to cover critical risk events</li> <li>– relationship with employer and contract support staff</li> <li>– ineffective contract mobilisation and operating procedures and controls</li> <li>– business disruption leading to significant loss of productivity and cost to the end user</li> <li>– lack of transparency of service standards and accountability</li> <li>– asbestos and hazardous materials</li> <li>– weather and seasonal implications</li> <li>– quality of asset information made available and subsequently not being kept up to date</li> <li>– incompatibility of asset management databases or ineffective use of IT/Computerised Maintenance Management System CMMS systems.</li> </ul>
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**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

<p><b>13.3.1 Project brief:</b></p> <ul style="list-style-type: none"> <li>– inadequate or unclear project brief</li> <li>– changes in quality (e.g. specification of materials and workmanship)</li> <li>– employer's specific requirements (e.g. functional standards).</li> </ul>
<p><b>13.3.2 Scope creep:</b></p> <ul style="list-style-type: none"> <li>– specific changes in requirements (e.g. scope of works, time horizon and facilities to maintain)</li> <li>– agility and mechanism to change the contract and realise cost/performance efficiencies</li> <li>– change of purpose and use of LCC exercise</li> <li>– carbon reduction commitments and taxation implications.</li> </ul>
<p><b>13.3.3 System redundancy:</b></p> <ul style="list-style-type: none"> <li>– Lack of resilience to prevent major business disruption</li> <li>– obsolescence – technology and system changes (e.g. renewables)</li> <li>– disposal risks associated with removal of plant and equipment from occupied areas.</li> </ul>
<p><b>13.3.4 Timescales:</b></p> <ul style="list-style-type: none"> <li>– replacement frequency forecasts wrong</li> <li>– peaks in expenditure versus forecast profile of life cycle replacement costs</li> <li>– change in periods of analysis</li> <li>– base dates altered or not clearly stated from the outset.</li> </ul>

## Element 13.4: Employer other risks

<p><b>13.4.1 Maintenance brief:</b></p> <ul style="list-style-type: none"> <li>– inadequate or unclear brief, including understanding end user's specific requirements</li> <li>– uncertainty over who is responsible for repairs and maintenance (limits of liability/thresholds)</li> <li>– environmental and sustainability considerations</li> <li>– employer specific requirements (e.g. functional standards, site establishment rules and regulations and standing orders)</li> <li>– changes in use or function of facilities</li> <li>– impact of estate rationalisation, e.g. impact of footprint reductions and disposal of sites.</li> </ul>
<p><b>13.4.2 Timescales:</b></p> <ul style="list-style-type: none"> <li>– reference service life data predictions</li> <li>– product fails prior to predicted life due to manufacturer defect</li> <li>– timescales for decision making</li> </ul>
<p><b>13.4.3 Third party:</b></p> <ul style="list-style-type: none"> <li>– works arising out of party wall agreements</li> <li>– requirements relating to listed buildings and/or conservation areas</li> <li>– requirements relating to sites of special scientific interest (SSSI)</li> <li>– requirements relating to environmental impact assessments.</li> </ul>
<p><b>13.4.4 Management:</b></p> <ul style="list-style-type: none"> <li>– unclear roles and responsibilities</li> <li>– ineffective const-control procedures</li> <li>– ineffective performance measures, audit and monitoring procedures</li> <li>– ineffective or no risk management strategy</li> <li>– inadequate design and maintenance review procedures</li> <li>– ineffective reporting and information management systems.</li> </ul>

<p><b>13.4.5 Financial:</b></p> <ul style="list-style-type: none"> <li>— availability of funds</li> <li>— unavailable of grants/grant refusal</li> <li>— changing interest rates</li> <li>— changes in taxation (e.g. VAT)</li> <li>— liquidation/insolvency of main contractor</li> <li>— actual costs much higher than estimated (undermining the incentive to deliver maintenance)</li> <li>— labour costs vary due to labour market/economic climate</li> <li>— provision for unscheduled maintenance, e.g. historical data (significantly more in reality)</li> <li>— availability of funds to do minimum maintenance standard</li> <li>— availability of competent resources</li> <li>— cash flow effect on timing of approval of extra works</li> <li>— existing risks and liabilities (e.g. backlog maintenance/condition status)</li> <li>— service charging obligations – landlord and tenant (could led to non-recovery of costs)</li> <li>— changing inflation/economic climate conditions</li> </ul>
<p><b>13.4.6 Other:</b></p> <ul style="list-style-type: none"> <li>— availability of labour; materials and plant</li> <li>— statutory and legal requirements changes.</li> </ul>

# 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 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 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	Excluding
2.1 Areas occupied by internal walls and partitions	2.18 Perimeter wall thicknesses and external projections
2.2 Columns, piers, chimney breasts, stairwells, lift-wells, other internal projections, vertical ducts, and the like	2.19 External open-sided balconies, covered ways and fire escapes
2.3 Atria and entrance halls, with clear height above, measured at base level only	2.20 Canopies
2.4 Internal open-sided balconies, walkways, and the like	2.21 Voids over or under structural, raked or stepped floors
2.5 Structural, raked or stepped floors are to be treated as a level floor measured horizontally	2.22 Greenhouses, garden stores, fuel stores, and the like in residential property
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	

## Applications

(when to use GIA)

## Notes

(how to use GIA)

APP 4	<b>Building cost estimation</b> – GIA is a recognised method of measurement for calculating building costs	GIA 1	<b>Diagrams</b> – diagrams C and D illustrate how to apply GIA
APP 5	<b>Estate agency and valuation</b> – 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	GIA 2	<b>Separate buildings</b> – 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
APP 6	<b>Rating</b> – 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)	GIA 3	<b>Advice</b> – 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 <i>Property Misdescriptions Act 1991</i> and <i>Property Misdescriptions (Specified Matters) Order 1992</i> (see Introduction on page 1)
APP 7	<b>Property management</b> – GIA is a basis of measurement for the calculation of service charges for apportionment of occupiers' liabilities	GIA 4	<b>Internal face</b> – means the brick/block work or plaster coat applied to the brick/block work, not the surface of internal linings installed by the occupier
APP 8	<b>New homes valuation</b> – 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)	GIA 5	<b>Lift rooms, etc.</b> – 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	<b>Level changes</b> – the presence of steps or a change in floor levels is to be noted
		GIA 7	<b>Voids</b> – 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

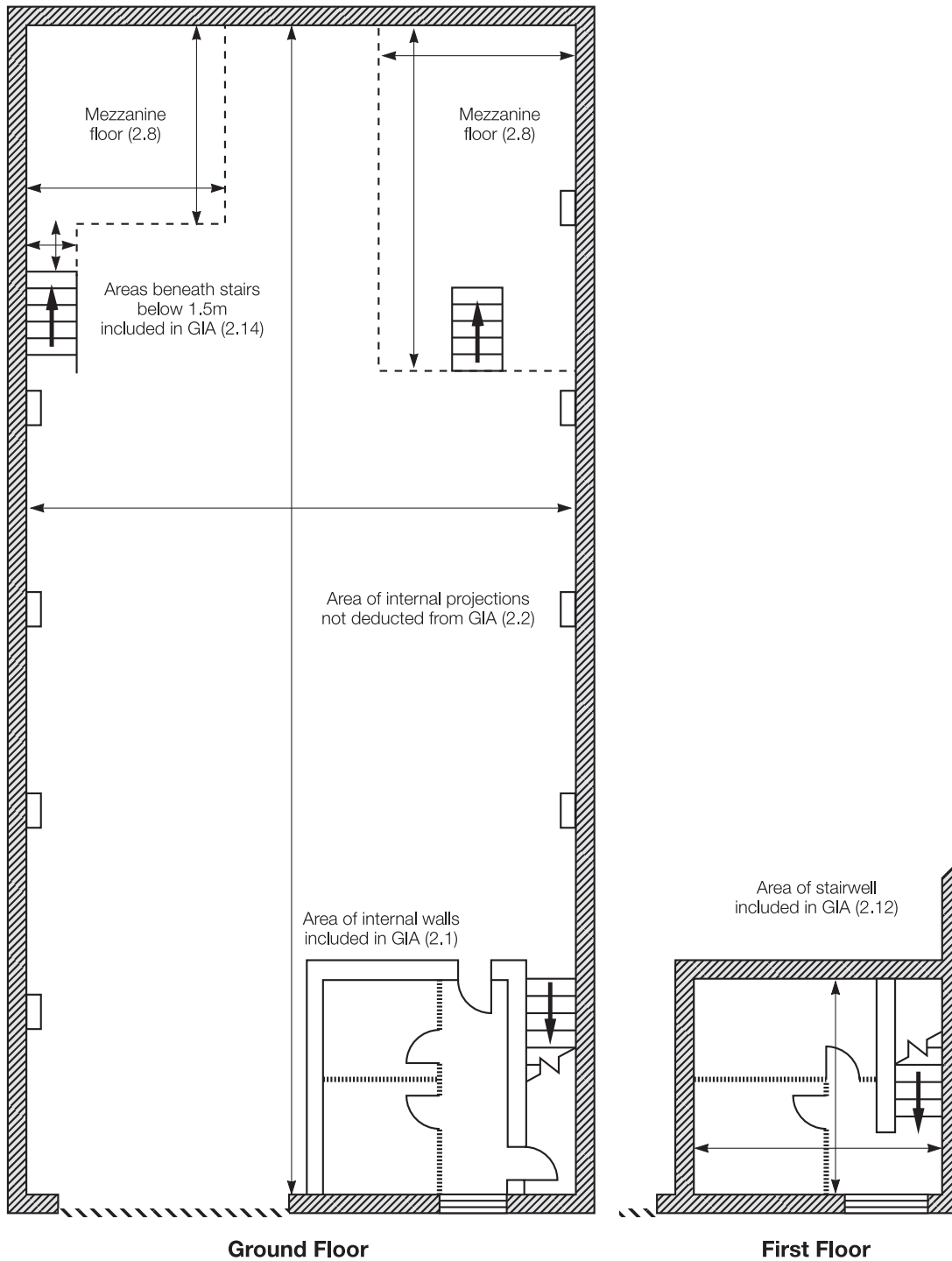
## Supplementary definitions: Gross internal area

The following definitions have been adapted from the *BCIS Standard Form of Cost Analysis*, (4th edition)

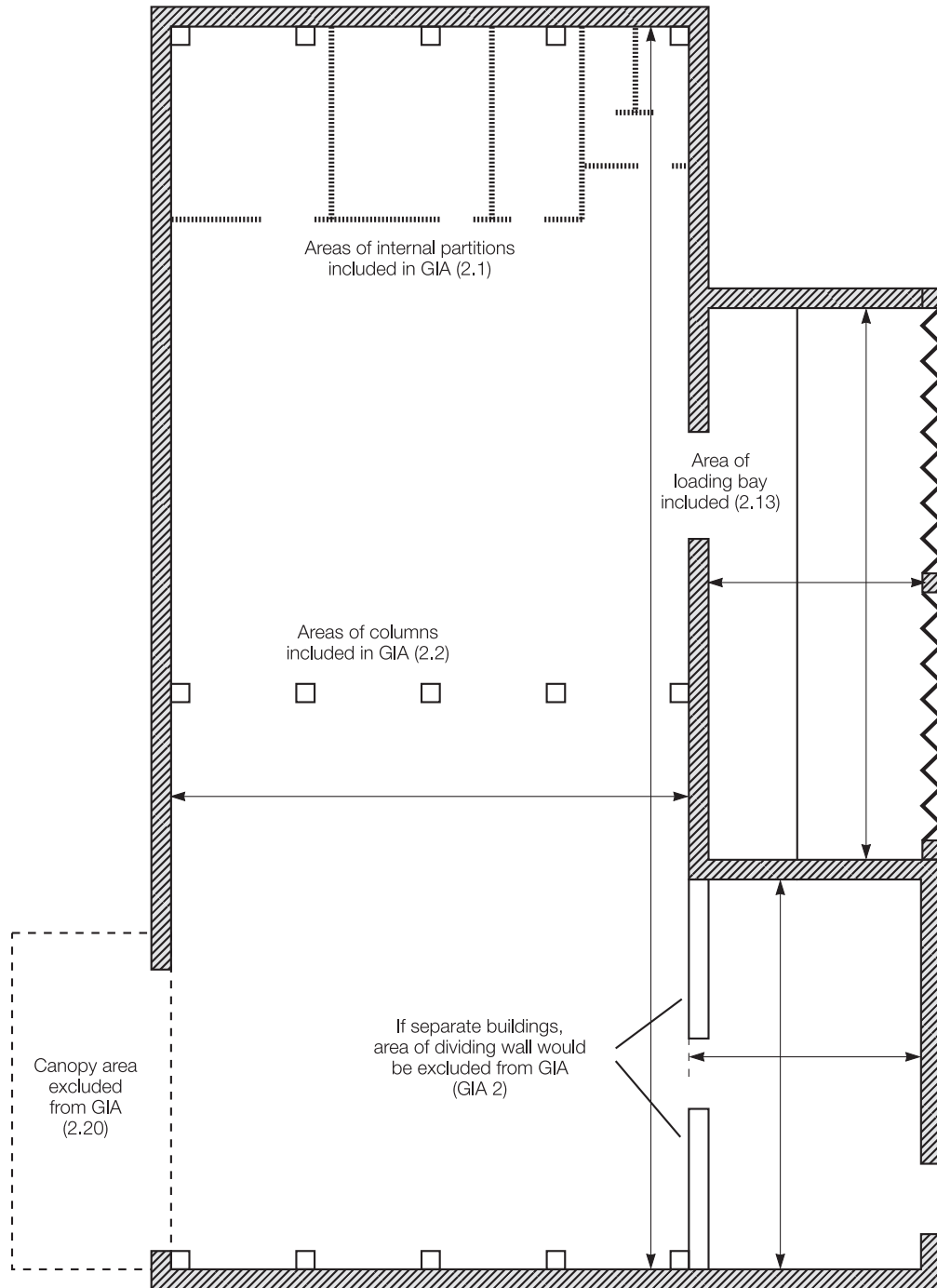
- 1 Areas of open ground floors and the like shall be excluded.
- 2 Walkways across an atrium at upper levels shall be included in the measurement of upper floors.
- 3 Areas in the roof space intended for use with permanent access shall be included in the gross internal area – measured to the internal 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 external wall should be treated as open sided balconies and excluded.



## Diagram C – Example of appropriate dimensions for GIA defined industrial/warehouse unit

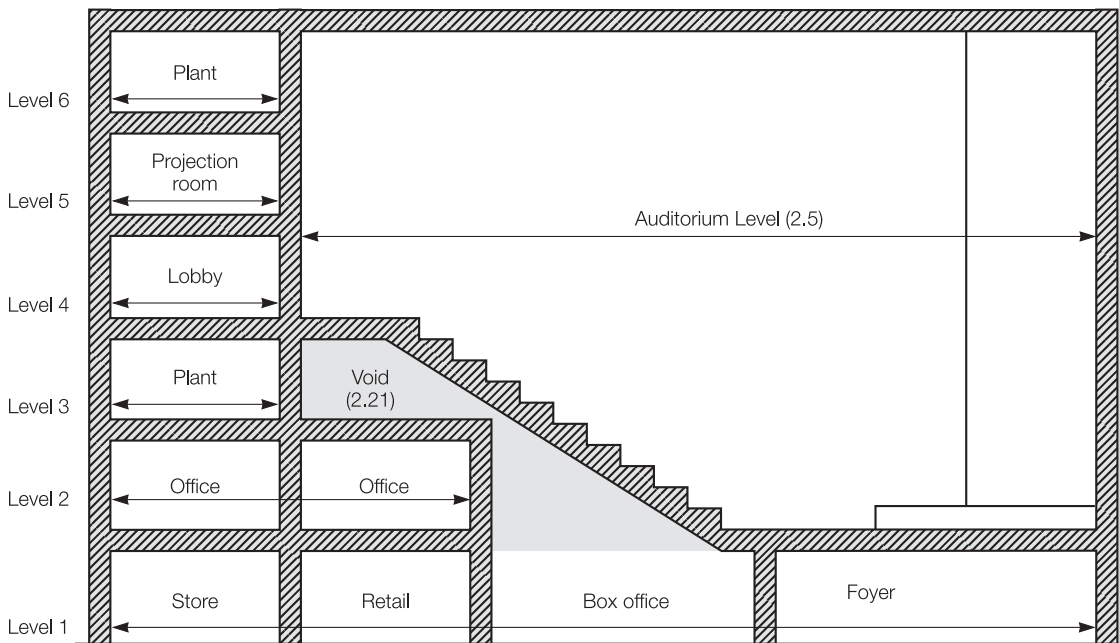


## Diagram D – Example of appropriate dimensions for GIA defined industrial/warehouse unit

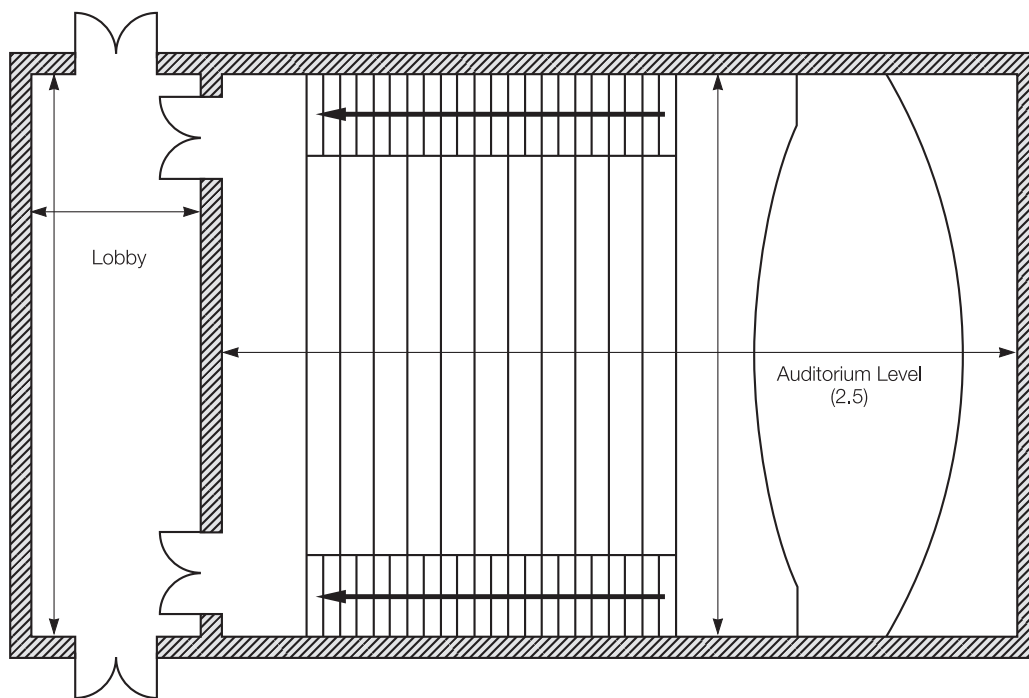


## Diagram M – Example of appropriate dimensions for GIA floor area defined at each level – Leisure facilities

[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)

<b>Including</b>		<b>Excluding</b>	
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)

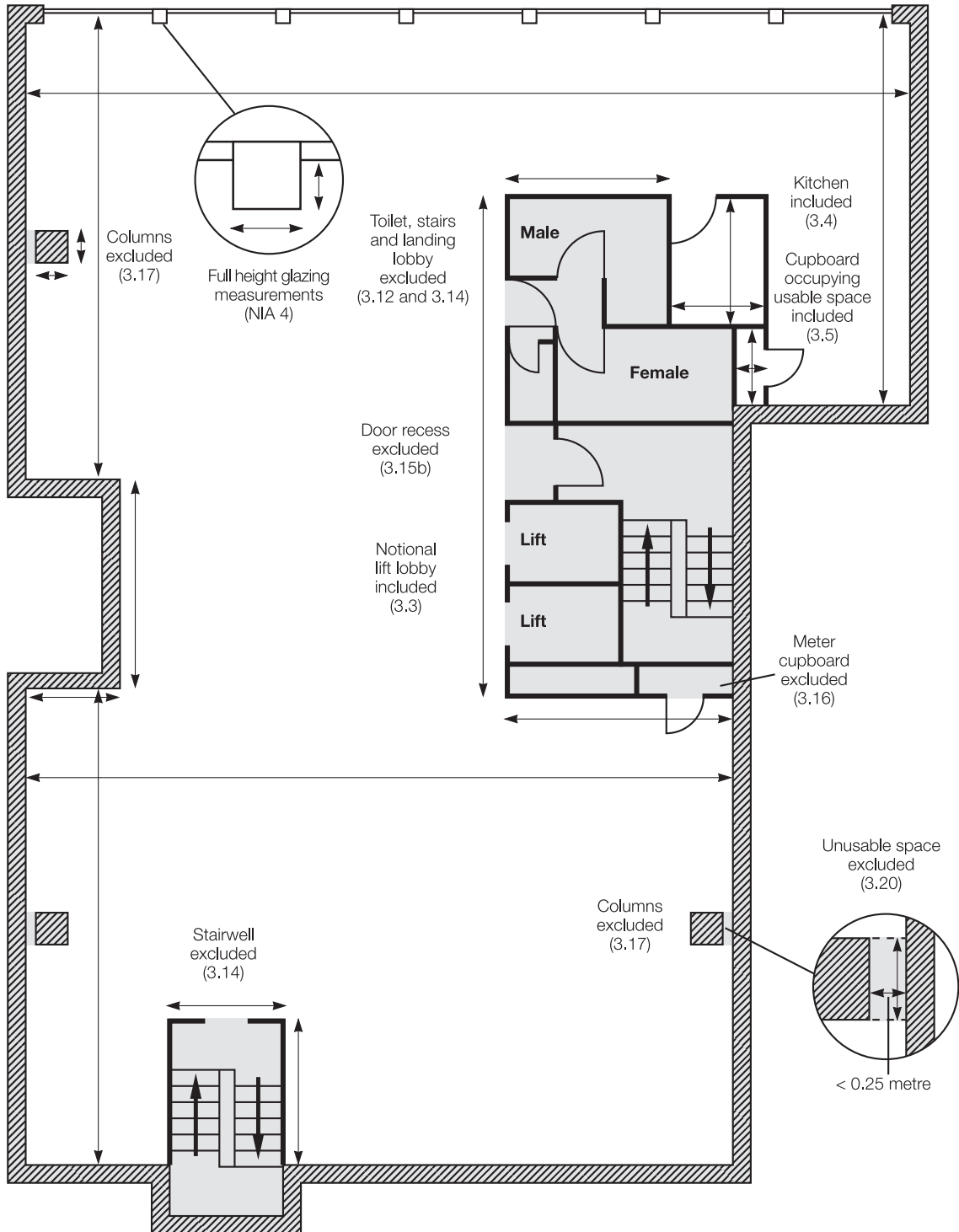
- APP 9      **Estate agency and valuation** – NIA is the basis of measurement for the valuation and marketing of the following types of buildings:
- Shops and supermarkets;
  - offices; and
  - business use (except those in APP 5)
- APP 10     **Rating** – NIA is the principal basis of measurement for 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

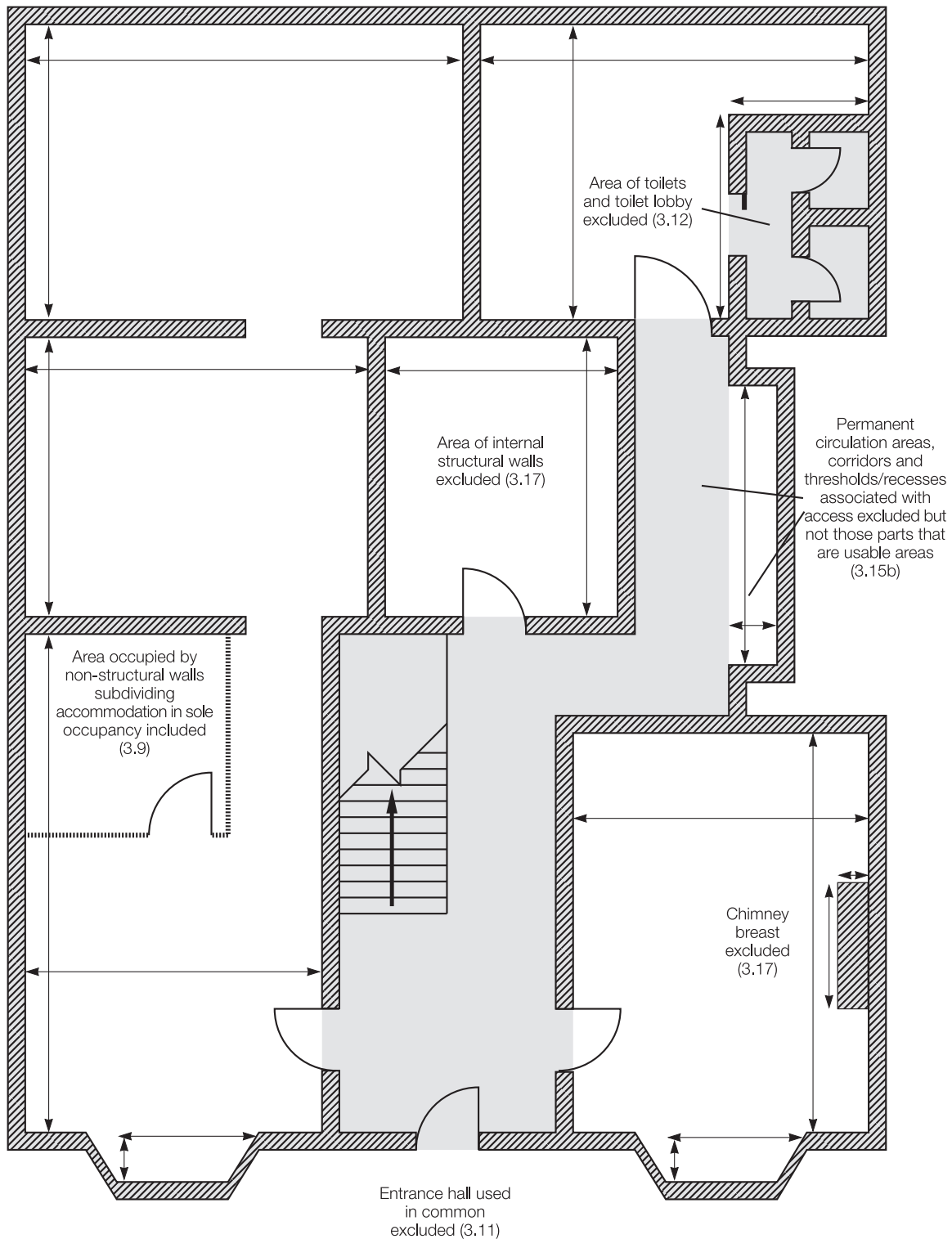
(how to use NIA)

- 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

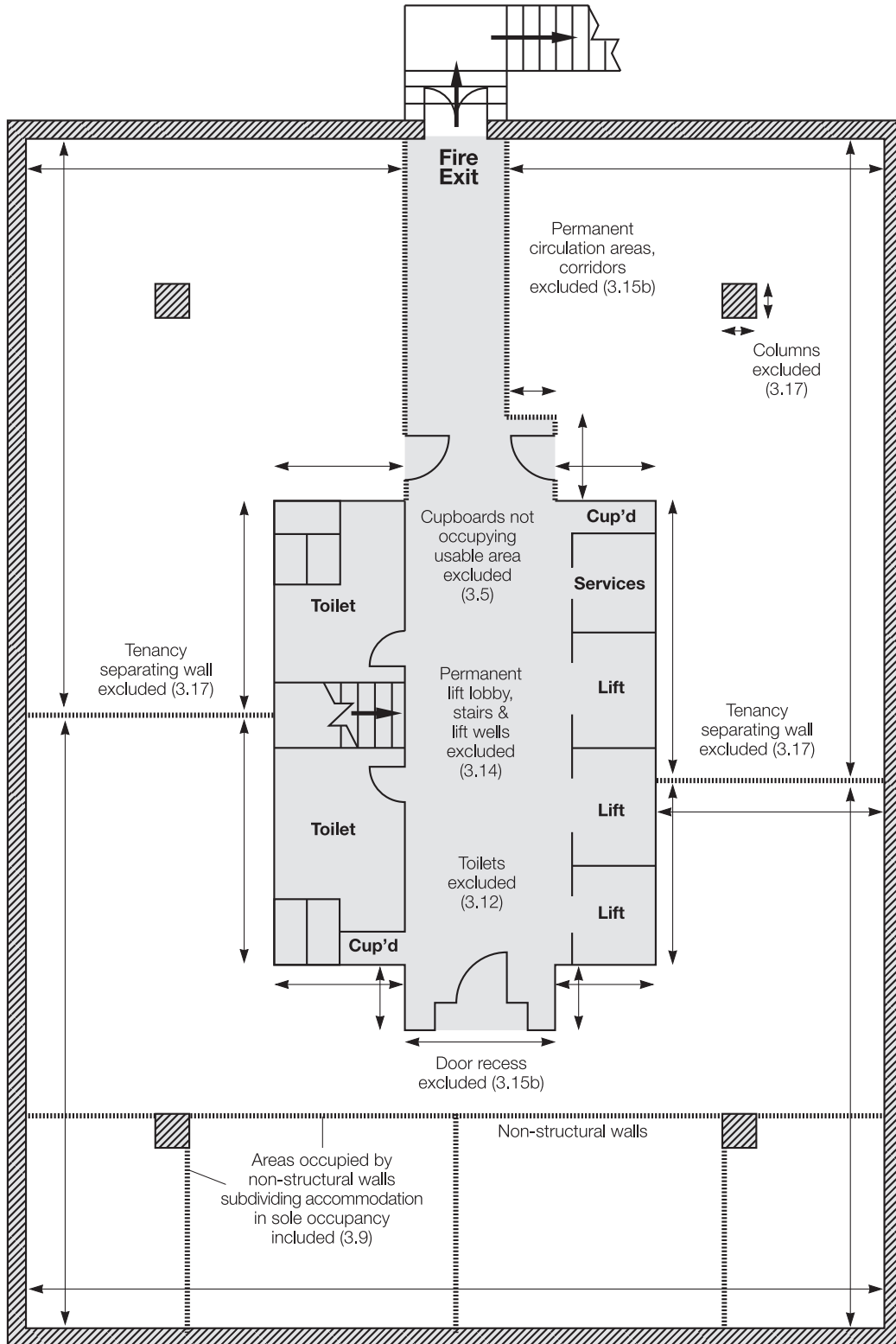
### Diagram E – Example of appropriate dimensions for NIA floor area defined purpose designed offices



## Diagram F – Example of appropriate dimensions for NIA floor area defined offices converted from dwelling house

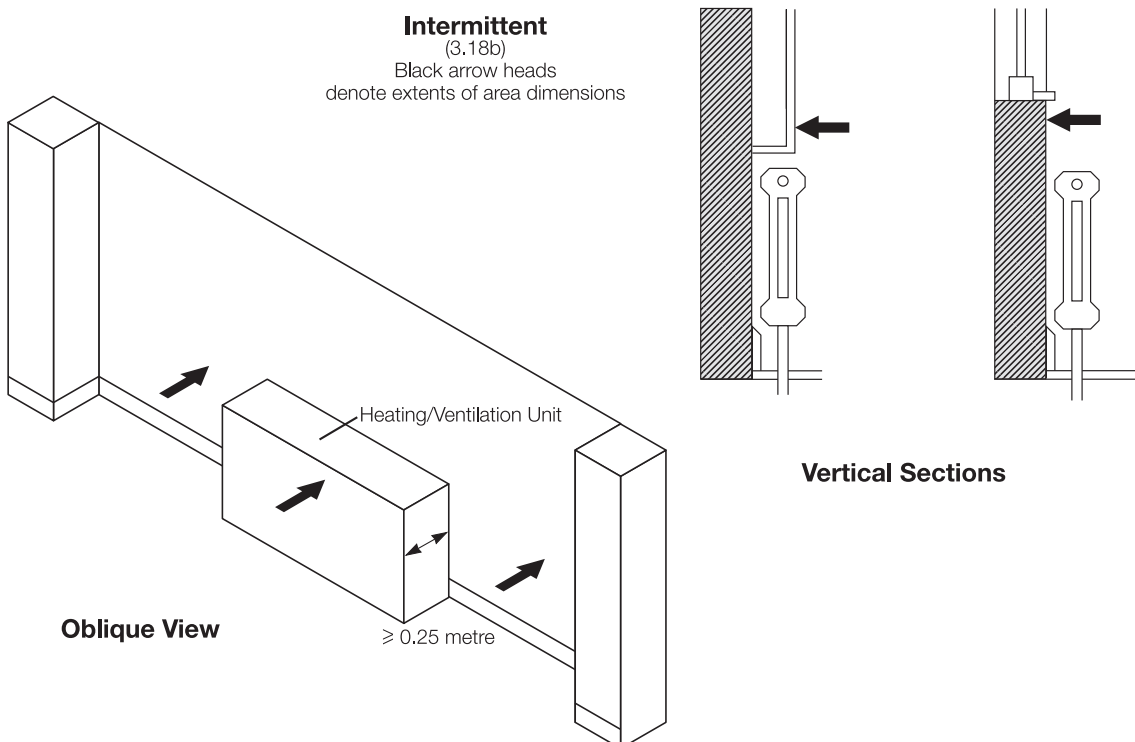
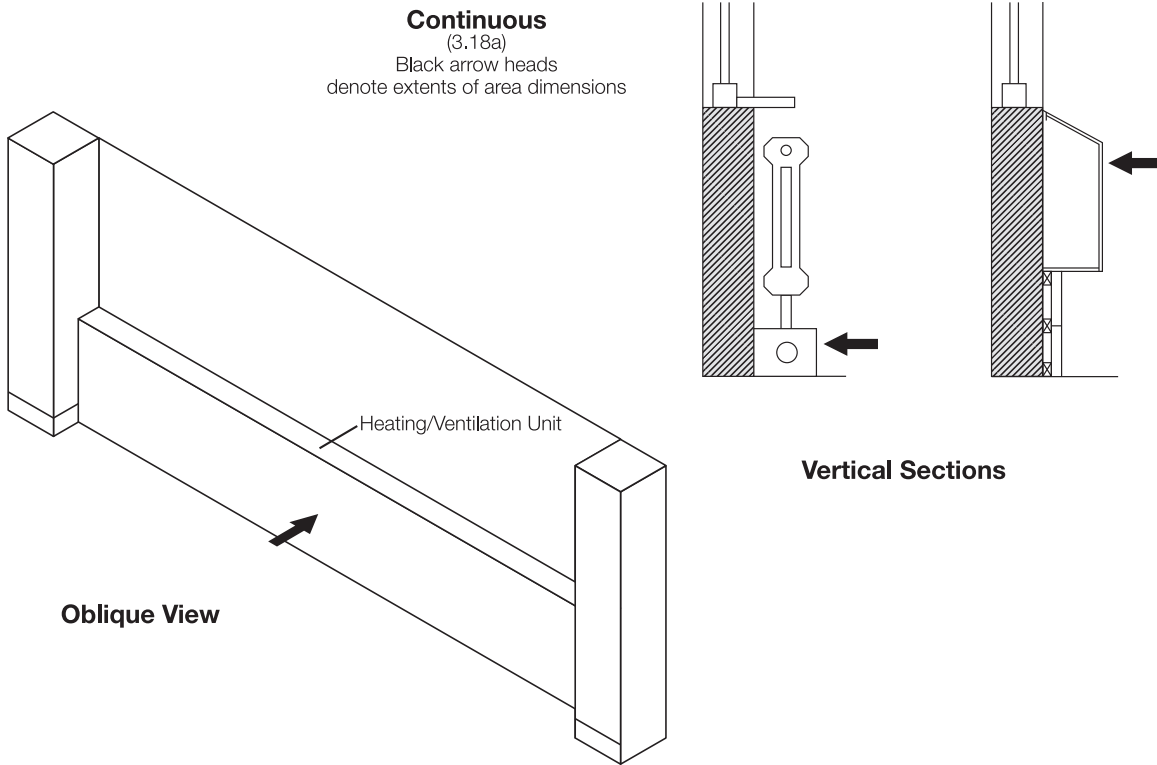


### Diagram G – Example of appropriate dimensions for NIA floor areas defined offices (open plan) multiple occupation





## 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
<b>Administrative, commercial, protective</b>	
Administrative and office buildings	per person or m <sup>2</sup> of Net Internal Area (NIA)
Banks and building society branches	per m <sup>2</sup> 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 <sup>2</sup> of retail area (m <sup>2</sup> )
Department stores	per m <sup>2</sup> of retail area (m <sup>2</sup> )
Shopping centres	per m <sup>2</sup> of retail area (m <sup>2</sup> )
Retail warehouses	per m <sup>2</sup> of retail area (m <sup>2</sup> )
Fire stations	per vehicle spaces
Ambulance stations	per vehicle spaces
Law courts	per courtrooms
Prisons	per prisoner space
<b>Industrial facilities</b>	
Livestock buildings – farms (pig pens, milking parlours and the like)	per animal
Agricultural storage buildings	per m <sup>2</sup> of Net Internal Area (NIA)
Breweries and distilleries	per m <sup>2</sup> of Net Internal Area (NIA)
Factories	per m <sup>2</sup> of Net Internal Area (NIA)
Warehouses/stores/cold stores	per m <sup>2</sup> of Net Internal Area (NIA)
<b>Residential facilities</b>	
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
<b>Religious</b>	
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 <sup>2</sup> 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
Gymnasias 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 ( <i>armoury, air traffic control tower, communications facility, guard room, fire and police stations, telephone exchange</i> )	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

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

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

16.1 Storerooms and ancillary accommodation formed by non-structural partitions, the existence of which should be noted

#### Excluding

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

20.1 The display window frame and shop entrance

#### Excluding

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)

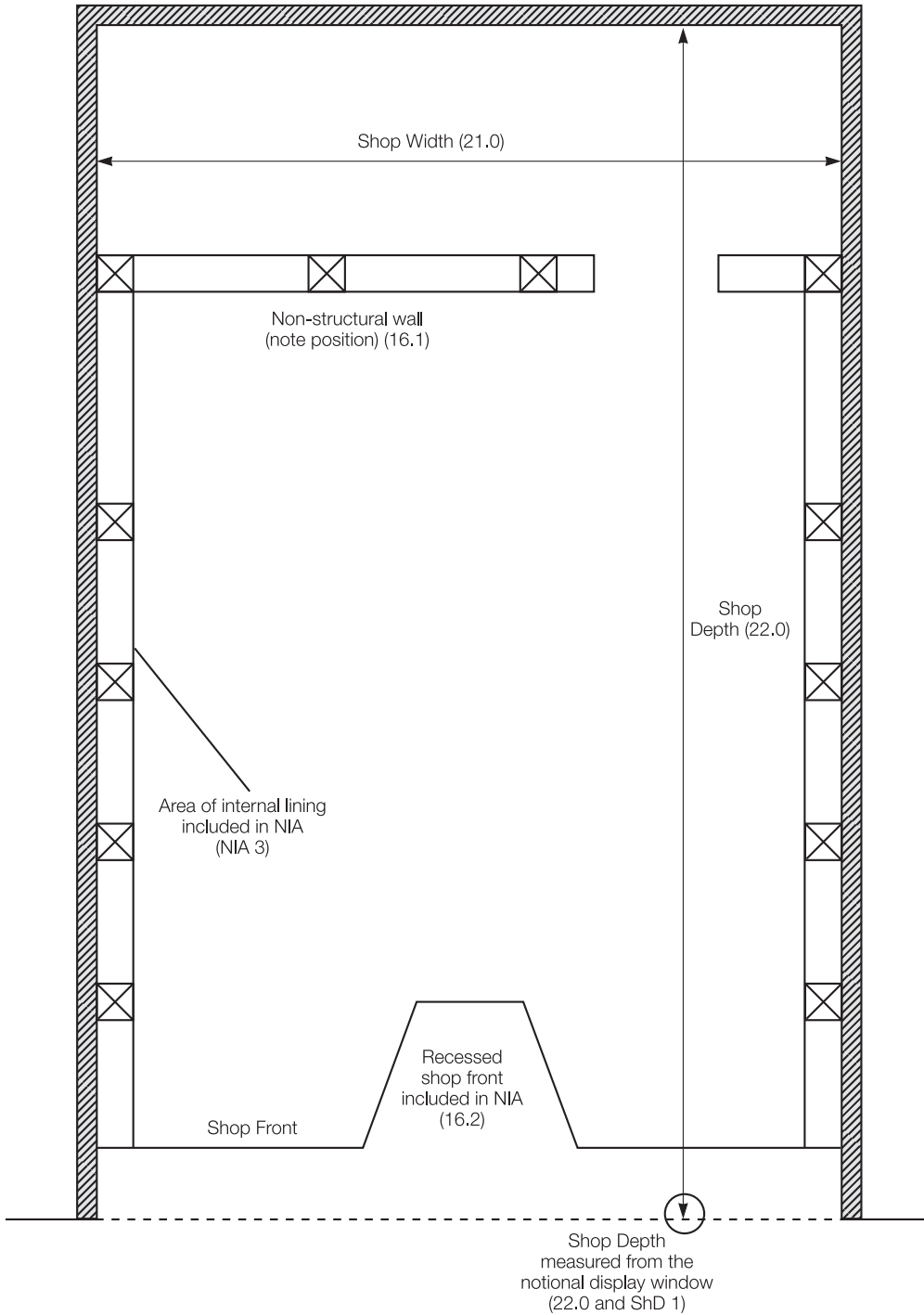
APP 19 **Estate agency and valuation** – RA is the basis of measurement for the valuation and marketing of shops and supermarkets

## Notes

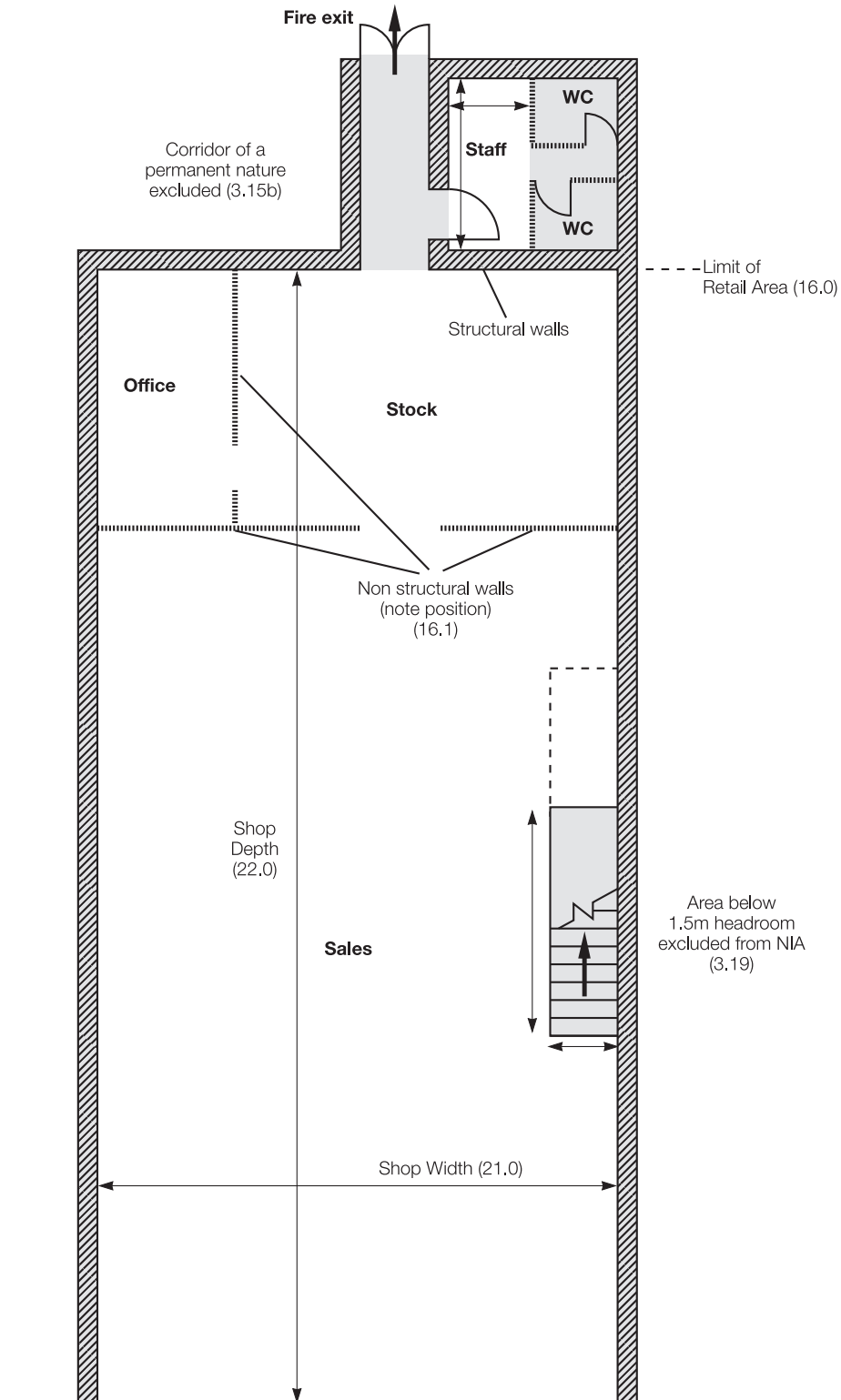
(how to use)

- 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.

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

# – planned inspection  
N/A – not applicable to maintain

C O D E	LEVEL 1 Group element	C O D E	LEVEL 2 Element	C O D E	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		2	Contaminated land	Not covered by NRM 3	Not covered by NRM 3
		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 groundworks	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		2	Specialist foundations	14 Underpinning	Monitoring subsidence

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

LEVEL 1 Group element		LEVEL 2 Element		LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system		LEVEL 4 – MAINTAIN Component or System		LEVEL 5 – MAINTAIN Sub-component	
C O D E	C O D E	C O D E	C O D E	C O D E	C O D E	C O D E	C O D E	C O D E	C O D E
					3	Lowest floor construction	(1 to 7 – Not applicable to maintain)	N/A	
					4	Basement excavation	8 Gullies, floor outlets 9 Internal manholes	Prefabricated floor channels	
					5	Basement retaining walls	N/A	N/A	
2	Superstructure	1	Frame	1	Structural steel frames	19 Basement retaining walls #		Instrumentation and monitoring	
					2	Space frames/decks	1 Frame – steel	N/A	
					3	Concrete casings to steel frames	1 Frame – space deck	N/A	
					4	Concrete frames	1 Frame – concrete casings	N/A	
					5	Timber frames	1 Frame – concrete	N/A	
					6	Specialist frames	1 Frame – timber	N/A	
							1 Frame – specialist	N/A	
					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	
					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	

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

C O D E	LEVEL 1 Group element	C O D E	LEVEL 2 Element	C O D E	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

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

C O D E	LEVEL 1 Group element	C O D E	LEVEL 2 Element	C O D E	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 2 Solar/rain screening – horizontal	N/A 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/siding 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

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

C O D E	LEVEL 1 Group element	C O D E	LEVEL 2 Element	C O D E	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 sideights/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



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

C O D E	LEVEL 1 Group element	C O D E	LEVEL 2 Element	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
5	Services	1	Sanitary appliances	Sanitary appliances	1 Wires, nets, traps and the like 2 Electronic and sonic systems 3 Bird repellent coatings 1 Sanitary appliances	N/A 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	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
		1	Services equipment	Services equipment	1 Services equipment	Catering equipment Food storage equipment Other service equipment (to be defined)
		3	Disposal installations	Foul drainage above ground	1 Drainage to sanitary appliances 2 Drainage to services equipment	Foul drainage Floor channels/gratings Sump pumps



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

C O D E	LEVEL 1 Group element	C O D E	LEVEL 2 Element	C O D E	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
					Chemical toxic and industrial liquid waste drainage	I 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
				2	Refuse disposal	I Refuse disposal	Refuse collection and disposal equipment Incineration plant Safety devices
				3	Mains water supply	I Mains water supply above ground	Pipe work systems Valves Meters Trace heating Thermal insulation
				1	Cold water distribution	I 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
				2			
				4	Water installations		

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

C O D E	LEVEL 1 Group element	C O D E	LEVEL 2 Element	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				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
				Local hot water distribution	I Water heaters	Instantaneous water heaters Under-sink, multipoint and over sink units
				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

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

C O D E	LEVEL 1 Group element	C O D E	LEVEL 2 Element	C O D E	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
		5	Heat source	I	Heat source	I 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

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

C O D E	LEVEL 1 Group element	C O D E	LEVEL 2 Element	C O D E	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		Central heating	I 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	I Heaters	Heat emitters Flues Instrumentation and controls

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

C O D E	LEVEL 1 Group element	C O D E	LEVEL 2 Element	C O D E	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				3	Central cooling	I 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	I Cooling units	Air conditioning units Pipe work systems Valves Duckwork system Grilles and diffusers Instrumentation and controls Thermal insulation

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

C O D E	LEVEL 1 Group element	C O D E	LEVEL 2 Element	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				5 Central heating and cooling	I 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	I Local heating and cooling units	Split systems/DX systems Pipe work systems Valves Pumps Ductwork system Grilles and diffusers Instrumentation and controls Thermal insulation

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

C O D E	LEVEL 1 Group element	C O D E	LEVEL 2 Element	C O D E	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				7	Central air conditioning	I 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	I 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	I	Central ventilation	I Central ventilation systems	Fans Terminal units Ductwork system Grilles and diffusers Pipe work system Valves Pumps Instrumentation and controls

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

C O D E	LEVEL 1 Group element	C O D E	LEVEL 2 Element	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				Local and special ventilation	<ul style="list-style-type: none"> <li>1 Toilets/bathroom ventilation units</li> <li>2 Kitchen ventilation units</li> <li>3 Safety cabinet and fume cupboards</li> <li>4 Fume extracts</li> <li>5 Dust collection units</li> <li>6 Anaesthetic ags extracts</li> <li>7 Cyclone systems</li> <li>8 Unit extract fans</li> <li>9 Rotating ventilators</li> <li>10 Roof – mounted ventilation</li> <li>11 Car parking ventilation</li> <li>12 Other local and special ventilation units</li> </ul>	<ul style="list-style-type: none"> <li>Fans</li> <li>Ductwork cleaning</li> <li>Grilles and diffusers</li> <li>Instrumentation and controls</li> </ul>
				Smoke extract/control	<ul style="list-style-type: none"> <li>1 Smoke extract/control systems</li> </ul>	<ul style="list-style-type: none"> <li>Smoke extract/control</li> <li>Automatic smoke compartmentation systems</li> <li>Fans</li> <li>Ductwork systems</li> <li>Grilles and diffusers</li> <li>Instrumentation and controls</li> </ul>
		8	Electrical installations	Electrical mains and sub mains distribution	<ul style="list-style-type: none"> <li>1 Electrical mains and sub mains LV distribution</li> </ul>	<ul style="list-style-type: none"> <li>LV distribution</li> <li>HV switch gear</li> <li>LV switchgear and distribution boards</li> <li>HV and LV cables and wiring</li> <li>Conduits and cable trunking</li> <li>Basbar trunking</li> <li>Transformers</li> <li>Feeder pillars, base units and the like</li> <li>Electricity monitoring system</li> </ul>



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

C O D E	LEVEL 1 Group element	C O D E	LEVEL 2 Element	C O D E	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				2	Power installations	I 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	I 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

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

C O D E	LEVEL 1 Group element	C O D E	LEVEL 2 Element	C O D E	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
					Specialist lighting installations	I 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
				4			
				5	Local electricity generation systems	I 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	Earthing and bonding systems	I Earthing and bonding systems	Protection conductor and earth Hazardous areas electric areas – earthing
		9	9 Fuel installations	I	Fuel storage	I Fuel storage	Fuel systems – oil, petrol, diesel and liquified petroleum gas, biomass and others Thermal insulation

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

C O D E	LEVEL 1 Group element	C O D E	LEVEL 2 Element	C O D E	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 liquified 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

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

C O D E	LEVEL 1 Group element	C O D E	LEVEL 2 Element	C O D E	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 Finals Conductor tapes Ground/earthing

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

C O D E	LEVEL 1 Group element	C O D E	LEVEL 2 Element	C O D E	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		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



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

C O D E	LEVEL 1 Group element	C O D E	LEVEL 2 Element	C O D E	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	





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

C O D E	LEVEL 1 Group element	C O D E	LEVEL 2 Element	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
		2		External planting	<ul style="list-style-type: none"> <li>1 Planting</li> <li>2 Planting reed beds</li> <li>3 Hedges</li> <li>4 Trees</li> <li>5 Woodland planting</li> <li>6 Tree surgery</li> <li>7 Maintenance works to plants</li> <li>8 Maintenance works to trees</li> <li>9 Maintenance works to hedges</li> </ul>	Grounds maintenance works
		3		Irrigation systems	<ul style="list-style-type: none"> <li>1 Irrigation systems</li> </ul>	Irrigation pipework systems Storage tanks Chemical storage tanks Chemical dosing equipment Nutrient treatment and equipment Outlet pipe and nozzles
		1	Fencing, railing and walls	Fencing and railings	<ul style="list-style-type: none"> <li>1 Fencing</li> <li>2 Railings</li> <li>3 Gates</li> </ul>	Fencing systems (types) Railings Gates – security Noise/light screening Ironmongery Painting/redecorations
		2		Walls and screens	<ul style="list-style-type: none"> <li>1 Walls</li> <li>2 Screens</li> <li>3 Gates</li> </ul>	Copings Pier caps Ironmongery
		3		Retaining walls	<ul style="list-style-type: none"> <li>1 Retaining walls</li> </ul>	Refer to table 8.4.3
		4		Barriers and guardrails	<ul style="list-style-type: none"> <li>1 Vehicle restraint systems</li> <li>2 Pedestrian restraint systems</li> <li>3 Vehicle and pedestrian control barriers and gates</li> </ul>	Fixing barriers and guardrails Redecorations

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

C O D E	LEVEL 1 Group element	C O D E	LEVEL 2 Element	C O D E	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	I	Site/street furniture and equipment	I Components	Gates Turnstiles Bollards Poster display units/notice boards Directional signage Flagpoles Sports/playground equipment Other furniture Bus stops/shelters Sculptures
				2	Ornamental features	I Ornamental features	Water features
		6	External drainage	I	Surface water and foul drainage	I 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 existing manholes 8 Cleaning existing drains 9 Sealing redundant drains – N/A 10 Filling disused manholes – N/A	Gullies and gratings
				2	Ancillary drainage systems	I Pumping stations 2 Ejector stations 3 Storage/retention tanks and vessels 4 Sewage treatment 5 Enzyme systems 6 Sustainable urban drainage systems	Pipework systems

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

C O D E	LEVEL 1 Group element	C O D E	LEVEL 2 Element	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	<ol style="list-style-type: none"> <li>1 Drainage runs below ground</li> <li>2 Drainage runs above ground</li> <li>3 Equipment and plant</li> </ol>	<ul style="list-style-type: none"> <li>Pipe work systems</li> <li>Storage tanks</li> <li>Settlement tanks</li> <li>Effluent treatment – dosing equipment</li> <li>Sterilisation equipment</li> <li>Control components</li> <li>Monitoring equipment</li> </ul>
		4		Land drainage	<ol style="list-style-type: none"> <li>1 Drainage runs below ground</li> <li>2 Manholes</li> <li>3 Drainage blankets</li> <li>4 Land drainage to parkland</li> </ol>	<ul style="list-style-type: none"> <li>Inspections</li> <li>Drain clearance</li> </ul>
		1	External services	Water mains supply	<ol style="list-style-type: none"> <li>1 Connections</li> <li>2 Connections to external plant</li> <li>3 Service runs</li> <li>4 Rainwater harvesting systems</li> <li>5 Grey water systems</li> </ol>	<ul style="list-style-type: none"> <li>Fire hydrants</li> <li>Trace heating</li> <li>Thermal insulation</li> <li>Meters</li> </ul>
		2		Electricity mains supply	<ol style="list-style-type: none"> <li>1 Connections to SU</li> <li>2 Service runs</li> <li>3 Transformer substations</li> <li>4 External electricity generation installation /plant</li> </ol>	<ul style="list-style-type: none"> <li>Distribution of LV electricity</li> <li>Generator plant</li> <li>Draw pits</li> </ul>
		3		External mains transformation devices	<ol style="list-style-type: none"> <li>1 Wind turbines</li> <li>2 Photovoltaic devices</li> <li>3 Other transformation devices</li> </ol>	<ul style="list-style-type: none"> <li>Generator plant</li> </ul>
		4		Electricity distribution to external plant and equipment	<ol style="list-style-type: none"> <li>1 and 2 Connections to external plant or equipment</li> <li>3 Service runs</li> </ol>	<ul style="list-style-type: none"> <li>Electrical distribution systems</li> </ul>
		5		Gas mains supply	<ol style="list-style-type: none"> <li>1 Connections to SU gas main</li> <li>2 Service runs</li> <li>3 Governing stations</li> </ol>	

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

LEVEL 1 Group element		LEVEL 2 Element		LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system		LEVEL 4 – MAINTAIN Component or System		LEVEL 5 – MAINTAIN Sub-component			
C	O	D	E	C	O	D	E	C	O	D	E
				6				1 Telecommunications system connections 2 Cables television connections 3 Other communication systems 4 Service runs			
				7				1 Fuel storage and piped distribution systems 2 Service runs			Storage tanks Thermal insulation Monitoring equipment
				8				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				1 External lighting to pedestrian areas 2 External lighting to paths 3 External lighting to roads 4 Illuminated traffic signs			External lighting/fixings (LED) Columns, poles, masts and the like Fixing luminaries and lamps General power installations
				10				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



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

C O D E	LEVEL 1 Group element	C O D E	LEVEL 2 Element	C O D E	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	<ul style="list-style-type: none"> <li>1 Handover requirements</li> <li>2 Operation and maintenance services</li> </ul>	(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	<ul style="list-style-type: none"> <li>1 Contract specific management &amp; staff</li> <li>2 Visiting management and staff</li> <li>3 Extraordinary support costs</li> <li>4 Staff travel (not part of labour rates)</li> </ul>	Refer to table item 9.2.1
				2	Site establishment – OPTIONAL IF IN SCOPE	<ul style="list-style-type: none"> <li>1 Site accommodation</li> <li>2 Temporary works</li> <li>3 Furniture and equipment</li> <li>4 IT systems</li> <li>5 Consumables and services</li> <li>6 Brought on services</li> <li>7 Sundries</li> </ul>	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	<ul style="list-style-type: none"> <li>1 Security staff</li> <li>2 Security equipment</li> <li>3 Hoardings, fences and gates</li> </ul>	N/A
				5	Safety and environmental protection	<ul style="list-style-type: none"> <li>1 Safety performance</li> <li>2 Barriers and safety scaffolding</li> <li>3 Environmental protection measures</li> </ul>	Refer to table item 9.2.5
				6	Control and protection	<ul style="list-style-type: none"> <li>1 Surveys, inspections and monitoring</li> <li>2 Setting out</li> <li>3 Protection of works</li> <li>4 Samples</li> <li>5 Environmental control of building</li> </ul>	Refer to table item 9.2.6

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

C O D E	LEVEL 1 Group element	C O D E	LEVEL 2 Element	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
7				Mechanical plant	<ul style="list-style-type: none"> <li>1 Generally</li> <li>2 Tower cranes</li> <li>3 Mobile cranes</li> <li>4 Hoists</li> <li>5 Access plant</li> <li>6 Concrete plant</li> <li>7 Other plant</li> </ul>	Refer to table item 9.2.7
8				Temporary works – INCLUDED WITH WORK ITEMS	<ul style="list-style-type: none"> <li>1 Access scaffolding</li> <li>2 Temporary works</li> </ul>	N/A
9				Site records	<ul style="list-style-type: none"> <li>1 Maintenance works</li> <li>22 Web based facilities management systems</li> </ul>	Refer to table 9.2
10				Transition and exit requirements	<ul style="list-style-type: none"> <li>1 Testing and commissioning plan</li> <li>2 Handover</li> <li>3 Post completion services (handback)</li> </ul>	Refer to table item 9.2.9
11				Cleaning	<ul style="list-style-type: none"> <li>1 Site tidy</li> <li>2 Maintenance of roads, paths and parings</li> </ul>	Refer to table item 9.2.10
12				Fees and charges	<ul style="list-style-type: none"> <li>1 Fees</li> <li>2 Charges</li> </ul>	Refer to table item 9.2.11
13				Site services	<ul style="list-style-type: none"> <li>1 Temporary works</li> <li>2 Multi-service gang</li> </ul>	Refer to table item 9.2.13
14				Insurance, bonds, guarantees and warranties	<ul style="list-style-type: none"> <li>1 Works insurances</li> <li>2 Public liability insurances</li> <li>3 Employers liability insurances</li> <li>4 Other insurances</li> <li>5 Bonds</li> <li>6 Guarantees</li> <li>7 Warranties</li> </ul>	Refer to table item 9.2.14

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

C O D E	LEVEL 1 Group element	C O D E	LEVEL 2 Element	C O D E	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		2	Other consultant's fees	1 Other consultant's fees	Refer to table item 11.1.2
		3		3	Site investigation fees	1 Site investigation fees	Refer to table item 11.1.3
		4		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		2	Specialist support services fees	1 Specialist support services fees	Refer to table item 11.2.2
		3		3	Temporary accommodation, services and facilities charges	1 Temporary accommodation, services and facilities charges	Refer to table item 11.2.3
		4		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		2	Employer finance costs	1 Employer finance costs	
		3		3	Fees	1 Fees	Refer to table item 12.1.3
		4		4	Charges	1.Charges	
		5		5	Planning contributions	Not covered in NRM 3	Not covered in NRM 3
		6		6	Insurances	1.Insurances	Refer to table item 12.1.6
		7		7	Archaeological field work	1 Archaeological field work	
		8		8	Other specialist fieldwork	1 Other specialist fieldwork	



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

C O D E	LEVEL 1 Group element	C O D E	LEVEL 2 Element	LEVEL 3 – CONSTRUCT & RENEWAL Sub-element or system	LEVEL 4 – MAINTAIN Component or System	LEVEL 5 – MAINTAIN Sub-component
				Decanting and relocation costs	1. Decanting and relocation costs	Refer to table item 12.1.9
				Fittings, furnishings and equipment	1 Fittings, furnishings and equipment	
				Tenant's costs/contributions	1 Tenant's costs/contributions	
				Marketing costs	1 Marketing costs	
				Other employer costs	1 Other employer costs	
				Allowances	1 Allowances	
				Energy efficiency	1 Energy efficiency	
				Office churn	Not covered in NRM 3	Not covered in NRM 3
				Not covered in NRM 3	N/A	Not covered in NRM 3
				End of life	Taken elsewhere	
				Third party income	Not covered in NRM 3	Not covered in NRM 3
				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

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

C O D E	LEVEL 1 Group element	C O D E	LEVEL 2 Element	C O D E	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
		4	Life cycle discount rate				Refer to table item 14.4
14							

# 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)	<p>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.</p> <p>Costs to include:</p> <ul style="list-style-type: none"> <li>● asset maintenance registers (i.e. initial production and subsequent updates);</li> <li>● identification of applicable level of assets required for the LCC of maintain and/or renewal plans with or without tagging;</li> <li>● verification for completeness and capturing specific assets details (e.g. make, model, capacity, rating and other asset details as required with or without tagging);</li> <li>● asset tagging and bar coding identification if required – (optional);</li> <li>● relevant maintenance information available for the LCC maintenance and renewal programming (refer to Appendix I);</li> <li>● relevant as built/computer-aided design (CAD) drawings/room data sheets and object BIM related information.</li> </ul>
Condition surveys, reports and the percentage asset remaining life expectancy (PARL) asset assessment data <sup>D)</sup>	<p>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</p> <p>Included costs for initial, periodic and specialist asset surveys should include:</p> <ul style="list-style-type: none"> <li>● stock condition surveys;</li> <li>● percentage asset remaining life (PARL) assessments;</li> <li>● inspection/monitoring regimes – e.g. site tours, thermal imaging and vibration analysis, etc.;</li> <li>● specialist surveys, e.g. historic listed building;</li> <li>● other costs, as applicable.</li> </ul> <p>Excluded costs for initial, periodic and specialist asset surveys:</p> <ul style="list-style-type: none"> <li>● inspections carried out as part of the maintenance contract work (included in the maintain regime);</li> <li>● 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).</li> </ul>

Appendix F: Maintenance cost categories and definitions

Cost Category	Maintenance cost category definitions
Other forms of assessment (Optional) <sup>E</sup>	<p>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.</p> <p>Included costs for other forms of asset assessment may be:</p> <ul style="list-style-type: none"> <li>● capacity forecasts/resilience assessments;</li> <li>● energy efficiency reviews (EPC);</li> <li>● space utilization; functional suitability (optional);</li> <li>● Disability Discrimination Act (DDA), Equality Act 2010, e.g. considerations and other regulatory risk surveys;</li> <li>● wider sustainability implications (to be defined);</li> <li>● other forms of assessment as applicable (if agreed in scope).</li> </ul> <p>Note For example, carbon reduction commitments resulting in energy efficiency improvement work.</p>
NOTES	<p><sup>A</sup> Applies to asset registers in any form (hardcopy, electronic, building information model, etc.)</p> <p><sup>B</sup> 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.</p> <p><sup>C</sup> Stock surveys include for obtaining relevant information from as built /O&amp;M data files and site log books, plus capturing local knowledge to inform findings.</p> <p><sup>D</sup> Refer to the information assumptions and data sources in BS8544, Clause 9 for detailed guidance on remaining service life data sources.</p> <p><sup>E</sup> See NRM clause 4.6. in Part 4 for guidance on costing other forms of assessment.</p>
<b>Maintain cost</b>	<i>Planned, reactive, and proactive maintenance costs (including on costs and employer costs)</i>
<p>Planned maintenance (including PPM regime )</p> <p>Including minor repairs and asset sub-component replacement costs (up to sub-limit of liability)</p>	<p>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.</p> <p>Included costs:</p> <ul style="list-style-type: none"> <li>● labour (annual man hours for scheduled or PPM programmed work);</li> <li>● subcontracted and specialist scheduled or PPM works;</li> <li>● consumables, plant and equipment, sundries;</li> <li>● premium costs for out of normal hours of working.</li> <li>● Plus on-cost items, if it is a PPM-only contract. <sup>F</sup>)</li> <li>● 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.</li> </ul> <p>Excluded costs – major repair; refurbishing replacement costs (i.e. included in life-cycle renewal costs).</p> <p>NOTE: See life-cycle renewal costs for guidance on definitions of “major” and “minor” replacement.</p>
<p>Reactive, responsive and corrective maintenance</p> <p>Including unscheduled component replacement, repairs costs (up to sub limit of costs or liability)</p>	<p>Allowance for unforeseen or unplanned maintenance arising from early failure, inappropriate use, etc. and associated making good and minor redecorations.</p> <p>Included costs:</p> <ul style="list-style-type: none"> <li>● labour (man hours for reactive first line work);</li> <li>● subcontracted and specialist reactive cover;</li> <li>● consumables, plant and equipment, sundries;</li> <li>● premium costs for out of normal hours of working</li> </ul> <p>Plus on-cost items, if it is a reactive cover only. <sup>F</sup>)</p>
<p>Proactive maintenance provision</p> <p>Including planned inspections and monitoring and site management procedures</p>	<p>Allowance for proactive maintenance provision. <sup>G</sup>)</p> <p>Included costs:</p> <ul style="list-style-type: none"> <li>● planned inspections of buildings (PIB);</li> <li>● tours of plant rooms and critical systems;</li> <li>● targeted monitoring, e.g. energy focused (BMS controls);</li> <li>● employer definable maintenance related maintenance management activities;</li> <li>● others (as defined in scope).</li> </ul> <p>Plus on-cost items, if the proactive cover is costed separately.</p> <p>Also, the cost of works resulting from inspections should be included in reactive maintenance.</p>

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

Cost Category	Maintenance cost category definitions
Maintenance contractors on costs and risk allowance, consultant fees and inflation, taxation etc <sup>G)</sup>	<p>Included costs (for planned, reactive and proactive):</p> <ul style="list-style-type: none"> <li>● maintenance contractor's management prelims notes and administration;</li> <li>● maintenance contractor's overhead and profit;</li> <li>● contractor's consultants' fees and specialist works costs;</li> <li>● risk – (including commercial / other considerations). <sup>H)</sup></li> <li>● 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.</li> <li>● taxation and incentives – if required to be in scopes (e.g.VAT normally excluded for costing).</li> </ul>
NOTES	<p><sup>F)</sup> 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).</p> <p><sup>G)</sup> Proactive maintenance activity to include for early interventions to failing assets.</p> <p><sup>H)</sup> Risks to include costs for relevant commercial or other considerations.</p>
<b>Renewal cost</b>	<i>Planned major repairs, refurbishing, replacements, redecorations – plus specific improvements and upgrade works (if required for certain LCC outcomes – e.g. improve energy efficiency)</i>
Major repairs <sup>J)</sup> and replacements	<p><i>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.</i></p> <p>Costs to include:</p> <ul style="list-style-type: none"> <li>● repair and replacement of major building assets and plant and equipment items <sup>B)</sup></li> <li>● access and location adjustment factors;</li> <li>● travel, transport and subsistence costs;</li> <li>● facilitating works</li> <li>● pre-inspection costs;</li> <li>● landfill tax and income/disposal costs;</li> <li>● maintenance contractor's management of the works and specialist's on-costs</li> <li>● maintenance contractors on-costs;</li> <li>● costs and income from disposal of replaced components and parts, where applicable;</li> <li>● any life-cycle fund management and the employed direct labour where those costs are considered to be direct overheads to the works.</li> </ul> <p>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</p>
Refurbish and adaptation Note – normally dealt with as construction project works	<p><i>Scheduled refurbishment, improvement, adaptation and upgrades during the in-use period of analysis.</i></p> <p>If in scope, this includes:</p> <ul style="list-style-type: none"> <li>● improvement works to buildings or parts thereof;</li> <li>● refurbishment of whole installations including associated works;</li> <li>● upgrade works (e.g. carbon reduction/Part L);</li> <li>● renewables (e.g. CHP, solar panelling);</li> <li>● alterations and churn costs.</li> </ul> <p>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).</p>
Redecorations	<p><i>Scheduled redecoration works to existing buildings. <sup>K)</sup></i></p> <p>This excludes decorations carried out in connection with maintenance or replacement work.</p> <p>Plus on-cost items, if separate contracts.</p>

Appendix F: Maintenance cost categories and definitions

Cost Category	Maintenance cost category definitions
Maintenance contractor's on-costs and risk allowance, fees, taxation, inflation allowances <sup>L)</sup>	<p>Costs to include (for 'renewal' maintenance works):</p> <ul style="list-style-type: none"> <li>● maintenance contractor's preliminaries and administration;</li> <li>● maintenance contractor's overhead and profit;</li> <li>● consultants fees and specialist works costs;</li> <li>● employer definable maintenance related works (if in scope)</li> <li>● risk (including commercial/other considerations); <sup>M)</sup></li> <li>● inflation;</li> <li>● taxes (e.g. VAT normally excluded for costing).</li> </ul>
NOTES	<p><sup>J)</sup> Costs should be presented in an elemental and sub-elemental cost structure categories for buildings and external works, as NRM appendix I and J.</p> <p><sup>K)</sup> 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.</p> <p><sup>L)</sup> Redecoration costs can be calculated within their associated elemental costings but should be shown separately.</p> <p><sup>M)</sup> 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).</p> <p><sup>N)</sup> Risks to include costs for relevant commercial or other considerations</p>
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	<p>All employer client cost involved in managing and administration of the maintenance of the building or its parts.</p> <p>Included costs:</p> <p>supervisory staff (e.g. building maintenance supervisors; maintenance managers);</p> <p>professional staff or consultants (e.g. architects, engineers, surveyors);</p> <p>clerical and administration staff;</p> <p>any relevant general and regulatory inspections and surveys commissioned by or on behalf of the client;</p> <p>staff engaged to maintain the building (e.g. care-takers and other responsible persons);</p> <p>staff costs should include wages, expenses, overtime, insurances, administrative support, overheads, accommodation, supply of uniforms, travel costs, pensions.</p> <p>Excluded costs:</p> <p>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);</p> <p>2) inspections carried out in connection with pricing the items of maintenance works (included in annualized maintenance, grounds maintenance, periodic renewal works);</p> <p>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);</p> <p>NOTE – Condition surveys and other forms of assessment data (see clause 4.7 in Part 4, on asset registers and assessment data)</p>

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

Cost Category	Maintenance cost category definitions
Other employer definable costs, included in the study	<p>Other employer definable cost and benefits required to be included in the maintenance life-cycle cost plan.</p> <p>Included costs – for example:</p> <ul style="list-style-type: none"> <li>● mothball maintenance;</li> <li>● operation costs (as defined in BS8544 table 2);</li> <li>● occupancy costs (as defined in BS8544 table 2);</li> <li>● end of life liabilities, recycling, salvage, etc;</li> <li>● hand-back contractual obligations;</li> <li>● capital allowances;</li> <li>● asset depreciation/write down;</li> <li>● other elements (to be defined).</li> </ul> <p>This is not an exhaustive list, simply a guide.</p>
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)

## I 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 inappropriate 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%)

$$PV \text{ of } \text{£}x = \text{£}x (1+r)^{-t}$$

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%) =

$$AE = \frac{PV}{PVA}$$

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 different 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).

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

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.

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

- (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 I (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

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

- 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:



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- 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 FCPI)
- (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

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- 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 FCPI)
- (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

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- 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 FCPI report
- (xviii) Authority to commence the 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

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- (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;

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- (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;

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- 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 from 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

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- 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 the 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;



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- (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.

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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;

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- 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

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

- (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 the 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

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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

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- (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 I codes)

Project Title:		Functional Unit:		Number of Storeys:	
Cost Plan No:		Level of analysis:		Floor Area (GIFA) m <sup>2</sup> :	
Base date:		Space Usage (m <sup>2</sup> ):		Maintainable Area (NIA) m <sup>2</sup> :	
Period of Analysis (Yrs):	X	Hours of Operation:		Location (BCIS Index):	

Cost centre	Group element/Element	£Y <sub>1</sub>	£Y <sub>2</sub>	£Y <sub>3</sub>	...	£Y <sub>n</sub>	X Year total	Cost per m <sup>2</sup> GIFA per annum
							£	£/m <sup>2</sup> pa
	<b>RENEWAL</b>	[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							
	<b>SUBTOTAL: RENEWAL</b>	[Insert summation of all sub-elements]						
	<b>MAINTAIN</b>	[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							
	<b>SUBTOTAL: MAINTAIN</b>							
	<b>SUBTOTAL – MAINTAIN + RENEWAL (A)</b>							
9	Maintenance contractor's management and administration costs (B)							
	<b>SUBTOTAL – MAINTAIN + RENEWAL (including maintenance contractor's preliminaries (C) [C = A + B])</b>							
10	Maintenance contractor's overheads and profit (D)							
	<b>TOTAL – MAINTAIN + RENEWAL ESTIMATE (E) [E = C + D]</b>							

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

11	Consultants' and specialists' fees (F)							
12	Employer definable costs (G)							
	<b>TOTAL – CONSULTANTS FEES/EMPLOYER DEFINABLE COSTS (H) [H = F + G]</b>							
	<b>BASE ELEMENTAL COST ESTIMATE (I) [I = E + H]</b>							
13A–B	Risk allowances – as item 3.14							
13C	Commercial and other considerations – as item 3.16 & 3.18							
	<b>TOTAL – RISK ALLOWANCE ESTIMATE (J)</b>							
	<b>COST LIMIT (excluding inflation) (K) [K = I + J]</b>							
14	Inflation/deflation – as item 3.15							
	<b>TOTAL – INFLATION / DEFLATION (L)</b>							
	<b>COST LIMIT (excluding VAT assessment) (M) [M = K + L]</b>							
	VAT assessment	Excluded (see note)						
	<b>MAINTENANCE FUNCTIONAL UNIT RATE (FUR) £/m<sup>2</sup>pa</b>							

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 <sup>2</sup> ):	
Base date:		Space usage (m <sup>2</sup> ):		Maintainable Area (NIA) (m <sup>2</sup> ):	
Period of Analysis (Yrs)	X	Hours of Operation:		Location (BCIS index):	

Cost centre	Group element/element/sub-element	£Y <sub>1</sub>	£Y <sub>2</sub>	£Y <sub>3</sub>	...	£Y <sub>n</sub>	X Year total	Cost per m <sup>2</sup> GIFA per annum
							£	£/m <sup>2</sup> pa
	<b>RENEWAL</b>							
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							

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

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							
<b>SUBTOTAL: RENEWAL</b>								
<b>MAINTAIN</b>								
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							

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

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						
5.1.1	Fire and lightning protection						
5.1.2	Communication, security and control systems						
5.1.3	Special installations						
5.1.4	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						
	<b>SUBTOTAL: MAINTAIN</b>						
	<b>SUBTOTAL – MAINTAIN + RENEWAL (A)</b>						
9	Maintenance contractor's management and administration costs (B)						
	<b>SUBTOTAL – MAINTAIN + RENEWAL (including maintenance contractor's preliminaries (C) [C = A + B])</b>						
10	Maintenance contractor's overheads and profit (D)						
	<b>TOTAL – MAINTAIN + RENEWAL ESTIMATE (E) [E = C + D]</b>						
11	Consultant's and specialist's fees (F)						



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# 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.



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