VOLUME 4 BILLS OF QUANTITIES FOR HIGHWAY WORKS

BILLS OF QUANTITIES FOR HIGHWAY WORKS

AMENDMENT MAY 2009

This document contains replacement pages for incorporation into the Bills of Quantities for Highway Works.

INSTRUCTIONS FOR USE

1. Insert replacement pages listed on the Amendment sheet (Amendment - May 2009), remove the corresponding existing pages, which are superseded by this amendment and archive as appropriate. (Advice on archiving is given in Advice Note SD 0/08.)
2. Remove and archive existing November 2006 Amendments sheet and insert the latest Amendments sheet (May 2009) at the front of the document.
3. Enter details of Amendment May 2009 on the Registration of Amendments sheet, sign and date to confirm that the amendment has been incorporated.
4. Archive this sheet as appropriate.

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VOLUME 4

BILLS OF QUANTITIES FOR HIGHWAY WORKS

Amendment - May 2001 (incorporating amendments listed in SD 9/01 - Annex D)

Amendment - May 2002 (incorporating amendments listed in SD 10/02 - Annex D)

Amendment - February 2003 (incorporating amendments listed in SD 12/03 - Annex D)

Amendment - May 2003 (incorporating amendments listed in SD 13/03 - Annex D)

Amendment - November 2003 (incorporating amendments listed in SD 15/03 - Annex D)

Amendment - May 2004 (incorporating amendments listed in SD 16/04 - Annex D)

Amendment - November 2004 (incorporating amendments listed in SD 17/04 - Annex D)

Amendment - May 2005 (incorporating amendments listed in SD 18/05 - Annex D)

Amendment - November 2006 (incorporating amendments listed in SD 21/06 - Annex D)

Amendment - May 2009 (replacement pages listed overleaf, incorporating amendments listed in SD 27/09 - Annex D)

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MANUAL OF CONTRACT DOCUMENTS FOR HIGHWAY WORKS
A BRIEF DESCRIPTION OF MAY 2009 AMENDMENTS

DOCUMENT	DESCRIPTION
Volume 4	**Bills of Quantities for Highway Works (MCHW 4)**
General	The user's attention is drawn to the following note which has been abstracted from Implementing Standard SD 27/09: ''Contracts for which tenders are to be invited after 1 November 2009 shall incorporate by reference the amendments implemented by this Standard, except where the preparation of a contract has reached a stage at which in the opinion of the Overseeing Organisation use of the amendments would result in significant additional expense or delay progress.'' The user's attention is drawn to GD 03/08 (DMRB 0.2.2) Implementation and Use of the Standards Improvement System. This Standard superseded HD 34/03 which introduced the Standards Improvement System (SIS). SIS is a computerised database of reports generated from failures of specifications and design standards and other observations on these documents. The database records potential improvements using lists of components, symptoms, diagnoses and detailed descriptions. SIS is operated and maintained by the Highways Agency. Its prime objective is to improve the performance of the engineering standards and specifications published by the Highways Agency, both independently and jointly with other Overseeing Organisations. **Feedback Arrangement** To provide feedback on the Highways Agency's standards and specifications, please use this link: **http://www.highways-net.co.uk/information/dmrbaccess.asp**
Section 3: Library of Standard Item Descriptions for Highway Works	**Series 700**: Amendments to Groups 1*, 2*, 3*,4*, 6* and 10* in line with Specification for Highway Works (MCHW 1) amendments to Series 800 and Series 900.

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BILLS OF QUANTITIES FOR HIGHWAY WORKS - MARCH 1998

Section 1 **Method of Measurement for Highway Works**

Amendments dated May 2001, May 2002, February 2003, May 2003, November 2003, May 2004, November 2004, May 2005 and November 2006 (Incorporating amendments listed in SD 21/06 Annex D)

Section 2 **Notes for Guidance on the Method of Measurement for Highways Works**

Amendments dated May 2001, May 2003, November 2003, May 2004, November 2004 and November 2006 (Incorporating amendments listed in SD 21/06 Annex D)

Section 3 **Library of Standard Item Descriptions for Highway Works**

Amendments dated May 2001, May 2002, May 2003, November 2003, May 2004, November 2004, May 2005, November 2006 and May 2009 (Incorporating amendments listed in SD 27/09)

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AMENDMENTS TO VOLUME 4 - MAY 2009

Instruction Sheet

Section	**Revision**
Index	Replace Section 3 pages with new May 2009 pages
Section 3	
Series 700	Replace pages 3 to 8 with new pages 3 to 8

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VOLUME 4 BILLS OF QUANTITIES FOR HIGHWAY WORKS

BILLS OF QUANTITIES FOR HIGHWAY WORKS

MARCH 1998

This document contains a new edition dated March 1998 of the Bills of Quantities for Highway Works.

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Manual of Contract Documents for Highway Works

New edition March 1998 of

VOLUME 4

Bills of Quantities for Highway Works

SUPERSEDED

March 1998

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Publisher's Note

1. Notes for Guidance on the Specification for Highway Works are published by The Stationery Office as a companion to the Specification for Highway Works in Volume 2 of the Manual of Contract Documents for Highway Works. They also incorporate samples of the numbered Appendices which are referred to in the Specification, as guidance to the compiler on what type of information the numbered Appendices should contain. They have been compiled to assist compilers in preparing contracts for Highway Works and to advise on the interpretation of the Specification for Highway Works and to give background information.

2. The Method of Measurement for Highway Works is also published by The Stationery Office in Section 1 of Volume 4 of the Manual of Contract Documents for Highway Works - Bills of Quantities for Highway Works for incorporation into contracts by reference. This defines the coverage of items in Bill of Quantities and their Method of Measurement. Notes for Guidance on the Method of Measurement for Highway Works and a Library of Standard Item Descriptions are also published by The Stationery Office in Sections 2 and 3 respectively of Volume 4 giving typical Bill of Quantities items.

3. Highway Construction Details are published as Volume 3 of the Manual of Contract Documents for Highway Works to which both Specification and Method of Measurement relate. These include a set of drawings of typical standard details applicable to most highways contracts which can be incorporated by reference into the contract.

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REGISTRATION OF AMENDMENTS

Amendment No.	Page No.	Signature & Date of Incorporation of Amendments	Amendment No.	Page No.	Signature & Date of Incorporation of Amendments

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BILLS OF QUANTITIES FOR HIGHWAY WORKS

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METHOD OF MEASUREMENT FOR HIGHWAY WORKS

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Chapter I

Definitions

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Definitions

1 In this document entitled Method of Measurement for Highway Works (hereinafter referred to as "the Method of Measurement") unless the context otherwise requires, the following words and expressions shall have the meanings hereby respectively assigned to them, that is to say:

(a) "Conditions of Contract" means the Conditions of Contract referred to in the Tender;

(b) words and expressions to which meanings are assigned in the Specification and Contract Drawings have the same meanings in the Method of Measurement;

(c) "Bill of Quantities" means a list of items giving brief identifying descriptions and estimated quantities of work comprised in the execution of the works to be performed;

(d) items designated "Provisional" are items for which the quantities of work to be executed cannot be determined with the same degree of accuracy as other items but for which it is deemed necessary to make provision;

(e) "Preliminary Item" means an item in respect of works, general obligations and risks antecedent to or involved in the execution of the Contract and which is set out in a "Preliminaries" section of the Bill of Quantities;

(f) "Finishings" means the miscellaneous surfacings, furniture and ancillary features that are added to any part of a structure;

(g) "Existing Ground Level" means the level of the ground before any work under the Contract is carried out;

(h) "Hard Material" means the following:

(i) material so designated in the Preambles to Bill of Quantities; and/or

(ii) material which requires the use of blasting, breakers or splitters for its removal but excluding individual masses less than 0.20 cubic metres;

(i) "Culvert" means an enclosed channel or pipe designated as a culvert in the Contract;

(j) "Type of Pavement" means one of the following designs of pavement:

(i) flexible;

(ii) flexible composite;

(iii) rigid;

(iv) rigid composite;

(k) "Designated Outline" means the designated outline shown on the Drawings.

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Note. A Designated Outline is shown as enclosing each structure to be designed by the Contractor and each structure for which a choice of designs is offered. The Designated Outline delineates the limits of measurement of work to be included for each structure (with the exception of those works scheduled as not to be included).

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Chapter II

General Principles

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General Principles

Method of Measurement

1 (a) The Method of Measurement is intended for use for highway contracts with any form of contract. Amendments may be required for particular Contract Conditions.

(b) (05/01) The Method of Measurement, as amended May 2001, is based on the amended March 1998 version of the Specification for Highway Works and of the Highway Construction Details published as Volume 1 and Volume 3 of the Manual of Contract Documents for Highway Works and on the principle that full details of construction requirements are provided in the Contract. Additions or amendments to the Specification for Highway Works or the Highway Construction Details which are not adequately covered by the Method of Measurement will necessitate appropriate amendment to suit. Provision is made in Chapter III Preambles to Bill of Quantities, "Amendments to the Method of Measurement" to accommodate such amendments.

Bill of Quantities

2 (a) In the Bill of Quantities the sub-headings and item descriptions identify the work covered by the respective items read in conjunction with the matters listed against the relevant marginal headings "Item coverage" in Chapter IV of the Method of Measurement, Chapter III Preambles to Bill of Quantities and amendments. The nature and extent of the work to be performed is to be ascertained by reference to the Drawings, Specification and Conditions of Contract.

(b) Items included in the Bill of Quantities for work to be executed or goods, materials or services to be supplied by a Nominated Sub-contractor shall be followed by separate items for:

(i) Labours in connection therewith in the form of a lump sum.

(ii) All other charges and profit in connection therewith in the form of a percentage.

Itemisation - Groups and Features

3 Each item description is to be consistent with and be compounded from one or more of the Groups listed under the marginal headings "Itemisation" within the Series of Chapter IV of the Method of Measurement incorporating amendments introduced in the Preambles to the Bill of Quantities. An item description may contain Features from as many Groups as necessary to identify the work required, but may include only one Feature from any one Group.

Items in the Bill of Quantities

4 The Bill of Quantities, unless expressly stated otherwise in the Contract is to contain all those items compounded in accordance with the foregoing paragraph 3 required to comprise the Works (apart from Provisional Sums and Prime Cost Items which may be required).

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Chapter III

Preparation of Bill of Quantities

(including Preambles to Bill of Quantities and
Schedule of Pages and Relevant Publication Dates
for the Method of Measurement for Highway Works)

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Preparation of Bill of Quantities

Sub-division of Bill of Quantities

1 The Bill of Quantities is to be divided as appropriate into separate levels of identification, in the sequence set down in Table 1.

Quantities

2 Quantities shall be expressed in whole numbers except for units of measurement of tonnes and hectares in which case the quantities shall be to three decimal places.

Units of Measurement

3 (05/01) The following abbreviations shall be used for the units of measurement:

Unit	Abbreviation	Unit	Abbreviation
millimetre	mm	sum	sum
metre	m	number	no
square millimetre	mm^2	hour	hr
		week	wk
square metre	m^2	item	item
hectare	ha	vehicle week	v.wk
cubic metre	m^3	man hour	man hr
kilogramme	kg	vehicle day	v.day
tonne	t	operative day	op.day
day	day		

Special Preliminary Items

4 Provision is made in Table 1 for the inclusion of "Special Preliminary" items in the Bill of Quantities.

"Special Preliminary" items are not included in Chapter IV Units and Method of Measurement as their use is intended to be restricted and particular to a given Contract.

"Special Preliminary" items shall not be used for Temporary Works, cofferdams, accesses, advance operations and the like unless the work or operation is unusual in relation to the Works, and:

(a) the magnitude of such work, not separately measured, is such as to be disproportionately high in cost in relation to the measured work with which it is associated; or

(b) an operation, not separately measured, is required to be executed far in advance or after the main measured operation to which it relates.

The inclusion of "Special Preliminary" items in a Contract shall be entirely at the discretion of the Overseeing Organisation. Whether a "Special Preliminary" item is included in the Bill of Quantities or not shall in no way relieve the Contractor of his obligations under the Contract.

Alternative Types of Pavement

5 Where the Contract provides for the tenderer to select the Type of Pavement to be constructed from a range of alternatives a separate Bill of Quantities is to be provided within Series 600 : Earthworks, of the Roadworks General Bill; and Series 700 : Pavements, of the Main Carriageway, Interchanges and Side Roads Bills as appropriate, for each Type of Pavement permitted by the Contract.

Each of the individual Bills of Quantities within Series 600 of the Roadworks General Bill and in Series 700 of the Main Carriageway, Interchanges and Side Roads Bills as appropriate, is to be based on the thinnest pavement permitted by the Contract for the particular Type of Pavement to which it refers.

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Immediately preceding the separate sets of alternative Bills in Series 600 : Earthworks and Series 700: Pavements respectively an Index (Table 2) is to be provided of the Types of Pavement permitted by the Contract.

Provision is to be made for only the one Bill of Quantities in Series 600 of the Roadworks General Bill and in Series 700 of the Main Carriageway, Interchanges and Side Roads Bills as appropriate which relates to the Type of Pavement elected to be constructed by the Contractor, to be priced and included in the Tender Total.

Structures Where a Choice of Designs is Offered

6 (05/04) Where the Contract provides for a structure designed by the Contractor to be constructed as an alternative to the structure which has been designed by the Overseeing Organisation, a separate Bill of Quantities is to be provided for each of the two construction procedures permitted by the Contract.

Each of the two individual Bills of Quantities is to be provided in accordance with the various Chapters and Series of the Method of Measurement for all the works contained within the Designated Outline (with the exception of those works scheduled as not to be included). For the structure designed by the Contractor the Bill of Quantities is to comprise a single item in accordance with Series 2500. The Bill for the structure designed by the Overseeing Organisation is to be compiled in accordance with the appropriate Series. Those works scheduled as not to be included in either of these alternative Bills of Quantities shall be included by the Overseeing Organisation in other Bills compiled in accordance with the appropriate Series.

Provision is to be made for only the one Bill of Quantities which relates to the form of construction elected to be constructed by the Contractor to be priced and included in the Tender Total.

Immediately preceding the separate alternative Bills of Quantities an Index (Table 3) is to be provided for the alternative forms of construction permitted by the Contract.

Structures Designed by the Contractor

7 (05/04) Where the Contract provides only for a structure designed by the Contractor to be constructed a Bill of Quantities comprising a single item for all the works within the Designated Outline (with the exception of those works scheduled as not to be included) is to be provided in accordance with Series 2500. Those works scheduled as not to be included in this single item are to be included by the Overseeing Organisation in other Bills compiled in accordance with the appropriate Series.

Earthworks within the Designated Outlines shall not be included in the Earthworks Schedules.

Landscape and Ecology (05/01)

8 (05/04) Where the Contract includes for Landscape and Ecology a separate Bill of Quantities shall be provided within the Roadworks Bill as set down in Table 1.

Payments for new planting, seeding and turfing measured in accordance with Series 3000 paragraphs 6 to 13 inclusive shall be subject to staged payments as set out in Table 4 which shall be completed by the compiler. This table shall be inserted immediately preceding the Collection page for the separate Bill of Quantities for Landscape and Ecology.

Preambles to Bill of Quantities

9 (05/04) The matters set out under the heading "Preambles to Bill of Quantities" (1-19) hereafter are always to be included as a Preamble to the Bill of Quantities. Additional numbered Preambles may be included as necessary. Amendments to the Method of Measurement are to follow paragraph 20 (see notes to compiler).

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TABLE 1 (05/04)

LEVEL 1 DIVISION	LEVEL 2 CONSTRUCTION HEADING	LEVEL 3 MMHW SERIES HEADINGS	NOTES
(i) Preliminaries	Preliminaries	100 Preliminaries	Special Preliminaries should be inserted under level 3
(ii) Roadworks	Roadworks General	200 Site Clearance 300 Fencing (05/01) 400 Road Restraint Systems (Vehicle and Pedestrian) (05/04) 600 Earthworks	Geotechnics and Hedgebanks and the like should be inserted under level 3 Series 600
	Main Carriageway	500 Drainage and Service Ducts 700 Pavements 1100 Kerbs, Footways and Paved Areas	Police observation platforms, cycle tracks, and the like should be inserted under level 3 Series 1100
	Interchanges	500 Drainage and Service Ducts 700 Pavements 1100 Kerbs, Footways and Paved Areas	Cycle tracks and the like should be inserted under level 3 Series 1100
	Side Roads	500 Drainage and Service Ducts 700 Pavements 1100 Kerbs, Footways and Paved Areas	Cycle tracks and the like should be inserted under level 3 Series 1100
	Signs, Motorway Communications and Lighting	1200 Traffic Signs and Road Markings 1300 Road Lighting Columns, Brackets and CCTV Masts (05/01) 1400 Electrical Work for Road Lighting and Traffic Signs 1500 Motorway Communications	
	Landscape and Ecology (05/01)	3000 Landscape and Ecology	

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LEVEL 1 DIVISION		LEVEL 2 CONSTRUCTION HEADING	LEVEL 3 MMHW SERIES HEADINGS	NOTES
DIVISION	SUB-DIVISION			
(iii) Structures	Structure in form of Bridge or Viaduct; Name or Reference	Special Preliminaries		Special Preliminaries should be inserted as a separate construction heading under level 2
		Piling	1600 Piling and Embedded Retaining Walls (05/01)	
		Substructure - End Supports	500 Drainage and Ducts 600 Earthworks 1100 Kerbs, Footways and Paved Areas 1700 Structural Concrete 1800 Structural Steelwork 1900 Protection of Steelwork Against Corrosion 2300 Bridge Expansion Joints and Sealing of Gaps 2400 Brickwork, Blockwork and Stonework	To include wingwalls and paved areas beneath structures
		Substructure - Intermediate Supports Substructure - Main Span Substructure - Approach Spans	As for End Supports	To include piers and columns

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LEVEL 1 DIVISION		LEVEL 2 CONSTRUCTION HEADING	LEVEL 3 MMHW SERIES HEADINGS	NOTES
DIVISION	SUB-DIVISION			
		Superstructure - Main Span Superstructure - Approach Spans Superstructure - Arch Ribs	500 Drainage and Service Ducts 1700 Structural Concrete 1800 Structural Steelwork 1900 Protection of Steelwork Against Corrosion 2100 Bridge Bearings 2300 Joints and Sealing of Gaps 2400 Brickwork, Blockwork and Stonework	
		Finishings	400 Road Restraint Systems (Vehicle and Pedestrian) (05/04) 600 Earthworks 700 Pavements 1100 Kerbs, Footways and Paved Areas 2000 Waterproofing for Structures 2400 Brickwork, Blockwork and Stonework	Pavements, footways and the like to be included here if no Roadworks Bill of Quantities
	Retaining Wall, Culvert, Subway, Gantry, Large Headwall, Gabion Wall, Diaphragm Wall, Pocket Type Reinforced Brickwork Retaining Wall and the like; Name or Reference	Special Preliminaries		Special Preliminaries should be inserted as a separate construction heading under level 2

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LEVEL 1 DIVISION		LEVEL 2 CONSTRUCTION HEADING	LEVEL 3 MMHW SERIES HEADINGS	NOTES
DIVISION	SUB-DIVISION			
		Main Construction	500 Drainage and Service Ducts 600 Earthworks 1100 Kerbs, Footways and Paved Areas 1600 Piling and Embedded Retaining Walls (05/01) 1700 Structural Concrete 1800 Structural Steelwork 1900 Protection of Steelwork Against Corrosion 2300 Bridge Expansion Joints and Sealing of Gaps 2400 Brickwork, Blockwork and Stonework	
		Finishings	400 Road Restraint Systems (Vehicle and Pedestrian) (05/04) 600 Earthworks 700 Pavements 1100 Kerbs, Footways and Paved Areas 2000 Waterproofing for Structures 2400 Brickwork, Blockwork and Stonework	Pavements, Footways and the like to be included here if no Roadworks Bill of Quantities

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LEVEL 1 DIVISION		LEVEL 2 CONSTRUCTION HEADING	LEVEL 3 MMHW SERIES HEADINGS	NOTES
DIVISION	SUB-DIVISION			
(iv) Structures Where a Choice of Designs is Offered	Structure Designed by the Overseeing Organisation; Name or Reference	To comply with the principles set down above for Structures		To include works within Designated Outlines with the exception of works scheduled as not to be included. This division is not to be used where the Contract provides only for a structure designed by the Contractor
	Structure Designed by the Contractor; Name or Reference			
(v) Structures Designed by the Contractor	Structure; Name or Reference			To include works within Designated Outlines with the exception of works scheduled as not to be included
(vi) Service Areas		Roadworks Structures	To comply with the principles set down above for Roadworks and Structures	
(vii) Maintenance Compounds		Roadworks Structures		
(viii) Accommodation Works		Interest; Name or Reference		
(ix) Works for Statutory or Other Bodies		Body; Name or Reference	To comply with the principles set down above for Roadworks and Structures	
(x) Daywork		Daywork		
(xi) PC and Provisional Sum		PC and Provisional Sum		To include PC and Provisional sums not allocated to a particular construction heading

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TABLE 2

(This Table 2 is an example of the introduction and index to be inserted as a separate page immediately preceding each set of the separate Bills of Quantities included within Series 600 : Earthworks in the Roadworks General Bill and Series 700 : Pavements in the Main Carriageway, Interchanges and Side Roads Bills, to cover the alternative Types of Pavement included in the Contract.)

# (Bill No .....Roadworks General - Series 600: Earthworks) * (Bill No ..... Main Carriageway - Series 700: Pavements) * (Bill No ..... Interchanges - Series 700: Pavements) * (Bill No ..... Side Roads - Series 700: Pavements)			
A separate Bill of Quantities is provided for each of the Types of Pavement permitted by the Contract. Notwithstanding the provisions paragraph 4 of the Preambles to Bill of Quantities, the tenderer shall price, extend and carry to the collection of # (Bill No ... Series 600 :Earthworks) * (Bill No ... Series 700: Pavements) only that Bill of Quantities appropriate to the Type of Pavement he has elected to construct. The tenderer shall price the Bill of Quantities in Series 600 : Earthworks corresponding to the Type of Pavement he prices in Series 700 : Pavements which he has elected to construct.			
Index			
Type of Pavement	Bill No.	Page(s)	
Flexible	#(6A) *(7A)		Measurement is based on the thinnest permitted flexible pavement relevant to this Bill
Flexible Composite	#(6B) *(7B)		Measurement is based on the thinnest permitted flexible composite pavement relevant to this Bill φ (Measurement in respect of any flexible pavement is based on the thinnest permitted flexible pavement relevant to this Bill)
Rigid	#(6C) *(7C)		Measurement is based on the thinnest permitted rigid pavement relevant to this Bill φ (Measurement in respect of any flexible pavement is based on the thinnest permitted flexible pavement relevant to this Bill)
Rigid Composite	#(6D) *(7D)		Measurement is based on the thinnest permitted rigid composite pavement relevant to this Bill φ (Measurement in respect of any flexible pavement is based on the thinnest permitted flexible pavement relevant to this Bill)

(# Include when Index is for Series 600: Earthworks in Roadworks General Bill)

(* Include when Index is for Series 700: Pavements in Main Carriageway, Interchanges and Side Roads Bills as appropriate)

(φ Insert if a section of pavement within this Bill is restricted to flexible construction)

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TABLE 3 (05/04)

(This Table 3 is an example of the introduction and index to be inserted as a separate page immediately preceding the separate Bills of Quantities included within the Bill for Structures Where a Choice of Designs is Offered (as defined under paragraph 7 of the Preparation of Bill of Quantities).)

Bill No. ..... Structures Where a Choice of Designs is Offered			
A separate Bill of Quantities is provided for each of the two construction procedures permitted by the Contract. Notwithstanding the provisions of paragraph 4 of the Preambles to Bill of Quantities, the tenderer shall price, extend and carry to the collection of Bill No. ....: Structures Where a Choice of Designs is Offered, only that Bill of Quantities appropriate to the form of construction he has elected to construct.			
Index			
Type of Structure	Structure No.	Bill No.	Page(s)
Structure Designed by the Overseeing Organisation	... A		
Structure Designed by the Contractor	... B		

(Repeat for each structure)

TABLE 4 (05/04)

(This Table 4 is an example of the Staged Payment Schedule for new Planting, Seeding and Turfing work to be inserted as a separate page immediately preceding the Collection Page for the separate Bill of Quantities for Series 3000 – Landscape and Ecology.)

Bill No. . . . . - Series 3000 - Landscape and Ecology
The following Staged Payments Schedule is to be used for the assessment of payments for work included in the Bill of Quantities in respect of new Planting, Seeding and Turfing measured in accordance with Series 3000 paragraphs 6 to 13 inclusive.

Activity	Percentage to be paid on planting in accordance with Note 1 below. [To be inserted by Compiler]	Percentage to be paid in respect of post-planting works in accordance with Note 2 below. [To be inserted by Compiler]	Total
Grass Seeding:			
High Frequency Cuts Medium Frequency Cuts Low Frequency Cuts Minimal Frequency Cuts			100% 100% 100% 100%
Wildflower Seeding			100%
Turfing			100%
Trees including whips			100%
Shrubs including transplants			100%
Wildflower Plants			100%
Hedge Plants			100%
Emergent, Marginal and Aquatic Plants			100%
Bulbs: in grassed areas in beds			 100% 100%

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Note 1: The percentage entered in this column shall be the proportion of the rates and prices in the Bill of Quantities for those items which become due to the Contractor upon the completion of the particular planting operation.

Note 2: The percentage entered in this column shall be the proportion of the rates and prices in the Bill of Quantities in respect of post-planting works required to be carried out over the remainder of the Contract Period. This proportion shall be divided equally over the period of the Contract remaining (in months) after the specific planting has taken place to give a 'periodic value' in respect of post-planting works. Notwithstanding the Contract payment terms this 'periodic value' shall be paid on accrual at . . *[to be inserted by the Compiler]* . . monthly intervals with any balance due on completion of the whole of the Works.

TABLE 5 (05/04)

(This Table 5 is an example of the Contract-specific table of factors for those materials and aggregates permitted under the Contract for use in bituminous regulating courses. This table is to be completed by the Compiler and inserted in the Bill of Quantities immediately following the items of Regulating Course included in Series 700 : Pavements.)

(Bill No ..... Roadworks General - Series 700: Pavements)			
The measurement of bituminous regulating course by tonne shall be calculated from the tonnage of material certified by the Overseeing Organisation multiplied by the following factors for the particular aggregate used.			
	Factors for:		
	Coarse Limestone Aggregate	Coarse Granite Aggregate	[Stated Material]
Dense Macadam Base	... per tonne certified	... per tonne certified	... per tonne certified
Rolled Asphalt Base	... per tonne certified	... per tonne certified	... per tonne certified
[Stated Material]	... per tonne certified	... per tonne certified	... per tonne certified

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Preambles to Bill of Quantities

General Directions

1 The Bill of Quantities has been prepared in accordance with the Method of Measurement for Highway Works published by The Stationery Office as Section 1 of Volume 4 of the Manual of Contract Documents for Highway Works. The relevant publication date of each page of the Method of Measurement for Highway Works is given in the Schedule of Pages and Relevant Publication Dates.

2 (05/01) In the Bill of Quantities the sub-headings and item descriptions identify the work covered by the respective items, read in conjunction with the matters listed against the relevant marginal headings "Item coverage" in Chapter IV of the Method of Measurement for Highway Works, these Preambles and the amendments to the Method of Measurement immediately following these Preambles. The nature and extent of the work is to be ascertained by reference to the Drawings, Specification and Conditions of Contract. The rates and prices entered in the Bill of Quantities shall be deemed to be the full inclusive value of the work covered by the several items including the following, unless expressly stated otherwise:

(i) Labour and costs in connection therewith.

(ii) The supply of materials, goods, storage and costs in connection therewith including delivery to Site. Taking delivery of materials and goods supplied by others, unloading, storage, and costs in connection therewith.

(iii) Plant and costs in connection therewith.

(iv) Fixing, erecting and installing or placing of materials and goods in position.

(v) Temporary Works.

(vi) The effect on the phasing of the Works or any element of the Works to the extent set forth or reasonably implied in the documents on which the tender is based.

(vii) General obligations, liabilities and risks involved in the execution of the Works set forth or reasonably implied in the documents on which the tender is based.

(viii) Establishment charges, overheads and profit.

(ix) Waste.

(x) Testing carried out by the Contractor in accordance with the particular requirements of Appendix 1/5 including supplying results of tests, reports and certificates.

(xi) Supply and delivery of samples to the Overseeing Organisation in accordance with the particular requirements of Appendix 1/6.

(xii) Checking, inspecting, examining, measuring and verifying goods, materials and workmanship including supplying results, reports and certificates.

(xiii) Attendance and transport for sampling and testing carried out by the Overseeing Organisation.

(xiv) Complying with Quality Assurance requirements of the contract and providing certificates of conformity.

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(xv) Preparation and supply of detailed working drawings.

(xvi) Awaiting approvals and consent.

(xvii) Where stipulated complying with the particular requirements of Appendix 1/24.

Measurement

3 (i) The measurement of work shall be computed net from the dimensions stated in the Contract unless otherwise stated in the Method of Measurement.

(ii) (11/06) Where the tender documents specify the Type of Pavement to be constructed then the measurement of work shall be based upon the thinnest pavement construction and surfacing over structures permitted by the Contract for that Type of Pavement. Where the tender documents provide for the Contractor to select the type of safety barrier, pavement or buried structure (where the structure is not within Designated Outlines) to be constructed then the measurement of all work in each area so affected shall be based upon the thinnest pavement construction and surfacing over structures permitted by the Contract in that area for the particular type of safety barrier, pavement or buried structure the Contractor has elected to construct.

Pricing of Items

4 Each individual item shall have a rate or price entered against it. Rates and prices shall be expressed to two decimal places.

Alternative Specified Materials, Designs and Options Within Types of Pavement

5 Where in the Contract a choice of alternatives is permitted:

(i) the description billed and the rates and prices inserted shall be deemed to cover any of the permitted alternative materials or designs the Contractor may elect to use;

(ii) and where separate Bills of Quantities are provided within Series 600: Earthworks for each Type of Pavement permitted by the Contract the rates and prices inserted in respect of the earthworks for the particular Type of Pavement shall be deemed to cover the earthworks for any inherent permitted option within the Type of Pavement elected to be constructed by the Contractor;

(iii) and where separate Bills of Quantities are provided within Series 700: Pavements for each Type of Pavement permitted by the Contract the rates and prices inserted in respect of the particular Type of Pavement shall also be deemed to cover any inherent permitted option within the Type of Pavement elected to be constructed by the Contractor.

In all cases the rates and prices inserted in all Series of the Bill of Quantities shall be deemed to include for any adjustments of work content, rates, costs and the like occasioned by the choice of alternatives elected to be used or constructed by the Contractor.

Privately and Publicly Owned Services or Supplies

6 The information in the Contract as to the whereabouts of existing services and mains is believed to be correct but the Contractor shall not be relieved thereby of his obligations under the Contract. The Contractor shall include in his rates and prices for locating and taking measures for the support and full protection of pipes, cables and other apparatus during the progress of the Works, obtaining the written consent of the appropriate authority to interrupt the service or supply and for keeping the Overseeing Organisation informed of all arrangements he makes with the owners of privately owned services or supplies, Statutory Undertakers and Public Authorities as appropriate.

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Labours

7 Labours in connection with Nominated Sub-contractors shall include:

(i) in the case of work or services executed - for affording the use of existing working space, access, temporary roads, erected scaffolding, working shelters, staging, ladders, hoists, storage, latrines, messing, welfare and other facilities existing on Site and the provision of protection, water, electricity for lighting and clearing away rubbish and debris arising from the work;

(ii) in the case of goods, materials or services supplied - for taking delivery, unloading, storing, protecting and returning crates, cartons and packing materials.

Roadworks Overall Requirements

8 The Contractor shall allow in his rates and prices for complying with requirements in respect of pavement construction, horizontal alignments, surface levels and surface regularity of pavement courses, dealing with changes in weather conditions, use of surfaces by traffic and construction plant, and general requirements for sub-bases and road bases.

Work Within and Below Non-tidal Open Water or Tidal Water

9 The Contractor shall allow in his rates and prices for taking measures required to execute work within and below non-tidal open water or tidal water. The Contractor shall include in his rates and prices for any investigations to ascertain actual boundaries, surface levels and ranges affected by non-tidal open water or tidal water.

Dealing with Flow

10 The Contractor shall allow in his rates and prices for taking measures to deal with the existing flow of water, sewage and the like.

Reimbursement of Fees, Rates, Taxes and Overseeing Organisation's Telephone Calls

11 The Contractor will be reimbursed the actual price paid by the Contractor in respect of:

(i) fees, rates and taxes - the sums certified as properly repayable to the Contractor in accordance with the Contract;

(ii) Overseeing Organisation's telephone calls - telephone calls charged to the number or numbers allocated to the Overseeing Organisation.

Any other cost, charge or expense in respect of these items shall be allowed for in the rates and prices for temporary accommodation.

Site Limitations and Constraints

12 The Contractor shall allow in his rates and prices for complying with any limitations and constraints on the use of the Site.

Hard Material

13 For the purposes of the Contract the following are designated as Hard Material in accordance with Chapter 1 Definitions, paragraph 1(h)(i):

(a) .....* strata;

(b) those deposits designated by limits shown on the Drawings;

(c) existing pavements, footways, paved areas (but excluding unbound materials) and foundations in masses in excess of 0.20 cubic metres.

Equivalent Products and Materials

14 Where the Contractor offers an equivalent product or material in place of the one identified or specified, then the rates and prices in the Bill of Quantities shall be deemed to include for all the obligations and costs associated with the incorporation of the equivalent into the Works, including design, provision of data and drawings, certificates, awaiting acceptance, resubmissions and modifications and amendments to the Works.

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Unless specifically stated to the contrary in the Contract the measurement of the Works affected by the incorporation of the equivalent products and materials shall be based on the Tender documents and not on the Works as amended and completed to incorporate the equivalent products and materials.

Permanent Works Designed by the Contractor

15 (05/01) Where the Contract requires part(s) of the Permanent Works to be designed by the Contractor, the rates and prices in the Bill of Quantities shall include for all the obligations and costs associated with the incorporation of the Contractor's design into the Works, including design, provision of data and drawings, certificates, awaiting approvals, resubmissions and modifications and amendments to the Works.

Additionally the rates and prices in the Bill of Quantities shall include for the costs of all testing and sampling to be carried out by the Contractor in respect of workmanship, goods and materials incorporated into the Works or to prove the Contractor's design.

Structures Designed by the Contractor

16 In respect of each priced Bill of Quantities comprising a single item for a structure designed by the Contractor, the Contractor shall prepare a priced schedule of quantities. This priced schedule shall be prepared in accordance with the relevant Chapters and Series of the Method of Measurement and submitted to the Overseeing Organisation.

The quantities, rates and prices in the priced schedule of quantities shall in each case, when extended and totalled, give the amount entered in the priced Bill of Quantities against the item for the relevant structure designed by the Contractor.

The priced schedule of quantities shall only be used for Payment Applications and for the valuation of variations ordered under the Contract in connection with structures designed by the Contractor.

Unless specifically stated to the contrary in the Contract the measurement of the Works affected by the incorporation of the Contractor's design shall be based on the Tender documents and not on the Works as amended and completed to incorporate the Contractor's design.

The parts of the Works included by the Contractor in the priced schedule of quantities shall include all the parts of the Works within the Designated Outline except those designed and scheduled by the Overseeing Organisation as not to be included.

National Alterations for The Overseeing Organisations of Scotland, Wales and Northern Ireland

17 Where a paragraph in Chapter IV of the Method of Measurement for Highway Works (Units and Methods of Measurement) or in the Notes for Guidance on the Method of Measurement for Highway Works or in the Library of Standard Item Descriptions for Highway Works is prefixed by # this indicates that this particular paragraph has a National Alteration for one or more of the Overseeing Organisations of Scotland, Wales or Northern Ireland. The use of national paragraphs is permitted only within the countries to which they specifically apply and they are deemed to replace corresponding paragraphs in the main body of Chapter IV of the Method of Measurement for Highway Works (Units and Methods of Measurement) or in the Notes for Guidance on the Method of Measurement for Highway Works or in the Library of Standard Item Descriptions for Highway Works as appropriate. The National paragraphs correspond to the particular requirements of the National Alterations for the Overseeing Organisations of Scotland, Wales or Northern Ireland contained in Volume 1 of the Manual of Contract Documents for Highway Works. The substitute or additional paragraphs are located at the end of the relevant Series.

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Testing

18 (05/01) Testing as paragraph 2(x) above, is in respect of tests to be carried out by the Contractor to verify workmanship, goods and materials incorporated into the permanent works and testing of the permanent works in order to prove the Overseeing Organisation's design as set out in Appendix 1/5.

Checking, inspecting, examining, measuring and verifying goods, materials and workmanship incorporated in the permanent works, as paragraph 2(xii) above, is in respect of other operations set forth or reasonably implied in the Contract to be carried out by the Contractor to demonstrate compliance with the particular requirements of the Contract, or to prove the Overseeing Organisation's design where not separately listed in Appendix 1/5, but excluding trial erection of structural steelwork which shall be measured separately in accordance with Series 1800.

Procedural trials, trial panels and trial areas required to be carried out or constructed as separate operations in advance of the permanent works in order to verify goods, materials and workmanship shall not be measured separately but are included within the item coverage for the relevant Series.

Testing of existing structures and other investigative works shall be individually measured within the relevant Series.

Landscape and Ecology

19 (05/01) The rates and prices inserted in the Bill of Quantities for new Planting, Seeding and Turfing measured in accordance with Volume 4 - Series 3000 include for all post-planting maintenance work required to be carried out in accordance with the Specification and the relevant Appendices.

In order to properly reflect the scope and duration of the planting and post-planting requirements a series of staged payments for the various items of planting, seeding and turfing will be made in accordance with the Staged Payments Schedule.

The Staged Payments Schedule is to be inserted in the Bill of Quantities immediately preceding the collection page for Landscape and Ecology and shall be used for assessing payments due to the Contractor in accordance with the Contract.

†Amendments to the Method of Measurement (05/01)

20 (05/01) For the purposes of the Contract the Method of Measurement for Highway Works is amended in accordance with the pages immediately following.

[Notes to compiler:

The Preambles to Bill of Quantities (duly completed) and the Schedule of Pages and Relevant Publication Dates must be reproduced unaltered and bound in the Bill of Quantities. A revised Schedule of Pages and Relevant Publication Dates will be included in each published national alteration to the Method of Measurement for Highway Works.

* To be completed by compiler as appropriate.

† Where amendments to Chapter IV of the Method of Measurement are required in accordance with paragraph 1(b) of Chapter II, General Principles, this preamble should be the last numbered preamble and inserted immediately prior to the amendments.]

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Method of Measurement for Highway Works
Schedule of Pages and Relevant Publication Dates

Chapter/Series	Page Number	Publication Date
Contents	1	November 2004
	2	May 2005
	3	November 2004
	4 to 7 inclusive	May 2005
Chapter I	1 to 3 inclusive	March 1998
Chapter II	1	March 1998
	2	May 2001
Chapter III	1	March 1998
	2	May 2001
	3 to 12	May 2004
	13	November 2006
	14 to 16 inclusive	May 2005
	17 to 19 inclusive	November 2006
Chapter IV	1	March 1998
100	1 to 2 inclusive	March 1998
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	8	November 2004
	9 to 11 inclusive	May 2001
	12	November 2004
	13 to 15 inclusive	May 2001
200	1	May 2001
	2 to 3 inclusive	May 2004
	4	May 2001
300	1 to 5 inclusive	May 2001
400	1 to 2 and 4 to 8 inclusive	November 2004
	3	November 2006
500	1 to 5 inclusive	May 2001
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	7 to 13 inclusive	May 2001
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	16 to 17 inclusive	May 2005
	18	May 2001
	19	November 2003
600	1	May 2002
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	3	March 1998
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	15 to 38 inclusive	May 2001
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Chapter/Series	Page Number	Publication Date
700	1	May 2001
	2	May 2002
	3	May 2001
	4 to 5 inclusive	May 2002
	6	May 2001
	7 to 9 inclusive	May 2002
	10	May 2001
	11	May 2002
	12 to 13 inclusive	May 2001
	14	May 2002
	15 to 18 inclusive	May 2001
800	)	
900	) Not taken up	
1000	)	
1100	1	May 2001
	2	November 2004
	3	May 2001
	4 to 5 inclusive	May 2002
	6	May 2001
	7 to 8 inclusive	May 2005
1200	1 to 2 inclusive	May 2001
	3 to 5 inclusive	March 1998
	6 to 11 inclusive	May 2001
1300	1 to 3 inclusive	November 2003
1400	1 to 2 inclusive	May 2001
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1500	1 to 2 inclusive	May 2001
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	4 to 7 inclusive	February 2003
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1600	1 to 2 inclusive	March 1998
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1700	1	May 2004
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1800	1	March 1998
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1900	1	May 2003
2000	1	May 2002
	2 to 3 inclusive	May 2001
2100	1	March 1998
2200	Not taken up	May 2004
2300	1 to 3 inclusive	March 1998

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Chapter/Series	Page Number	Publication Date
2400	1 to 3 inclusive 4	May 2001 March 1998
2500	1 to 2 inclusive	May 2001
2600	Not taken up	
2700	1	May 2001
3000	1 to 15 inclusive	May 2001
5000	1 to 2 inclusive	May 2003

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Chapter IV

Units and Methods of Measurement

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Series 100: Preliminaries

Definitions

1

(a) "until completion of the works" shall mean until completion of the whole of the works in accordance with the Conditions of Contract;

(b) "after completion of the works" shall mean subsequent to (a) above for the period stated in the Specification;

(c) "temporary diversion for traffic" shall mean (1) a temporary carriageway onto which vehicular traffic is diverted from a highway or (2) a temporary footpath or bridleway onto which pedestrian or equestrian traffic is diverted from a highway or (3) a combination of (1) and (2) or a temporary carriageway as in (1) with an associated footway and/or way for the use of animals and equestrian traffic; or (4) a temporary private means of access onto which traffic is diverted from a private means of access but in all cases shall not include a central reserve crossover constructed to permit contraflow traffic on an existing carriageway.

Temporary Accommodation

Units

2 The unit of measurement shall be:

(i) erection, servicing, dismantling of temporary accommodation ..... item.

Itemisation

3 Separate items shall be provided for temporary accommodation in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Erection.
	2	Servicing.
	3	Dismantling.
II	1	Principal offices for the Overseeing Organisation.
	2	Principal laboratories for the Overseeing Organisation.
	3	Portable offices for the Overseeing Organisation.
	4	Portable laboratories for the Overseeing Organisation.
	5	Offices and messes for the Contractor.
	6	Stores and workshops for the Contractor.
III	1	Provided by the Overseeing Organisation.
IV	1	At the place of fabrication or manufacture.
V	1	Until completion of the works.
	2	After completion of the works.

Note: Group IV and Group V features shall be applied only to items of temporary accommodation for the Overseeing Organisation.

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Erection of Temporary Accommodation

Item coverage

4 The items for erection of temporary accommodation shall in accordance with the Preambles to Bill of Quantities General Directions include for:

(i) in the case of accommodation for the Contractor:

(a) everything required by the Contractor.

(ii) in the case of accommodation for the Overseeing Organisation:

(a) initial accommodation and equipment, maintenance, servicing and removing;

(b) sites for the accommodation;

(c) preparation of sites;

(d) foundations, bases and hardstandings;

(e) water, sanitation, heating, power and lighting services;

(f) fences, notice and direction boards;

(g) vehicle access, hardstandings, parking areas and footpaths;

(h) equipment, furnishings, fittings, supplies and initial consumable stores;

(i) telephones, extensions, switchboard and switching systems separately connected to the telephone system;

(j) in the case of accommodation provided by the Overseeing Organisation, alterations and refurbishments.

Servicing Temporary Accommodation

Item coverage

5 The items for servicing temporary accommodation shall in accordance with the Preambles to Bill of Quantities General Directions include for:

(i) in the case of accommodation for the Contractor:

(a) everything required by the Contractor.

(ii) in the case of accommodation for the Overseeing Organisation:

(a) rental and leasing including telephone rental;

(b) heating, sanitation, power, lighting and water;

(c) depreciation and maintenance of buildings, services, fences, notice and direction boards, vehicle access, parking areas, hardstandings and footpaths;

(d) depreciation, maintenance and replacement of equipment, furnishings, fittings and supplies;

(e) cleaning accommodation;

(f) moving and re-establishing portable accommodation as required;

(g) replenishment of consumable stores;

(h) repairing, replacing, calibration of equipment;

(i) disposal of waste.

Dismantling Temporary Accommodation

Item coverage

6 The items for dismantling temporary accommodation shall in accordance with the Preambles to Bill of Quantities General Directions include for:

(a) receiving back from the Overseeing Organisation and removing equipment, furniture, fittings and supplies off Site;

(b) disconnecting, removing and sealing off disused services;

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(c) demolishing and removing off Site temporary accommodation, vehicle access, hardstanding, parking areas, footpaths, fences, notice and direction boards;

(d) disposal of material (as Series 600 paragraph 39);

(e) reinstatement of the sites occupied by temporary accommodation;

(f) in the case of accommodation for the Overseeing Organisation, the credit value of surplus equipment or material which becomes the property of the Contractor;

(g) in the case of accommodation for the Overseeing Organisation, the transport and delivery to the Overseeing Organisation of equipment or material which becomes the property of the Overseeing Organisation;

(h) in the case of accommodation provided by the Overseeing Organisation, handing back to the Overseeing Organisation in the condition specified.

Vehicles for the Overseeing Organisation

Units

7 (05/01) The unit of measurement shall be:

(i) vehicles for the Overseeing Organisation ..... vehicle day.

Measurement

8 (05/01) The measurement of vehicles for the Overseeing Organisation shall be each day or part thereof during which a vehicle is provided.

Itemisation

9 Separate items shall be provided for vehicles for the Overseeing Organisation in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Each type of vehicle for the Overseeing Organisation.
II	1	Until completion of the works.
	2	After completion of the works.

Vehicles for the Overseeing Organisation

10 The items for vehicles for the Overseeing Organisation shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) equipment;

(b) taxing for use on public highways and for the carriage of goods and samples;

(c) comprehensive insurance;

(d) suitable replacement including equipment;

(e) depreciation;

(f) maintaining in a roadworthy condition and in conformity with the vehicle manufacturer's recommendations;

(g) fuel, oil and other consumable items;

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(h) keeping clean inside and out;

(i) collecting from Site when the vehicle is returned.

Communication System for the Overseeing Organisation

Units

11 The unit of measurement shall be:

(i) communication system for the Overseeing Organisation ..... item.

Itemisation

12 Separate items shall be provided for communication system for the Overseeing Organisation in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Communication system for the Overseeing Organisation.
II	1	Until completion of the works.
	2	After completion of the works.

Communication System for the Overseeing Organisation

13 The items for communication system for the Overseeing Organisation shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) confirming licences, wavelengths and channels and costs arising therefrom;

(b) equipment and installation;

(c) rental, running costs and power;

(d) depreciation, maintenance and repairs;

(e) replacement equipment;

(f) receiving back from the Overseeing Organisation and removing equipment and supplies off Site;

(g) connections and links to telephone systems.

Operatives for the Overseeing Organisation

Units

14 (05/01) The unit of measurement shall be:

(i) operatives for the Overseeing Organisation ..... operative day.

Measurement

15 The measurement of operatives for the Overseeing Organisation shall be a continuous period of four hours or more within any one day during which the operative's services are supplied in accordance with the written order of the Overseeing Organisation.

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Itemisation

16 Separate items shall be provided for operatives for the Overseeing Organisation in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Each type of operative for the Overseeing Organisation.
II	1	Until completion of the works.
	2	After completion of the works.

Operatives for the Overseeing Organisation

17 The items for operatives for the Overseeing Organisation shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) the wages and other emoluments paid including payment for overtime;

(b) working outside the Contractor's normal working hours if so required by the Overseeing Organisation;

(c) costs and expenses incurred consequent upon the employment or hiring;

(d) periods of less than four hours.

Information Board

Units

18 The unit of measurement shall be:

(i) information board ..... number.

Itemisation

19 Separate items shall be provided for information boards in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Information board.
II	1	Different types.

Information Board

20 (05/01)The items for information board shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(b) excavation of unacceptable material (as Series 600 paragraph 19);

(c) excavation in Hard Material (as Series 600 paragraph 23);

(d) backfilling and compaction;

(e) in situ concrete (as Series 1700 paragraph 5);

(f) formwork (as Series 1700 paragraph 15);

(g) disposal of material (as Series 600 paragraph 39);

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(h) painting, reflectorisation and illumination;

(i) cleaning, maintaining and repairing;

(j) dismantling and removing from Site;

(k) reinstatement of surfaces.

Traffic Safety and Management

Units

21 (05/01) The unit of measurement shall be:

(i) traffic safety and management ..... item.

(ii) Traffic safety and management for landscape and ecology …… item

(iii) taking measures for or construction, maintenance, removal of contraflow arrangements ..... item.

Measurement

22 (05/01) Traffic safety and management shall be measured once only for all works excluding landscape and ecology measured in accordance with Series 3000.

23 (05/01) Traffic safety and management for landscape and ecology shall only be measured when items measured in accordance with Series 3000 are included in the Bill of Quantities and shall be measured once only for all landscape and ecology works.

24 (05/01) Unless expressly stated otherwise in the Contract, taking measures for or construction, maintenance, removal of contraflow arrangements shall be measured once only to include for all contraflow arrangements specified in Appendix 1/17 and all contraflow arrangements proposed by the Contractor.

Itemisation

25 (05/01) Separate items shall be provided for traffic safety and management in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Traffic safety and management.
	2	Traffic Safety and management for landscape and ecology.
	3	Taking measures for or construction, maintenance, removal of contraflow arrangements.

Traffic Safety and Management and Traffic Safety and Management for Landscape and Ecology (05/01)

26 (05/01) The items for traffic safety and management and traffic safety and management for landscape and ecology shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) complying with the recommendations contained in Chapter 8 of the "Traffic Signs Manual" published by The Stationery Office and any amendment thereto or where the circumstances of any particular case are not covered submitting proposals for dealing with such situations to the Overseeing Organisation for its consent;

(b) complying with particular requirements of the Contract;

(c) initiating or continuing consultation with statutory, police or other authorities concerned, proposing or developing and submitting to the Overseeing Organisation, proposals based on such consultation

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showing a scheme of traffic safety and management measures including details of safety zones and emergency routes and furnishing such details as necessitated by the works or as the Overseeing Organisation may require;

(d) design of traffic safety and management measures specified by the Overseeing Organisation;

(e) traffic safety and control personnel;

(f) modification and resubmission of proposals and designs;

(g) traffic signs, driver information signs, traffic signs provided by the Overseeing Organisation, road markings, lamps, barriers, and traffic control signals including maintaining, cleaning, repositioning, covering, uncovering and removing;

(h) complying with the requirements for labour and plant working on or adjacent to a highway and at entry and exit points to the Site including signing;

(i) road lighting, modification, and removal;

(j) emergency telephones, modification, and removal;

(k) giving of notice to the Overseeing Organisation;

(l) collecting and returning traffic signs provided by the Overseeing Organisation;

(m) surveillance and maintaining stocks;

(n) immediate reinstatement and replacement of defective or damaged items;

(o) maintenance of highways.

Taking Measures for or Construction, Maintenance, Removal of Contraflow Arrangements

27 (05/01) The items for taking measures for or construction, maintenance, removal of contraflow arrangements shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) traffic safety and management (as this Series paragraph 26);

(b) temporary diversions for traffic (as this Series paragraphs 31, 32 and 33);

(c) crossovers;

(d) temporary removal and reinstatement;

(e) design of contraflow arrangements specified by the Overseeing Organisation.

Temporary Diversion for Traffic

Units

28 (05/01) The unit of measurement shall be:

(i) taking measures for or construction, maintenance, removal of temporary diversion for traffic ..... item.

Measurement

29 (05/01) The measurement of taking measures for or construction, maintenance, removal of temporary diversion for traffic shall be in respect of the complete measures for or construction at the locations listed in Appendix 1/18 to the Specification and at locations proposed by the Contractor.

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Itemisation

30 (05/01) Separate items shall be provided for temporary diversion for traffic in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Taking measures for or construction of temporary diversion for traffic.
	2	Maintenance of measures for or construction of temporary diversion for traffic.
	3	Removal of measures for or construction of temporary diversion for traffic.
II	1	At locations listed in Appendix 1/18.
	2	At those locations listed in Appendix 1/18 but not measured individually.
	3	At locations proposed by the Contractor.

Taking Measures for or Construction of Temporary Diversion for Traffic

31 (05/01) The items for taking measures for or construction of temporary diversion for traffic shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) obtaining licences and agreements;

(b) making arrangements with owners and occupiers of land temporarily required and costs arising therefrom;

(c) preparing, amending and submitting to the highway authority and other interested bodies, proposals and programme;

(d) consulting with police and other authorities;

(e) design of temporary diversions for traffic specified by the Overseeing Organisation;

(f) preparation of site;

(g) (11/04) site clearance, fencing, safety barriers, concrete safety barriers, drainage, earthworks, pavements, kerbs, footways, traffic signs, road markings, road lighting, structures, parapets, ramps and accesses;

(h) temporary diversions of services;

(i) emergency lanes.

Maintenance of Measures for or Construction of Temporary Diversion for Traffic

32 (05/01) The items for maintenance of measures for or construction of temporary diversion for traffic shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) continuous adequate provision for traffic flows;

(b) modifications and amendments to suit the requirements of the Contract including temporary removal and subsequent reinstatement.

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Removal of Measures for or Construction of Temporary Diversion for Traffic

33 (05/01) The items for removal of measures for or construction of temporary diversion for traffic shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) breaking up;

(b) disposal of material (as Series 600 paragraph 39);

(c) reinstatement of the Site to its previous condition.

Recovery Vehicles

Units

34 (05/01) The units of measurement shall be:

(i) establishment of recovery vehicle ..... item.

(ii) maintenance of recovery vehicle …… vehicle day.

(iii) removal of recovery vehicle …… item.

Measurement

35 (05/01) Establishment and removal of recovery vehicle shall each be measured once only for each type of recovery vehicle.

The measurement of maintenance of recovery vehicle shall be each day or part thereof during which each type of recovery vehicle is provided.

Itemisation

36 (05/01) Separate items shall be provided for establishment, maintenance and removal of recovery vehicles in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Establishment of each type of recovery vehicle.
	2	Maintenance of each type of recovery vehicle
	3	Removal of each type of recovery vehicle.

Establishment of Recovery Vehicles (05/01)

37 (05/01) The items for establishment of recovery vehicles shall in accordance with the Preamble to Bill of Quantities General Directions include for:

Item coverage

(a) vehicle inspections and submission of certificates;

(b) establishment of hardstandings and accommodation;

(c) establishment of locations and facilities for vehicle removal;

(d) bringing plant and equipment to site;

(e) establishment of all equipment including communication equipment and identification signs.

Maintenance of Recovery Vehicles (05/01)

38 (05/01) The items for maintenance of recovery vehicles shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) maintenance of equipment including communication equipment and identification sign;

(b) taxing for use on public highways;

(c) comprehensive insurance;

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(d) replacement vehicle including equipment;

(e) depreciation;

(f) maintenance;

(g) fuel, oil and other consumables;

(h) qualified operatives and safety officer and provision of documents;

(i) completion and submission of information log sheets and record sheets;

(j) dealing with broken down, accident damaged or abandoned vehicles and removal;

(k) explanatory leaflets and distribution;

(l) liaising with police;

(m) maintenance of hardstandings, accommodation and servicing;

(n) maintenance of locations and facilities for vehicle removal;

(o) vehicle inspections and reports;

(p) lighting board.

Removal of Recovery Vehicles (05/01)

39 (05/01) The items for removal of recovery vehicles shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) removal of all plant and equipment from site;

(b) removal of hardstandings and accommodation;

(c) removal of locations and facilities for vehicle removal;

(d) reinstatement.

Progress Photographs

Units

40 (05/01) The unit of measurement shall be:

(i) set of progress photographs, set of aerial progress photographs ..... number.

(ii) additional progress photographs, additional aerial progress photographs ..... number.

Measurement

41 (05/01) A set of photographs shall comprise such numbers of negatives and prints as described in the Contract taken on any one flight or visit to Site.

Where in any one flight or visit the Overseeing Organisation orders less than one complete set of photographs, then one set shall be measured.

Where in any flight or visit the Overseeing Organisation orders progress or aerial photographs in excess of the number in the set then the additional photographs shall be measured and be deemed to include the negative and the same number of prints per negative as those in the set.

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Itemisation

42 (05/01) Separate items shall be provided for progress photographs in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Set of progress photographs.
	2	Set of aerial progress photographs.
	3	Additional progress photographs.
	4	Additional aerial progress photographs.
II	1	Monochrome prints.
	2	Colour prints.

Progress Photographs, Aerial Progress Photographs, Additional Progress Photographs and Additional Aerial Progress Photographs

43 (05/01) The items for progress photographs, aerial progress photographs, additional progress photographs and additional aerial progress photographs shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) delivery of negatives and prints to the Overseeing Organisation;

(b) identification marking on the prints;

(c) albums.

Temporary Closed Circuit Television (CCTV) System for the Monitoring of Traffic

Units

44 (05/01) The units of measurement shall be:

(i) installation of temporary closed circuit television (CCTV) system for the monitoring of traffic ..... item.

(ii) maintenance of temporary closed circuit television (CCTV) system for the monitoring of traffic …… day.

(iii) removal of temporary closed circuit television (CCTV) system for the monitoring of traffic …… item.

Measurement

45 (05/01) The measurement of installation and removal of temporary closed circuit television (CCTV) system for the monitoring of traffic shall be for the complete installation and removal and each item shall be measured once only.

The measurement of maintenance of temporary closed circuit television (CCTV) system for monitoring of traffic shall be each day or part thereof during which the system is provided.

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Itemisation

46 (05/01) Separate items shall be provided for temporary closed circuit television (CCTV) system for the monitoring of traffic in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Installation of temporary closed circuit television (CCTV) system for the monitoring of traffic.
	2	Maintenance of temporary closed circuit television (CCTV) system for the monitoring of traffic.
	3	Removal of temporary closed circuit television (CCTV) system for the monitoring of traffic.

Installation of Temporary Closed Circuit Television (CCTV) System for the Monitoring of Traffic (05/01)

47 (05/01) The items for installation of temporary closed circuit television (CCTV) system for the monitoring of traffic shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(b) excavation of unacceptable material (as Series 600 paragraph 19);

(c) excavation of hard material (as Series 600 paragraph 23);

(d) concrete (as Series 1700 paragraphs 5 and 10);

(e) reinforcement (as Series 1700 paragraph 26);

(f) backfilling and compaction;

(g) formwork (as Series 1700 paragraph 15);

(h) disposal of material (as Series 600 paragraph 39);

(i) electrical equipment, wiring and connections;

(j) cameras and associated equipment;

(k) (11/04) housings, camera poles and supports, associated safety barriers, paving, steps and handrails;

(l) control and monitoring equipment;

(m) replacement equipment;

(n) communication link to the Police Control Office;

(o) design and structural certification of camera poles and supports and the provision of drawings;

(p) design of systems including preparation and supply of general layout drawings, electrical and communications cabling diagrams and layouts;

(q) complying with wiring regulations, earthing and inspection;

(r) earth electrodes (as Series 1400 paragraph 27);

(s) wiring protection;

(t) staff for monitoring of the works area, including training;

(u) take up or down and set aside for reuse or remove to store or tip off site (as Series 200 paragraph 11);

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(v) modifications;

(w) provision of electrical power feeds by mains connection or generators;

(x) electrical power;

(y) accommodation for monitoring equipment and staff;

(z) testing and commissioning of the whole of the system.

Maintenance of Temporary Closed Circuit Television (CCTV) System for the Monitoring of Traffic (05/01)

48 (05/01) The items for maintenance of temporary closed circuit television (CCTV) system for monitoring traffic shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) depreciation, maintenance and repair of equipment;

(b) electrical power;

(c) wiring protection;

(d) modifications;

(e) moving equipment, power feeds and all cabling to suit traffic management and phasing of the works;

(f) re-installing poles (as this Series paragraph 47);

(g) re-testing and re-commissioning after moving equipment;

(h) provision of video tapes.

Removal of Temporary Closed Circuit Television (CCTV) System for the Monitoring of Traffic (05/01)

49 (05/01) The items for removal of temporary closed circuit television (CCTV) system for the monitoring of traffic shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) dismantling;

(b) reinstatement and making good;

(c) take up or down and set aside for reuse or remove to store or tip off site (as Series 200 paragraph 11).

Temporary Automatic Speed Camera System for the Enforcement of Mandatory Speed Limits at Roadworks (05/01)

Units

50 (05/01) The units of measurement shall be:

(i) installation of temporary automatic speed camera system for the enforcement of mandatory speed limits at roadworks …… item.

(ii) maintenance of temporary automatic speed camera system for the enforcement of mandatory speed limits at roadworks …….. day.

(iii) removal of temporary automatic speed camera system for the enforcement of mandatory speed limits at roadworks ……item.

Measurement

51 (05/01) The measurement of installation and removal of temporary automatic speed camera system for the enforcement of mandatory speed limits at roadworks shall be for the complete installation and removal and each item shall be measured once only.

The measurement of maintenance of temporary automatic speed camera system for the enforcement of mandatory speed limits at roadworks shall be each day or part thereof during which the system is provided.

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Itemisation

52 (05/01) Separate items shall be provided for temporary automatic speed camera system for the enforcement of mandatory speed limits at roadworks in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Installation of temporary automatic speed camera system for the enforcement of mandatory speed limits at roadworks.
	2	Maintenance of temporary automatic speed camera system for the enforcement of mandatory speed limits at roadworks.
	3	Removal of temporary automatic speed camera system for the enforcement of mandatory speed limits at roadworks.
II	1	Different locations.

Installation of Temporary Automatic Speed Camera System for the Enforcement of Mandatory Speed Limits at Roadworks (05/01)

53 (05/01) The items for installation of temporary automatic speed camera system for the enforcement of mandatory speed limits at roadworks shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(b) excavation of unacceptable material (as Series 600 paragraph 19);

(c) excavation of hard material (as Series 600 paragraph 23);

(d) concrete (as Series 1700 paragraphs 5 and 10);

(e) reinforcement (as Series 1700 paragraph 26);

(f) backfilling and compaction;

(g) formwork (as Series 1700 paragraph 15);

(h) disposal of material (as Series 600 paragraph 39);

(i) electrical equipment, wiring and connections;

(j) cameras and associated equipment;

(k) housings, camera poles and supports, associated safety fencing, paving and handrails;

(l) control and monitoring equipment;

(m) replacement equipment;

(n) design and structural certification of camera poles and supports and the provision of drawings;

(o) design of systems including preparation and supply of general layout drawings, electrical and communications cabling diagrams and layouts;

(p) complying with wiring regulations, earthing and inspection;

(q) earth electrodes (as Series 1400 paragraph 27);

(r) wiring protection;

(s) take up or down and set aside for reuse or remove to store or tip off site (as Series 200 paragraph 11);

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(t) moving equipment between phases of the works;

(u) provision of electrical power feeds by mains connections or by generators;

(v) electrical power;

(w) commissioning of the whole system including provision of a second method of speed measurement;

(x) liaison with the Chief Officer of Police and his delegated staff and providing access for them during commissioning and acceptance trials.

Maintenance of Temporary Automatic Speed Camera System for the Enforcement of Mandatory Speed Limits at Roadworks (05/01)

54 (05/01) The items for maintenance of temporary automatic speed camera system for the enforcement of mandatory speed limits at roadworks shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) depreciation, maintenance and repair of equipment;

(b) electrical power;

(c) wiring protection;

(d) modifications including moving equipment to suit traffic management and phasing of the works;

(e) liaison with the Chief Officer of Police and his delegated staff and providing access for them at all times;

(f) assistance requested by the Chief Officer of Police through the Overseeing Organisation;

(g) provision of films.

Removal of Temporary Automatic Speed Camera System for the Enforcement of Mandatory Speed Limits at Roadworks (05/01)

55 (05/01) The items for removal of temporary automatic speed camera system for the enforcement of mandatory speed limits at roadworks shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) dismantling;

(b) reinstatement and making good;

(c) take up or down and set aside for reuse or remove to store or tip off site (as Series 200 paragraph 11).

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Series 200: Site Clearance

1 (05/01) Unless otherwise stated in the Contract the items in this Series shall include for the removal of superficial obstructions down to existing ground level. With the exception of items measured under paragraph 8 and those including for the removal of stumps and roots, work below existing ground level in the demolition and removal of foundations, drains and sewers specified in Appendix 2/2, chambers, cellars, ground slabs, carriageways, kerbs, pavings, backfilling and the like shall be measured under Series 600 Earthworks. Lowering of carriageway levels shall be measured under Series 700 Pavements.

The measurement of General Site Clearance includes for the removal of superficial obstructions down to existing ground level. If no General Site Clearance item is measured and the Contract requires items to be taken to Tip, these shall be measured within paragraphs 8-11 Take Up or Down and Set Aside for Re-use or Remove to Store or Tip off Site.

Site Clearance

Units

2 (05/01) The units of measurement shall be:

(i) general site clearance ..... hectare.

(ii) demolition of individual or groups of buildings or structures ..... item.

(iii) partial demolition of individual structures ..... item.

Measurement

3 (05/01) The measurement of general site clearance shall be the plan area. No deduction shall be made for buildings, structures, carriageways and the like.

The measurement of partial demolition shall be as stated in the Contract.

Itemisation

4 (05/01) Separate items shall be provided for site clearance in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	General site clearance.
	2	General site clearance of separate sections.
	3	Demolition of individual or groups of buildings or structures.
	4	Partial demolition of individual structures.

General Site Clearance

5 (05/01) The items for general site clearance shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) demolition, breaking up and removal;

(b) tree felling;

(c) grubbing up and blasting stumps and roots including backfilling and compaction;

(d) uprooting of bushes, small trees and hedges;

(e) credit value of materials;

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(f) disposal of material (as Series 600 paragraph 39);

(g) making good severed ends of existing fences, hedges and walls;

(h) cutting back trees, bushes and hedges;

(i) disconnecting, removing and sealing services and supplies;

(j) reinstatement and making good;

(k) preservation of individual or groups of trees, shrubs and the like;

(l) treatment of hazardous materials.

Demolition of Individual or Groups of Buildings or Structures

6 (05/01) The items for demolition of individual or groups of buildings or structures shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) blasting, breaking up and removal;

(b) credit value of materials;

(c) disposal of material (as Series 600 paragraph 39);

(d) disconnecting, removing and sealing services and supplies;

(e) treatment of hazardous materials.

Partial Demolition of Individual Structures

7 (05/01) The items for partial demolition of individual structures shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) demolition of individual or groups of buildings or structures (as this Series paragraph 6);

(b) cutting and trimming;

(c) saw cutting;

(d) cutting through reinforcement, removal, disposal, protecting cut ends with treatment, de-bonding existing reinforcement;

(e) working between and behind reinforcement and other obstructions;

(f) marking of surfaces;

(g) preparation to receive new works;

(h) measures in respect of specialist demolition techniques;

(i) protection of unaffected parts of the structure.

Take Up or Down and Set Aside for Re-use or Remove to Store or Tip off Site (05/01)

Units

8 (05/04) The units of measurement shall be:

Take up or down and set aside for re-use or remove to store or tip off Site the following:

(i) blockwork and stonework ..... cubic metre;

(ii) paved areas and the like, brickwork ..... square metre;

(iii) kerbs, channels, edgings, combined drainage and kerb blocks, linear drainage channel systems, fencing, safety barriers, vehicle parapets, transitions, terminals, pedestrian guardrails and pedestrian parapets and the like, copings, string courses and the like ..... linear metre;

(iv) cable ..... linear metre;

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(v) road lighting columns, brackets and wall mountings, traffic signs, road studs, gates, stiles, street furniture, feeder pillars, communications cabinets, posts, brackets, signal indicators, shelves, racking, frames, electronic units and the like …….. number;

(vi) chamber covers and frames, gully gratings and frames and the like ..... number;

(vii) individual blocks, features or stones ..... number.

Measurement

9 (05/04) The measurement for take up or down and set aside for re-use or remove to store or tip off Site blockwork, stonework, paved areas and the like, brickwork, kerbs, channels, edgings, combined drainage and kerb blocks, linear drainage channel systems, fencing, safety barriers, vehicle parapets, transitions, terminals, pedestrian guardrails and pedestrian parapets and the like, copings, string courses and the like, cable, road lighting columns, brackets and wall mountings, traffic signs, road studs, gates, stiles, street furniture and the like; feeder pillars, communications cabinets, posts, brackets, signal indicators, shelves, racking, frames, electronic units and the like; chamber covers and frames, gully gratings and frames and the like; individual blocks, features or stones shall be the volumes, areas, lengths or numbers stated in the Contract.

Itemisation

10 (05/04) Separate items shall be provided for take up or down and set aside for re-use or remove to store or tip off Site in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Take up or down and set aside for reuse.
	2	Take up or down and remove to store off Site.
	3	Take up or down and remove to tip off Site.
II	1	Blockwork and stonework.
	2	Paved areas and the like.
	3	Brickwork.
	4	Kerbs, channels, edgings, combined drainage and kerb blocks, linear drainage channel systems, fencing, safety barriers, vehicle parapets, transitions, terminals, pedestrian guardrails and pedestrian parapets and the like.
	5	Copings, string courses and the like.
	6	Cable.
	7	Road lighting columns, brackets and wall mountings, traffic signs, gates, stiles, street furniture, road studs and the like.
	8	Feeder pillars, communications cabinets, posts, brackets, signal indicators and the like.
	9	Shelves, racking, frames and the like.
	10	Electronic units and the like.
	11	Chamber covers and frames, gully gratings and frames and the like.
	12	Individual blocks, features or stones.
III	1	Different types and sizes.
IV	1	Different arrangements.

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Take Up or Down and Set Aside for Re-use or Remove to Store or Tip Off Site

11 (05/01) The items for take up or down and set aside for re-use or remove to store or tip off Site shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(b) excavation of unacceptable material (as Series 600 paragraph 19);

(c) excavation in Hard Material (as Series 600 paragraph 23);

(d) detensioning, dismantling and extracting posts;

(e) cleaning, stacking, protecting and labelling;

(f) transport and handling;

(g) disconnecting, removing, disposing of and sealing of services and supplies;

(h) sand and warning tape to cables where one or more are to remain in a shared trench;

(i) backfilling and compaction;

(j) making good to severed ends of existing walls, hedges, and fencing;

(k) disposal of material (as Series 600 paragraph 39);

(l) reinstatement and making good;

(m) storage facilities;

(n) replacing items damaged during the foregoing operations;

(o) credit value of materials;

(p) multiple handling of materials;

(q) treatment of hazardous materials.

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Series 300: Fencing (05/01)

Fencing, Gates and Stiles

Units

1 (05/01) The units of measurement shall be:

(i) fencing ..... linear metre.

(ii) concrete foundation to timber posts ..... number.

(iii) gates, stiles ..... number.

(iv) wire, wire mesh to existing fencing, gates and the like ….. linear metre.

(v) fenced tree guards ……. number.

Measurement

2 (05/01) Where a particular type of temporary fencing is specified in Appendix 3/1 by the Overseeing Organisation and shown on the drawings it shall be measured. All other temporary fencing shall not be measured.

The measurement of fencing shall be the developed length along the centre line of the fence. The measurement of height of fencing shall be that stated in the Contract for the type of fence.

The measurement of wire and wire mesh shall only be separately measurable where it is required by the Contract to be fixed to existing fencing, gates and the like, and shall be the developed length along the centre line of the fence.

The measurement of width of gates shall be the distance between the outer edges of the stiles; the outer edges of hanging stiles in the case of double gates.

The measurement of height of gates shall be the distance between the upper surface of the top rail and the underside of the bottom rail.

Concrete foundation to timber posts shall only be measured for those locations stated in Appendices 1/15 or 3/1 of the Specification.

Itemisation

3 (05/01) Separate items shall be provided for fencing in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Each type of fencing.
	2	Concrete foundation to each type of timber post for each type of fencing.
	3	Each type of gate.
	4	Each type of stile.
	5	Each type of wire to existing fencing, gates and the like.
	6	Each type of wire mesh to existing fencing, gates and the like.
	7	Each type of fenced tree guard.
II	1	Fencing of different heights.
	2	Gates of different heights and widths.
III	1	Painted fencing, gates or stiles.

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Fencing

4 (05/01) The items for fencing shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(b) excavation of unacceptable material (as Series 600 paragraph 19);

(c) trimming ground on the line of the fencing;

(d) concrete (as Series 1700 paragraphs 5 and 10);

(e) formwork (as Series 1700 paragraph 15);

(f) reinforcement (as Series 1700 paragraph 26);

(g) backfilling and compaction;

(h) disposal of material (as Series 600 paragraph 39);

(i) preservation of timber;

(j) adjustment of fencing to a flowing alignment including additional length posts;

(k) fixings and fittings;

(l) joining to existing fencing, gates, hedges and walls;

(m) protective system (as Series 1900 paragraph 4);

(n) inspection and maintenance of fencing and gates;

(o) erection and removal of temporary fencing and gates;

(p) additional posts and rails over ditches;

(q) maintenance of access for owners, tenants and occupiers of adjoining land and patrolling gaps or openings;

(r) epoxy resin compound and mastic filler to posts fixed in socket;

(s) additional posts at junctions and changes in direction or adjacent to gates, stiles and other obstacles;

(t) additional posts, stakes and ground anchors;

(u) inspection of existing fencing and reports;

(v) pegging, bending, turning and cutting mesh;

(w) cutting turves and turfing (as Series 3000 paragraph 9);

(x) patrolling.

Concrete Foundation to Timber Posts

5 (05/01) The items for concrete foundation to timber posts shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(b) excavation of unacceptable material (as Series 600 paragraph 19);

(c) in situ concrete (as Series 1700 paragraph 5);

(d) formwork (as Series 1700 paragraph 15);

(e) reinforcement (as Series 1700 paragraph 26);

(f) backfilling and compaction;

(g) disposal of material (as Series 600 paragraph 39).

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Gates and Stiles

6 (05/01) The items for gates and stiles shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(b) excavation of unacceptable material (as Series 600 paragraph 19);

(c) trimming ground at entrance;

(d) in situ concrete (as Series 1700 paragraph 5);

(e) formwork (as Series 1700 paragraph 15);

(f) reinforcement (as Series 1700 paragraph 26);

(g) backfilling and compaction;

(h) disposal of material (as Series 600 paragraph 39);

(i) preservation of timber;

(j) protective system (as Series 1900 paragraph 4);

(k) posts, fittings and furniture;

(l) joining to existing fencing, hedges and walls;

(m) in the case of new gates and stiles in existing fencing, hedges or walls, forming openings and making good;

(n) stock-proofing.

Remove from Store and Re-erect Fencing, Gates and Stiles

Units

7 (05/01) The units of measurement shall be:

(i) remove from store and re-erect fencing ..... linear metre.

(ii) concrete foundation to timber posts ..... number.

(iii) remove from store and re-erect gates and stiles ..... number.

Measurement

8 (05/01) The measurement of re-erected fencing shall be the developed length along the centre line of the re-erected fencing. The measurement of height of fencing shall be that stated in the Contract for the type of fence.

The measurement of width of gates shall be the distance between the outer edges of the stiles; the outer edges of hanging stiles in the case of double gates.

The measurement of height of gates shall be the distance between the upper surface of the top rail and the underside of the bottom rail.

Concrete foundation to timber posts shall only be measured for those locations stated in Appendices 1/15 or 3/1 of the Specification.

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Itemisation

9 (05/01) Separate items shall be provided for re-erected fencing, gates and stiles in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Each type of re-erected fencing.
	2	Concrete foundation to each type of timber post for each type of re-erected fencing.
	3	Each type of re-erected gate.
	4	Each type of re-erected stile.
II	1	Re-erected fencing of different heights.
	2	Re-erected gates of different heights and widths.
III	1	Re-erected painted fencing, gates or stiles.

Remove from Store and Re-erect Fencing

10 The items for remove from store and re-erect fencing shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) loading, transporting from store, unloading and positioning for re-erection;

(b) replacing items damaged during the foregoing operations;

(c) modification and new materials;

(d) painting existing painted items;

(e) fencing (as this Series paragraph 4).

Concrete Foundation to Timber Posts

11 (05/01) The items for concrete foundation to timber posts shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) concrete foundation to timber posts (as this Series paragraph 5).

Remove from Store and Re-erect Gates and Stiles

12 The items for remove from store and re-erect gates and stiles shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) loading, transporting from store, unloading and positioning for re-erection;

(b) replacing items damaged during the foregoing operations;

(c) modification and new materials;

(d) painting existing painted items;

(e) gates and stiles (as this Series paragraph 6).

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Excavation in Hard Material (05/01)

Units

13 (05/01) The unit of measurement shall be:

(i) extra over excavation for excavation in Hard Material in fencing works ……. cubic metre.

Measurement

14 (05/01) The measurement of extra over excavation for excavation in Hard Material in fencing works shall be the plan area of the minimum size of the particular foundation required by the Contract multiplied by the depth of Hard Material removed.

Itemisation

15 (05/01) Separate items shall be provided for extra over excavation for excavation in Hard Material in fencing works in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Extra over excavation for excavation in Hard Material in fencing works.

Extra Over Excavation for Excavation in Hard Material

16 (05/01) The items for extra over excavation for excavation in Hard Material in fencing works shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item Coverage

(a) excavation in Hard Material (as Series 600 paragraph 23).

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Series 400: Road Restraint Systems (Vehicle and Pedestrian)

(05/04)

Safety Barriers

Units

1 (11/04) The units of measurement shall be:

(i) safety barrier …… linear metre.

(ii) transition …… number.

Measurement

2 (11/04) The measurement of safety barriers shall be the developed length along the centre line for the containment performance class between the following points: the end of each safety barrier and the interface with connections, transitions and terminals.

3 (11/04) The measurement of transitions shall be the complete installation.

Itemisation

4 (11/04) Separate items shall be provided for safety barriers and transitions in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Safety barrier.
	2	Transition.
II	1	Each containment performance class.
III	1	Each working width class.
IV	1	Designed to be impacted on one side only.
	2	Designed to be impacted on both sides.
V	1	Straight or curved exceeding 120 metres radius.
	2	Curved exceeding 50 metres radius but not exceeding 120 metres radius.
	3	Curved not exceeding 50 metres radius.

Safety Barriers and Transitions

Item coverage

5 (11/04) The items for safety barriers and transitions shall in accordance with the Preambles to Bill of Quantities General Directions include for:

(a) design;

(b) provision of design calculations and details to the Overseeing Organisation for acceptance;

(c) reports, certificates;

(d) provision of data and drawings;

(e) re-submissions and modifications;

(f) amendments to the Works;

(g) obtaining approvals;

(h) everything necessary for the design, fabrication, installation and testing of the Works.

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Terminals

Units

6 (11/04) The unit of measurement shall be:

(i) terminal ……. number.

Measurement

7 (11/04) The measurement of terminals shall be the complete installation.

Itemisation

8 (11/04) Separate items shall be provided for terminals in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Terminal.
II	1	Each lateral displacement zone class.
III	1	Each performance class.
IV	1	Designed to be impacted on one side only.
	2	Designed to be impacted on both sides.

Terminals

9 (11/04) The items for terminals shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) safety barriers and transitions (as this Series paragraph 5).

Connections to Existing Systems

Units

10 (11/04) The unit of measurement shall be:

(i) connection to existing system ……. number.

Measurement

11 (11/04) The measurement of connections to existing systems shall be the complete installation.

Itemisation

12 (11/04) Separate items shall be provided for connections to existing systems in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Connection to existing system.
II	1	Each containment performance class.
III	1	Each working width class.
IV	1	Each type of connection.

Connections to Existing Systems

13 (11/04) The items for connections to existing systems shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) safety barriers and transitions (as this Series paragraph 5).

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Crash Cushions

Units

14 (11/04) The unit of measurement shall be:

(i) crash cushion …… number.

Measurement

15 (11/04) The measurement of crash cushions shall be the complete installation.

Itemisation

16 (11/04) Separate items shall be provided for crash cushions in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Crash cushion.
II	1	Each performance level.
III	1	Each velocity class.
IV	1	Each lateral displacement zone class.
V	1	Redirective.
	2	Non-redirective.
VI	1	Different locations.

Crash cushions

17 (11/06) The items for crash cushions shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) safety barriers and transitions (as this Series paragraph 5);

(b) monitoring and recording.

Vehicle Parapets

Units

18 (11/04) The unit of measurement shall be:

(i) vehicle parapet …… linear metre.

Measurement

19 (11/04) The measurement of vehicle parapets shall be the developed length along the centre line of the vehicle parapet.

Itemisation

20 (11/04) Separate items shall be provided for vehicle parapets in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Vehicle parapet.
II	1	Each containment performance class.
III	1	Each working width class.
IV	1	Different heights.
V	1	Different locations.
VI	1	Straight or curved exceeding 50 metres radius.

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	2	Curved not exceeding 50 metres radius.

Vehicle Parapets

21 (11/04) The items for vehicle parapets shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) safety barriers and transitions (as this Series paragraph 5).

Pedestrian Parapets and Pedestrian Guardrails

Definition

22 (11/04) Any reference to "pedestrian" shall be deemed to include equestrian and cyclist.

Units

23 (11/04) The unit of measurement shall be:

(i) pedestrian parapet, pedestrian guardrail.....linear metre.

Measurement

24 (11/04) The measurement of pedestrian parapets and pedestrian guardrails shall be the developed length along the centre line.

Itemisation

25 (11/04) Separate items shall be provided for pedestrian parapets and pedestrian guardrails in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Pedestrian parapet.
	2	Pedestrian guardrail.
II	1	Different classes.
III	1	Different heights.
IV	1	Different locations.
V	1	Straight or curved exceeding 50 metres radius.
	2	Curved not exceeding 50 metres radius.
VI	1	Curved in plan to different radii.

Note 1: Group V Features shall be applied only to Group I Feature 1.
Note 2: Group VI Feature shall be applied only to Group I Feature 2.

Pedestrian Parapets and Pedestrian Guardrails

26 (11/04) The items for pedestrian parapets and pedestrian guardrails shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) safety barriers and transitions (as this Series paragraph 5).

Anti-glare Screens

Units

27 (11/04) The unit of measurement shall be:

(i) anti-glare screen ……. linear metre.

Measurement

28 (11/04) The measurement of anti-glare screens shall be the developed

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Itemisation

29 (11/04) Separate items shall be provided for anti-glare screens in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Anti-glare screen.
II	1	Each type of anti-glare screen.
III	1	Straight or curved exceeding 120 metres radius.
	2	Curved exceeding 50 metres radius but not exceeding 120 metres radius.
	3	Curved not exceeding 50 metres radius.

Anti-glare Screens

30 (11/04) The items for anti-glare screens shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) safety barriers and transitions (as this Series paragraph 5).

Remove from Store and Re-erect Safety Barriers

Units

31 (11/04) The units of measurement shall be:

(i) remove from store and re-erect beam ..... linear metre.

(ii) remove from store and re-erect post, mounting bracket, terminal section, full height anchorage, expansion joint anchorage, connection to bridge parapet, connection piece ..... number.

(iii) concrete foundation and socketed foundation to re-erected post ..... number.

Measurement

32 (11/04) The measurement of remove from store and re-erect beams shall be the developed length along the centre line of the beams or in the case of double sided safety barrier and double rail safety barrier, measured once only along the centre line of the posts, between the following points:

(a) the end of each safety barrier type at a connection to bridge parapet or within a connection piece assembly;

(b) the connection of safety barrier to terminal sections, full height anchorages and expansion joint anchorages.

33 (11/04) The measurement of remove from store and re-erect terminal sections, full height anchorages, expansion joint anchorages and connections to bridge parapets shall be the complete installation. Mounting brackets and all other posts required between those points defined in paragraph 32 shall be measured. Concrete foundations and socketed foundation to posts, between those points defined in paragraph 32, shall only be measured for those locations stated in the Contract.

34 (11/04) The measurement of remove from store and re-erect connection pieces shall be the complete installation.

35 (11/04) The measurement of remove from store and re-erect expansion joint anchorages shall be for each anchorage on each side of the expansion joint.

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Itemisation

36 (11/04) Separate items shall be provided for remove from store and re-erect safety barrier in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Each type of re-erected safety beam.
	2	Each type of re-erected post.
	3	Each type of re-erected mounting bracket.
	4	Each type of re-erected terminal section.
	5	Each type of re-erected full height anchorage.
	6	Each type of re-erected expansion joint anchorage.
	7	Each type of re-erected connection to bridge parapet.
	8	Each type of re-erected connection piece.
	9	Each type of concrete foundation to re-erected post.
	10	Each type of socketed foundation to re-erected post.
II	1	Straight or curved exceeding 120 metres radius.
	2	Curved exceeding 50 metres radius but not exceeding 120 metres radius.
	3	Curved not exceeding 50 metres radius.

Remove from Store and Re-erect Beams

37 (11/04) The items for remove from store and re-erect beams shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) loading, transporting from store, unloading and positioning for re-erection;

(b) replacing items damaged during the foregoing operations;

(c) modification and new materials;

(d) (11/04) transitions;

(e) making good to protective system.

Remove from Store and Re-erect Posts

38 (11/04) The items for remove from store and re-erect posts shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) loading, transporting from store, unloading and positioning for re-erection;

(b) replacing items damaged during the foregoing operations;

(c) modification and new materials;

(d) making good to protective system;

(e) fabrication (as Series 1800 paragraph 6);

(f) protective system (as Series 1900 paragraph 4);

(g) driving in any material;

(h) fixing to structures including attachment systems;

(i) fixing to beam including spacers;

(j) drilling or forming holes and pockets and casting in bolts, base plates and anchorage assemblies;

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(k) bedding;

(l) filling;

(m) making good to protective system.

Remove from Store and Re-erect Mounting Brackets

39 (11/04) The items for remove from store and re-erect mounting brackets shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) loading, transporting from store, unloading and positioning for re-erection;

(b) replacing items damaged during the foregoing operations;

(c) modification and new materials;

(d) making good to protective system;

(e) fabrication (as Series 1800 paragraph 6);

(f) protective system (as Series 1900 paragraph 4);

(g) fixing to structures including adaptor platforms;

(h) fixing to beam;

(i) drilling or forming holes and pockets and casting in bolts, base plates and anchorage assemblies.

Remove from Store and Re-erect Terminal Sections, Full Height Anchorages, Expansion Joint Anchorages, Connections to Bridge Parapets and Connection Pieces

40 (11/04) The items for remove from store and re-erect terminal sections, full height anchorages, expansion joint anchorages, connections to bridge parapets and connection pieces shall, in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) loading, transporting from store, unloading and positioning for re-erection;

(b) replacing items damaged during the foregoing operations;

(c) modification and new materials;

(d) making good to protective system.

Concrete Foundations and Socketed Foundations to Re-erected Posts

41 (11/04) The items for concrete foundations and socketed foundations to re-erected posts shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation in any material (as Series 600 paragraphs 17, 18, 19 and 23);

(b) disposal of material (as Series 600 paragraph 39);

(c) concrete (as Series 1700 paragraphs 5 and 10);

(d) formwork (as Series 1700 paragraph 15);

(e) reinforcement (as Series 1700 paragraph 26);

(f) casings;

(g) fabrication (as Series 1800 paragraph 6);

(h) protective system (as Series 1900 paragraph 4);

(i) socket covers and filling;

(j) plastic sheeting.

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Post Extension Units

Units

42 (11/04) The unit of measurement shall be:

(i) post extension unit……...number.

Itemisation

43 (11/04) Separate items shall be provided for post extension units in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Each type of post extension unit.

Post Extension Units

44 (11/04) The items for post extension units shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) fabrication (as Series 1800 paragraph 6);

(b) protective system (as Series 1900 paragraph 4);

(c) drilling existing posts;

(d) fixing to existing posts.

Raising Existing Sockets

Units

45 (11/04) The unit of measurement shall be:

(i) raising existing socket……number.

Itemisation

46 (11/04) Separate items shall be provided for raising existing sockets in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Raising each type of existing socket.

Raising Existing Sockets

47 (11/04) The items for raising existing sockets shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item Coverage

(a) removing existing posts and setting aside for re-use;

(b) cleaning out sockets;

(c) in-situ concrete (as Series 1700 paragraph 5);

(d) formwork (as Series 1700 paragraph 15);

(e) loading, transporting from store, unloading and positioning for re-erection;

(f) removing from store and re-erecting posts (as this Series paragraph 38);

(g) replacing items damaged during the foregoing operations;

(h) making good to protective systems.

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Series 500: Drainage and Service Ducts

Definitions

1 (05/01) Any reference to 'drain' shall be deemed to include sewers and piped culverts.

2 (05/01) Drains exceeding 900 mm internal diameter, box culverts, piped culverts and all associated chambers, headwalls, outfall works and concrete bagwork shall be measured in accordance with Series 2500 Special Structures.

3 (05/01) Trenches and ducts in connection with electrical work for road lighting and traffic signs cabling shall be measured in accordance with Series 1400.

4 (05/01) Trenches and ducts in connection with motorway communications cabling shall be measured in accordance with Series 1500.

5 (05/01) The Earthworks Outline is defined in Series 600 Earthworks paragraphs 1 to 6 inclusive and shall apply equally to this Series.

6 (05/01) Where the ground level has been subjected to treatment, under the Contract, in respect of ground improvement, mine workings, swallow holes and the like, for the purposes of this Series Existing Ground Level shall be the level obtained upon completion of any such treatment of the areas affected.

7 (05/01) Sub-soil Level is defined as the level of the ground after the removal of topsoil required by the Contract.

8 (05/01) Surcharge is defined as material placed on embankments for the purpose of loading the embankment for the periods stated in the Contract.

Drains and Service Ducts (Excluding Filter Drains, Narrow Filter Drains and Fin Drains) (05/01)

Units

9 (05/01) The unit of measurement for drains and service ducts shall be:

(i) drains, service ducts ..... linear metre.

Measurement

10 (05/01) The measurement of drains and service ducts shall be the summation of their individual lengths measured along the centre lines of the pipes between any of the following:

(a) the internal faces of chambers;

(b) the external faces of headwalls;

(c) the intersections of the centre lines at pipe junctions;

(d) the centre of gully gratings (or where no grating is provided, the centre of the gully);

(e) the position of terminations shown in the Contract;

(f) the point of change of stage depth.

11 (05/01) The depth of drains and service ducts shall be the vertical measurement between the invert and the following:

(a) where the invert is below the Existing Ground Level - the Existing Ground Level except that where the Earthworks Outline is below the Existing Ground Level the measurement shall be taken to the Earthworks Outline;

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(b) where the invert is at or above the Existing Ground Level - the datum stated in the Contract, or where none is stated, the Earthworks Outline.

Notwithstanding the foregoing, where in the Contract a commencing level or a minimum level of cover is stated from which excavation shall commence, then the depth shall be taken to that stated level.

12 (05/01) The average depth to invert shall be the calculated arithmetic mean of the depths taken at intervals of 10 metres along the pipelines starting from the outfall end. For terminal lengths and pipelines less than 10 metres long the measurement of depths shall be taken at their ends.

13 (05/01) The measurement of service ducts shall be for the complete construction irrespective of the number of ducts contained within any one trench.

Where more than one duct is laid in a trench then the number of ducts shall be stated in the item description.

14 (05/01) Drains and service ducts required to be designed by the Contractor shall be measured in accordance with Series 2500.

Itemisation

15 (05/01) Separate items shall be provided for drains and service ducts (excluding filter drains, narrow filter drains and fin drains) in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Drains.
	2	Service ducts.
II	1	Different internal diameters.
III	1	Depths to invert not exceeding 2 metres. The average depth to invert to be stated to the nearest 25 mm.
	2	Depths to invert exceeding 2 metres but not exceeding 4 metres and so on in steps of 2 metres. The average depth to invert to be stated to the nearest 25 mm.
IV	1	Specified design groups.
	2	Particular designs stated in the Contract.
V	1	Construction in trench.
	2	Construction in heading.
	3	Construction by jacking or thrust boring.
	4	Suspended on discrete supports.
VI	1	In side slopes of cuttings or side slopes of embankments.

Note: For each item which includes Group III Feature 1 or 2, an associated item shall be provided for adjustment of the rate for each 25 mm of difference in excess of 150 mm where the average depth to invert calculated from site measurement varies from that stated in the Bill of Quantities. The foregoing shall apply to both increases and decreases of average in excess of 150 mm, and will result in either a positive or negative adjustment of the rate.

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Drains and Service Ducts

16 (05/01) The items for drains and service ducts shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(b) excavation of unacceptable material (as Series 600 paragraph 19);

(c) access shafts to headings and their subsequent reinstatement;

(d) thrust pits and thrust blocks for pipe jacking and their removal on completion;

(e) articulated pipes and fittings;

(f) cutting, laying, jointing and bedding;

(g) building in pipes to headwalls and outfall works;

(h) hangers, stools and discrete supports;

(i) bedding, haunching and surrounding;

(j) formwork (as Series 1700 paragraph 15);

(k) backfilling and compaction;

(l) disposal of material (as Series 600 paragraph 39);

(m) movement joints to beds, surrounds and the like;

(n) reinstatement of unpaved areas;

(o) checking and cleaning;

(p) recording, staking and labelling;

(q) in the case of ducts, fixing draw ropes, removable stoppers, marker blocks and posts;

(r) pipe schedules;

(s) lubricants, packing, grouting and caulking;

(t) surveys and recordings;

(u) protective system (as Series 1900 paragraph 4).

Filter Drains

Units

17 (05/01) The units of measurement for filter drains shall be:

(i) filter drains ..... linear metre.

(ii) filter material contiguous with filter drains ..... cubic metre.

(iii) sub-base material ..... cubic metre.

(iv) lightweight aggregate infill ..... cubic metre.

(v) excavate and replace filter material ……. cubic metre.

Measurement

18 (05/01) The measurement of filter drains, excluding narrow filter drains, shall be the summation of their individual lengths measured along the centre lines of the pipe (or trench where no pipe is provided), between any of the following:

(a) the internal faces of chambers;

(b) the external faces of headwalls;

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(c) the intersection of centre lines at junctions;

(d) the centre of gully gratings (or where no grating is provided the centre of the gully);

(e) the position of terminations shown in the Contract;

(f) the point of change of stage depth.

19 (05/01) The depth of filter drains shall be the vertical measurement between the invert (or the centre line of the trench bottom where no pipe is provided) and the following:

(a) where the invert is below the Existing Ground Level - the Existing Ground Level or the Earthworks Outline whichever is the lower, except that where the finished level of the filter material is above the Existing Ground Level the measurement shall be taken to the finished level of the filter material;

(b) where the invert is at or above the Existing Ground Level - the datum stated in the Contract, or where none is stated, the finished level of the filter material.

The calculation of average depth to invert of filter drains shall be as paragraph 12 of this Series taken along the centre line of the filter drain.

Narrow filter drains shall be measured in accordance with paragraphs 25 to 28 of this Series.

20 (05/01) The measurement of contiguous filter material shall be the volume of the material occupying the void between the filter drain and the adjacent carriageway, hardshoulder and hardstrip. The side of the contiguous filter material next to the filter drain shall be taken as the vertical extension of the trench side above capping or where no capping is provided above subgrade level.

The measurement of sub-base material shall be the volume of the sub-base material within non-pavement verge or central reserve adjacent to the carriageway, hardshoulder and hardstrip filled to the outline stated in the Contract.

The measurement of lightweight aggregate infill shall be the volume of the lightweight aggregate infill above the filter drain filled to the outline stated in the Contract.

The measurement of excavate and replace filter material shall be the product of the lengths, widths and depths instructed by the Overseeing Organisation with no deduction for pipes, ducts or chambers. Lengths and widths shall be taken as the lengths and widths at the level of the drain invert or, in the case that partial excavation is instructed, at the depth to which excavation is instructed by the Overseeing Organisation.

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Itemisation

21 (05/01) Separate items shall be provided for filter drains in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Filter drains.
	2	Filter material contiguous with filter drains.
	3	Sub-base material.
	4	Lightweight aggregate infill.
	5	Excavate and replace filter material.
II	1	Different internal diameters.
	2	Different types of filter material.
	3	Different types of sub-base material.
	4	Different types of lightweight aggregate infill.
III	1	Depths to invert not exceeding 2 metres. The average depth to invert to be stated to the nearest 25 mm.
	2	Depths to invert exceeding 2 metres but not exceeding 4 metres and so on in steps of 2 metres. The average depth to invert to be stated to the nearest 25 mm.
IV	1	Specified design groups.
	2	Particular designs stated in the Contract.
V	1	In side slopes of cuttings or side slopes of embankments.

Note: For each item which includes Group III Feature 1 or 2 an associated item shall be provided for adjustment of the rate for each 25 mm of difference in excess of 150 mm where the average depth to invert calculated from site measurement varies from that stated in the Bill of Quantities. The foregoing shall apply to both increases and decreases of average in excess of 150 mm, and will result in either a positive or negative adjustment of the rate.

Filter Drains

22 (05/01) The items for filter drains shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(b) excavation of unacceptable material (as Series 600 paragraph 19);

(c) disposal of material (as Series 600 paragraph 39);

(d) articulated pipes, and fittings;

(e) cutting, laying, jointing and bedding;

(f) bedding, haunching and surrounding;

(g) formwork (as Series 1700 paragraph 15);

(h) filter material and compaction;

(i) reinstatement of unpaved areas;

(j) checking and cleaning;

(k) recording, staking and labelling;

(l) geotextiles;

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(m) topsoiling, seeding and turfing;

(n) mesh;

(o) pipe schedules;

(p) (11/04) surveys and recordings;

(q) (11/04) protective system (as Series 1900 paragraph 4).

Filter Material Contiguous with Filter Drains, Sub-base Material and Lightweight Aggregate Infill

23 (05/01) The items for filter material contiguous with filter drains, sub-base material and lightweight aggregate infill shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) compaction;

(b) formwork (as Series 1700 paragraph 15);

(c) geotextiles;

(d) mesh.

Excavate and Replace Filter Material (05/01)

24 (05/01) The items for excavate and replace filter material shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation (as Series 600 paragraphs 18 and 19);

(b) disposal of material (as Series 600 paragraph 39);

(c) compaction of fill (as Series 600 paragraph 52);

(d) geotextiles.

Fin Drains and Narrow Filter Drains

Units

25 (05/01) The unit of measurement shall be:

(i) fin drains ..... linear metre.

(ii) narrow filter drains ..... linear metre.

Measurement

26 (05/01) The measurement of fin drains and narrow filter drains shall be the summation of their individual lengths measured along their centre lines between any of the following:

(a) the internal faces of chambers;

(b) the position of terminations shown in the Contract;

(c) the external faces of headwalls.

The depth of the fin drain or narrow filter drain shall be the vertical measurement between the invert and the Earthworks Outline.

Itemisation

27 (05/01) Separate items shall be provided for fin drains and narrow filter drains in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Fin drains.
	2	Narrow filter drains.
II	1	Specified design group.
	2	Particular designs stated in the Contract.
III	1	Depth not exceeding 1.5 metres.

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Fin Drains and Narrow Filter Drains

28 (05/01) The items for fin drains and narrow filter drains shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) geotextiles and cores;

(b) backfilling and compaction;

(c) filter drains (as this Series paragraph 22);

(d) protection from ultra-violet light;

(e) marker tapes;

(f) lapping and jointing;

(g) connections, attachments and fittings;

(h) treatment at chambers, gullies, pipelines and the like.

Connections

Units

29 (05/01) The unit of measurement for connections shall be:

(i) connection to existing drain, existing piped culvert, existing chamber, permanently severed land or mole drain ..... number.

Measurement

30 (05/01) Connections shall only be separately measured for connection to existing drains, existing piped culverts or existing chambers, and permanently severed land or mole drains.

Itemisation

31 (05/01) Separate items shall be provided for connections in accordance with Chapter II paragraphs 3 and 4 and the following:

Group		Feature
I	1	Connection to existing drain and existing piped culvert.
	2	Connection to existing chamber.
	3	Connection to permanently severed land or mole drain.
II	1	Different diameters.
III	1	Depths to invert not exceeding 2 metres.
	2	Depths to invert exceeding 2 metres but not exceeding 4 metres and so on in steps of 2 metres.

Connections to Existing Drains, Existing Piped Culverts, Existing Chambers, Permanently Severed Land or Mole Drains (05/01)

32 (05/01) The items for connection to existing drains, existing piped culverts, existing chambers, permanently severed land or mole drains shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(b) excavation of unacceptable material (as Series 600 paragraph 19);

(c) locating and making entry;

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(d) backfilling and compaction;

(e) disposal of material (as Series 600 paragraph 39);

(f) making entry into chambers, concrete benching and channels, and making good the benching, channels and walls;

(g) locating severed ends of land and mole drains;

(h) pipes, fittings and saddles;

(i) bedding, haunching and surrounding, and filter material;

(j) formwork (as Series 1700 paragraph 15);

(k) sealing off disused ends;

(l) re-laying existing pipes disturbed.

Chambers and Gullies

Units

33 (05/01) The unit of measurement shall be:

(i) chambers, gullies ..... number.

Measurement

34 (05/01) The measurement shall be of the complete chamber or gully.

35 (05/01) Depths of chambers shall be the distance between the top surface of the cover and the invert of the main channel, or where no channel is required by the Contract, the uppermost surface of the base slab. Where no base slab is required the depth shall be taken to the bottom of the excavation.

Itemisation

36 (05/01) Separate items shall be provided for chambers and gullies in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Chambers.
	2	Gullies.
II	1	Specified design groups.
	2	Particular designs stated in the Contract.
III	1	Depths not exceeding 1 metre.
	2	Depths exceeding 1 metre but not exceeding 2 metres and so on in steps of 1 metre.
IV	1	Different types of covers or gratings.

Chambers

37 (05/01) The items for chambers shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(b) excavation of unacceptable material (as Series 600 paragraph 19);

(c) locating existing drains;

(d) breaking into existing drains;

(e) connecting and re-connecting existing drains;

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(f) construction of bases, walls, roof and cover slabs and shafts, surrounds and corbelling for cover;

(g) channels, fittings, benchings, building in pipes and fin drain connections;

(h) cleaning;

(i) steps, safety chains, ladders, handholds and the like;

(j) covers, frames, seatings and bedding;

(k) lifting keys;

(l) concrete (as Series 1700 paragraphs 5 and 10);

(m) formwork (as Series 1700 paragraph 15);

(n) reinforcement (as Series 1700 paragraph 26);

(o) backfilling and compaction;

(p) disposal of material (as Series 600 paragraph 39);

(q) filling;

(r) notices;

(s) sealants (as Series 2300 paragraph 10);

(t) brickwork (as Series 2400 paragraph 4);

(u) re-laying existing pipes disturbed;

(v) pipework and fittings;

(w) penstocks and ancillary equipment.

Gullies

38 (05/01) The items for gullies shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(b) excavation of unacceptable material (as Series 600 paragraph 19);

(c) fittings including in situ concrete (as Series 1700 paragraph 5) bed and surround and jointing to pipes;

(d) gratings, frames, slabs, surrounds, aprons, seatings, liners and bedding;

(e) formwork (as Series 1700 paragraph 15);

(f) cleaning;

(g) backfilling and compaction;

(h) disposal of material (as Series 600 paragraph 39);

(i) brickwork (as Series 2400 paragraph 4);

(j) re-laying existing pipes disturbed.

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Headwalls and Outfall Works

Measurement

39 (05/01) Headwalls and outfall works and the like to pipes up to 900 mm internal diameter shall be measured in accordance with this Series paragraphs 40 to 42.

Headwalls and outfall works and the like to pipes exceeding 900 mm internal diameter shall be measured in accordance with Series 2500.

Headwalls and outfall works and the like constructed using concrete bagwork shall be measured in accordance with this Series paragraphs 77 to 80.

Units

40 (05/01) The unit of measurement shall be:

(i) headwalls, revetments ..... number.

Itemisation

41 (05/01) Separate items shall be provided for headwalls and revetments in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Headwalls.
	2	Revetments.
II	1	Different types.
III	1	Different materials.
IV	1	Pipe not exceeding 100 mm internal diameter.
	2	Pipe exceeding 100 mm but not exceeding 300 mm internal diameter.
	3	Pipe exceeding 300 mm but not exceeding 600 mm internal diameter.
	4	Pipe exceeding 600 mm but not exceeding 900 mm internal diameter.

Headwalls and Outfall Works

Item coverage

42 (05/01) The items for headwalls and outfall works shall in accordance with the Preambles to Bill of Quantities General Directions include for:

(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(b) excavation of unacceptable material (as Series 600 paragraph 19);

(c) concrete (as Series 1700 paragraphs 5 and 10);

(d) formwork (as Series 1700 paragraph 15);

(e) backfilling and compaction;

(f) disposal of material (as Series 600 paragraph 39);

(g) brickwork, copings, string courses and the like (as Series 2400 paragraph 4);

(h) blockwork, stonework, copings, string courses, individual blocks, features or stones (as Series 2400 paragraph 8);

(i) lining of watercourses (as Series 600 paragraph 89);

(j) drainage channel blocks (as Series 1100 paragraph 4);

(k) building in pipes and fin drain connections;

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(l) reinforcement (as Series 1700 paragraph 26);

(m) miscellaneous metalwork (as Series 1800 paragraph 14);

(n) waterproofing (as Series 2000 paragraph 4);

(o) flap valves.

Soft Spots and Other Voids

Units

43 (05/01) The unit of measurement shall be:

(i) soft spots, other voids ..... cubic metre.

Measurement

44 (05/01) The measurement of soft spots and other voids shall be the volume of the void directed to be excavated or filled. For this measurement the width shall be taken for drains, service ducts and filter drains, as the internal diameter of the pipe plus 600 mm. Where no pipe is required the width shall be taken as 600 mm. For chambers, gullies and the like the measurement shall be taken as the horizontal area of the base slab or where no base slab is required the bottom of the excavation. The depths shall be measured from the underside of the thinnest permitted bed in any one group for trenches and from the underside of the base slab for chambers, gullies and the like.

Itemisation

45 (05/01) Separate items shall be provided for soft spots and other voids in accordance with Chapter II paragraphs 3 and 4 and the following:

Group		Feature
I	1	Excavation of soft spots and other voids.
	2	Filling of soft spots and other voids.
II	1	Different types of fill.

Excavation of Soft Spots and Other Voids

46 (05/01) The items for excavation of soft spots and other voids shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(b) excavation of unacceptable material (as Series 600 paragraph 19);

(c) disposal of material (as Series 600 paragraph 39).

Filling of Soft Spots and Other Voids

47 (05/01) The items for filling of soft spots and other voids shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) deposition of fill (as Series 600 paragraph 33);

(b) compaction of fill (as Series 600 paragraph 52);

(c) in situ concrete (as Series 1700 paragraph 5);

(d) formwork (as Series 1700 paragraph 15).

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Supports Left in Excavation

Units

48 (05/01) The unit of measurement shall be:

(i) supports left in excavation ..... square metre.

Measurement

49 (05/01) The measurement shall be the area of face required by the Contract to be left with supports in position.

Itemisation

50 (05/01) Separate items shall be provided for supports left in excavation in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Supports.
II	1	Timber.
	2	Steel.
III	1	Different types.
IV	1	Construction in trench.
	2	Construction in pits.
	3	Construction in heading.

Supports Left in Excavation

51 (05/01) The items for supports left in excavation shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) struts, walings and the like and working around them.

Drainage and Service Ducts in Structures (Including Reinforced Earth Structures and Anchored Earth Structures)

Units

52 (05/01) The unit of measurement shall be:

(i) drainage and service ducts in structures ..... item.

Measurement

53 (05/01) The components comprising the items of drainage and service ducts in structures shall be identified and scheduled in the Contract.

Itemisation

54 (05/01) Separate items shall be provided for drainage and service ducts in structures in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Drainage.
	2	Service ducts.
II	1	Substructure - end supports.
	2	Substructure - intermediate supports.
	3	Superstructure.
	4	Reinforced earth structure.
	5	Anchored earth structure.

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Drainage and Service Ducts in Structures

55 (05/01) The items for drainage and service ducts in structures shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) drains, service ducts, filter drains, fin drains and narrow filter drains and connections (as this Series paragraphs 16, 22, 28 and 32);

(b) chambers (as this Series paragraph 37);

(c) gullies (as this Series paragraph 38);

(d) pipework, gullies, downpipes, fittings and the like including brackets, hangers and straps, fixing to or building into the structure;

(e) making good protective system, waterproofing;

(f) permeable backing including compaction and supports;

(g) channels.

Filling to Pipe Bays and Verges on Bridges

Units

56 (05/01) The unit of measurement shall be:

(i) filling to pipe bays and verges on bridges ..... cubic metre.

Measurement

57 (05/01) The measurement shall be the volume of the void stated in the Contract to be filled except that no deduction shall be made for drains, service ducts, services, supplies and the like and their supports.

Itemisation

58 (05/01) Separate items shall be provided for filling to pipe bays and verges on bridges in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Filling to pipe bays and verges on bridges.
II	1	Different types.

Filling to Pipe Bays and Verges on Bridges

59 (05/01) The items for filling to pipe bays and verges on bridges shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) deposition;

(b) complying with any restrictions on the placing and compacting of materials;

(c) compaction around drains, service ducts, services, supplies, supports and the like.

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Renewal, Raising or Lowering of Covers and Gratings on Existing Chambers and Gullies (05/05)

Definition

60 (05/01) For the purpose of paragraphs 61 to 64 of this Series any reference to covers and gratings shall be deemed to include associated frames.

Units

61 (05/05) The units of measurement shall be:

(i) renewal of covers and gratings on existing chambers and gullies …… number.

(ii) raising or lowering of covers and gratings on existing chambers and gullies …….. number.

Measurement

62 (05/05) When an existing cover or grating is to be raised/lowered and renewed, separate items shall be measured for raising/lowering and renewal.

Itemisation

63 (05/05) Separate items shall be provided for renewal, raising or lowering of covers and gratings on existing chambers and gullies in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Renewal.
	2	Raising the level.
	3	Lowering the level.
II	1	Different sizes of cover.
	2	Different sizes of grating.
III	1	Different types of cover.
	2	Different types of grating.
IV	1	Different sizes of chamber.
	2	Different sizes of gully.
V	1	Different construction of chamber.
	2	Different construction of gully.
VI	1	Not exceeding 150 mm.
	2	Exceeding 150 mm but not exceeding 300 mm and so on in steps of 150 mm.

Renewal, Raising or Lowering of Covers and Gratings on Existing Chambers and Gullies (05/05)

64 (05/05) The items for renewal, raising or lowering of covers and gratings on existing chambers and gullies shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(b) excavation of unacceptable material (as Series 600 paragraph 19);

(c) excavation of Hard Material (as Series 600 paragraph 23);

(d) take up existing cover or grating including frame and clean and set aside for re-use;

(e) demolition and preparation to receive new construction;

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(f) construction of walls, roof and cover slabs and shafts, surrounds and corbelling for cover and making good;

(g) steps, safety chains, ladders, handholds, lifting keys and the like;

(h) bedding cover or grating including frame;

(i) concrete (as Series 1700 paragraphs 5 and 10);

(j) formwork (as Series 1700 paragraph 15);

(k) reinforcement (as Series 1700 paragraph 26);

(l) backfilling and compaction;

(m) disposal of material (as Series 600 paragraph 39);

(n) taking precautions to avoid damage to drains;

(o) cleaning;

(p) reinstatement of adjacent surfaces;

(q) brickwork (as Series 2400 paragraph 4);

(r) sealants (as Series 2300 paragraph 10);

(s) modification and new materials;

(t) replacing items damaged during the foregoing operations.

Remove from Store and Reinstall Chamber Covers and Frames, and Gully Gratings and Frames

Units

65 (05/01) The unit of measurement shall be:

(i) remove from store and reinstall chamber covers and frames, and gully gratings and frames ..... number.

Measurement

66 (05/01) The measurement of remove from store and reinstall chamber covers and frames and gully gratings and frames shall be the complete installation.

Itemisation

67 (05/01) Separate items shall be provided for remove from store and reinstall chamber covers and frames and gully gratings and frames in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Remove from store and reinstall different types of chamber covers and frames.
	2	Remove from store and reinstall different types of gully gratings and frames.
II	1	Different sizes.

Remove from Store and Reinstall Chamber Covers and Frames and Gully Gratings and Frames

68 (05/01) The items for remove from store and reinstall chamber covers and frames and gully gratings and frames shall in accordance with the Preambles to Bill of Quantities General Directions include for:

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Item coverage

(a) loading, transporting from store, unloading and positioning for reinstallation;

(b) replacing items damaged during the foregoing operations;

(c) modification and new materials;

(d) (05/05) renewal, raising or lowering of covers and gratings on existing chambers and gullies (as this Series paragraph 64).

Grouting Up of Existing Drains and Service Ducts (05/01)

Units

69 (05/01) The unit of measurement shall be:

(i) grouting up of existing drains and service ducts ..... linear metre.

Measurement

70 (05/01) The measurement of grouting up of existing drains and service ducts shall be the length to be grouted as stated in the Contract.

Itemisation

71 (05/01) Separate items shall be provided for grouting up of existing drains and service ducts in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Grouting up of existing drains and service ducts.
II	1	Different diameters.
III	1	Different types of grout.

Grouting Up of Existing Drains and Service Ducts

72 (05/01) The items for grouting up of existing drains and service ducts shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(b) excavation of unacceptable material (as Series 600 paragraph 19);

(c) breaking into drain or service duct and cleaning;

(d) mixing and placing grout;

(e) in situ concrete (as Series 1700 paragraph 5);

(f) formwork (as Series 1700 paragraph 15);

(g) backfilling and compaction;

(h) disposal of material (as Series 600 paragraph 39).

Excavation in Hard Material

Units

73 (05/01) The unit of measurement shall be:

(i) extra over excavation for excavation in Hard Material in drainage ..... cubic metre.

Measurement

74 (05/01) The measurement shall be the volume of the voids formed by the removal of the Hard Material.

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For the measurement of:

(a) drains, service ducts and filter drains (except fin drains and narrow filter drains), the width shall be taken as the internal diameter of the pipe plus 600 mm. Where no pipe is required the width shall be taken as 600 mm;

(b) fin drains and narrow filter drains the width shall be taken as 300 mm;

(c) chambers, gullies and the like the area shall be taken as the horizontal area of the base slab or where no base slab is required the area of the bottom of the excavation;

(d) (05/05) Excavation in hard material shall not be measured separately in connection with renewal and raising or lowering of covers and gratings on existing chambers and gullies.

Itemisation

75 (05/01) Separate items shall be provided for extra over excavation for excavation in Hard Material in drainage in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Extra over excavation for excavation in Hard Material in drainage.

Extra Over Excavation for Excavation in Hard Material

Quantities

76 (05/01) The items for extra over excavation for excavation in Hard Material in drainage shall in accordance with the Preambles to Bill of

General Directions include for:

Item coverage

(a) excavation in Hard Material (as Series 600 paragraph 23).

Concrete Bagwork (05/01)

Units

77 (05/01) The unit of measurement shall be:

(i) Concrete bagwork ……..cubic metre.

Measurement

78 (05/01) No deduction shall be made for holes, ducts, pockets, sockets, mortices and the like not exceeding 0.15 cubic metres each in volume.

Itemisation

79 (05/01) Separate items shall be provided for concrete bagwork in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Concrete bagwork.
II	1	In headwalls.
	2	Other stated location.
III	1	With battered face.

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Concrete Bagwork

80 (05/01) The items for concrete bagwork shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item Coverage

(a) excavation (as Series 600 paragraphs 18 and 19);

(b) disposal of material (as Series 600 paragraph 39);

(c) trials and trial panels;

(d) deposition, fill and compaction (as Series 600 paragraphs 33, 45 and 52);

(e) filling bags with concrete and tucking in ends of bags;

(f) shaping bags and soaking;

(g) dowel bars (as Series 1700 paragraph 27);

(h) building in pipes;

(i) tying into existing work;

(j) construction of bagwork in more than one lift;

(k) in situ concrete (as Series 1700 paragraph 5);

(l) formwork (as Series 1700 paragraph 15);

(m) reinforcement (as Series 1700 paragraph 26);

(n) geotextiles (as Series 600 paragraph 60);

(o) water supply.

Cleaning Existing Drainage Systems (05/01)

Units

81 (05/01) The units of measurement shall be:

(i) cleaning of piped drainage systems, drainage channels, linear drainage channel systems, combined drainage and kerb systems…….linear metre.

(ii) cleaning of bridge drainage system ……item.

(iii) cleaning of chambers, gullies …….number.

Measurement

82 (05/01) The measurement of cleaning piped drainage systems, drainage channels, linear drainage channel systems and combined drainage and kerb systems shall be the individual lengths measured along the centre lines between any of the following:

(a) the internal faces of chambers;

(b) the external faces of headwalls;

(c) the intersections of the centre lines at pipe junctions;

(d) the centre of gully gratings (or where no grating is provided, the centre of the gully);

(e) the position of terminations shown in the Contract.

The measurement of cleaning drainage channels, linear drainage channel systems, combined drainage and kerb systems and bridge drainage systems shall be deemed to include associated chambers, sumps and the like.

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Itemisation

83 (05/01) Separate items shall be provided for cleaning existing drainage systems in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Cleaning.
II	1	Piped drainage system.
	2	Drainage channels.
	3	Linear drainage channel system.
	4	Combined drainage and kerb system.
	5	Bridge drainage system.
	6	Chambers.
	7	Gullies.
III	1	Different stated sizes.
IV	1	Different stated locations.

Cleaning Existing Drainage Systems

84 (11/03) The items for cleaning existing drainage systems shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item Coverage

(a) marking;
(b) lifting chamber covers, replacement and bedding;
(c) rodding;
(d) jetting;
(e) water supply;
(f) mandrelling;
(g) de-watering of silt, sand and rubble prior to disposal;
(h) disposal of material (as Series 600 paragraph 39);
(i) recording and reporting;
(j) greasing;
(k) covering of apertures;
(l) cleaning covers, gratings and frames, offlets and the like;
(m) filling with water;
(n) vacuum/air suction;
(o) locating obstructions and the like;
(p) contamination prevention measures;
(q) locating chambers and gullies.

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Series 600: Earthworks

Definitions

#1 (05/02) The Earthworks Outline, unless expressly stated otherwise, is defined as the finished earthworks levels and dimensions (prior to topsoiling) required by the Contract for the construction, where specified, of:

(a) carriageway, hard shoulder, hard strip, footway, paved area, central reserve, verge, side slope;

(b) sub-base;

(c) fill on sub-base material, base and capping;

(d) contiguous filter material, lightweight aggregate infill;

(e) surface water channels;

(f) landscape areas, environmental bunds.

In all cases of filter drains, except narrow filter drains, the Earthworks Outline shall be the top of the filter material.

#2 Where capping or stabilisation to form capping is required by the Contract in cutting or on embankment, the Earthworks Outline shall be as defined in paragraph 1 of this Series i.e. as the top of capping.

3 Where an embankment is required by the Contract to be surcharged, the Earthworks Outline shall be as defined in paragraph 1 of this Series and exclude the surcharge.

4 Where permanent storage or stockpiling of topsoil is required by the Contract, the Earthworks Outline shall be as defined in paragraph 1 of this Series and exclude stored topsoil.

5 Where the bottom of a structural foundation for an earth retaining structure (other than for reinforced earth and an anchored earth structure) is below Existing Ground Level, the Earthworks Outline shall be the permanently exposed face of the structure below Existing Ground Level.

6 Where the bottom of the facing foundation for a reinforced earth structure or an anchored earth structure is below Existing Ground Level, the Earthworks Outline shall be the inside face of the facing above Existing Ground Level to the underside of the capping unit, or where no capping unit is required, to the finished earthworks level prior to topsoiling.

7 Where the ground has been subjected to treatment under the Contract in respect of ground improvement, mine workings, swallow holes and the like, for the purpose of this Series Existing Ground Level shall be the level obtained upon completion of any such treatment of the areas affected.

8 Sub-soil Level is defined as the level of the ground after the removal of topsoil required by the Contract.

9 Surcharge is defined as material placed on embankments for the purpose of loading the embankment for the periods stated in the Contract.

Measurement General (05/01)

10 For the purposes of this Series it shall be assumed that one cubic metre of material excavated forms one cubic metre of compacted fill. No allowance shall be made in the measurement for bulking and shrinkage of any material.

11 Earthworks within Designated Outlines shall not be measured in this Series.

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12 (05/01) For the purpose of this Series no account shall be taken of excavated material arising from the Works measured in accordance with Series 100 to 500 and 700 to 3000 hereof.

13 (05/01) Where deposition and compaction of an embankment has been carried out in accordance with the Contract and settlement occurs:

(a) subsequent to the Earthworks Outline having been reached, or in the case of a surcharged embankment subsequent to the removal of the surcharge; or

(b) from settlement of or penetration into the ground beneath the embankment;

then the additional fill, deposition and compaction required shall be measured immediately prior to the preparation of formation, provided that the first 75 mm of settlement or penetration shall not be measured.

In the case of landscape areas, environmental bunds and other areas of fill where settlement or penetration occurs, the additional fill, deposition and compaction required shall not be measured.

Excavation

Units

14 The unit of excavation shall be:

(i) excavation ..... cubic metre.

Measurement

15 The measurement of excavation shall be, for:

(a) Topsoil Class 5A - the volume of the void formed by the excavation of material designated topsoil Class 5A.

(b) Cutting and other excavation:

(i) cutting and bulk excavation - the volume of the void formed by the excavation of material from Existing Ground Level down to the Earthworks Outline, together with the volume of the void formed by the excavation of material below that Outline; or

(ii) under embankments and other areas of fill - the volume of the void formed by the excavation of material below Existing Ground Level;

less in each case the volume of topsoil Class 5A in the void included in the measurement under paragraph 15(a). The volume of excavation of soft spots measured under paragraph 62 of this Series shall not be included.

(c) Removal of surcharge - the volume of material remaining as surcharge to be removed down to the datum stated in the Contract, or if none is stated, to the Earthworks Outline.

(d) Structural foundations - the volume of the void to accommodate the structural foundation calculated on the basis of the horizontal area of the bottom of the foundation with the depth being measured from the bottom of the foundation (including blinding concrete) to:

(i) where the bottom of the foundation is below Existing Ground Level - the Existing Ground Level; provided that where the Earthworks Outline is below Existing Ground Level the depth shall be measured to the Earthworks Outline;

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(ii) where the bottom of the foundation is at or above Existing Ground Level - the datum stated in the Contract, or where none is stated to the Earthworks Outline;

less in each case the volume of topsoil Class 5A in the void included in the measurement under paragraph 15(a). The volume of excavation of soft spots measured under paragraph 62 of this Series shall not be included.

The classification of stage depths for the excavation of structural foundations shall be the maximum depth of excavation obtained in accordance with this sub-paragraph.

(e) Foundations for corrugated steel buried structures and the like - the volume of the void to accommodate the structure, bedding and surround down to the outline stated in the Contract from:

(i) where the bottom of the bedding is below Existing Ground Level - Existing Ground Level;

(ii) where the bottom of the bedding is at or above Existing Ground Level - the datum stated in the Contract or where none is stated - Earthworks Outline;

less in each case the volume of topsoil Class 5A in the void included in the measurement under paragraph 15(a). The volume of excavation of soft spots measured under paragraph 62 of this Series shall not be included.

The classification of stage depths for the excavation of the foundation shall be the maximum depth of excavation obtained in accordance with this sub-paragraph.

(f) New and enlarged watercourses, intercepting ditches - the volume of the void formed from Existing Ground Level down to the outline stated in the Contract less the volume of topsoil Class 5A in the void included in the measurement under paragraph 15(a) of this Series.

(g) Clearing abandoned watercourses - the volume of the void formed from Existing Ground Level down to the outline stated in the Contract.

(h) Gabion walling, mattresses and crib walling - as for structural foundations sub-paragraph (d) of this paragraph.

(i) Caps to mine working, well, swallow hole and the like - the volume of the voids formed to accommodate the caps.

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Itemisation

16 (11/04) Separate items shall be provided for excavation in accordance with Chapter II paragraphs 3 and 4, and the following:

Group	Feature	
I	1	Excavation.
II	1	Acceptable material Class 5A.
	2	Acceptable material excluding Class 5A.
	3	Unacceptable material Class U1A.
	4	Unacceptable material Class U1B.
	5	Unacceptable material Class U2.
III	1	Cutting and other excavation.
	2	Structural foundations.
	3	Foundations for corrugated steel buried structures and the like.
	4	New watercourses.
	5	Enlarged watercourses.
	6	Intercepting ditches.
	7	Clearing abandoned watercourses.
	8	Removal of surcharge.
	9	Gabion walling and mattresses.
	10	Crib walling.
	11	Caps to mine working, well, swallow hole and the like.
IV	1	0 metres to 3 metres in depth.
	2	0 metres to 6 metres in depth and so on in steps of 3 metres.

Note 1: Acceptable material Class 5A shall not be separately identified by any Group III or IV feature.

Note 2: Group IV features shall be applied only to Features 2, 3, 9, 10 and 11 of Group III.

Excavation of Acceptable Material Class 5A

17 (11/04) The items for excavation of acceptable material Class 5A shall, in accordance with the Preambles to Bill of Quantities General Directions, include for:

Item coverage

(a) selection and separation of materials;

(b) loading into transport;

(c) multiple handling of material;

(d) keeping earthworks free of water;

(e) haulage and deposition in temporary stockpiles including the provision of sites for stockpiles;

(f) taking precautions to avoid damage to property, structures, drains, services, instrumentation and the like;

(g) grading beds and trimming side slopes of watercourses and the like;

(h) replacing acceptable material rendered unacceptable.

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Excavation of Acceptable Material Excluding Class 5A

18 (05/01) The items for excavation of acceptable material excluding Class 5A shall, in accordance with the Preambles to Bill of Quantities General Directions, include for:

Item coverage

(a) loosening or breaking up material before or in the process of excavation;

(b) upholding the sides;

(c) working around and between piles;

(d) overbreak and making good;

(e) keeping earthworks free of water;

(f) selection and separation of materials;

(g) forming and trimming side slopes, benchings and berms;

(h) trimming the bottom and sides of foundations;

(i) grading beds and trimming sides of watercourses and the like;

(j) protection of subgrade;

(k) additional excavation the Contractor may require for working space, timbering, formwork or other temporary works and its subsequent backfilling with approved materials and compaction;

(l) (11/04) taking precautions to avoid damage to property, structures, drains, services, instrumentation and the like;

(m) treatment of faces of cuttings which are not to receive topsoil;

(n) loading into transport;

(o) multiple handling of material;

(p) disposal of surcharge material (as this Series paragraph 39) where occasioned by the Contractor's method of working;

(q) disposal of surcharge material rendered unacceptable (as this Series paragraph 39);

(r) waiting for frozen material to thaw;

(s) haulage, deposition and compaction in temporary stockpiles including provision of sites for stockpiles;

(t) replacing acceptable material rendered unacceptable;

(u) breaking down material necessary to comply with the requirements of fill;

(v) complying with special requirements for Class 3 material and other materials requiring special treatments.

Excavation of Unacceptable Material Classes U1A, U1B and U2 (11/04)

19 (11/04) The items for excavation of unacceptable material Classes U1A, U1B and U2 shall, in accordance with the Preambles to Bill of Quantities General Directions, include for:

Item coverage

(a) excavation (as this Series paragraph 18);

(b) special measures for dealing with Classes U1B and U2 material.

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Excavation in Hard Material

Units

20 The unit of measurement shall be:

(i) extra over excavation for excavation in Hard Material ..... cubic metre.

Measurement

21 The measurement of extra over excavation for excavation in Hard Material shall be the volume of Hard Material within the void measured under paragraph 15 of this Series.

Itemisation

22 Separate items shall be provided for extra over excavation for excavation in Hard Material in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Extra over excavation for excavation in Hard Material.
II	1	Cutting and other excavation.
	2	Structural foundations.
	3	Foundations for corrugated steel buried structures and the like.
	4	New watercourses.
	5	Enlarged watercourses.
	6	Intercepting ditches.
	7	Clearing abandoned watercourses.
	8	Gabion walling and mattresses.
	9	Crib walling.
	10	Caps to mine working, well, swallow hole and the like.

Extra Over Excavation for Excavation in Hard Material

23 The items for extra over excavation for excavation in Hard Material shall, in accordance with the Preambles to Bill of Quantities General Directions, include for:

Item coverage

(a) preliminary site trials of blasting;

(b) blasting, splitting, breaking and the like;

(c) cutting through reinforcement;

(d) saw cutting and trimming;

(e) removal of existing paved areas by course or layer, cleaning surfaces, milling or planing, stepping out and treatment to bottoms of foundations.

(11/04) Processing of Unacceptable Material Classes U1A and U1B

Definition

24 The term 'processing' shall refer to treatment whereby material arising from the Site is rendered acceptable for a particular use in the Works by mechanical, chemical, hydraulic or other means.

Units

25 (11/04) The unit of measurement shall be:

(i) processing of unacceptable material Class U1A, Class U1B ..... cubic metre.

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Measurement

26 (11/04) The processing of unacceptable material Classes U1A and U1B shall be measured only when the Contract specifically requires particular material to be obtained for use in the Works by processing. Other processing carried out by the Contractor shall not be measured. The measurement of processing of unacceptable material Classes U1A and U1B shall be the volume of the void required to be filled with the processed material.

Itemisation

27 (11/04) Separate items shall be provided for processing of unacceptable material Classes U1A and U1B in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Processing of unacceptable material Class U1A.
	2	Processing of unacceptable material Class U1B.
II	1	Different locations.
III	1	Into different classes of acceptable material.

Processing of Unacceptable Material Classes U1A and U1B (11/04)

28 (11/04) The items for processing of unacceptable material Classes U1A and U1B shall, in accordance with the Preambles to Bill of Quantities General Directions, include for:

Item coverage

(a) selection and separation of materials;

(b) (11/04) taking precautions to avoid damage to property, structures, drains, services, instrumentation and the like;

(c) loading into transport;

(d) multiple handling of material;

(e) waiting for frozen material to thaw;

(f) replacing acceptable material rendered unacceptable;

(g) haulage, deposition and compaction in temporary stockpiles including provision of sites for stockpiles;

(h) crushing, screening, mixing, grading, drying, wetting and sieving;

(i) mechanical, chemical, hydraulic and other methods;

(j) producing the required classification of material from Site-won materials;

(k) obtaining permissions and approvals;

(l) special measures for dealing with Class U1B material.

Deposition of Fill

Units

29 The unit of measurement shall be:

(i) deposition of fill ..... cubic metre.

Measurement

30 The measurement of deposition of fill shall be the volume of compacted fill, calculated in accordance with paragraphs 47, 48 and 49 of this Series, less the volume of imported fill calculated in accordance with paragraphs 41 and 42 of this Series.

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31 Deposition of Class 1C and 6B materials shall be separately measured only where Class 1C or 6B material is specifically stated by the Contract to be required to be placed in a particular location.

Itemisation

#32 (05/02) Separate items shall be provided for deposition of fill in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Deposition.
II	1	Acceptable material.
	2	Acceptable material Class 1C.
	3	Acceptable material Class 6B.
III	1	Embankments and other areas of fill.
	2	Strengthened embankments.
	3	Reinforced earth structures.
	4	Anchored earth structures.
	5	Landscape areas.
	6	Environmental bunds.
	7	Fill to structures.
	8	Fill above structural concrete foundations.
	9	Fill on sub-base material, base and capping.
	10	Fill on bridges (under footways, verges and central reserves).
	11	Upper bedding to corrugated steel buried structures and the like.
	12	Lower bedding to corrugated steel buried structures and the like.
	13	Surround to corrugated steel buried structures and the like.
	14	Fill above corrugated steel buried structures and the like.

Deposition of Fill

33 (11/04) The items for deposition of fill shall, in accordance with the Preambles to Bill of Quantities General Directions, include for:

Item coverage

(a) protection of subgrade;

(b) multiple handling of material;

(c) keeping earthworks free of water;

(d) complying with requirements and constraints on the sequence, timing and rate of deposition and filling, and equalisation of earth pressures;

(e) complying with the special requirements for Class 3 and processed materials and other materials requiring special treatments;

(f) complying with the particular requirements and constraints with regard to soil stabilisation, reinforced earth structures, strengthened embankments, anchored earth structures, corrugated steel buried structures and the like;

(g) (11/04) taking precautions to avoid damage to property, structures, drains, services, instrumentation and the like;

(h) haulage;

(i) waiting for frozen material to thaw;

(j) replacing acceptable material rendered unacceptable;

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(k) selection of material of stated Classes and layering or depositing in locations stated in the Contract;

(l) depositing fill to slope away from vertical drainage layers and measures to prevent surface water entering such layers;

(m) treatment of soil as the Contractor may require to facilitate the use of particular plant;

(n) trimming and shaping to levels and contours;

(o) deposition of fill resulting from settlement and penetration of landscape areas, environmental bunds and other areas of fill, and from the first 75 mm of settlement and penetration of embankments.

Disposal of Material

Units

34 The unit of measurement shall be:

(i) disposal of material ..... cubic metre.

Measurement

35 The measurement of disposal of acceptable material shall be, for:

(a) acceptable material excluding Class 5A - the volume excavated from within the Site measured in this Series less the volume of compacted fill calculated in accordance with paragraphs 47, 48 and 49 of this Series, after deduction from the latter of the volume of imported fill calculated in accordance with paragraphs 41 and 42 of this Series.

(b) acceptable material Class 5A - the volume excavated from within the Site measured in accordance with paragraph 15(a) of this Series less the volume of topsoil to be permanently stored and the volume of topsoil calculated from the areas and thicknesses to be topsoiled in accordance with paragraph 78 of this Series.

36 (11/04) The measurement of disposal of unacceptable material Classes U1A and U1B shall be the volume of unacceptable material Classes U1A and U1B excavated from within the Site and measured under this Series less the volume of processed unacceptable material Classes U1A and U1B calculated in accordance with paragraph 26 of this Series.

37 The measurement of disposal of unacceptable material Class U2 shall be the volume of unacceptable material Class U2 excavated from within the Site and measured under this Series.

Itemisation

38 (11/04) Separate items shall be provided for disposal of material in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Disposal.
II	1	Acceptable material excluding Class 5A.
	2	Acceptable material Class 5A.
	3	Unacceptable material Class U1A.
	4	Unacceptable material Class U1B.
	5	Unacceptable material Class U2.

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Disposal of Material

39 (11/04) The items for disposal of material shall, in accordance with the Preambles to Bill of Quantities General Directions, include for:

Item coverage

(a) haulage and deposition in tips off Site provided by the Contractor;

(b) multiple handling of material;

(c) special measures for dealing with Classes U1B and U2 material;

(d) allowing for deposition in lieu of disposal of acceptable fill resulting from settlement and penetration of landscape areas, environmental bunds and other areas of fill, and from the first 75 mm of settlement and penetration of embankments.

Imported Fill

Units

40 The unit of measurement shall be:

(i) imported fill ..... cubic metre.

Measurement

41 The measurement of imported acceptable fill shall be the volume of compacted fill, calculated in accordance with paragraphs 47, 48 and 49 of this Series less the volumes of:

(a) acceptable material (including that measured in accordance with this Series paragraph 26), excluding topsoil Class 5A and acceptable material of a particular Class being both surplus to the requirements of the Contract for that Class of material and which does not meet the requirements for acceptability for use elsewhere within the measured volume of compacted fill, excavated from within the Site and measured in this Series;

(b) other stated classes of imported acceptable fill excluding topsoil Class 5B.

42 The measurement of other stated classes of imported acceptable fill, other than topsoil Class 5B, shall be the volume of the void filled with the stated class of imported acceptable fill to the outline stated in the Contract.

43 (05/01) The measurement of imported topsoil Class 5B shall be the volume of topsoil calculated from the areas and thicknesses to be topsoiled less the volume of topsoil Class 5A excavated from within the Site and measured in accordance with paragraph 15(a) of this Series. Notwithstanding paragraph 45(j) and (k) of this Series, when an item for imported topsoil is measured, corresponding items for placing shall be measured under paragraphs 77 to 81 inclusive of this Series for Topsoiling and Storage of Topsoil.

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Itemisation

#44 (05/02) Separate items shall be provided for imported acceptable fill in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Imported acceptable material.
	2	Other stated classes of imported acceptable fill.
	3	Imported topsoil Class 5B
II	1	Embankments and other areas of fill.
	2	Strengthened embankments.
	3	Reinforced earth structures.
	4	Anchored earth structures.
	5	Landscape areas.
	6	Environmental bunds.
	7	Fill to structures.
	8	Fill above structural concrete foundations.
	9	Fill on sub-base material, base and capping.
	10	Fill on bridges (under footways, verges, and central reserves).
	11	Upper bedding to corrugated steel buried structures and the like.
	12	Lower bedding to corrugated steel buried structures and the like.
	13	Surround to corrugated steel buried structures and the like.
	14	Fill above corrugated steel buried structures and the like.

Note: Group I Feature 3 imported topsoil Class 5B shall not be separately identified by any Group II feature.

Imported Fill

45 (05/01) The items for imported fill shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) protection of subgrade;

(b) multiple handling of material;

(c) keeping earthworks free of water;

(d) complying with requirements and constraints on the sequence, timing and rate of deposition and filling, and equalisation of earth pressures;

(e) complying with the special requirements for Class 3 material and other materials requiring special treatments;

(f) complying with the particular requirements and constraints with regard to soil stabilisation, reinforced earth structures, strengthened embankments, anchored earth structures, corrugated steel buried structures and the like;

(g) (11/04) taking precautions to avoid damage to property, structures, drains, services, instrumentation and the like;

(h) fill provided by the Contractor from sources outside the Site;

(i) replacing acceptable material rendered unacceptable;

(j) selection of material of stated Classes and layering or depositing in locations stated in the Contract;

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(k) depositing fill to slope away from vertical drainage layers and measures to prevent surface water entering such layers;

(l) trimming and shaping to levels and contours;

(m) imported fill resulting from settlement and penetration of landscape areas, environmental bunds and other areas of fill, and from the first 75 mm of settlement and penetration of embankments;

(n) reports.

Compaction of Fill

Units

46 The unit of measurement shall be:

(i) compaction of fill ..... cubic metre.

Measurement

47 The measurement of compaction of fill in embankments and other areas of fill, in strengthened embankments, in reinforced earth structures, in anchored earth structures, in landscape areas and in environmental bunds shall be the volume of the embankment or void filled from Existing Ground Level up to the Earthworks Outline plus, where required by the Contract, the volume of:

(a) the void formed by the removal of topsoil Class 5A beneath the fill in question, and included in the measurement under paragraph 15(a) of this Series;

(b) the void formed by excavation for the fill in question:

(i) below the Earthworks Outline included in the measurement under paragraph 15(b)(i) of this Series; and

(ii) below Existing Ground Level included in the measurement under paragraph 15(b) (ii) of this Series;

(c) surcharge, being the void filled from the Earthworks Outline up to the profile stated in the Contract to which the surcharge is required to be constructed;

less in each case the volume of any compaction of fill to structures, and bedding and surround to corrugated steel buried structures and the like included in the volume so obtained and which is measured separately under paragraph 49 of this Series.

48 The measurement of compaction of fill above structural concrete foundations shall be the volume of the void measured in accordance with paragraph 15(d) of this Series less the volume of the structural foundation and structure within that void.

#49 (05/02) The measurement of compaction of:

(a) fill to structures;

(b) fill on sub-base material, base and capping;

(c) fill on bridges (under footways, verges and central reserves);

(d) bedding to corrugated steel buried structures and the like;

(e) surround to corrugated steel buried structures and the like;

in each case, shall be the volume of the voids filled to the outline stated in the Contract less the volume of corrugated steel buried structures and the like within that void.

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50 Compaction of Class 1C and 6B materials shall be separately measured only where Class 1C or 6B material as such is specifically stated by the Contract to be required to be placed in a particular location.

Itemisation

#51 (05/02) Separate items shall be provided for compaction of fill in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Compaction.
II	1	Acceptable material.
	2	Acceptable material Class 1C.
	3	Acceptable material Class 6B.
III	1	Embankments and other areas of fill.
	2	Strengthened embankments.
	3	Reinforced earth structures.
	4	Anchored earth structures.
	5	Landscape areas.
	6	Environmental bunds.
	7	Fill to structures.
	8	Fill above structural concrete foundations.
	9	Fill on sub-base material, base and capping.
	10	Fill on bridges (under footways, verges and central reserves).
	11	Upper bedding to corrugated steel buried structures and the like.
	12	Lower bedding to corrugated steel buried structures and the like.
	13	Surround to corrugated steel buried structures and the like.
	14	Fill above corrugated steel buried structures and the like.

Compaction of Fill

52 (11/04) The items for compaction of fill shall, in accordance with the Preambles to Bill of Quantities General Directions, include for:

Item coverage

(a) protection of subgrade;

(b) multiple handling of material;

(c) keeping earthworks free of water;

(d) complying with requirements and constraints on the sequence, timing and rate of deposition and filling, and equalisation of earth pressures;

(e) complying with the requirements for Class 3 material and other materials requiring special treatment;

(f) complying with the particular requirements and constraints with regard to soil stabilisation, reinforced earth structures, strengthened embankments, anchored earth structures, corrugated steel buried structures and the like;

(g) (11/04) taking precautions to avoid damage to property, structures, drains, services, instrumentation and the like;

(h) spreading and levelling;

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(i) trial areas, trials and demonstrations;

(j) making good after sampling and testing;

(k) forming and trimming side slopes, benchings and berms;

(l) treatment of side slopes and berms;

(m) compaction of fill resulting from settlement and penetration of landscape areas, environmental bunds and other areas of fill, and from the first 75 mm of settlement and penetration of embankments;

(n) blinding;

(o) special measures for dealing with processed material.

Soil Stabilisation

Units

53 The unit of measurement shall be:

(i) soil stabilisation ..... cubic metre.

Measurement

54 The measurement of soil stabilisation shall be the volume of the material to be stabilised measured to the outlines stated in the Contract irrespective of the number of layers or thicknesses, methods or sequences of operations involved in stabilising the material to the depth required.

Note: Soil stabilisation means the process of stabilisation whether the material is intact and undisturbed or deposited and compacted prior to stabilisation.

Excavation, fill, import, disposal, deposition and compaction required to expose or produce the layer to be stabilised, as appropriate, shall be included under the measurement of earthworks elsewhere in this Series.

Excavation, deposition and compaction involved in the process of stabilisation itself shall not be measured.

Itemisation

55 Separate items shall be provided for soil stabilisation in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Soil stabilisation.
II	1	Capping.
III	1	Cement.
	2	Lime.

Soil Stabilisation with Cement, Soil Stabilisation with Lime

56 The items for soil stabilisation shall, in accordance with the Preambles to Bill of Quantities General Directions, include for:

Item coverage

(a) excavation of acceptable material (as this Series paragraphs 17 and 18);

(b) deposition (as this Series paragraph 33);

(c) compaction of fill (as this Series paragraph 52);

(d) pulverising, measuring and mixing;

(e) laps and joints;

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(f) curing, protection and sealing;

(g) shaping to cambers, falls and crowns;

(h) edge supports;

(i) additional fill, deposition, compaction or disposal resulting from the process of stabilisation;

(j) additional fill and stabilisation resulting from the first 75 mm of settlement and penetration of embankments.

Geotextiles

Units

57 The unit of measurement shall be:

(i) geotextile ..... square metre.

Measurement

58 The measurement of geotextile shall be the developed area of the geotextile measured to the limits stated in the Contract.

Itemisation

59 Separate items shall be provided for geotextile in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature
I	1 Geotextile.
II	1 Different types.
III	1 Different grades.

Geotextile

60 The items for geotextile shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) cleaning, trimming, regulating and preparing surfaces;

(b) laps;

(c) measures to protect material;

(d) cutting, jointing, sealing and fixing;

(e) securing material in place;

(f) complying with the requirements of strengthened earthworks.

Soft Spots and Other Voids

Units

61 The unit of measurement shall be:

(i) soft spots, other voids ..... cubic metre.

Measurement

62 The measurement of soft spots and other voids shall be the volume of the voids directed to be excavated or filled. Soft spots and other voids shall be measured separately from the main excavation or filling where the volume:

(a) below structural foundations, foundations for corrugated steel buried structures or in side slopes of cuttings is less than 1 cubic metre;

(b) elsewhere is less than 25 cubic metres.

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Itemisation

63 Separate items shall be provided for soft spots and other voids in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Excavation of soft spots and other voids.
	2	Filling of soft spots and other voids.
II	1	Below cuttings or under embankments.
	2	In side slopes.
	3	Below structural foundations and foundations for corrugated steel buried structures.
III	1	Different types of fill.

Excavation of Soft Spots and Other Voids

64 The items for excavation of soft spots and other voids shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as this Series paragraphs 17 and 18);

(b) excavation of unacceptable material (as this Series paragraph 19);

(c) disposal of material (as this Series paragraph 39);

(d) trimming back cutting faces.

Filling of Soft Spots Spots and Other Voids

65 (05/01)The items for filling of soft spots and other voids shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) deposition of fill (as this Series paragraph 33);

(b) compaction of fill (as this Series paragraph 52);

(c) formwork (as Series 1700 paragraph 15);

(d) treatment of cutting faces;

(e) in situ concrete (as Series 1700 paragraph 5).

Disused Sewers, Drains, Cables, Ducts, Pipelines and the Like Occurring at Formation or Sub-formation Level; Disused Basements, Cellars and the Like and Gullies

Definition

66 The term 'services' in paragraphs 67 to 72 inclusive shall be deemed to include sewers, drains, cables, ducts, pipelines and the like, together with associated chambers, fittings etc.

Units

67 The units of measurement shall be:

(i) removal of disused services ..... linear metre.

(ii) backfilling disused services ..... cubic metre.

(iii) backfilling disused basement, cellar and the like ..... cubic metre.

(iv) backfilling disused gullies ..... number.

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Measurement

68 The measurement of removal of disused services shall be applied only to those existing services occurring at or below formation or sub-formation level in cutting and/or which are specifically stated in the Contract to be removed. The measurement shall be the distance along the centre line of the route of the services and, unless stated otherwise in the Contract no deduction shall be made for chambers and the like.

The measurement of backfilling disused services shall be applied only to those existing services occurring at or below formation or sub-formation level in cutting and/or which are specifically stated in the Contract to be backfilled. The measurement shall be the volume of the void directed to be filled, and unless stated otherwise in the Contract shall include chambers and the like.

The removal or backfilling of other disused services occurring elsewhere in the Works shall not qualify for separate measurement under this paragraph.

69 The measurement of backfilling disused basements, cellars and the like shall be the volume of the void directed to be filled.

The measurement of backfilling disused gullies shall be the complete operation.

Itemisation

70 Separate items shall be provided for removal, backfilling disused services, backfilling disused basements, cellars and the like and gullies in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Removal.
	2	Backfilling.
II	1	Different types.
III	1	Different sizes.
IV	1	Disused service with one metre or less of cover to formation level.
	2	Disused service exceeding one metre and not exceeding two metres of cover to formation level, and so on in steps of one metre.
	3	Disused basement, cellar and the like.
	4	Disused gully.
V	1	Different materials.

Note: Group IV Features 3 and 4 shall not be applied to Group I Feature 1.

Removal of Disused Services

71 The items for removal of disused services shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as this Series paragraphs 17 and 18);

(b) excavation of unacceptable material (as this Series paragraph 19);

(c) breaking up beds, haunches and surrounds;

(d) disposal of material (as this Series paragraph 39);

(e) sealing ends of services;

(f) credit value of materials.

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Backfilling, Disused Services, Basements, Cellars and the Like and Gullies

72 (05/01)The items for backfilling disused services, basements, cellars and the like and gullies shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) compaction (as this Series paragraph 52);

(b) perforation of existing slabs and cleaning;

(c) in situ concrete (as Series 1700 paragraph 5);

(d) reinforcement (as Series 1700 paragraph 26);

(e) formwork (as Series 1700 paragraph 15);

(f) sealing ends of services;

(g) grouting.

Supports Left in Excavation

Units

73 The unit of measurement shall be:

(i) supports left in excavation ..... square metre.

Measurement

74 The measurement of supports left in excavation shall be the area of face directed to be left with supports in position.

Itemisation

75 Separate items shall be provided for supports left in excavation in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Supports.
II	1	Timber.
	2	Steel.
III	1	Different types.

Supports Left in Excavation

76 The items for supports left in excavation shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) struts, walings and the like and working around them.

Topsoiling and Storage of Topsoil

Units

77 The units of measurement shall be:

(i) topsoiling..... square metre.

(ii) permanent storage of topsoil ..... cubic metre.

Measurement

78 (05/01) The measurement of the topsoiling shall be the area of the surface to be topsoiled and shall include topsoil Class 5A excavated from within the site and imported topsoil Class 5B. The measurement of the permanent storage of topsoil shall be the volume of topsoil Class 5A excavated from within the Site and measured in accordance with paragraph 15(a) of this Series less the volume of topsoil calculated from the areas and thicknesses to be topsoiled.

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Itemisation

79 Separate items shall be provided for topsoiling in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Topsoiling of different thicknesses.
	2	Permanent storage of topsoil.
II	1	Surfaces sloping at 10° or less to the horizontal.
	2	Surfaces sloping at more than 10° to the horizontal.

Note: Group I feature 2 shall not be identified by any Group II feature.

Topsoiling

80 (05/01) The items for topsoiling shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) the removal of debris;

(b) taking delivery of imported topsoil;

(c) excavation from stockpile;

(d) loading into transport;

(e) haulage, deposition, spreading, levelling and compaction;

(f) trimming and shaping to levels and contours;

(g) herbicide treatment.

Permanent Storage of Topsoil

81 The items for permanent storage of topsoil shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation from stockpile;

(b) loading into transport;

(c) hauling, deposition, spreading, levelling and compaction in permanent storage area;

(d) trimming and shaping to levels and contours;

(e) multiple handling of material.

Completion of Formation and Sub-formation

Units

82 (05/01) The unit of measurement shall be:

(i) completion of formation, sub-formation ..... square metre.

Measurement

#83 (05/01) The measurement of completion of formation shall be the area of the surface immediately beneath the sub-base except that where capping is required the measurement shall be the area of the surface of the capping excluding sloping sides and edges.

The measurement of completion of sub-formation shall be the area of the surface immediately beneath capping.

Completion of formation and sub-formation on Classes 1C and 6B materials shall be measured separately only when the Contract states specifically that those materials are to be provided at formation or sub-formation level.

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Itemisation

84 (05/01) Separate items shall be provided for completion of formation and sub-formation in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Completion of sub-formation.
	2	Completion of formation.
II	1	On material other than Class 1C, 6B or rock in cuttings.
	2	On Class 1C material.
	3	On Class 6B material.
	4	On rock in cuttings.

Completion of Formation and Sub-formation

85 (05/01) The items for completion of formation and sub-formation shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) removal of protective layer, mud and slurry;

(b) compaction;

(c) cleaning, trimming, regulating, making good and rolling;

(d) cement bound materials;

(e) excavation, processing, compaction of naturally occurring Hard Material;

(f) measures to protect formation and sub-formation against deterioration or degradation.

Lining of Watercourses

Units

86 (05/01) The unit of measurement shall be:

(i) lining of watercourses ..... square metre.

Measurement

87 (05/01) The measurement of lining of watercourses shall be the permanently exposed face area of the work.

The measurement of bagwork shall be the flat undeveloped area of the work.

Itemisation

88 (05/01) Separate items shall be provided for lining of watercourses in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Lining of new watercourse.
	2	Lining of enlarged watercourse.
	3	Lining of intercepting ditches.
II	1	To inverts.
	2	To side slopes.
III	1	Different types.
IV	1	Different thicknesses.

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Lining of Watercourses

89 (05/01) The items for lining of watercourses shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) bedding and compaction;

(b) laying, setting, bedding, jointing, wedging, cutting and pointing;

(c) building in pipes;

(d) concrete (as Series 1700 paragraphs 5 and 10);

(e) formwork (as Series 1700 paragraph 15);

(f) reinforcement (as Series 1700 paragraph 26);

(g) bags, filling, staking and securing.

Clearing of Existing Ditches

Units

90 (05/01) The unit of measurement shall be:

(i) clearing of existing ditches ..... linear metre.

Measurement

91 (05/01) The measurement of clearing of existing ditches shall be the length along the centre line of the ditch.

Itemisation

92 (05/01) Separate items shall be provided for clearing of existing ditches in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Clearing of existing ditches.
II	1	Different locations.

Clearing of Existing Ditches

93 (05/01) The items for clearing of existing ditches shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as this Series paragraphs 17 and 18);

(b) excavation of unacceptable material (as this Series paragraph19);

(c) disposal of material (as this Series paragraph39);

(d) clearing debris and vegetable growth;

(e) trimming side slopes and grading bottoms;

(f) maintaining existing outfalls.

Ground Improvement - Establishment of Plant

Units

94 (05/01) The unit of measurement shall be:

(i) establishment of ground improvement plant ..... item.

Measurement

95 (05/01) The establishment of ground improvement plant shall be measured once only to each separate location for each method of ground improvement on the Site. Any additional establishment of plant to suit the Contractor's method of working shall not be measured.

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Itemisation

96 (05/01) Separate items shall be provided for establishment of ground improvement plant in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Establishment of dynamic compaction plant.
	2	Establishment of vibrated stone columns plant.
II	1	Different locations.

Establishment of Ground Improvement Plant

97 (05/01) The items for establishment of ground improvement plant shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) bringing plant and equipment to the location of the ground improvement;

(b) erecting and setting up plant and equipment including site preparation, levelling, and access ramps;

(c) moving and setting up plant and equipment at each position including site preparation, levelling and access ramps;

(d) dismantling and removing plant and equipment from the Site on completion.

Ground Improvement - Dynamic Compaction

Units

98 (05/01) The units of measurement shall be:

(i) dynamic compaction ..... linear metre.

(ii) dynamic compaction plant standing time ..... hour.

(iii) granular blanket ..... tonne.

Measurement

99 (05/01) The measurement of dynamic compaction shall be the sum of the distances through which the pounder is required to fall. The distance for each drop shall be the vertical measurement from the underside of the pounder immediately prior to release, to the level of the ground beneath the pounder immediately prior to the first drop at that point.

100 (05/01) The measurement of dynamic compaction plant standing time shall be for the period or periods of standing time ordered by the Overseeing Organisation. Periods of less than half an hour shall not be measured. Any other standing time due to the Contractor's method of working, necessitated by the process of ground improvement provided for in the Contract or other than that ordered by the Overseeing Organisation shall not be measured.

101 (05/01) The measurement of granular blanket shall be the tonnage of material certified by the Overseeing Organisation, being only that material included on delivery tickets which is incorporated within the Permanent Works in the locations to the extent and thicknesses stated in the Contract or ordered by the Overseeing Organisation.

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Itemisation

102 (05/01) Separate items shall be provided for dynamic compaction, dynamic compaction plant standing time, and granular blanket in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Dynamic compaction.
	2	Dynamic compaction plant standing time.
	3	Granular blanket.
II	1	Trial compaction.
	2	Main compaction.
III	1	Different weight of pounder.
IV	1	Different materials.

Note: Group II and III features shall be applied only to Group I Feature 1.

Dynamic Compaction

103 (05/01) The items for dynamic compaction shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) preparation and levelling prior to placing the granular blanket;

(b) pounding;

(c) filling craters with adjacent material and compaction;

(d) keeping earthworks free of water;

(e) compaction of surface after the final pass;

(f) complying with particular requirements and constraints;

(g) keeping records;

(h) extracting buried pounder.

Dynamic Compaction Plant Standing Time

104 (05/01) The items for dynamic compaction plant standing time shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) ancillary plant;

(b) equipment and operatives;

(c) periods of less than half an hour.

Granular Blanket

105 (05/01) The items for granular blanket shall in accordance with the Preambles to Bill of Quantities General Directions include for:

(a) deposition of fill (as this Series paragraph 33);

(b) compaction of fill (as this Series paragraph 52).

Ground Improvement - Vibrated Stone Columns

Units

106 (05/01) The units of measurement shall be:

(i) vibrated stone columns ..... linear metre.

(ii) vibrated stone column plant standing time ..... hour.

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Measurement

107 (05/01) The measurement of vibrated stone columns shall be the length measured along the axis of the stone column from the maximum depth of the vibrator tip to the specified finished level.

108 (05/01) The measurement of vibrated stone column plant standing time shall be for the period or periods of standing time ordered by the Overseeing Organisation. Periods of less than half an hour shall not be measured. Any other standing time due to the Contractor's method of working, necessitated by the process of ground improvement provided for in the Contract or other than that ordered by the Overseeing Organisation shall not be measured.

Itemisation

109 (05/01) Separate items shall be provided for vibrated stone columns and vibrated stone columns plant standing time in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Vibrated stone columns.
	2	Vibrated stone columns plant standing time.
II	1	Different minimum diameters.
III	1	Different methods of installation.
IV	1	Columns not exceeding 5 metres in length.
	2	Columns exceeding 5 metres in length but not exceeding 10 metres and so on in steps of 5 metres.

Note: Group II, III and IV features shall be applied only to Group I Feature 1.

Vibrated Stone Columns

110 (05/01) The items for vibrated stone columns shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) complying with design criteria;

(b) certificates;

(c) provision of data and drawings;

(d) resubmissions and modifications;

(e) amendments to the Works;

(f) air or water supply;

(g) effluent/slurry disposal;

(h) precautions to prevent ingress of surface water or foreign matter;

(i) preliminary treatment areas;

(j) trial areas;

(k) demonstrations;

(l) site control, observations, records and reports;

(m) additional stone required due to penetration into surrounding ground.

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Vibrated Stone Columns Plant Standing Time

111 (05/01) The items for vibrated stone columns plant standing time shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) ancillary plant;

(b) equipment and operatives;

(c) periods of less than half an hour.

Gabion Walling and Mattresses

Units

112 (05/01) The unit of measurement shall be:

(i) gabion walling, mattresses ..... cubic metre.

Measurement

113 (05/01) The measurement of gabion walling and mattresses shall be the volume contained within the outline of the gabions or mattresses as stated in the Contract.

Itemisation

114 (05/01) Separate items shall be provided for gabion walling and mattresses in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Gabion walling.
	2	Mattresses.
II	1	Different mesh materials.
III	1	Different mesh size.
IV	1	Different types of fill.
V	1	Mattresses installed at 10° or less to the horizontal.
	2	Mattresses installed at more than 10° to the horizontal.
VI	1	In environmental bunds.

Gabion Walling and Mattresses

115 (05/01) The items for gabion walling and mattresses shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) assembling, tying, fixing, staking and tensioning;

(b) fill, compaction and finishes;

(c) mesh including cutting and folding to form special units and shapes;

(d) bracing and wiring lids.

Crib Walling

Units

116 (05/01) The unit of measurement shall be:

(i) crib walling ..... square metre.

Measurement

117 (05/01) The measurement shall be the flat undeveloped area of crib walling. No deduction shall be made for openings within the wall which are part of the modular system, nor for other openings of one square metre or less.

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Itemisation

118 (05/01) Separate items shall be provided for crib walling in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Crib walling.
II	1	Different types.
III	1	Curved on plan.
IV	1	With a battered face.
V	1	Different finishes.
VI	1	Different infill.

Crib Walling

119 (05/01) The items for crib walling shall in accordance with the Preamble to Bill of Quantities General Directions include for:

Item coverage

(a) bedding and jointing;

(b) dowels and pins;

(c) granular infill and compaction;

(d) special units and forming ends and corners;

(e) obtaining manufacturer's certificate and supplying copy to the Overseeing Organisation;

(f) building in pipes and forming small openings.

Filling and Caps to Mine Working, Well, Swallow Hole and the Like

Units

120 (05/01) The units of measurement shall be:

(i) filling to mine working, well, swallow hole and the like ..... tonne.

(ii) caps to mine working, well, swallow hole and the like ..... cubic metre.

Measurement

121 (05/01) The measurement of filling to mine working, well, swallow hole and the like shall be calculated from the tonnage of material certified by the Overseeing Organisation, being only that material, included on delivery tickets, which is incorporated in the Permanent Works in the locations and to the extent and thickness required by the Contract. Material in excess of the requirements of the Contract and material used for any other purpose shall not be included within the certified tonnage.

122 (05/01) The measurement of caps to mine working, well, swallow hole and the like shall be the volume of concrete forming the caps.

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Itemisation

123 (05/01) Separate items shall be provided for filling and caps to mine working, well, swallow hole and the like in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Filling.
	2	Caps.
II	1	Mine working.
	2	Well.
	3	Swallow hole and the like.
III	1	Different materials.

Filling and Caps to Mine Working, Well, Swallow Hole and the Like

124 (05/01) The items for filling and caps to mine working, well, swallow hole and the like shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as this Series paragraphs 17 and 18);

(b) excavation of unacceptable material (as this Series paragraph 19);

(c) backfilling and compaction;

(d) concrete (as Series 1700 paragraphs 5 and 10);

(e) formwork including permanent formwork (as Series 1700 paragraph 15);

(f) reinforcement (as Series 1700 paragraph 26);

(g) flushing;

(h) disposal of material (as this Series paragraph 39);

(i) investigation and monitoring;

(j) material not used as filling.

Ground Anchorages - Ground Anchorage Plant

Units

125 (05/01) The unit of measurement shall be:

(i) establishment of ground anchorage plant ..... item.

Measurement

126 (05/01) The establishment of ground anchorage plant shall be measured once only to each separate location of ground anchorages on the Site. Any additional establishment of ground anchorage plant to suit the Contractor's method of working shall not be measured.

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Itemisation

127 (05/01) Separate items shall be provided for ground anchorage plant in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Establishment of ground anchorage plant.
II	1	Different locations.

Establishment of Ground Anchorage Plant

128 (05/01) The items for establishment of ground anchorage plant shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) bringing plant and equipment to the location of ground anchorages;

(b) erecting and setting up plant and equipment including site preparation, levelling and access ramps;

(c) moving and setting up plant and equipment at each position including site preparation, levelling and access ramps;

(d) dismantling and removing plant and equipment from Site on completion.

Ground Anchorages

Units

129 (05/01) The unit of measurement shall be:

(i) ground anchorages ..... linear metre.

Measurement

130 (05/01) The measurement of ground anchorages shall be for the complete anchorage assembly and shall be the length from the bottom of the fixed anchorage to the bearing face.

Itemisation

131 (05/01) Separate items shall be provided for ground anchorages in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Ground anchorages.
II	1	Different types.
III	1	Different capacities.
IV	1	Not exceeding 5 metres in length.
	2	Exceeding 5 metres in length but not exceeding 10 metres in length and so on in steps of 5 metres.
V	1	Trial anchorages.
	2	Main anchorages.

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Ground Anchorages

132 (05/01) The items for ground anchorages shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) design;

(b) provision of data and drawings;

(c) certificates;

(d) resubmissions and modifications;

(e) amendments to the Works;

(f) boring, augering, lining, under-reaming, removing and disposing of material;

(g) cables, wires or strands with couplers, binders and spacers;

(h) anchorages, bearing plates, reinforcing helices, grout inlets, vents and the like;

(i) applying water under pressure and proving watertightness of boreholes;

(j) flushing borehole, cleaning and preparation;

(k) protective system (as Series 1900 paragraph 4);

(l) grouting ground anchorages including fixed length and free stressing length;

(m) applying prestress in one or more stages;

(n) checking the accuracy of load measuring equipment and adjusting;

(o) taking observations and compiling a record of stressing and grouting operations and supplying one copy to the Overseeing Organisation;

(p) measures to prove anchorage suitability.

Ground Anchorages - Waterproofing Anchorage Boreholes

Units

133 (05/01) The unit of measurement shall be:

(i) waterproofing of boreholes ..... linear metre.

Measurement

134 (05/01) The measurement of waterproofing of boreholes shall be the total length of waterproofing operation instructed by the Overseeing Organisation.

Itemisation

135 (05/01) Separate items shall be provided for waterproofing of boreholes in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Waterproofing of boreholes.
II	1	Standard grouting.
	2	Pressure grouting.

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Waterproofing of Boreholes

136 (05/01) The items for waterproofing of boreholes shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) pre-grouting;

(b) re-drilling and applying water under pressure and proving watertightness of borehole.

Instrumentation and Monitoring - Boring Plant

Units

137 (05/01) The unit of measurement shall be:

(i) establishment of boring plant ..... item.

Measurement

138 (05/01) The establishment of boring plant shall be measured once only to each separate location of boring on the Site. Any additional establishment of boring plant to suit the Contractor's method of working shall not be measured.

Itemisation

139 (05/01) Separate items shall be provided for boring plant in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Establishment of boring plant.
II	1	Different locations.

Establishment of Boring Plant

140 (05/01) The items for establishment of boring plant shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) bringing plant and equipment to the location of boring;

(b) erecting and setting up plant and equipment including site preparation, levelling and access ramps;

(c) moving and setting up plant at each position including site preparation, levelling, and access ramps;

(d) dismantling and removing plant and equipment from Site on completion.

Instrumentation and Monitoring - Boring Holes

Units

141 (05/01) The unit of measurement shall be:

(i) boring holes ..... linear metre.

Measurement

142 (05/01) The measurement of boring holes shall be the linear distance along the axis of the borehole between the instrument base and the level stated in the Contract.

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Itemisation

143 (05/01) Separate items shall be provided for boring holes in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Boring holes.
II	1	Vertical.
	2	Raking.
III	1	Depth not exceeding 10 metres.
	2	Depth exceeding 10 metres but not exceeding 20 metres and so on in steps of 10 metres.

Boring Holes

144 (05/01) The items for boring holes shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) boring holes in any material, including changing bits and tools;

(b) disposal of material (as this Series paragraph 39);

(c) taking measures to deal with the presence of water in the boreholes;

(d) drilling fluid;

(e) standing time including ancillary plant, equipment and operatives.

Instrumentation and Monitoring - Instrumentation

Units

145 (05/01) The units of measurement shall be:

(i) installation of instruments ..... number.

(ii) installation of tubing, cabling and the like ..... linear metre.

(iii) grouting ..... linear metre.

Measurement

146 (05/01) The measurement of installation of instruments shall be the complete installation.

The measurement of tubing and the like shall be the length measured from the instrument to the underside of the screw cap, plug or the like, along the centre line of the trench or borehole.

The measurement of cabling and the like shall be the length measured from the instrument to the base of the instrument hut or cabinet along the centre line of the trench or borehole.

The measurement of grouting shall be the distance from the top of the seal to either the bottom of the trench or to the underside of the screw cap plug or the like whichever is the lower.

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Itemisation

147 (05/01) Separate items shall be provided for instrumentation in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Installation.
II	1	Different types of instruments.
	2	Different types of tubing or cabling.
	3	Different types of grouting.
III	1	Length or depth not exceeding 10 metres.
	2	Length or depth exceeding 10 metres but not exceeding 50 metres, and so on in steps of 50 metres.

Installation of Instruments

148 (05/01) The items for installation of instruments shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) recording water levels;

(b) cleaning and keeping hole free of deleterious materials;

(c) connections and joints;

(d) keeping items clean during installation;

(e) sand filters including allowing time for settlement;

(f) removing contaminated water;

(g) recording data and supplying one copy to the Overseeing Organisation;

(h) proving correct functioning;

(i) bedding and surround.

Installation of Tubing and Cabling

149 (05/01) The items for installation of tubing and cabling shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) standpipes;

(b) cutting and jointing tubing including fittings and screw caps;

(c) connections and joints;

(d) excavation in any material (as this Series paragraphs 17, 18, 19 and 23);

(e) bedding and surround to cable or tube;

(f) backfilling and compaction;

(g) marking tape or cable covers;

(h) extra length of cable for connection to monitoring equipment;

(i) twisting and snaking;

(j) incremental installation;

(k) ducts (as Series 500 paragraph 16).

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Grouting

150 (05/01) The items for grouting shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) mixing and placing;
(b) in situ concrete (as Series 1700 paragraph 5);
(c) formwork (as Series 1700 paragraph 15);
(d) backfilling and compaction;
(e) disposal of material (as this Series paragraph 39);
(f) covers, frames, seatings and bedding;
(g) locks and keys.

Instrumentation and Monitoring - Instrument Hut or Cabinet

Units

151 (05/01) The unit of measurement shall be:

(i) erection, servicing, dismantling of instrument hut or cabinet ..... item.

Itemisation

152 (05/01) Separate items shall be provided for instrument hut or cabinet in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Erection.
	2	Servicing.
	3	Dismantling.
II	1	Instrument hut for the Overseeing Organisation.
	2	Instrument cabinet for the Overseeing Organisation.
III	1	Until completion of the works.
	2	After completion of the works.

Erection of Instrument Hut

153 (05/01) The items for erection of instrument hut shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) preparation of site;
(b) foundations, bases and hardstandings;
(c) heating, power, water and lighting services;
(d) security fence and lockable gates;
(e) furnishings and fittings;
(f) locks and keys.

Servicing Instrument Hut

154 (05/01) The items for servicing instrument hut shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) depreciation and maintenance of building, services and fences;
(b) depreciation and maintenance of furnishings, fittings and supplies.

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Dismantling Instrument Hut

155 (05/01) The items for dismantling instrument hut shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) receiving back from the Overseeing Organisation and removing furnishings and fittings;

(b) disconnecting, removing and sealing off disused services;

(c) demolishing and removing including hardstandings, fences and gates;

(d) disposal of material (as this Series paragraph 39);

(e) reinstatement of the site.

Erection of Instrument Cabinet

156 (05/01) The items for erection of instrument cabinet shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) preparation of site;

(b) foundations and bases;

(c) power and water services;

(d) locks and keys.

Servicing of Instrument Cabinet

157 (05/01) The items for servicing of instrument cabinet shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) depreciation and maintenance of cabinet and services;

(b) depreciation and maintenance of fittings and supplies;

(c) servicing.

Dismantling of Instrument Cabinet

158 (05/01) The items for dismantling of instrument cabinet shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) disconnecting, removing, and sealing off disused services;

(b) removing instrument cabinet off Site;

(c) breaking up and removal of foundations, and bases, and disposal of surplus material;

(d) disposal of material (as this Series paragraph 39);

(e) reinstatement of the site.

Instrumentation and Monitoring - Monitoring Equipment

Units

159 (05/01) The unit of measurement shall be:

(i) monitoring equipment ..... item.

Itemisation

160 (05/01) Separate items shall be provided for monitoring equipment in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Monitoring equipment.
II	1	Different types.

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Monitoring Equipment

161 (05/01) The items for monitoring equipment shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) installing, commissioning, calibrating and maintaining monitoring equipment in instrument hut or cabinet;

(b) installing, commissioning, calibrating and maintaining monitoring equipment in vehicles for the Overseeing Organisation;

(c) copies of reports and results and supplying to the Overseeing Organisation;

(d) instructing the Overseeing Organisation's staff in the operation and maintenance of the instrumentation;

(e) attendance during measurement carried out by the Overseeing Organisation;

(f) removing on completion.

Ground Water Lowering

Units

162 (05/01) The unit of measurement shall be:

(i) ground water lowering ..... item.

Measurement

163 (05/01) The measurement of ground water lowering shall be the complete installation. Ground water lowering shall be separately measured only where ground water lowering is specifically required in the Contract.

Itemisation

164 (05/01) Separate items shall be provided for ground water lowering in accordance with Chapter II paragraphs 3 and 4 and the following:

Group		Feature
I	1	Ground water lowering.
II	1	Different locations.

Ground Water Lowering

165 (05/01) The items for ground water lowering shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) preparing, amending and submitting proposals to the Overseeing Organisation;

(b) installation, operation, maintenance and removal of plant;

(c) making arrangements with owners and occupiers of land temporarily acquired, and cost arising therefrom;

(d) diversion of rivers and the like;

(e) soakaways, lagoons and the like;

(f) measures to safeguard water supplies including liaising with water companies.

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Trial Pits

Units

166 (05/01) The unit of measurement shall be:

(i) trial pits ..... cubic metre.

Measurement

167 (05/01) The measurement of trial pits shall be the volume of the void, calculated on the basis of the horizontal area of the bottom of the excavation with the depth being measured from the bottom of the excavation to the level at which excavation is directed to be commenced.

Itemisation

168 (05/01) Separate items shall be provided for trial pits in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Trial pits.
II	1	0 metres to 3 metres in depth.
	2	0 metres to 6 metres in depth, and so on in steps of 3 metres.

Trial Pits

169 (05/01) The items for trial pits shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as this Series paragraphs 17 and 18);

(b) excavation of unacceptable material (as this Series paragraph 19);

(c) excavation in Hard Material (as this Series paragraph 23);

(d) locating, working around and supporting pipes, cables, services, apparatus and the like;

(e) attendance on the Overseeing Organisation and others for inspection and investigation purposes;

(f) disposal of material (as this Series paragraph 39);

(g) backfilling and compaction;

(h) reinstatement of surfaces.

Breaking Up and Perforation of Redundant Pavements

Units

170 (05/01) The unit of measurement shall be:

(i) breaking up of redundant pavements, perforation of redundant pavements ..... square metre.

Measurement

171 (05/01) The measurement of breaking up and perforation of redundant pavements shall be the areas stated in the Contract to be broken up or perforated and left in place. The depth of the pavement shall be the depth from the existing surface of the pavement to the underside of bituminous or cementitious material.

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Itemisation

172 (05/01) Separate items shall be provided for breaking up and perforation of redundant pavements in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Breaking up of redundant pavements.
	2	Perforation of redundant pavements.
II	1	Different types of pavement.
III	1	Depth not exceeding 100 mm.
	2	Depth exceeding 100 mm but not exceeding 200 mm, and so on in steps of 100 mm.

Breaking up and Perforation of Redundant Pavements

173 (05/01) The items for breaking up and perforation of redundant pavements shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation in Hard Material (as this Series paragraph 23);

(b) taking precautions to avoid damage to property, structures, drains, sewers, services, instrumentation and the like.

Perforation of Redundant Slabs, Basements and the Like

Units

174 (05/01) The unit of measurement shall be:

(i) perforation of redundant slabs, basements and the like ..... square metre.

Measurement

175 (05/01) The measurement of perforation of redundant slabs, basements and the like shall be the areas stated in the Contract to be perforated and left in place.

Itemisation

176 (05/01) Separate items shall be provided for perforation of redundant slabs, basements and the like in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Perforation of redundant slabs, basements and the like.
II	1	Different types of slabs, basements and the like.
III	1	Thickness not exceeding 100 mm.
	2	Thickness exceeding 100 mm but not exceeding 200 mm, and so on in steps of 100 mm.

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Perforation of Redundant Slabs, Basements and the Like

Item coverage

177 (05/01) The items for perforation of redundant slabs, basements and the like shall in accordance with the Preambles to Bill of Quantities General Directions include for:

(a) excavation in Hard Material (as this Series paragraph 23);

(b) taking precautions to avoid damage to property, structures, drains, sewers, services, instrumentation and the like.

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NATIONAL ALTERATIONS OF THE OVERSEEING ORGANISATION OF NORTHERN IRELAND

Definitions

1NI (05/02) The Earthworks Outline, unless expressly stated otherwise, is defined as the finished earthworks levels and dimensions (prior to topsoiling) required by the Contract for the construction, where specified, of:

(a) carriageway, hard shoulder, hard strip, footway, paved area, central reserve, verge, side slope;

(b) sub-base;

(c) fill on sub-base material, base and capping or filter layer;

(d) contiguous filter material, lightweight aggregate infill;

(e) surface water channels;

(f) landscape areas, environmental bunds.

In all cases of filter drains, except narrow filter drains, the Earthworks Outline shall be the top of the filter material.

2NI Where capping or stabilisation to form capping or a filter layer is required by the Contract in cutting or on embankment, the Earthworks Outline shall be as defined in paragraph 1 of this Series i.e. as the top of capping or filter layer.

Deposition of Fill

Itemisation

32NI (05/02) Separate items shall be provided for deposition of fill in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Deposition.
II	1	Acceptable material.
	2	Acceptable material Class 1C.
	3	Acceptable material Class 6B.
III	1	Embankments and other areas of fill.
	2	Strengthened embankments.
	3	Reinforced earth structures.
	4	Anchored earth structures.
	5	Landscape areas.
	6	Environmental bunds.
	7	Fill to structures.
	8	Fill above structural concrete foundations.
	9	Fill on sub-base material, base and capping or filter layer.
	10	Fill on bridges (under footways, verges and central reserves).
	11	Upper bedding to corrugated steel buried structures and the like.
	12	Lower bedding to corrugated steel buried structures and the like.
	13	Surround to corrugated steel buried structures and the like.
	14	Fill above corrugated steel buried structures and the like.

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Imported Fill

Itemisation

44NI (05/02) Separate items shall be provided for imported acceptable fill in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Imported acceptable material.
	2	Other stated classes of imported acceptable fill.
	3	Imported topsoil Class 5B
II	1	Embankments and other areas of fill.
	2	Strengthened embankments.
	3	Reinforced earth structures.
	4	Anchored earth structures.
	5	Landscape areas.
	6	Environmental bunds.
	7	Fill to structures.
	8	Fill above structural concrete foundations.
	9	Fill on sub-base material, base and capping or filter layer.
	10	Fill on bridges (under footways, verges, and central reserves).
	11	Upper bedding to corrugated steel buried structures and the like.
	12	Lower bedding to corrugated steel buried structures and the like.
	13	Surround to corrugated steel buried structures and the like.
	14	Fill above corrugated steel buried structures and the like.

Note: Group I Feature 3 Imported topsoil Class 5B shall not be separately identified by any Group II feature.

Compaction of Fill

49NI (05/02) The measurement of compaction of:

(a) fill to structures;

(b) fill on sub-base material, base and capping or filter layer;

(c) fill on bridges (under footways, verges and central reserves);

(d) bedding to corrugated steel buried structures and the like;

(e) surround to corrugated steel buried structures and the like;

in each case, shall be the volume of the voids filled to the outline stated in the Contract less the volume of corrugated steel buried structures and the like within that void.

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Itemisation

51NI (05/02) Separate items shall be provided for compaction of fill in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Compaction.
II	1	Acceptable material.
	2	Acceptable material Class 1C.
	3	Acceptable material Class 6B.
III	1	Embankments and other areas of fill.
	2	Strengthened embankments.
	3	Reinforced earth structures.
	4	Anchored earth structures.
	5	Landscape areas.
	6	Environmental bunds.
	7	Fill to structures.
	8	Fill above structural concrete foundations.
	9	Fill on sub-base material, base and capping or filter layer.
	10	Fill on bridges (under footways, verges and central reserves).
	11	Upper bedding to corrugated steel buried structures and the like.
	12	Lower bedding to corrugated steel buried structures and the like.
	13	Surround to corrugated steel buried structures and the like.
	14	Fill above corrugated steel buried structures and the like.

Completion of Formation and Sub-Formation

Measurement

83NI (05/01) The measurement of completion of formation shall be the area of the surface immediately beneath the sub-base except that where capping or filter layer is required the measurement shall be the area of the surface of the capping or filter layer excluding sloping sides and edges.

The measurement of completion of sub-formation shall be the area of the surface immediately beneath capping or filter layer.

Completion of formation and sub-formation on Classes 1C and 6B materials shall be measured separately only when the Contract states specifically that those materials are to be provided at formation or sub-formation level.

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Series 700: Pavements

Sub-base

Units

1 The unit of measurement shall be:

(i) sub-base ..... cubic metre.

Measurement

2 The measurement of sub-base shall be the volume of sub-base measured to the outlines stated in the Contract.

3 No deduction shall be made for openings of 1 square metre or less.

Itemisation

4 Separate items shall be provided for sub-base in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Each group or type of sub-base.
II	1	In carriageway, hardshoulder and hardstrip.
	2	In emergency crossing.
	3	In lay-by and bus bay.

Sub-base

5 (05/01) The items for sub-base shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) trial areas and trials;

(b) making good after sampling and testing;

(c) protection of material in transit and while awaiting tipping;

(d) grading, measuring, mixing and depositing materials;

(e) spreading and compaction;

(f) cleaning, preparing and working on or up to existing surfaces and features;

(g) curing and protection;

(h) edge support;

(i) maintenance of surface;

(j) induced cracking;

(k) taking measures to protect the subgrade and sub-base from deterioration due to the ingress of water and the use of constructional plant;

(l) taking measures to improve the sub-base to protect the sub-base and subgrade from damage due to the Contractor's method of construction and choice of constructional plant;

(m) shaping to cambers, falls and crowns;

(n) provision of soundness test certificate.

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Pavement

Units

6 (05/02) The unit of measurement shall be:

(i) base, lower base, upper base, binder course, surface course, concrete slab ..... square metre.

Measurement

7 (05/02) The measurement of base, lower base, upper base, binder course, surface course and concrete slab shall be calculated using the width of the top surface of the course or slab.

Note: The width of the "top surface" of the course or slab shall be the width required by the Contract and shall exclude sloping sides or edges.

No deductions shall be made for openings of 1 square metre or less.

Itemisation

8 (05/02) Separate items shall be provided for base, lower base, upper base, binder course, surface course and concrete slab in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Pavement.
II	1	Base.
	2	Lower base.
	3	Upper base.
	4	Binder course.
	5	Surface course.
	6	Concrete slab.
III	1	Each group or type.
IV	1	Different thicknesses.
V	1	Reinforced.
VI	1	In carriageway, hardshoulder and hardstrip.
	2	In emergency crossing.
	3	In lay-by and bus bay.
VII	1	In overlay.

Base, Lower Base, Upper Base, Binder Course, Surface Course and Concrete Slab
(05/02)

9 (05/02) The items for base, lower base, upper base, binder course, surface course and concrete slab shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) trial areas and trials;

(b) making good after sampling and testing;

(c) protection of material in transit and while awaiting tipping;

(d) designing and verifying mixes;

(e) grading, measuring, reclaiming, mixing and depositing materials;

(f) air entrainment;

(g) spreading and compaction;

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(h) cutting back, saw cutting, cleaning, preparing and working on or up to existing surfaces and features;

(i) edge support;

(j) reinforcement (as Series 1700 paragraph 26);

(k) waterproof and separation membranes;

(l) chippings;

(m) surface texturing;

(n) formwork (as Series 1700 paragraph 15);

(o) making joints;

(p) forming or sawing grooves, cleaning, grit blasting, priming, caulking, temporary and permanent sealing of joints;

(q) longitudinal, expansion, contraction, warping and construction joint assemblies, including joint filler and crack inducers, tie and dowel bars, dowel bar cradles, caps and sheaths and inspection of dowel bars and corrosion protection to tie bars and coating to transverse reinforcement;

(r) shaping to cambers, falls and crowns;

(s) forming sockets, recesses, openings, and bays;

(t) curing and protection;

(u) protection and masking and unmasking of kerbs, drainage channels, chamber covers, gully gratings, expansion joints, and the like;

(v) maintenance of surface;

(w) taking measures to protect and maintain the pavement from deterioration by the use of constructional plant and the ingress of water and other materials;

(x) anchorages including excavation and disposal, steel beams, ground beams and thickening of slab;

(y) measures required for aftercare and opening the road to traffic;

(z) protective system to steel beams (as Series 1900 paragraph 4);

(aa) slurry sealing, surface dressing, bituminous spray, resin based treatment and tack coat forming integral parts of the pavement;

(bb) admixtures and additives;

(cc) retarders, brushing and other measures necessary to provide exposed aggregate textured surface including disposal of surplus mortar arising;

(dd) saw cutting and sealing bituminous overlays;

(ee) bond-breaker tape.

Regulating Course

Units

10 The units of measurement shall be:

(i) bituminous regulating course ..... tonne or cubic metre.

(ii) cement bound regulating course ..... cubic metre.

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Measurement

11 The measurement of bituminous regulating course by tonne shall be calculated from the tonnage of material certified by the Overseeing Organisation multiplied by the factor for the particular aggregate used.

The tonnage certified by the Overseeing Organisation shall be only that material included on delivery tickets which is incorporated in the Permanent Works in the locations and to the extent and thickness required by the Contract. Material in excess of the requirements of the Contract and material used for any other purpose shall not be included within the certified tonnage.

The measurement of bituminous regulating course by cubic metres shall be the volume of material measured to the outlines required by the Contract.

12 The measurement of cement bound regulating course shall be the volume of material measured to the outlines required by the Contract.

Itemisation

13 (05/02) Separate items shall be provided for bituminous regulating courses and cement bound regulating courses in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Each group or type of bituminous regulating course.
	2	Each group or type of cement bound regulating course.
II	1	Lower base.
	2	Upper base.
	3	Base.
	4	Binder course.
	5	Surface course.

Note: Each item description which includes Group I Feature 1 shall relate to the tabulated list of the different constituent aggregate types and their factors included in the Bill of Quantities.

Bituminous and Cement Bound Regulating Course

14 (05/02) The items for bituminous and cement bound regulating course shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) base, lower base, upper base, binder course, surface course and concrete slab (as this Series paragraph 9);

(b) weighing, tickets and copies;

(c) material not laid as regulating course.

Surface Treatment

Units

15 The unit of measurement shall be:

(i) surface treatment ..... square metre.

Measurement

16 The measurement of surface treatment shall be calculated using the width of the top surface to be treated as described in paragraph 7.

17 Surface treatment shall only be measured separately when the Contract requires a separate or additional surface treatment to be applied to the pavement. Surface treatment forming an integral part of any specified group or type of pavement shall not be separately measured.

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No deductions shall be made for openings of 1 square metre or less.

Itemisation

18 (05/01) Separate items shall be provided for surface treatment, in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Slurry sealing.
	2	Surface dressing.
	3	Bituminous spray.
	4	Resin based surface treatment.
II	1	Different types.
III	1	Different colours.
IV	1	Different rates of spread.

Surface Treatment

19 The items for surface treatment shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) trial areas and trials;

(b) spreading and rolling deposited materials;

(c) tack coat (as this Series paragraph 24);

(d) in the case of resin based surface treatment certification of spraying equipment and supplying copy of certificate at monthly intervals to the Overseeing Organisation;

(e) measures required for aftercare and opening road to traffic.

Tack Coat

Units

20 The unit of measurement shall be:

(i) tack coat ..... square metre.

Measurement

21 (05/02) For the purposes of measurement any reference to tack coat shall be deemed to include bond coats.

22 Tack coat shall only be measured separately when the Contract requires a separate or additional tack coat to be applied to an existing surface prior to the construction of the following course or treatment. Tack coat forming an integral part of any specified group or type of pavement or surface treatment shall not be separately measured.

Itemisation

23 Separate items shall be provided for tack coat in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Tack coat.
II	1	Different materials.
III	1	Different rates of spread.

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Tack Coat

24 The items for tack coat shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) trial areas and trials;

(b) making good after sampling and testing;

(c) designing and verifying mixes;

(d) grading, measuring, mixing and depositing materials;

(e) making joints;

(f) cleaning surfaces;

(g) protection and masking and unmasking of kerbs, drainage channels, chamber covers, gully gratings, expansion joints, road studs, road markings and the like and obtaining clean markings;

(h) cutting back, preparing and working on or up to adjacent faces, surfaces and features;

(i) admixtures and additives.

Cold Milling (Planing)

Units

25 The unit of measurement shall be:

(i) milling ..... square metre.

Measurement

26 The measurement of milling shall be calculated using the width stated in the Contract. No deductions shall be made for openings of 1 square metre or less.

Milling carried out as part of a repave recycle process shall not be separately measured.

Itemisation

27 Separate items shall be provided for milling in accordance with Chapter II paragraphs 3 and 4 and the following:

Group		Feature
I	1	Milling.
II	1	Different thicknesses or depths.

Milling

28 (05/01)The items for milling shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) re-shaping and rolling;

(b) shaping to cambers, falls and crowns;

(c) multiple handling of material;

(d) loading into transport;

(e) disposal of material (as Series 600 paragraph 39);

(f) working around drainage channels, chamber covers, gully gratings, expansion joints and the like;

(g) ramps;

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(h) removing road studs not required for re-use;

(i) surface preparation and cleaning;

(j) cutting out and removal of material by other means;

(k) water supply and damping down;

(l) electronic detection sweep, referencing and reports.

Insitu Recycling - The Remix and Repave Processes

Units

29 The unit of measurement shall be:

(i) repave recycle process ..... square metre.

(ii) remix recycle process ..... square metre.

(iii) remix/repave recycle process ..... square metre.

Measurement

30 The measurement of insitu recycle processes shall be calculated using the width stated in the Contract. No deductions shall be made for openings of 1 square metre or less.

Itemisation

31 Separate items shall be provided for insitu recycle processes in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Repave recycle process.
	2	Remix recycle process.
	3	Remix/Repave recycle process.
II	1	Different thicknesses or depths.

Insitu Recycling - The Remix and Repave Processes

Item coverage

32 (05/02)The items for insitu recycle processes shall in accordance with the Preambles to Bill of Quantities General Directions include for:

(a) milling (as this Series paragraph 28);

(b) heating and scarifying;

(c) base, lower base, upper base, binder course, surface course and concrete slab (as this Series paragraph 9);

(d) make up to low areas and reprofiling;

(e) removal of surface dressing;

(f) removal of road markings;

(g) reports.

Reinstatement of Paved Areas

Units

33 The unit of measurement shall be:

(i) reinstatement of paved area ..... square metre.

Measurement

34 (05/01) The measurement of reinstatement of paved area shall be calculated using the width of the top surface to be reinstated excluding sides and edges.

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No deduction shall be made for openings of 1 square metre or less.

The top surface for the following features shall be the widths or areas described below:

(a) for drains, sewers, piped culverts, service ducts and filter drains - the width shall be the internal diameter of the pipe plus 600 mm;

(b) for kerbs, channels, edgings, combined drainage and kerb blocks, linear drainage channel systems and the like - the width of the foundations;

(c) for chambers, gullies, traffic signs, traffic signals, road lighting columns and the like - the horizontal area of the base slab or where no base slab is required the area of the bottom of the excavation.

Itemisation

35 Separate items shall be provided for reinstatement of paved area in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Each type of paved area reinstatement.
II	1	Different thicknesses or depths.

Reinstatement of Paved Area

36 (05/02) The items for reinstatement of paved area shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) determination of the extent of the reinstatement and agreement with the Overseeing Organisation;

(b) sub-base (as this Series paragraph 5);

(c) base, lower base, upper base, binder course, surface course and concrete slab (as this Series paragraph 9);

(d) bituminous and cement bound regulating course (as this Series paragraph 14);

(e) surface treatment (as this Series paragraph 19);

(f) kerbs, channels, edgings, combined drainage and kerb blocks and linear drainage channel systems (as Series 1100 paragraph 4);

(g) footways and paved areas (as Series 1100 paragraph 21);

(h) scarifying;

(i) milling (as this Series paragraph 28);

(j) drilling holes;

(k) tack coat (as this Series paragraph 24);

(l) bringing to correct levels and surface regularity following settlement.

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Thin Bonded Repairs and Joint Repairs to Existing Concrete Carriageway (05/01)

Units

37 (05/01) The units of measurement shall be:

(i) thin bonded repairs ..... square metre.

(ii) joint repairs ..... linear metre.

(iii) saw-cutting grooves …….. linear metre.

(iv) sealing grooves …… linear metre.

Measurement

38 The measurement of thin bonded repairs shall be calculated using the plan area of the top surface of each repair patch excluding areas of joint sealant.

39 Thin bonded repairs and joint repairs shall only be measured separately when areas and lengths to be repaired are stated in the Contract.

40 (05/01) The measurement of saw-cutting grooves shall be the summation of the lengths of saw-cutting grooves stated in the Contract.

41 (05/01) The measurement of sealing grooves shall be the summation of the lengths of the sealed grooves stated in the Contract.

Itemisation

42 (05/01) Separate items shall be provided for thin bonded repairs and joint repairs in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Thin bonded repairs.
	2	Joint repairs.
	3	Saw-cutting grooves.
	4	Sealing grooves.
II	1	Each type.
III	1	Individual areas not exceeding 1 square metre on plan.
	2	Individual areas exceeding 1 square metre but not exceeding 2 square metres on plan and so on in steps of 1 square metre.
	3	In individual lengths not exceeding 1 linear metre.
	4	In individual lengths exceeding 1 linear metre but not exceeding 2 linear metres and so on in steps of 1 linear metre.
IV	1	Depth of cut not exceeding 50mm.
	2	Depth of cut exceeding 50mm but not exceeding 75mm and so on in steps of 25 mm.
V	1	Different thicknesses or depths.

Thin Bonded Repairs and Joint Repairs

43 (05/02) The items for thin bonded repairs and joint repairs shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) determination of the area or length of the repair and agreement with the Overseeing Organisation;

(b) base, lower base, upper base, binder course, surface course and concrete slab (as this Series paragraph 9);

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(c) removal of any existing joint sealant and caulking material;

(d) removal of unsound concrete and cutting back reinforcement within the repair area;

(e) treatment of repair area and surrounds;

(f) supply and application of clean water;

(g) removal of excess water;

(h) finishing repair material flush with the level of the surrounding concrete slab and brushing and applying surface texture to match existing;

(i) reinstatement of sub-base;

(j) disposal of material (as Series 600 paragraph 39).

Saw-cutting Grooves and Sealing Grooves (05/01)

44 (05/01) The items for saw-cutting grooves and sealing grooves shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) preparing;

(b) cleaning;

(c) drying;

(d) bond-breaker tape;

(e) recording details;

(f) disposal of material (as Series 600 paragraph 39).

Full Depth Repairs and Bay Replacement Repairs to Existing Concrete Carriageway (05/01)

Units

45 (05/01) The units of measurement shall be:

(i) full depth repairs, bay replacement repairs ……. square metre.

(ii) reinstatement of sub-base …… cubic metre.

Measurement

46 (05/01) The measurement of full depth repairs and bay replacement repairs shall be the summation of the individual areas to be repaired as stated in the Contract.

Itemisation

47 (05/01) Separate items shall be provided for full depth repairs and bay replacement repairs to existing concrete carriageway in accordance with Chapter II Paragraph 3 and 4 and the following:

Group	Feature	
I	1	Full depth repairs.
	2	Bay replacement repairs.
	3	Reinstatement of sub-base.
II	1	In unreinforced slabs.
	2	In reinforced slabs.
III	1	Different thicknesses of slabs.

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Full Depth Repairs and Bay Replacement Repairs to Existing Concrete Carriageway (05/01)

48 (05/02) The items for full depth repairs and bay replacement repairs to existing concrete carriageway shall in accordance with the Preambles to Bills of Quantities General Directions include for:

Item coverage

(a) saw cutting and drilling to full depth;

(b) excavation of acceptable material (as Series 600 paragraph 18);

(c) excavation of unacceptable material (as Series 600 paragraph 19);

(d) excavation in hard material (as Series 600 paragraph 23);

(e) disposal of material (as Series 600 paragraph 39);

(f) completion of formation (as Series 600 paragraph 85);

(g) dowel bars and tie bars including drilling and supports, cleaning, plugging with resin mortar and de-bonding and compressive discs;

(h) sub-base (as this Series paragraph 5);

(i) separation layer;

(j) joint filler board;

(k) joint groove forming strip;

(l) concrete slab (as this Series paragraph 9).

Saw Cutting, Cracking and Seating Existing Jointed Reinforced Concrete Pavements (05/01)

Units

49 (05/01) The units of measurement shall be:

(i) removal of existing bituminous overlay …… square metre.

(ii) main trial …… item.

(iii) re-assessment trial …… number.

(iv) saw cutting existing pavement …… square metre.

(v) cracking existing pavement …… square metre.

(vi) seating existing pavement …… square metre.

Measurement

50 (05/01) The main trial shall be measured once only for the main trial area stated in the Contract.

51 (05/01) The re-assessment trial shall be measured once only for each time that the defined circumstances in the Contract require that such a trial be carried out as stated in the Contract.

52 (05/01) The measurement of cracking and seating shall be the areas stated in the Contract to be cracked and seated. No deductions shall be made for openings of 1 square metre or less.

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Itemisation

53 (05/01) Separate items shall be provided for saw-cutting, cracking and seating existing jointed reinforced concrete pavements in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Removal of existing bituminous overlay.
	2	Main trial.
	3	Re-assessment trial.
	4	Saw-cutting existing pavement.
	5	Cracking existing pavement.
	6	Seating existing pavement.
II	1	Saw-cuts exceeding 50mm but not exceeding 70mm in depth.
	2	Saw-cuts exceeding 70mm but not exceeding 90mm in depth.
	3	Saw-cuts exceeding 90mm but not exceeding 110mm in depth, and so on in steps of 20mm.
III	1	Thickness not exceeding 50mm.
	2	Thickness exceeding 50mm but not exceeding 100mm.
	3	Thickness exceeding100mm but not exceeding 150mm, and so on in steps of 50mm.

Note 1: Group II Features shall be applied only to Feature 4 of Group I.

Note 2: Group III Features shall be applied only to Features 5 and 6 of Group I.

Removal of Existing Bituminous Overlay (05/01)

54 (05/01) The items for removal of existing bituminous overlay shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as Series 600 Paragraph 18);

(b) excavation of unacceptable material (as Series 600 paragraph 19);

(c) excavation in hard material (as Series 600 paragraph 23);

(d) disposal of material (as Series 600 paragraph 39);

(e) milling (as Series 700 paragraph 28).

Main Trial (05/01)

55 (05/01) The items for main trial shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) saw-cutting (as this Series paragraph 57);

(b) cracking and seating existing pavements (as this Series paragraphs 58 and 59);

(c) checking cracking;

(d) checking saw cuts.

Re-assessment Trial (05/01)

56 (05/01) The items for re-assessment trial shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) main trial (as this Series paragraph 55);

(b) lost time, standing time and disruption caused by re-assessment trials.

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Saw-cutting (05/01)

57 (05/01) The items for saw-cutting shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) locating existing joints;
(b) water supply;
(c) monitoring and adjusting plant and equipment;
(d) removal of loose material and debris;
(e) disposal of material (as Series 600 paragraph 39);
(f) taking measurements and calculations;
(g) observations and examinations;
(h) coring, reinstatement and compaction;
(i) marking reference chainages and grid;
(j) giving of notices, keeping records, completing and supplying reports and certificates;
(k) lighting for core inspection.

Cracking (05/01)

58 (05/01) The items for cracking shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) supply and application of clean water;
(b) monitoring and adjusting plant and equipment;
(c) removal of loose material and debris;
(d) disposal of material (as Series 600 paragraph 39);
(e) taking measurements and calculations;
(f) observations and examinations;
(g) cleaning;
(h) coring, reinstatement and compaction;
(i) marking reference chainages and grid;
(j) giving of notices, keeping records, completing and supplying reports and certificates;
(k) providing and maintaining side restraint;
(l) lighting for core inspection.

Seating (05/01)

59 (05/01) The items for seating shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) monitoring and adjusting plant and equipment;
(b) removal of loose material and debris;
(c) disposal of material (as Series 600 paragraph 39);
(d) taking measurements and calculations;
(e) observations and examinations;
(f) rolling;
(g) measures to rectify unstable seating;
(h) giving of notices, keeping records, completing and supplying reports and certificates;
(i) providing and maintaining side restraint;

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Cracking and Seating Existing Jointed Unreinforced Concrete Pavements and CBM Bases (05/02)

Units

60 (05/01) The units of measurement shall be:

(i) removal of existing bituminous overlay …… square metre.

(ii) main trial ……item.

(iii) re-assessment trial…… number.

(iv) cracking ……...square metre.

(v) seating ……...square metre.

Measurement

61 (05/01) The main trial shall be measured once only for the stated area.

62 (05/01) The re-assessment trial shall be measured once only for each time that the defined circumstances in the Contract require that such a trial be carried out as stated in the Contract.

63 (05/01) The measurement of cracking and seating shall be the areas stated in the Contract to be cracked and seated. No deductions shall be made for openings of 1 square metre or less.

Itemisation

64 (05/02) Separate items shall be provided for cracking and seating existing jointed unreinforced concrete pavements and CBM bases in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Removal of existing bituminous overlay.
	2	Main trial.
	3	Re-assessment trial.
	4	Cracking.
	5	Seating.
II	1	Jointed unreinforced concrete pavements.
	2	CBM bases.
III	1	Thickness not exceeding 50mm.
	2	Thickness exceeding 50mm but not exceeding 100mm.
	3	Thickness exceeding100mm but not exceeding 150mm, and so on in steps of 50mm.
IV	1	Transverse cracks exceeding 1.00m but not exceeding 2.00m centres.
	2	Transverse cracks exceeding 2.00m but not exceeding 3.00m centres.
	3	Transverse cracks exceeding 3.00m but not exceeding 4.00m centres.
	4	Transverse cracks exceeding 4.00m but not exceeding 6.00m centres, and so on in steps of 2.00m.

Note 1: Group III Features shall be applied only to Features 4 and 5 of Group I.

Note 2: Group IV Features shall be applied only to Feature 4 of Group I.

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Removal of Existing Bituminous Overlay (05/01)

65 (05/01) The items for removal of existing bituminous overlay shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as Series 600 paragraph 18);

(b) excavation of unacceptable material (as Series 600 paragraph 19);

(c) excavation in hard material (as Series 600 paragraph 23);

(d) disposal of material (as Series 600 paragraph 39);

(e) milling (as this Series paragraph 28).

Main Trial (05/01)

66 (05/01) The items for main trial shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) main trial (as this Series paragraph 55).

Re-assessment Trial (05/01)

67 (05/01) The items for re-assessment trial shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) re-assessment trial (as this Series paragraph 56).

Cracking (05/01)

68 (05/01) The items for cracking shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) cracking (as this Series paragraph 58).

Seating 05/01)

69 (05/01) The items for seating shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) seating (as this Series paragraph 59).

Overbanding and Inlaid Crack Sealing Repair Systems (05/01)

Units

70 (05/01) The units of measurement shall be:

(i) simple overbanding repair system ….. linear metre.

(ii) fill and overbanding repair system …. linear metre.

(iii) inlaid sealing repair system …. linear metre.

Measurement

71 (05/01) The measurement of simple overbanding repair system, fill and overbanding repair system and inlaid sealing repair system shall be the summation of the lengths stated in the Contract and shall be for the complete system.

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Itemisation

72 (05/01) Separate items shall be provided for simple overbanding repair system, fill and overbanding repair system and inlaid sealing repair system in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Simple overbanding repair system.
	2	Fill and overbanding repair system.
	3	Inlaid sealing repair system.
II	1	Different stated materials.
III	1	Crack exceeding 5mm but not exceeding 10mm wide.
	2	Crack exceeding 10mm but not exceeding 15mm wide.
	3	Crack exceeding 15mm but not exceeding 20mm wide.
IV	1	Stated width of crack.

Note: Group III Features shall be applied only to Group I Feature 2.

Note: Group IV Feature shall be applied only to Group 1 Feature 3.

Overbanding and Inlaid Crack Sealing Repair Systems (05/01)

73 (05/01) The items for overbanding and inlaid crack sealing repair systems shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) cleaning;
(b) drying;
(c) disposal of material (as Series 600 paragraph 39);
(d) priming;
(e) bond-breaker tape;
(f) recording details.

Maintenance of Arrester Beds (05/01)

Units

74 (05/01) The unit of measurement shall be:

(i) maintenance of arrester bed ……. item.

Itemisation

75 (05/01) Separate items shall be provided for maintenance of arrester beds in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Maintenance of arrester bed.
II	1	Stated location.

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Maintenance of Arrester Beds (05/01)

Item Coverage

76 (05/01) The items for maintenance of arrester beds shall in accordance with the Preambles to Bill of Quantities General Directions include for:

(a) clearance of debris, litter and weed growth from granular material;

(b) disposal of material (as Series 600 paragraph 39);

(c) sweeping;

(d) re-placing material on bed;

(e) raking and levelling.

Repairs and Patching (05/01)

Units

77 (05/01) The units of measurement shall be:

(i) repairs to potholes, repairs to depressions ……..kilogramme.

(ii) patching ……. square metre.

Measurement

78 (05/01) The measurement of repairs to potholes and repairs to depressions shall be the mass of specified material placed in the voids.

79 (05/01) The measurement of patching shall be the area of the top surface of the patch.

Itemisation

80 (05/01) Separate items shall be provided for repairs and patching in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Repairs to potholes.
	2	Repairs to depressions.
	3	Patching.
II	1	Different thicknesses.
III	1	Stated repair materials or system.
IV	1	In areas not exceeding 5 square metres.
	2	In areas exceeding 5 square metres but not exceeding 10 square metres.
	3	In areas exceeding 10 square metres but not exceeding 15 square metres and so on in steps of 5 square metres.

Note: Groups II & IV features shall be applied only to Group I feature 3.

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Repairs and Patching

81 (05/01) The items for repairs and patching shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as Series 600 paragraph 18);
(b) excavation of unacceptable material (as Series 600 paragraph 19);
(c) excavation of hard material (as Series 600 paragraph 23);
(d) disposal of material (as Series 600 paragraph 39);
(e) milling (as this Series paragraph 28);
(f) removing loose material and water;
(g) tack coat (as this Series paragraph 24);
(h) compaction and shaping;
(i) forming joints and sealing.

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Series 1100: Kerbs, Footways and Paved Areas

Kerbs, Channels, Edgings, Combined Drainage and Kerb Blocks and Linear Drainage Channel Systems (05/01)

Units

1 (05/01) The unit of measurement shall be:

(i) kerbs, channels, edgings, combined drainage and kerb blocks and linear drainage channel systems ..... linear metre.

Measurement

2 (05/01) The measurement of kerbs, channels, edgings, combined drainage and kerb blocks and linear drainage channel systems shall be the lengths required by the Contract. No deduction shall be made for gaps of 1 linear metre or less.

Itemisation

3 (05/01) Separate items shall be provided for kerbs, channels, edgings, combined drainage and kerb blocks and linear drainage channel systems in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Kerbs.
	2	Channels.
	3	Edgings.
	4	Combined drainage and kerb blocks.
	5	Linear drainage channel systems.
II	1	Permitted alternative materials and designs.
	2	Different materials and designs.
	3	Group reference.
III	1	Straight or curved exceeding 12 metres radius.
	2	Curved not exceeding 12 metres radius.

Kerbs, Channels, Edgings, Combined Drainage and Kerb Blocks and Linear Drainage Channel Systems (05/01)

4 (5/01) The items for kerbs, channels, edgings, and combined drainage and kerb blocks and linear drainage channel systems shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) trial mixes;

(b) making good after sampling and testing;

(c) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(d) excavation of unacceptable material (as Series 600 paragraph 19);

(e) excavation in Hard Material (as Series 600 paragraph 23);

(f) disposal of material (as Series 600 paragraph 39);

(g) concrete (as Series 1700 paragraphs 5 and 10);

(h) formwork (as Series 1700 paragraph 15);

(i) reinforcement (as Series 1700 paragraph 26);

(j) mixing materials and extruding kerbs;

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(k) bedding, bonding, jointing, including movement joints, filling and sealing of joints;

(l) keying of surfaces and tack coats;

(m) surface finishing, curing and protecting;

(n) gratings, frames, bedding and seatings;

(o) tie bars;

(p) drainage holes or pipes through concrete;

(q) quadrants, dropper kerbs and other special kerb units;

(r) edge support;

(s) preservation of timber;

(t) cutting;

(u) drainage layer;

(v) additional pavement material below channels;

(w) backfilling and compaction;

(x) special units and fittings;

(y) connections to chambers;

(z) in the case of combined drainage and kerb blocks and linear drainage channel systems - design, certificates, provision of data and drawings, resubmissions, modifications and amendments to the Works.

(aa) in the case of combined drainage and kerb blocks and linear drainage channel systems - internal checking and cleaning;

(bb) (11/04) in the case of combined drainage and kerb blocks and linear drainage channel systems - surveys and recordings;

(cc) (11/04) reinstatement of surfaces.

Additional Concrete for Kerbs, Channels, Edgings, Combined Drainage and Kerb Blocks and Linear Drainage Channel Systems (05/01)

Units

5 (05/01) The unit of measurement shall be:

(i) additional concrete for kerbs, channels, edgings, combined drainage and kerb blocks and linear drainage channel systems ..... cubic metre.

Measurement

6 (05/01) The measurement of additional concrete for kerbs, channels, edgings, combined drainage and kerb blocks and linear drainage channel systems shall be the volume required by the Contract in excess of the standard requirements of the Contract for each type of kerb, channel, edging, combined drainage and kerb block or linear drainage channel system.

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Itemisation

7 (05/01) Separate items shall be provided for additional concrete for kerbs, channels, edgings, combined drainage and kerb blocks and linear drainage channel systems in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Additional concrete of different mixes, classes or grades.
II	1	To kerbs.
	2	To channels.
	3	To edgings.
	4	To combined drainage and kerb blocks.
	5	To linear drainage channel systems.

Additional Concrete for Kerbs, Channels, Edgings, Combined Drainage and Kerb Blocks and Linear Drainage Channel Systems (05/01)

8 (05/01) The items for additional concrete for kerbs, channels, edgings, combined drainage and kerb blocks and linear drainage channel systems shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(b) excavation of unacceptable material (as Series 600 paragraph 19);

(c) excavation in Hard Material (as Series 600 paragraph 23);

(d) in situ concrete (as Series 1700 paragraph 5);

(e) formwork (as Series 1700 paragraph 15);

(f) reinforcement (as Series 1700 paragraph 26);

(g) forming, filling and sealing joints;

(h) surface finishing, curing and protecting;

(i) movement joints;

(j) drainage holes or pipes through concrete;

(k) disposal of material (as Series 600 paragraph 39).

Remove from Store and Relay Kerbs, Channels, Edgings, Combined Drainage and Kerb Blocks and Linear Drainage Channel Systems (05/01)

Units

9 (05/01) The unit of measurement shall be:

(i) remove from store and relay kerbs, channels, edgings, combined drainage and kerb blocks and linear drainage channel systems ..... linear metre.

Measurement

10 (05/01) The measurement for remove from store and relay kerbs, channels, edgings, combined drainage and kerb blocks and linear drainage channel systems shall be the length required by the Contract. No deduction shall be made for gaps of 1 linear metre or less.

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Itemisation

11 (05/01) Separate items shall be provided for remove from store and relay kerbs, channels, edgings, combined drainage and kerb blocks and linear drainage channel systems in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Remove from store and relay kerbs.
	2	Remove from store and relay channels.
	3	Remove from store and relay edgings.
	4	Remove from store and relay combined drainage and kerb blocks.
	5	Remove from store and relay linear drainage channel systems.
II	1	Different materials and designs.
III	1	Straight or curved exceeding 12 metres radius.
	2	Curved not exceeding 12 metres radius.

Remove from Store and Relay Kerbs, Channels, Edgings, Combined Drainage Kerb Blocks and Linear Drainage Channel Systems (05/01)

12 (05/01) The items for remove from store and relay kerbs, channels, edgings, combined drainage and kerb blocks and linear drainage channel systems shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) loading, transporting from store, unloading and positioning for relaying;

(b) replacing items damaged during the foregoing operations;

(c) modification and new materials;

(d) kerbs, channels, edgings, combined drainage and kerb blocks and linear drainage channel systems (as this Series paragraph 4).

Footways and Paved Areas

Units

13 The units of measurement shall be:

(i) footways and paved areas ..... square metre.

(ii) bituminous regulating course ..... tonne.

(iii) cement bound regulating course ..... cubic metre.

Measurement

14 The measurement of footways and paved areas shall be calculated using the width of the top surface stated in the Contract.

15 (05/02) In the case of flexible construction where a Group reference is given for the whole construction, the total thickness of the combined sub-base, binder course, surface course and/or surface dressing shall be stated.

16 In all other cases of flexible construction the thickness of each course shall be stated in the item description except that where a surface dressing is an integral part of any course then the combined thickness of the course and surface dressing shall be stated.

17 (05/01) In the cases of in situ and precast concrete, stone, slab and block paving the thickness of the sub-base, bedding and paving shall be separately stated in the item description.

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18 The measurement of bituminous regulating course shall be the tonnage certified by the Overseeing Organisation, being only that material included on delivery tickets which is incorporated in the Permanent Works in the locations and to the extent and thickness required by the Contract.

The measurement of cement bound regulating course shall be the volume of material measured to the outlines stated in the Contract.

19 No deduction shall be made for openings of 1 square metre or less.

Itemisation

20 Separate items shall be provided for footways and paved areas in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Footways.
	2	Paved areas.
II	1	Different types of construction.
III	1	Different thicknesses.
IV	1	Different sizes, groups or types.
V	1	Surfaces sloping at 10° or less to the horizontal.
	2	Surfaces sloping at more than 10° to the horizontal.
VI	1	Regulating course of different groups or types.

Footways and Paved Areas

21 (05/02) The items for footways and paved areas shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) sub-base (as Series 700 paragraph 5);

(b) edge support;

(c) concrete (as Series 1700 paragraphs 5 and 10);

(d) formwork (as Series 1700 paragraph 15);

(e) void formers (as Series 1700 paragraph 16);

(f) reinforcement (as Series 1700 paragraph 26);

(g) joint filler and sealant (as Series 2300 paragraphs 9 and 10);

(h) trial mixes;

(i) laying to levels and falls;

(j) bedding, jointing and pointing;

(k) straight, circular and radial cutting and fitting;

(l) rough and fair cutting and fitting;

(m) base, lower base, upper base, binder course, surface course and concrete slab (as Series 700 paragraph 9);

(n) compacting;

(o) membrane;

(p) topsoiling (as Series 600 paragraph 80);

(q) grass seeding (as Series 3000 paragraph 9).

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Bituminous and Cement Bound Regulating Course

22 The items for bituminous and cement bound regulating course shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) bituminous and cement bound regulating course (as Series 700 paragraph 14).

Remove from Store and Relay Paving Flags, Slabs and Blocks (05/01)

Units

23 (05/01) The unit of measurement shall be:

(i) remove from store and relay paving flags, slabs and blocks ..... square metre.

Measurement

24 (05/01) The measurement of remove from store and relay paving flags, slabs and blocks shall be the area of the top surface of the work stated in the Contract.

No deduction shall be made for openings of 1 square metre or less.

Itemisation

25 (05/01) Separate items shall be provided for remove from store and relay paving flags, slabs and blocks in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Remove from store and relay paving in footways.
	2	Remove from store and relay paving in paved areas.
II	1	Different types of construction.
III	1	Different thicknesses.
IV	1	Different sizes groups or types.
V	1	Surfaces sloping at 10° or less to the horizontal.
	2	Surfaces sloping at more than 10° to the horizontal.

Remove from Store and Relay Paving Flags, Slabs and Blocks (05/01)

26 (5/01) The items for remove from store and relay paving flags, slabs and blocks shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) loading, transporting from store unloading and positioning for relaying;

(b) replacing items damaged during the foregoing operations;

(c) modification and new materials;

(d) footways and paved areas (as this Series paragraph 21).

Steps

27 The unit of measurement shall be:

(i) flights of steps ..... number.

Measurement

28 The measurement of steps shall be the complete flight including landings.

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Itemisation

29 Separate items shall be provided for steps in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Flight of steps.
II	1	Different locations.

Steps

30 (05/01) The items for steps shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(b) excavation of unacceptable material (as Series 600 paragraph 19);

(c) excavation in Hard Material (as Series 600 paragraph 23);

(d) backfilling, compaction and reinstatement;

(e) disposal of material (as Series 600 paragraph 39);

(f) completion of formation (as Series 600 paragraph 85)

(g) brickwork, blockwork and stonework (as Series 2400 paragraphs 4 and 8);

(h) kerbs, channels, edgings, combined drainage and kerb blocks and linear drainage channel systems (as this Series paragraph 4);

(i) footways and paved areas (as this Series paragraph 21);

(j) surface finishing and non-slip treatment;

(k) tread nosings;

(l) pedestrian guardrails and handrails (as Series 400 paragraph 46);

(m) fencing (as Series 300 paragraph 4);

(n) concrete foundation to timber posts (as Series 300 paragraph 5);

(o) gates and stiles (as Series 300 paragraph 6);

(p) reinstatement of surfaces.

Remove from Store and Re-erect Street Furniture (05/05)

Units

31 (05/05) The unit of measurement shall be:

(i) remove from store and re-erect street furniture …… number.

Itemisation

32 (05/05) Separate items shall be provided for remove from store and re-erect street furniture in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Remove from store and re-erect street furniture.
II	1	Different types.

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Remove from Store and Re-erect Street, Furniture (05/05)

Item coverage

33 (05/05) The items for remove from store and re-erect street furniture shall in accordance with the Preambles to Bill of Quantities General Directions include for:

(a) loading, transporting from store unloading and positioning for relaying or re-erecting;

(b) replacing items damaged during the foregoing operations;

(c) modification and new materials;

(d) footways and paved areas (as this Series paragraph 21);

(e) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(f) excavation of unacceptable material (as Series 600 paragraph 19);

(g) excavation in Hard Material (as Series 600 paragraph 23);

(h) backfilling, compaction and reinstatement;

(i) disposal of material (as Series 600 paragraph 39);

(j) painting existing painted items.

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Series 1200: Traffic Signs and Road Markings

Traffic Signs

Units

1 The unit of measurement shall be:

(i) traffic signs ..... number.

Measurement

2 (05/01) The measurement of traffic signs shall be the complete installation except for earth electrodes which shall be measured separately under Series 1400 (paragraphs 24 to 27).

Itemisation

3 Separate items shall be provided for traffic signs in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Permanent traffic signs.
	2	Prescribed temporary traffic signs.
II	1	Particular sign reference.
III	1	Retroreflective.
	2	Non-retroreflective.
	3	Enhanced retroreflective.
IV	1	Lit Sign Units.
	2	Non Lit Sign Units.
V	1	Different types.
VI	1	Different sizes.
VII	1	Different posts or supports.

Permanent Traffic Signs

4 (05/01) The items for permanent traffic signs shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(b) excavation of unacceptable material (as Series 600 paragraph 19);

(c) excavation in hard material (as Series 600 paragraph 23);

(d) backfilling and compaction;

(e) in situ concrete (as Series 1700 paragraph 5);

(f) formwork (as Series 1700 paragraph 15);

(g) reinforcement (as Series 1700 paragraph 26);

(h) ducts in bases;

(i) reinstatement of surfaces;

(j) covering and removal of covering of signs;

(k) disposal of material (as Series 600 paragraph 39);

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(l) doors, locks and keys;

(m) location lettering and marking;

(n) drilling or forming holes and pockets in structures, lighting columns or foundations and casting in bolts, sockets, base plates and anchorage assemblies;

(o) bedding and grouting;

(p) protective system (as Series 1900 paragraph 4);

(q) rivets, bolts, nuts and the like;

(r) electrical equipment, wiring, and connections, excluding supply and control cabling;

(s) conduit including screwed and threaded connections, bends, tees, and the like and draw wires;

(t) threading cable through ducts, sleeves, conduit and the like;

(u) backboard, fixings, protective caps, sealing, grommets, spacers, mounting plates and strips;

(v) complying with wiring regulations, earthing (other than earth electrodes), and inspection;

(w) protective treatment;

(x) notices and recording;

(y) preparation and supply of record drawings;

(z) light spill screens;

(aa) fixing to structures and foundations including attachment systems.

Prescribed Temporary Traffic Signs

5 (05/01) The items for prescribed temporary traffic signs shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) permanent traffic signs (as this Series paragraph 4);

(b) take up or down and set aside for reuse or remove to store off Site (as Series 200 paragraph 11);

(c) maintaining and servicing equipment.

Remove from Store and Re-erect Traffic Signs

Units

6 The unit of measurement shall be:

(i) remove from store and re-erect traffic signs ..... number.

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Itemisation

7 Separate items shall be provided for remove from store and re-erect traffic signs in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Remove from store and re-erect traffic signs.
II	1	Retroreflective.
	2	Non-retroreflective.
	3	Enhanced retroreflective.
III	1	Lit Sign Units.
	2	Non Lit Sign Units.
IV	1	Different types.
V	1	Different sizes.
VI	1	Different posts or supports.

Remove from Store and Re-erect Traffic Signs

8 The items for remove from store and re-erect traffic signs shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) loading, transporting from store, unloading and positioning for re-erection;

(b) replacing items damaged during the foregoing operations;

(c) modification and new materials;

(d) painting existing painted items;

(e) permanent traffic signs (as this Series paragraph 4).

Road Markings

Units

9 The units of measurement shall be:

(i) marking and removal of solid areas ..... square metre.

(ii) marking and removal of lines ..... linear metre.

(iii) marking and removal of triangles, circles with enclosing arrows, arrows, kerb markings, symbols, letters and numerals ..... number. (The diagram number from the Traffic Signs Regulations and General Directions to be stated.)

Measurement

10 The removal of road markings shall only be measured where specifically required by the Contract.

The marking and removal of solid areas shall only be measured for the solid infilling between converging lines, the enclosing lines themselves shall be measured as lines.

Road markings which form part of a traffic signal installation or a controlled or uncontrolled crossing shall not be separately measured.

Road markings which require enhanced reflectorised marking materials for 'wet-night' conditions stated in Appendix 12/3 shall be identified and measured separately.

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11 Road markings other than those measured under sub-paragraphs 9(i) and (iii) above shall be measured as lines and shall be grouped together according to width.

In the case of intermittent lines the measurement shall be of the marks only but the length of the mark and gap shall be stated. Double lines shall be measured as two single lines.

Diagonal lines between double lines and short transverse lines at the ends of any longitudinal lines shall be measured with the lines of which they form part.

Ancillary lines shall include lines forming hatched areas, chevrons, zigzag lines, boxed areas and lines enclosing boxed areas. In the case of hatched areas and chevrons the enclosing lines shall be measured as the longitudinal line of which they form part. The measurement of zigzag lines shall include any transverse or longitudinal lines at their ends.

12 The measurement of circles with enclosing arrows (mini roundabouts) shall be for the complete marking, the external diameter of the circle being stated. Distinction shall be made for all other arrows between straight, curved, turning or double headed.

13 Kerb markings shall be measured as a single item irrespective of the number of lines forming any one marking.

14 Each letter or numeral shall be separately measured with all letters or numerals grouped together according to height.

15 Symbols shall be measured separately and grouped together according to size.

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Itemisation

16 Separate items shall be provided for marking and removal of road markings in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Removal of road markings.
	2	Road markings.
II	1	Solid areas.
	2	Continuous lines.
	3	Intermittent lines.
	4	Ancillary lines.
	5	Raised rib lines.
	6	Triangles.
	7	Circle with enclosing arrows.
	8	Arrows.
	9	Kerb markings.
	10	Letters and numerals.
	11	Symbols.
III	1	Different materials.
IV	1	Different widths of lines.
	2	Different sizes of circles with enclosing arrows.
	3	Different lengths of arrows.
	4	Different lengths of kerb markings.
	5	Different heights of letters and numerals.
	6	Different sizes of symbols.
V	1	Different lengths of mark and gap for intermittent lines.
	2	Different diagram numbers for arrows, kerb markings and symbols.
VI	1	Different types.
VII	1	Different colours.
VIII	1	Reflectorised.
IX	1	Different rib spacings.

Removal of Road Markings

17 The items for the removal of road markings shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) disposal of material (as Series 600 paragraph 39);

(b) reinstatement;

(c) apostrophes in the case of letters and numerals;

(d) markings down the face of kerbs;

Road Markings

18 The items for road markings shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item Coverage

(a) cleaning, brushing and drying surfaces;

(b) application of the marking materials including the incorporation of specified reflecting medium;

(c) thinners, primers and tack coats;

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(d) apostrophes in the case of letters and numerals;

(e) markings down the face of kerbs;

(f) adhesives;

Road Studs (05/01)

Units

19 (05/01) The unit of measurement shall be:

(i) road studs ..... number.

Measurement

20 (05/01) The measurement of road studs shall be the complete installation.

Road studs which form part of a traffic signals installation or a pedestrian crossing shall not be separately measured.

Itemisation

21 (05/01) Separate items shall be provided for road studs in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Road studs.
II	1	Different sizes.
III	1	Different types.
IV	1	Different coloured reflectors.

Road Studs (05/01)

Item coverage

22 (05/01) The items for road studs shall in accordance with the Preambles to Bill of Quantities General Directions include for:

(a) cutting or forming holes;

(b) milling;

(c) adhesives and grout;

(d) reinstatement of surfaces;

(e) disposal of material (as Series 600 paragraph 39).

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Remove from Store and Re-install Road Studs (05/01)

Units

23 (05/01) The unit of measurement shall be:

(i) remove from store and re-install road studs ..... number.

Itemisation

24 (05/01) Separate items shall be provided for remove from store and re-install road studs in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Remove from store and re-install road studs.
II	1	Different sizes.
III	1	Different types.

Remove from Store and Re-install Road Studs (05/01)

25 The items for remove from store and re-install road studs shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) loading, transporting from store, unloading and positioning for re-installation;

(b) replacing items damaged during the foregoing operations;

(c) new materials;

(d) road studs (as this Series paragraph 22).

Traffic Signal Installations (05/01)

Definitions (05/01)

26 (05/01) For the purposes of measurement of Traffic Signal Installations the network is defined as all cabling emanating from either an outstation transmission unit (O.T.U), an outstation monitoring unit (O.M.U.) or an outstation monitoring and control unit (O.M.C.U.) and terminating at a location outside the limits of the site.

Units

27 (05/01) The unit of measurement shall be:

(i) traffic signal installations ..... item.

Measurement

28 (05/01) The measurement of traffic signal installations shall be the complete installations except for earth electrodes which shall be measured separately under Series 1400 (paragraphs 24 to 27).

Itemisation

29 (05/01) Separate items shall be provided for traffic signal installations in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Permanent traffic signal installations.
	2	Prescribed temporary traffic signal installations.
II	1	Different locations.

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Permanent Traffic Signal Installations (05/01)

30 (05/01) The items for permanent traffic signal installations shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(b) excavation of unacceptable material (as Series 600 paragraph 19);

(c) excavation in hard material (as Series 600 paragraph 23);

(d) in situ concrete (as Series 1700 paragraph 5);

(e) backfilling and compaction;

(f) disposal of material (as Series 600 paragraph 39);

(g) detectors;

(h) detector loops (as Series 1500 paragraph 31);

(i) detector feeders;

(j) trench for cable (as Series 1400 paragraph 8) excluding network cabling;

(k) cable (as Series 1400 paragraph 13) excluding network cabling;

(l) control equipment;

(m) electrical equipment, wiring, and connections, excluding network cabling;

(n) marking out, cutting or forming slots, drying, damming, backfilling, cleaning and sealing;

(o) road markings (as this Series paragraph 18);

(p) notices and recording;

(q) numbering and lettering;

(r) complying with wiring regulations and earthing (other than earth electrodes);

(s) reinstatement of surfaces;

(t) preparation and supply of record drawings;

(u) road studs;

(v) ducts;

(w) chambers (as Series 500 paragraph 37);

(x) protective system (as Series 1900 paragraph 4).

Prescribed Temporary Traffic Signal Installations (05/01)

31 (05/01) The items for prescribed temporary traffic signal installations shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) permanent traffic signal installations (as this Series paragraph 30);

(b) take up or down and set aside for reuse or remove to store off Site (as Series 200 paragraph 11);

(c) removal of road markings (as this Series paragraph 17);

(d) maintaining and servicing equipment.

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Controlled and Uncontrolled Crossings

Units

32 (05/01) The unit of measurement shall be:

(i) controlled crossings ..... item.

(ii) uncontrolled crossings ..... item.

Measurement

33 (05/01) The measurement of controlled and uncontrolled crossings shall be the complete installation.

Itemisation

34 (05/01) Separate items shall be provided for prescribed, controlled and uncontrolled crossings in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Permanent controlled crossings.
	2	Permanent uncontrolled crossings.
	3	Prescribed temporary controlled crossings.
	4	Prescribed temporary uncontrolled crossings.
II	1	Different locations.

Permanent Controlled and Uncontrolled Crossings

35 (05/01) The items for permanent controlled and uncontrolled crossings shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) permanent traffic signal installations (as this Series paragraph 30);

(b) road studs;

(c) kerbs, channels, edgings, combined drainage and kerb blocks and linear drainage channel systems (as Series 1100 paragraph 4);

(d) footways and paved areas (as Series 1100 paragraph 21);

(e) flashing beacons and additional lighting.

Prescribed Temporary Controlled and Uncontrolled Crossings

36 (05/01) The items for prescribed temporary controlled and uncontrolled crossings shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) permanent controlled and uncontrolled crossings (as this Series paragraph 35);

(b) take up or down and set aside for reuse or remove to store off Site (as Series 200 paragraph 11);

(c) removal of road markings (as this Series paragraph 17);

(d) maintaining and servicing equipment.

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Marker Posts

Units

37 (05/01) The unit of measurement shall be:

(i) marker posts ..... number.

Itemisation

38 (05/01) Separate items shall be provided for marker posts in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Marker posts.
II	1	Different types.

Marker Posts

Item coverage

39 (05/01) The items for marker posts shall in accordance with the Preambles to Bill of Quantities General Directions include for:

(a) protective system (as Series 1900 paragraph 4);

(b) numerals, symbols and reflectorised strips or discs including adhesive;

(c) driving or excavating in any material (as Series 600 paragraphs 17, 18, 19 and 23);

(d) backfilling and compaction;

(e) sockets;

(f) galvanized fixings and fittings;

(g) preservation of timber;

(h) disposal of material (as Series 600 paragraph 39);

(i) in-situ concrete (as Series 1700 paragraph 5);

(j) formwork (as Series 1700 paragraph 15);

(k) reinforcement (as Series 1700 paragraph 26);

(l) reinstatement of surfaces.

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Permanent Bollards

Units

40 (05/01) The unit of measurement shall be:

(i) permanent bollards ..... number.

Itemisation

41 (05/01) Separate items shall be provided for permanent bollards in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Permanent bollards.
II	1	Internally illuminated.
	2	Non-illuminated.
III	1	Different types.
IV	1	Different sizes.

Permanent Bollards

42 (05/01) The items for permanent bollards shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) permanent traffic signs (as this Series paragraph 4);

(b) preservation of timber.

Node Markers

Units

43 (05/01) The unit of measurement shall be:

(i) node markers ..... number.

Itemisation

44 (05/01) Separate items shall be provided for node markers in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Node markers.
II	1	Different types.
III	1	Different sizes.

Node Markers

45 (05/01) The items for node markers shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) coring pockets in carriageway;

(b) cleaning and drying pockets;

(c) disposal of material (as Series 600 paragraph 39);

(d) incorporation of solid glass beads.

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Series 1300: Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts (11/03)

Road Lighting Columns and Brackets, Wall Mountings, CCTV Masts and Cantilever Masts (11/03)

Units

1 (11/03) The unit of measurement shall be:

(i) road lighting columns and brackets, wall mountings, CCTV masts, cantilever masts..... number.

Measurement

2 (11/03) The measurement of road lighting columns and brackets, wall mountings, CCTV masts and cantilever masts shall be the complete installation except for earth electrodes which shall be measured separately (under Series 1400 paragraphs 24 to 27).

Itemisation

3 (11/03) Separate items shall be provided for road lighting columns and brackets, wall mountings, CCTV masts and cantilever masts in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Road lighting columns and brackets.
	2	Wall mountings.
	3	CCTV masts.
	4	Cantilever masts.
II	1	Different height of lighting columns.
	2	Different height of CCTV masts.
	3	Different height of cantilever masts.
III	1	Different projection of brackets.
	2	Different projection of cantilever.
IV	1	Different luminaires.
V	1	Different types.

Road Lighting Columns and Brackets, Wall Mountings, CCTV Masts and Cantilever Masts (11/03)

4 (11/03) The items for road lighting columns and brackets, wall mountings, CCTV masts and cantilever masts shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) design;

(b) certificates;

(c) provision of data and drawings;

(d) resubmissions and modifications;

(e) amendments to the Works;

(f) obtaining aesthetic approval;

(g) excavation of acceptable material (as Series 600 paragraphs 17

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and 18);

(h) excavation of unacceptable material (as Series 600 paragraph 19);

(i) excavation in Hard Material (as Series 600 paragraph 23);

(j) rivets, nuts, bolts, shims, washers, welds, clamps and the like;

(k) blinding concrete and paving slab;

(l) in situ concrete (as Series 1700 paragraph 5);

(m) formwork (as Series 1700 paragraph 15);

(n) reinforcement (as Series 1700 paragraph 26);

(o) drilling or forming holes and pockets in structures or foundations, and casting in bolts, sockets, base plates and anchorage assemblies;

(p) bedding, grouting and filling;

(q) backfilling and compaction;

(r) protective system (as Series 1900 paragraph 4);

(s) marking and lettering;

(t) electrical equipment, wiring and making connections, excluding supply and control cabling;

(u) disposal of material (as Series 600 paragraph 39);

(v) reinstatement of surfaces;

(w) plugging cable entry slots;

(x) doors, locks and keys;

(y) ducts in bases;

(z) conduit including screwed and threaded connections, bends, tees and the like and draw wires;

(aa) threading cable through ducts, sleeves, conduit and the like;

(bb) backboards, fixings, protective caps, sealing, grommets, spacers, mounting plates and strips;

(cc) complying with wiring regulations and earthing (other than earth electrodes);

(dd) protective treatment;

(ee) notices, recording and preparation and supply of record drawings;

(ff) fixing to structures and foundations including attachment systems.

Remove from Store and Re-erect Road Lighting Columns and Brackets, Wall Mountings, CCTV Masts and Cantilever Masts (11/03)

Units

5 The unit of measurement shall be:

(i) (11/03) remove from store and re-erect road lighting columns and

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brackets, wall mountings, CCTV masts and cantilever masts..... number.

Itemisation

6 (11/03) Separate items shall be provided for remove from store and re-erect road lighting columns and brackets, wall mountings, CCTV masts and cantilever masts in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Remove from store and re-erect road lighting columns and brackets.
	2	Remove from store and re-erect wall mountings.
	3	Remove from store and re-erect CCTV masts.
	4	Remove from store and re-erect cantilever masts.
II	1	Different height of columns.
III	1	Different projections of brackets.
IV	1	Different luminaires.
V	1	Different types.

Remove from Store and Re-erect Road Lighting Columns and Brackets, Wall Mountings, CCTV Masts and Cantilever Masts (11/03)

7 (11/03) The items for remove from store and re-erect road lighting columns and brackets, wall mountings, CCTV masts and cantilever masts shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) loading, transporting from store, unloading and positioning for re-erection;

(b) replacing items damaged during the foregoing operations;

(c) modification and new materials;

(d) painting existing painted items;

(e) road lighting columns and brackets, wall mountings, CCTV masts and cantilever masts (as this Series paragraph 4).

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Series 1400: Electrical Work for Road Lighting and Traffic Signs

Locating Buried Road Lighting and Traffic Signs Cable

Units

1 The unit of measurement shall be:

(i) locating buried road lighting and traffic signs cable ..... linear metre.

Measurement

2 (05/01) The measurement shall be the length of the buried road lighting or traffic signs cable located (as this Series paragraph 10 for the measurement of cable).

Itemisation

3 Separate items shall be provided for locating buried road lighting and traffic signs cable in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Locating buried road lighting, traffic signs cable and paved areas.
II	1	In carriageways, footways, bridge decks and paved areas.
	2	In verges and central reserves.
	3	In side slopes of cuttings or side slopes of embankments.

Locating Buried Road Lighting and Traffic Signs Cable

Item coverage

4 The items for locating buried road lighting and traffic signs cable shall in accordance with the Preambles to Bill of Quantities General Directions include for:

(a) marking the cable runs on the ground;

(b) pegging and removal;

(c) maintaining location system;

(d) proving insulation integrity and supplying results to the Overseeing Organisation;

(e) site records.

Trench for Cable or Duct (05/01)

Units

5 (05/01) The units of measurement shall be:

(i) trench for cable ..... linear metre.

(ii) trench for duct ..... linear metre.

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Measurement

6 (05/01) The measurement of trench for cable or duct shall be the summation of the distance along the centre line of the route between the following points:

(a) face of foundation to post, road lighting column, lit sign unit, feeder pillar, electricity supply point and the like;

(b) the intersection of the centre line at junctions;

(c) the position of terminations shown in the Contract;

(d) the point of change of stage depth.

The measurement of trench for cable or duct shall be measured once only irrespective of the number of cables or ducts in the trench. The depth of cable or duct trenches shall be the vertical measurement between the underside of the bedding, or if no bedding is specified the underside of the cable or duct, and the Earthworks Outline.

Itemisation

7 (05/01) Separate items shall be provided for trench for cable or duct in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Trench for cable.
	2	Trench for duct.
II	1	Different widths of trench.
III	1	Trench depth not exceeding 1.5 metres.
	2	Trench depth exceeding 1.5 metres but not exceeding 2.0 metres and so on in steps of 0.5 metres.
IV	1	In carriageways, footways and paved areas.
	2	In verges and central reserves.
	3	In side slopes of cuttings or side slopes of embankments

Trench for Cable or Duct

8 (05/01) The items for trench for cable or duct shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(b) excavation of unacceptable material (as Series 600 paragraph 19);

(c) excavation in Hard Material (as Series 600 paragraph 23);

(d) additional depth of excavation to maintain specified cover at obstructions;

(e) additional excavation to accommodate extra lengths of cable;

(f) locating, working around and supporting pipes, cables, services, apparatus and the like;

(g) trimming, levelling and compacting;

(h) cable bedding and covering;

(i) duct bedding, haunching and surrounding;

(j) formwork (as Series 1700 paragraph 15);

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(k) movement joints to beds, surrounds and the like;

(l) backfilling and compaction;

(m) troughing, lids, access points and bedding;

(n) disposal of material (as Series 600 paragraph 39);

(o) marking tape or cable covers;

(p) reinstatement of surfaces;

(q) site records.

Cable and Duct (05/01)

Units

9 (05/01) The units of measurement shall be:

(i) cable ..... linear metre.

(ii) duct ..... linear metre.

Measurement

10 (05/01) The measurement of cable shall be the summation of the individual lengths along the centre line of the route of the cable between the points of cable termination within each item of equipment.

Points of cable termination shall be:

(a) in the case of loop detector feeders - the point at which the cable enters the terminal block;

(b) in all other cases - the point at which the cables enter the boxes, distributors, lighting columns, cut-outs and the like.

11 (05/01) The measurement of ducts shall be for the complete construction irrespective of the number of ducts contained within any one trench.

Itemisation

12 (05/05) Separate items shall be provided for cable and duct in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Cable.
	2	Duct.
II	1	Different types and sizes of cable.
	2	Different internal diameters of duct.
III	1	Specified design groups.
	2	Particular design stated in the contract.
IV	1	Stated number of ducts in trench.
V	1	In trench depth not exceeding 1.5 metres.
	2	In trench depth exceeding 1.5 metres but not exceeding 2.0 metres and so on in steps of 0.5 metres.
VI	1	In duct.
	2	Fixed above ground
VII	1	In side slopes of cuttings or side slopes of embankments.
VIII	1	Supplied by the Overseeing Organisation.

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Cable

13 (05/01) The items for cable shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) retermination loop required for connection into a unit, future retermination and tying in;

(b) unsealing, clearing and swabbing out ducts, drawing cables through, replacing draw ropes, plugging and sealing duct ends and marking;

(c) intermediate supports and fixing devices where cables leave trench and prior to entry into equipment;

(d) supports to vertical and horizontal cables;

(e) sealing to cable ends;

(f) cutting, tying together, sealing, coiling and strapping of unused cores;

(g) unscheduled joints;

(h) marker blocks, marker tape, identification tags, sleeves and the like;

(i) twisting and snaking;

(j) preparation and supply of record drawings;

(k) service connections and commissioning;

(l) additional protection and support;

(m) site records and colour coding.

Cable Supplied by the Overseeing Organisation

14 (05/01) The items for cable supplied by the Overseeing Organisation shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) loading, transporting from store, unloading and positioning for installation or re-installation;

(b) replacing items damaged during the foregoing operations;

(c) cable (as this Series paragraph 13);

(d) modification and new materials.

Duct

15 (05/01) The items for duct shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) cutting, laying, jointing and bedding;

(b) supports to vertical and horizontal ducts;

(c) recording, staking and labelling;

(d) fixing draw ropes, removable stoppers, marker blocks and posts;

(e) schedules;

(f) lubricants, packing, grouting and caulking;

(g) surveys and recordings;

(h) protective system (as Series 1900 paragraph 4).

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Cable Joints and Terminations

Units

16 (05/01) The unit of measurement shall be:

(i) cable joints, cable terminations ..... number.

Measurement

17 (05/01) Cable joints shall be measured only where they are required specifically by the Contract. Unscheduled cable joints in running lengths shall not be measured.

Itemisation

18 (05/01) Separate items shall be provided for cable joints and cable terminations in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Cable joint.
	2	Cable termination.
II	1	Different types.
III	1	Different sizes.

Cable Joints and Cable Terminations

19 (05/01) The items for cable joints and cable terminations shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) preparing, stripping and cleaning ends;

(b) connectors, glands, clamps, sleeves, cleats, tags and terminal blocks;

(c) connecting conductors to terminals;

(d) removing “knock outs” and drilling backboard;

(e) insulating ends of unused conductors;

(f) bonding;

(g) jointing kits;

(h) numbering and lettering;

(i) complying with wiring regulations and earthing (other than earth electrodes);

(j) protection, curing and support of cable joints and keeping the cable joint free of moisture;

(k) markers;

(l) additional excavation in any material (as Series 600 paragraphs 17, 18, 19 and 23);

(m) disposal of material (as Series 600 paragraph 39);

(n) links and jumper leads;

(o) building out;

(p) site records.

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Feeder Pillars

Units

20 (05/01) The unit of measurement shall be:

(i) feeder pillar ..... number.

Itemisation

21 (05/01) Separate items shall be provided for feeder pillars in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Each type of feeder pillar.
II	1	Supplied by Overseeing Organisation.

Feeder Pillars

22 (05/01) The items for feeder pillars shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(b) excavation of unacceptable material (as Series 600 paragraph 19);

(c) excavation in Hard Material (as Series 600 paragraph 23);

(d) brickwork, blockwork and stonework (as Series 2400 paragraphs 4 and 8);

(e) backfilling and compaction;

(f) disposal of material (as Series 600 paragraph 39);

(g) building in or forming cable ducts in bases;

(h) concrete (as Series 1700 paragraphs 5 and 10);

(i) formwork (as Series 1700 paragraph 15);

(j) reinforcement (as Series 1700 paragraph 26);

(k) removing knock-outs, drilling or forming holes and pockets and casting in bars, sockets, base plates, plinths and anchorage assemblies;

(l) footways and paved areas (as Series 1100 paragraph 21);

(m) adhesives and epoxy or polyester mortar, bedding mortar or grout;

(n) backboards, fixings, protective caps, sealing, grommets, spacers, mounting plates and strips;

(o) complying with wiring regulations and earthing (other than earth electrodes);

(p) conduit including screwed and threaded connections, bends, tees and the like and draw wires;

(q) electrical equipment, batteries, colour coding, wiring and making connections, excluding electricity supplier's connection;

(r) threading cable through ducts, sleeves, conduit and the like;

(s) doors, locks and keys;

(t) protective system (as Series 1900 paragraph 4);

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(u) notices, labelling, recording numbering and lettering;

(v) in the case of equipment supplied by the Overseeing Organisation, loading, transporting from store, unloading and positioning for installation or re-installation and replacing items damaged during the foregoing operations;

(w) filling, bedding and sealing;

(x) cleaners, solvents and dessicants;

(y) preparation and supply of record drawings;

(z) service connections and commissioning.

Feeder Pillars Supplied by the Overseeing Organisation

23 (05/01) The items for feeder pillars supplied by the Overseeing Organisation shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) loading, transporting from store, unloading and positioning for installation or re-installation;

(b) replacing items damaged during the foregoing operations;

(c) modification and new materials;

(d) feeder pillars (as this Series paragraph 22).

Earth Electrodes

Units

24 (05/01) The unit of measurement shall be:

(i) earth electrodes ..... number.

Measurement

25 (05/01) The measurement of earth electrodes shall be the complete installation including conduit and cable between the structure, nearest Lit Sign Unit or lighting unit and the earth electrode.

Itemisation

26 (05/01) Separate items shall be provided for earth electrodes in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Different types and sizes of earth electrodes.

Earth Electrodes

27 (05/01) The items for earth electrodes shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(b) excavation of unacceptable material (as Series 600 paragraph 19);

(c) excavation in Hard Material (as Series 600 paragraph 23);

(d) backfilling and compaction;

(e) disposal of material (as Series 600 paragraph 39);

(f) in situ concrete (as Series 1700 paragraph 5);

(g) formwork (as Series 1700 paragraph 15);

(h) driving;

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(i) clamps, cables and making connections;

(j) reinforcement (as Series 1700 paragraph 26);

(k) covers, frames, seating and bedding;

(l) earthing rods including pressure plates, glands and clamps;

(m) conductor cable including preparing, stripping and cleaning ends and connections;

(n) conduit including all purpose-made screwed and threaded connections, bends, tees and the like and draw wires;

(o) threading cable through ducts, sleeves, conduit and the like;

(p) complying with wiring regulations;

(q) markers, notices and recording;

(r) preparation and supply of record drawings.

Chambers

Units

28 (05/01) The unit of measurement shall be:

(i) chambers ..... number.

Measurement

29 (05/01) The measurement shall be of the complete chamber.

30 (05/01) Depths of chambers shall be the distance between the top surfaces of the cover and the uppermost surface of the base slab. Where no base slab is required the depth shall be taken to the bottom of the excavation.

Itemisation

31 (05/01) Separate items shall be provided for chambers in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Chambers.
II	1	Specified design groups.
	2	Particular designs stated in the contract.
III	1	Depths not exceeding 1 metre.
	2	Depths exceeding 1 metre but not exceeding 2 metres and so on in steps of 1 metre.
IV	1	Different types of covers or gratings.

Chambers

Item coverage

32 (05/01) The items for chambers shall in accordance with the Preambles to Bill of Quantities General Directions include for:

(a) chambers (as Series 500 paragraph 37).

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Remove from Store and Re-erect Feeder Pillars (05/05)

Units

33 The unit of measurement shall be:

(i) remove from store and re-erect feeder pillar …… number.

Itemisation

34 Separate items shall be provided for remove from store and re-erect feeder pillars in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Remove from store and re-erect feeder pillars.
II	1	Different types.

Remove from Store and Re-erect Feeder Pillars

35 The items for remove from store and re-erect feeder pillars shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) loading, transporting from store unloading and positioning for re erecting;

(b) replacing items damaged during the foregoing operations;

(c) modification and new materials;

(d) feeder pillars (as this Series paragraph 22).

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Series 1500: Motorway Communications

Locating Buried Communications Cable

Units

1 The unit of measurement shall be:

(i) locating buried communications cable ... linear metre.

Measurement

2 (05/01) The measurement shall be the length of the buried communications cable located (as this Series paragraph 10 for the measurement of cable).

Itemisation

3 (05/01) Separate items shall be provided for locating buried communications cable in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Locating buried communications cable.
II	1	In carriageways, footways, bridge decks and paved areas.
	2	In verges and central reserves.
	3	In side slopes of cuttings or side slopes of embankments.

Locating Buried Communications Cable

4 (05/01) The items for locating buried communications cable shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) marking the cable runs on the ground;

(b) location system and removal;

(c) maintaining location system;

(d) proving insulation integrity and supplying results to the Overseeing Organisation;

(e) trial pits (as Series 600 paragraph 169).

Trench for Communications Cable or Duct (05/01)

Units

5 (05/01) The unit of measurement shall be:

(i) trench for communications cable ..... linear metre.

(ii) trench for communications duct ..... linear metre.

Measurement

6 (05/01) The measurement of trench for communications cable or duct shall be the summation of the distance along the centre line of the route between the following points:

(a) face of foundation to cabinet, post, road lighting column, lit sign unit, feeder pillar, electricity supply point and the like;

(b) the intersection of the centre line at junctions;

(c) the position of terminations shown in the Contract;

(d) the internal faces of chambers;

(e) the point of change of stage depth.

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The measurement of trench for communications cable or duct shall be measured once only irrespective of the number of cables or ducts in the trench. The depth of cable or duct trenches shall be the vertical measurement between the underside of the bedding, or if no bedding is specified the underside of the cable or duct, and the Earthworks Outline.

Itemisation

7 (05/01) Separate items shall be provided for trench for communications cable or duct in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Trench for communications cable.
	2	Trench for communications duct.
II	1	Different widths of trench.
III	1	Trench depth not exceeding 1.5 metres.
	2	Trench depth exceeding 1.5 metres but not exceeding 2.0 metres and so on in steps of 0.5 metres.
IV	1	In carriageways, footways and paved areas.
	2	In verges and central reserves.
	3	In side slopes of cuttings or side slopes of embankments.

Trench for Communications Cable or Duct (05/01)

8 (05/01) The items for trench for communications cable or duct shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(b) excavation of unacceptable material (as Series 600 paragraph 19);

(c) excavation in Hard Material (as Series 600 paragraph 23);

(d) additional depth of excavation to maintain specified cover at obstructions;

(e) additional excavation to accommodate extra lengths of cable;

(f) locating, working around and supporting pipes, cables, services, apparatus and the like;

(g) trimming, levelling and compacting;

(h) cable bedding and covering;

(i) duct bedding, haunching and surrounding;

(j) formwork (as Series 1700 paragraph 15);

(k) movement joints to beds, surrounds and the like;

(l) backfilling and compaction;

(m) troughing, lids, access points and bedding;

(n) disposal of material (as Series 600 paragraph 39);

(o) marking tape or cable covers;

(p) reinstatement of surfaces;

(q) site records.

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Communications Cable and Communications Duct (05/01)

Units

9 (05/01) The unit of measurement shall be:

(i) communications cable ..... linear metre.

(ii) communications duct ..... linear metre.

Measurement

10 (05/01) The measurement of communications cable shall be the summation of the individual lengths along the centre line of the route of the cable between the points of cable termination within each item of equipment.

Points of cable termination shall be:

(a) in the case of loop detector feeders - the point at which the cable enters the terminal block;

(b) in all other cases - the point at which the cables enter the boxes, distributors and the like.

11 (05/01) The measurement of communications duct shall be for the complete construction irrespective of the number of ducts contained within any one trench.

Where more than one communications duct is laid in a trench then the number of ducts shall be stated in the item description.

Itemisation

12 (05/05) Separate items shall be provided for communications cable and duct in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Communications cable.
	2	Communications duct.
II	1	Different types and sizes of cable.
	2	Different internal diameters of ducts.
III	1	Specified design groups.
	2	Particular design stated in the contract.
IV	1	Stated number of ducts in trench.
V	1	In trench depth not exceeding 1.5 metres.
	2	In trench depth exceeding 1.5 metres but not exceeding 2.0 metres and so on in steps of 0.5 metres.
VI	1	In duct.
	2	Fixed above ground.
VII	1	In side slopes of cuttings or side slopes of embankments.
VIII	1	Supplied by the Overseeing Organisation.

Communications Cable

13 (02/03) The items for communications cable shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) extra length of cable required for connection into a unit, future retermination, and tying in;

(b) unsealing, clearing and swabbing out ducts, cable lubrication, duct bellmouths, cable chutes, drawing cables through, replacing draw cords, plugging and sealing duct ends and marking;

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(c) intermediate supports and fixing devices where cables leave trench and prior to entry into equipment;

(d) provision of buried loops;

(e) sealing to cable ends;

(f) cutting, tying together, sealing, coiling and strapping of unused cores;

(g) unscheduled joints;

(h) marker blocks, marker tape, identification tags, sleeves, labels and the like;

(i) twisting and snaking;

(j) service connections;

(k) additional protection and support;

(l) notification of lengths and provision of schedule of lengths and locations;

(m) in the case of gantries - conduits, trunking and cable trays;

(n) colour coding;

(o) supports to vertical and horizontal communication cables;

(p) cable management in chamber;

(q) electricity supply until handover.

Communications Cable Supplied by the Overseeing Organisation

14 (02/03) The items for communications cable supplied by the Overseeing Organisation shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) provision and maintenance of bulk purchase requirement profile;

(b) examination at the delivery point;

(c) arranging for delivery, unloading, secure storage and positioning for installation or re-installation;

(d) replacing items damaged during the foregoing operations;

(e) modification and new materials;

(f) maintaining record of bulk purchased equipment;

(g) communications cable (as this Series paragraph 13);

(h) keeping and maintaining cable drum register;

(i) arranging for and recording of empty cable drum collection;

(j) arranging for and recording of collection of all surplus unused bulk purchased cable;

(k) taking precautions to minimise wastage.

Communications Duct

15 (05/01) The items for communications duct shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) cutting, laying, jointing and bedding;

(b) supports to vertical and horizontal communication ducts;

(c) recording, staking and labelling;

(d) fixing draw ropes, removable stoppers, marker blocks and posts;

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(e) schedules;

(f) lubricants, packing, grouting and caulking;

(g) surveys and recordings;

(h) protective system (as Series 1900 paragraph 4);

(i) plugs and grommets.

Communications Cable Joints and Terminations

Units

16 (05/01) The unit of measurement shall be:

(i) communications cable joints, communications cable terminations ..... number.

Measurement

17 (05/01) Communications cable joints and communications cable terminations shall be measured only where they are required specifically by the Contract. Unscheduled communications cable joints in running lengths shall not be measured.

Itemisation

18 (05/01) Separate items shall be provided for communications cable joints and communications cable terminations in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Communications cable joint.
	2	Communications cable termination.
II	1	Different types.
III	1	Different sizes.

Communications Cable Joints and Communications Cable Terminations

Item coverage

19 (05/01) The items for communications cable joints and communications cable terminations shall in accordance with the Preambles to Bill of Quantities General Directions include for:

(a) preparing, stripping and cleaning ends;

(b) connectors, glands, clamps, sleeves, cleats, tags and terminal blocks;

(c) connecting conductors to terminals;

(d) removing 'knock outs"and drilling backboard;

(e) insulating ends of unused conductors;

(f) bonding;

(g) jointing kits;

(h) numbering and lettering;

(i) complying with wiring regulations and earthing (other than earth electrodes);

(j) protection, curing and support of cable joints and keeping the cable joint free of moisture;

(k) markers;

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(l) additional excavation in any material (as Series 600 paragraphs 17, 18, 19 and 23);

(m) links and jumper leads;

(n) building out;

(o) disposal of material (as Series 600 paragraph 39).

Communications Equipment

Units

20 (05/01) The unit of measurement shall be:

(i) communications equipment ..... number.

Itemisation

21 (05/01) Separate items shall be provided for communications equipment in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Communications equipment.
II	1	Different types.
III	1	Different sizes.
IV	1	Different locations.
V	1	Supplied by Overseeing Organisation.

Communications Equipment

22 (02/03) The items for communications equipment shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(b) excavation of unacceptable material (as Series 600 paragraph 19);

(c) excavation in Hard Material (as Series 600 paragraph 23);

(d) brickwork, blockwork and stonework (as Series 2400 paragraphs 4 and 8);

(e) backfilling and compaction;

(f) disposal of material (as Series 600 paragraph 39);

(g) building in or forming cable ducts in bases;

(h) formwork (as Series 1700 paragraph 15);

(i) reinforcement (as Series 1700 paragraph 26);

(j) concrete (as Series 1700 paragraphs 5 and 10);

(k) removing knock-outs, drilling or forming holes and pockets and casting in bars, sockets, base plates, plinths, anchorage assemblies, posts and the like including grouting;

(l) footways and paved areas (as Series 1100 paragraph 21);

(m) adhesives and epoxy or polyester mortar, bedding mortar or grout;

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(n) backboards, fixings, protective caps, sealing, grommets, spacers, bushes, mounting plates and neoprene strips;

(o) complying with wiring regulations and earthing (other than earth electrodes);

(p) conduit including screwed and threaded connections, bends, tees and the like and draw wires;

(q) electrical equipment, batteries, colour coding, wiring and making connections, excluding electricity supplier's connections;

(r) threading cable through ducts, sleeves, conduits and the like;

(s) doors, locks and keys;

(t) protective system (as Series 1900 paragraph 4);

(u) notices, labelling, numbering and lettering;

(v) filling, bedding and sealing;

(w) alignment and sighting;

(x) cleaners, solvents and dessicants;

(y) preparation and supply of record drawings;

(z) additional protection and support;

(aa) service connections and commissioning;

(bb) electricity supply until handover.

Communications Equipment Supplied by the Overseeing Organisation

23 (02/03) The items for communications equipment supplied by the Overseeing Organisation shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) provision and maintenance of bulk purchase requirement profile;

(b) examination at the delivery point;

(c) arranging for delivery, unloading, secure storage and positioning for installation or re-installation;

(d) taking delivery of keys and returning on completion;

(e) replacing items damaged during the foregoing operations;

(f) modifications and new materials;

(g) maintaining record of bulk purchased equipment;

(h) communications equipment (as this Series paragraph 22);

(i) arranging for and recording of collection of all unused bulk purchased equipment.

Remove from Store and Re-install Communications Cabling and Equipment

Units

24 (05/01) The units of measurement shall be:

(i) cable ..... linear metre.

(ii) cabinets, posts, brackets, signal indicators and the like .....number.

(iii) shelves, racking, frames and the like ..... number.

(iv) electronic units and the like ..... number.

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Measurement

25 (05/01) Re-installed cables shall be measured in accordance with this Series paragraph 10.

Itemisation

26 (05/01) Separate items shall be provided for remove from store and re-install communications cabling and equipment in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Remove from store and re-install cable.
	2	Remove from store and re-install cabinets, posts, brackets, signal indicators and the like.
	3	Remove from store and re-install shelves, racking, frames and the like.
	4	Remove from store and re-install electronic units and the like.
II	1	Different types.
III	1	Different sizes.

Remove from Store and Re-install Communications Cabling and Equipment

27 (05/01) The items for remove from store and re-install communications cabling and equipment shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) loading, transporting from store, unloading and positioning for re-installation;

(b) replacing items damaged during the foregoing operations;

(c) modification and new materials;

(d) communications cables (as this Series paragraph 13);

(e) service ducts (as Series 500 paragraph 16);

(f) communications cable joints and communications cable terminations (as this Series paragraph 19);

(g) communications equipment (as this Series paragraph 22).

Loop Detector Installations

Units

28 (05/01) The unit of measurement shall be:

(i) loop detector installations ..... number.

Measurement

29 (05/01) The measurement of loop detector installations shall be the complete installation from the joint with the feeder cable including the chamber box or pit within which the joint is located.

The joint of the feeder cable to the loop cable shall be measured in accordance with paragraph 17.

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Itemisation

30 (05/01) Separate items shall be provided for loop detector installations in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Loop detector installations.
II	1	Different types.
III	1	Different sizes.
IV	1	Different locations.

Loop Detector Installations

31 (05/01) The items for loop detector installations shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(b) excavation of unacceptable material (as Series 600 paragraph 19);

(c) excavation in Hard Material (as Series 600 paragraph 23);

(d) disposal of material (as Series 600 paragraph 39);

(e) marking out, cutting or forming slots, drying, damming, backfilling, cleaning and sealing;

(f) chambers, boxes and pits (as Series 500 paragraph 37);

(g) ducts (as Series 500 paragraph 16);

(h) building in ends of ducts;

(i) forming drainage holes;

(j) supports and foundations to cables;

(k) communications cable (as this Series paragraph 13);

(l) in situ concrete (as Series 1700 paragraph 5);

(m) formwork (as Series 1700 paragraph 15);

(n) complying with wiring regulations and earthing (other than earth electrodes);

(o) reinstatement of surfaces;

(p) dowels and wedges;

(q) anchor plates.

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Site Records

Units

32 (05/01) The unit of measurement shall be:

(i) site records ..... item.

Itemisation

33 (05/01) Separate items shall be provided for site records in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Site records.

Site Records

34 (05/01) The items for site records shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) preparing site records and submitting to the Overseeing Organisation;

(b) site measurements and surveying.

Stage 2 Commissioning of Cable

Units

35 (05/01) The unit of measurement shall be:

(i) Stage 2 commissioning of communications cable ..... item.

(ii) Stage 2 commissioning of power cable ..... item.

Measurement

36 (05/01) The measurement shall be the number of Stage 2 commissionings accepted by the Overseeing Organisation.

Itemisation

37 (05/01) Separate items shall be provided for Stage 2 commissioning of communications cable and Stage 2 commissioning of power cable in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Stage 2 commissioning.
II	1	Communications cable.
	2	Power cable.
III	1	Each section.

Stage 2 Commissioning of Cable

38 (05/01) The items for Stage 2 commissioning of communications cable and Stage 2 commissioning of power cable shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) setting up equipment;

(b) taking readings, measurement and observations of the performance of the cabling, recording and supplying 3 copies of the commissioning record to the Overseeing Organisation.

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Modification to Existing Communications Equipment

Units

39 (05/01) The unit of measurement shall be:

(i) Modification to existing communications equipment ..... item.

Itemisation

40 (05/01) Separate items shall be provided for modifications to existing communication equipment in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Modification to existing communications equipment.
II	1	Different types.
III	1	Different sizes.

Modifications to Existing Communications Equipment

41 (05/01) The items for modification to existing communications equipment shall in accordance with the Preamble to Bill of Quantities General Directions include for:

Item Coverage

(a) new materials;

(b) communication equipment (as this Series paragraph 22);

(c) communications cables (as this Series paragraph 13);

(d) service ducts (as Series 500 paragraph 16);

(e) communications cable joints and communications cable terminations (as this Series paragraph 19).

Chambers

Units

42 (05/01) The unit of measurement shall be:

(i) chambers ..... number.

Measurement

43 (05/01) The measurement shall be of the complete chamber.

44 (05/01) Depths of chambers shall be the distance between the top surfaces of the cover and the uppermost surface of the base slab. Where no base slab is required the depth shall be taken to the bottom of the excavation.

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Itemisation

45 (05/01) Separate items shall be provided for chambers in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Chambers.
II	1	Specified design groups.
	2	Particular designs stated in the contract.
III	1	Depths not exceeding 1 metre.
	2	Depths exceeding 1 metre but not exceeding 2 metres and so on in steps of 1 metre.
IV	1	Different types of covers or gratings.

Chambers

46 (05/01) The items for chambers shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) chambers (as Series 500 paragraph 37);

(b) markers, labelling, numbering, lettering and referencing system.

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Series 1600: Piling and Embedded Retaining Walls

Piling Plant

Units

1 The units of measurement shall be:

(i) establishment of piling plant ..... item.

(ii) moving piling plant ..... number.

Measurement

2 The establishment of piling plant shall be measured once only to each structure. Any additional establishment of piling plant to suit the Contractor's method of working shall not be measured. The measurement of moving piling plant shall be measured once only to each pile.

3 Moving of piling plant shall not be measured for steel sheet piling.

Itemisation

4 Separate items shall be provided for piling plant in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Establishment of piling plant.
	2	Moving piling plant.
II	1	Precast concrete piles.
	2	Bored cast-in-place piles.
	3	Driven cast-in-place piles.
	4	Steel bearing piles.
	5	Steel sheet piles.
III	1	Different types.
IV	1	Different cross-sections.
V	1	Preliminary piling as a separate operation in advance of the main piling.
	2	Main piling.
VI	1	Different locations.

Establishment of Piling Plant

5 The items for the establishment of piling plant shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) bringing plant and equipment to the site of the structure;

(b) erecting and setting up plant and equipment including site preparation, levelling and access ramps;

(c) dismantling and removing plant and equipment from Site on completion.

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Moving Piling Plant

6 The items for moving piling plant shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) moving and setting up plant and equipment at each pile position including site preparation, levelling and access ramps.

Precast Concrete Piles

Units

7 The units of measurement shall be:

(i) precast concrete piles, driving, lengthening, driving lengthened piles ..... linear metre.

(ii) stripping precast concrete pile heads ..... number.

Measurement

8 The measurement of precast concrete piles shall be the lengths required by the Contract. The jointing of segmental piles shall not be measured.

9 The measurement of driving precast concrete piles shall be the length of each pile measured along the axis from the toe to:

(a) the Existing Ground Level or the level of the underside of the pile cap or ground beam (ignoring any blinding layer) whichever is the lower, provided that where a particular level is specified from which driving shall commence then the measurement shall be to that specified level; or

(b) the site joint of piles to be lengthened, provided that the site joint after completion of the driving is below the level determined in accordance with the preceding sub-paragraph.

10 The measurement of lengthening precast concrete piles shall be the lengths of the added concrete ordered by the Overseeing Organisation.

The measurement of lengthening precast segmental piles shall be the length of the added segment ordered by the Overseeing Organisation.

11 The measurement of driving lengthened precast concrete piles shall be the length from the site joint to the level determined in accordance with sub-paragraph 9(a) above.

12 The length classification for those items listed in sub-paragraph 7(i) above shall be based on the appropriate measured lengths determined in accordance with paragraphs 8 to 11 above inclusive.

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Itemisation

13 Separate items shall be provided for precast concrete piles in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Precast concrete piles.
II	1	Driving precast concrete piles.
	2	Lengthening precast concrete piles.
	3	Driving lengthened precast concrete piles.
	4	Stripping pile heads.
III	1	Vertical.
	2	Raking.
IV	1	Different types.
V	1	Different materials.
VI	1	Different cross-sections.
VII	1	Piles not exceeding 5 metres in length.
	2	Piles exceeding 5 metres in length but not exceeding 10 metres and so on in steps of 5 metres.
VIII	1	Preliminary piling as a separate operation in advance of the main piling.
	2	Main piling.

Precast Concrete Piles

14 (05/01) The items for precast concrete piles shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) design;

(b) certificates;

(c) provision of data and drawings;

(d) resubmissions and modifications;

(e) amendments to the Works;

(f) precast members, and the like (as Series 1700 paragraph 10);

(g) pile shoes, tapered points, prefabricated joints and joint fitments;

(h) measures for reduction of friction.

Driving Precast Concrete Piles

15 The items for driving precast concrete piles shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) pre-boring or jetting;

(b) handling, pitching and driving to a set or level;

(c) taking observations and compiling the record of each pile and supplying one copy to the Overseeing Organisation;

(d) moving plant and equipment back and redriving risen piles.

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Lengthening Precast Concrete Piles

16 (05/01) The items for lengthening precast concrete piles shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) design;
(b) certificates;
(c) provision of data and drawings;
(d) resubmissions and modifications;
(e) amendments to the Works;
(f) stripping concrete;
(g) forming connection with the old work including splicing, tying, connecting or welding reinforcement;
(h) in situ concrete (as Series 1700 paragraph 5);
(i) formwork (as Series 1700 paragraph 15);
(j) reinforcement (as Series 1700 paragraph 26);
(k) precast members and the like (as Series 1700 paragraph 10), joints and fitments;
(l) lost time, moving plant and equipment, standing time and disruption caused by the process of lengthening including waiting for concrete to achieve a specified strength.

Driving Lengthened Precast Concrete Piles

17 The items for driving lengthened precast concrete piles shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) driving to a set or level;
(b) taking observations and compiling the record of each pile and supplying one copy to the Overseeing Organisation;
(c) moving plant and equipment back and driving lengthened piles;
(d) moving plant and equipment back and redriving risen piles.

Stripping Precast Concrete Pile Heads

18 (05/01) The items for stripping precast concrete pile heads shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) cutting off, removing and disposing of surplus;
(b) exposing reinforcement;
(c) bending projecting reinforcement.

Cast-in-place Piles

Units

19 The units of measurement shall be:

(i) pile shafts, empty bores ..... linear metre.
(ii) enlarged bases ..... number.

Measurement

20 The measurement of pile shafts shall be the length of the pile measured along the axis from the toe of the shoe or the bottom of the excavation, including any enlarged base, whichever is appropriate to the specified finished level of the concrete pile head.

Where an empty bore is specified above a pile shaft, the length classification of the pile shaft shall be based on the overall bored or driven depth including the empty bore.

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21 Empty bores shall only be measured where a particular level is specified from which boring or driving shall commence and shall be the length of empty bore or drive measured from the specified finished level of the concrete pile head, to that particular commencing level.

Itemisation

22 Separate items shall be provided for cast-in-place piles in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Pile shafts.
	2	Empty bores.
	3	Enlarged bases.
II	1	Vertical.
	2	Raking.
III	1	Different types.
IV	1	Different materials.
V	1	Different cross-sections.
VI	1	Pile shafts not exceeding 5 metres in length.
	2	Pile shafts exceeding 5 metres in length but not exceeding 10 metres and so on in steps of 5 metres.
VII	1	Preliminary piling as a separate operation in advance of the main piling.
	2	Main piling.

Pile Shafts and Empty Bores

23 (05/01) The items for pile shafts and empty bores shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) pre-boring or jetting;

(b) casing or lining;

(c) boring or augering to a given level and removing and disposing of surplus material;

(d) driving to a given set or level with or without pile shoe;

(e) excavation, removal, and disposal of material (as Series 600 paragraphs 17, 18, 19, 23 and 39);

(f) support fluid and disposal;

(g) protection for personnel, and apparatus for entering the empty bore for the inspection of pile excavation or inside of pile casing;

(h) taking observations and maintaining the boring or driving record and concreting or grouting record of each pile and supplying one copy to the Overseeing Organisation;

(i) precautions to prevent ingress of surface water and foreign matter;

(j) in situ concrete and precast members, and the like (as Series 1700 paragraphs 5 and 10) and stripping concrete to required level and exposing reinforcement;

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(k) taking undisturbed soil samples from the bore at any level;

(l) filling of empty bore and around the top of piles and subsequent removal and disposal;

(m) systems for monitoring construction of the piles;

(n) measures for reduction of friction.

Enlarged Bases

24 (05/01) The item for enlarged bases shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation, including under-reaming, removal and disposal of material (as Series 600 paragraphs 17, 18, 19, 23 and 39);

(b) in situ concrete (as Series 1700 paragraph 5);

(c) taking measures required because of the presence of water.

Reinforcement for Cast-in-place Piles

Units

25 The unit of measurement shall be:

(i) bar and helical reinforcement ..... tonne.

Measurement

26 The mass of plain bar reinforcement to cast-in-place piles shall be calculated on the basis that the nominal density of steel is 0.00785 kilogrammes per square millimetre of cross-sectional area per linear metre; the mass of deformed bar reinforcement shall be calculated on the basis of the nominal rolling mass of the reinforcement.

Itemisation

27 Separate items shall be provided for reinforcement for cast-in-place piles in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Bar reinforcement.
	2	Helical reinforcement.
II	1	Nominal size 16 millimetres and under.
	2	Nominal size 20 millimetres and over.
III	1	Different types and grades of steel.
IV	1	Bars not exceeding 12 metres in length.
	2	Bars exceeding 12 metres in length but not exceeding 13.5 metres and so on in steps of 1.5 metres.

Reinforcement for Cast-in-place Piles

28 (05/01) The items for reinforcement for cast-in-place piles shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) reinforcement (as Series 1700 paragraph 26);

(b) bending projecting reinforcement.

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Steel Bearing Piles

Units

29 The units of measurement shall be:

(i) steel bearing piles, driving, lengthening pieces, driving lengthened steel bearing piles ..... linear metre.

(ii) welding on lengthening pieces ..... number.

(iii) cutting or burning off surplus ..... number.

Measurement

30 The measurement of steel bearing piles shall be the length required by the Contract.

31 The measurement of driving steel bearing piles shall be the length of the pile measured along the axis from the toe to:

(a) the Existing Ground Level or the level of the underside of the pile cap or ground beam (ignoring any blinding layer) whichever is the lower, provided that where a particular level is specified from which driving shall commence then the measurement shall be to that specified level; or

(b) the site joint of piles to be lengthened, provided that the site joint after completion of the driving is below the level determined in accordance with the preceding sub-paragraph.

32 The measurement of lengthening pieces for steel bearing piles shall be the additional length ordered by the Overseeing Organisation.

33 The measurement of driving lengthened steel bearing piles shall be the length from the site joint to the level determined in accordance with sub-paragraph 31(a) above.

34 The length classification for those items listed in sub-paragraph 29(i) above shall be based on the appropriate measured lengths determined in accordance with paragraphs 30 to 33 above inclusive.

Itemisation

35 Separate items shall be provided for steel bearing piles in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Steel bearing piles.
	2	Lengthening pieces for steel bearing piles.
II	1	Driving steel bearing piles.
	2	Driving lengthened steel bearing piles.
	3	Welding on lengthening pieces.
	4	Cutting or burning off surplus.
III	1	Vertical.
	2	Raking.
IV	1	Different types.
V	1	Piles not exceeding 5 metres in length.
	2	Piles exceeding 5 metres in length but not exceeding 10 metres and so on in steps of 5 metres.
VI	1	Preliminary piling as a separate operation in advance of the main piling.
	2	Main piling.

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Steel Bearing Piles and Lengthening Pieces for Steel Bearing Piles

36 The items for steel bearing piles and lengthening pieces for steel bearing piles shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) fabrication (as Series 1800 paragraph 6) and slinging holes;

(b) protective system (as Series 1900 paragraph 4);

(c) measures for reduction of friction.

Driving Steel Bearing Piles and Driving Lengthened Steel Bearing Piles

37 The items for driving steel bearing piles and driving lengthened steel bearing piles shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) pre-boring or jetting;

(b) handling, pitching and driving to a set, level or penetration;

(c) taking observations and compiling the record of each pile and supplying one copy to the Overseeing Organisation;

(d) moving plant and equipment back and redriving risen piles.

Welding on Lengthening Pieces

38 (05/01) The items for welding on lengthening pieces shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) stripping protective system and preparing the head of the driven pile

to receive additional length;

(b) cleaning the affected area and applying protective system;

(c) lost time, moving plant and equipment, standing time and disruption caused by the process of lengthening;

(d) inspection of welds.

Cutting or Burning off Surplus

39 (05/01) The items for cutting or burning off surplus shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) achieving profile;

(b) cleaning the affected area and applying protective system;

(c) disposal of material (as Series 600 paragraph 39).

Proof Loading of Piles

Units

40 The units of measurement shall be:

(i) establishment of proof loading equipment ..... item.

(ii) proof loading of piles ..... number.

Measurement

41 The establishment of proof loading equipment shall be measured once only to each structure. Any additional establishment of proof loading equipment to suit the Contractor's method of working shall not be measured.

Measurement of proof loading of piles shall be the number required by the Contract.

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Itemisation

42 Separate items shall be provided for proof loading of piles in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Establishment of proof loading equipment.
	2	Proof loading of piles.
II	1	Piles of different types.
III	1	Preliminary piles.
	2	Main piles.
IV	1	Maintained load.
	2	Constant rate load.
	3	Dynamic load.
V	1	Vertical.
	2	Raking.

Establishment of Proof Loading Equipment

43 The items for establishment of proof loading equipment shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) bringing plant and equipment to the site of each structure;

(b) erecting and setting up plant and equipment including site preparation, levelling and access ramps;

(c) dismantling and removing plant and equipment from the Site on completion.

Proof Loading of Piles

44 (05/01) The items for proof loading of piles shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) setting up rigs, kentledge, cable anchorages, anchor piles, reference bench marks and the like;

(b) moving and setting up plant and equipment at each position including site preparation, levelling and access ramps;

(c) setting up, operating and maintaining instruments and apparatus;

(d) constructing temporary pile caps and subsequent removal;

(e) applying and re-applying the proof load and releasing;

(f) taking readings, measurements and observations;

(g) preparation and supply of record sheets.

Steel Sheet Piles

Units

45 The units of measurement shall be:

(i) steel sheet piling, driving, lengthening pieces, driving lengthened steel sheet piling ..... square metre.

(ii) corner, junction, special steel sheet piles ..... linear metre. Measured extra over steel sheet piling.

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(iii) lengthening pieces to corner, junction, special steel sheet piles ..... linear metre.
Measured extra over lengthening pieces to steel sheet piling.

(iv) driving corner, junction, special steel sheet piles ..... linear metre.
Measured extra over driving steel sheet piling.

(v) driving lengthened corner, junction, special steel sheet piles ..... linear metre.
Measured extra over driving lengthened steel sheet piling.

(vi) welding on lengthening pieces ..... linear metre.

(vii) cutting or burning off surplus ..... linear metre.

(viii) walings, ties ..... tonne.

Measurement

46 The measurement of steel sheet piling shall be the plane (undeveloped) horizontal length along the centre line of the piling multiplied by the pile length as required by the Contract.

47 The measurement for driving steel sheet piling shall be the plane (undeveloped) horizontal length along the centre line of the piling multiplied by the depth from the toe to:

(a) the Existing Ground Level, provided that where a particular level is specified from which driving shall commence then the measurement shall be to that specified level; or

(b) the site joint of piles to be lengthened provided that the site joint after completion of the driving is below the level determined in accordance with the preceding sub-paragraph.

48 The measurement of lengthening pieces to steel sheet piling shall be the plane (undeveloped) horizontal length along the centre line of the piling multiplied by the additional length ordered by the Overseeing Organisation.

49 The measurement for driving lengthened steel sheet piling shall be the plane (undeveloped) horizontal length along the centre line of the piling multiplied by the depth from the site joint to the level determined in accordance with sub-paragraph 47(a) above.

50 The length classification for those items listed in sub-paragraphs 45(i) to (v) above shall be based on the appropriate measured lengths determined in accordance with paragraphs 46 to 49 above inclusive.

51 The measurement of welding on lengthening pieces and cutting or burning off surplus shall be the plane (undeveloped) horizontal length along the centre line of the piling.

52 (05/01) The measurement of those items listed in paragraph 45(viii) shall be the computed mass of the finished member comprising plates, rolled sections, shear connectors, stiffeners, ties, cleats, packs, splice plates and all fittings, without allowance for tolerances for rolling margin and other permissible deviations from standard masses or nominal dimensions and excluding the masses of welds, couplings, turnbuckles, bolts, nuts, washers, rivets and protective coatings. No deductions shall be made for notches, cope holes, bolt and rivet holes, and the like, which are less than 0.03 square metres.

The computed mass of rolled and cast steel and cast iron shall be determined from the dimensions shown on the drawings on the following basis:

(a) rolled or cast steel, 7850 kilogrammes per cubic metre;

(b) cast iron, 7210 kilogrammes per cubic metre.

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Itemisation

53 (05/01) Separate items shall be provided for steel sheet piles in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Steel sheet piles.
	2	Corner, junction, special steel sheet piles.
	3	Lengthening pieces to steel sheet piles.
	4	Lengthening pieces to corner, junction, special steel sheet piles.
II	1	Driving.
	2	Welding on lengthening pieces.
	3	Cutting or burning off surplus.
III	1	Walings.
	2	Ties.
IV	1	Different types.
V	1	Piles not exceeding 5 metres in length.
	2	Piles exceeding 5 metres in length but not exceeding 10 metres and so on in steps of 5 metres.
VI	1	In main construction.
	2	In anchorages.

Steel Sheet Piling, Corner, Junction, Special Steel Sheet Piles and Lengthening Pieces to Steel Sheet Piling, Corner, Junctions, Special Steel Sheet Piles

54 (05/01) The items for steel sheet piling, corner, junction, special steel sheet piles and lengthening pieces to steel sheet piling, corner, junctions, special steel sheet piles shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) fabrication (as Series 1800 paragraph 6), slinging holes and tapered points;

(b) protective system (as Series 1900 paragraph 4);

(c) drainage holes and the like up to 200 mm in diameter and making good to protective system;

(d) measures for reduction of friction.

Driving Steel Sheet Piling, Corner, Junction, Special Steel Sheet Piles and Driving Lengthened Steel Sheet Piling, Corner, Junction, Special Steel Sheet Piles

55 (05/01) The items for driving steel sheet piling, corner, junction, special steel sheet piles and driving lengthened steel sheet piling, corner, junctions, special steel sheet piles shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) handling, pitching and driving to a set, level or penetration;

(b) moving and setting up plant and equipment at each pile position including site preparation or levelling;

(c) taking observations and compiling the record of the piling and supplying one copy to the Overseeing Organisation;

(d) moving plant and equipment back and redriving risen piles.

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Welding on Lengthening Pieces

56 (05/01) The items for welding on lengthening pieces shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) welding on lengthening pieces (as this Series paragraph 38).

Cutting or Burning Off Surplus

57 (05/01) The item for cutting or burning off surplus shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) cutting or burning off surplus (as this Series paragraph 39).

Walings and Ties

58 (05/01) The items for walings and ties shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) fabrication (as Series 1800 paragraph 6);

(b) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(c) excavation of unacceptable material (as Series 600 paragraph 19);

(d) excavation in Hard Material (as Series 600 paragraph 23);

(e) backfilling and compaction;

(f) disposal of material (as Series 600 paragraph 39);

(g) threading, couplings, turnbuckles and the like;

(h) protective system (as Series 1900 paragraph 4);

(i) marking and drilling piles and making good to protective system.

Embedded Retaining Wall Plant

Units

59 (05/01) The unit of measurement shall be:

(i) establishment of embedded retaining wall plant ..... item.

Measurement

60 (05/01) The establishment of embedded retaining wall plant shall be measured once only for each embedded retaining wall.

Itemisation

61 (05/01) Separate items shall be provided for embedded retaining wall plant in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Establishment of embedded retaining wall plant.
II	1	Diaphragm walls.
	2	Hard/hard secant pile walls.
	3	Hard/soft secant pile walls.
	4	Contiguous bored pile walls.
III	1	Different locations.

Establishment of Embedded Retaining Wall Plant

62 (05/01) The items for the establishment of embedded retaining wall plant shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) bringing plant and equipment to the site of the embedded retaining wall;

(b) erecting and setting up plant and equipment including site preparation, levelling and access ramps;

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(c) moving and setting up plant at each position including site preparation, levelling and access ramps;

(d) dismantling and removing plant and equipment from Site on completion;

(e) guide walls.

Diaphragm Walls

Units

63 (05/01) The unit of measurement shall be:

(i) diaphragm walls, empty excavation ..... square metre.

Measurement

64 (05/01) The measurement of the diaphragm walls shall be the area of the vertical section through the centre line of the wall as required by the Contract. All lengths of walls comprising T-shaped, L-shaped or other shaped panels in plan, shall be measured and included in the calculated area. Empty excavation shall only be measured where a particular level is specified from which excavation shall commence and shall be the area of the vertical section through the centre line of the empty excavation between the specified commencing level and the specified finished level of the top of the wall.

Itemisation

65 (05/01) Separate items shall be provided for diaphragm walls in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Diaphragm walls.
	2	Empty excavation.
II	1	Different thicknesses of walls.
III	1	Diaphragm walls 0 metres to 5 metres in depth.
	2	Diaphragm walls 0 metres to 10 metres in depth and so on in steps of 5 metres.

Diaphragm Walls and Empty Excavation

66 (05/01) The items for diaphragm walls and empty excavation shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);

(b) excavation of unacceptable material (as Series 600 paragraph 19);

(c) excavation in Hard Material (as Series 600 paragraph 23);

(d) backfilling and compaction;

(e) support fluid and disposal;

(f) in situ concrete (as Series 1700 paragraph 5);

(g) trimming concrete at top of wall;

(h) records and supplying one copy to the Overseeing Organisation;

(i) sealing;

(j) cutting chases, recesses, holes, mortices and the like;

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(k) disposal of material (as Series 600 paragraph 39);

(l) filling of empty excavation and its subsequent removal and disposal;

(m) cleaning and treatment of faces.

Secant Pile Walls

Units

67 (05/01) The unit of measurement shall be:

(i) secant pile walls, empty bores ..... square metre.

Measurement

68 (05/01) The measurement of the secant pile walls shall be the area of the vertical section through the centre line of the wall as required by the Contract. Empty bores shall only be measured where a particular level is specified from which boring shall commence and shall be the area of the vertical section through the centre line of the empty boring between the specified commencing level and specified finished level of the top of the wall.

Itemisation

69 (05/01) Separate items shall be provided for secant pile walls in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Hard/hard secant pile walls.
	2	Hard/soft secant pile walls.
	3	Empty bores.
II	1	Different diameters of piles.
	2	Different spacings and overlap of piles at commencing level.
III	1	Secant pile walls 0 metres to 5 metres in depth.
	2	Secant pile walls 0 metres to 10 metres in depth and so on in steps of 5 metres.

Hard/Hard and Hard/Soft Secant Pile Walls and Empty Bores

Item coverage

70 (05/01) The items for hard/hard and hard/soft secant pile walls and empty bores shall in accordance with the Preambles to Bill of Quantities General Directions include for:

(a) pre-boring or jetting;

(b) casing or lining;

(c) boring or augering to a given level and removing and disposing of surplus material;

(d) excavation, removal, and disposal of material (as Series 600 paragraphs 17, 18, 19, 23 and 39);

(e) support fluid and disposal;

(f) taking observations and maintaining the boring record and concreting or grouting record of each pile and supplying one copy to the Overseeing Organisation;

(g) precautions to prevent ingress of surface water and foreign matter;

(h) in situ concrete and precast members and the like (as Series 1700 paragraphs 5 and 10) and stripping concrete to required level and exposing reinforcement;

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(i) trimming concrete at top of wall;

(j) formwork (as Series 1700 paragraph 15);

(k) taking undisturbed soil samples from the bore at any level;

(l) filling of empty bore and around the top of piles and subsequent removal and disposal;

(m) systems for monitoring construction of the piles;

(n) measures for reduction of friction;

(o) cleaning and treatment of faces.

Contiguous Bored Pile Walls

Units

71 (05/01) The unit of measurement shall be:

(i) contiguous bored pile walls, empty bores ..... square metre.

Measurement

72 (05/01) The measurement of the contiguous bored pile walls shall be the area of the vertical section through the centre line of the wall as required by the Contract. Empty bores shall only be measured where a particular level is specified from which boring shall commence and shall be the area of the vertical section through the centre line of the empty boring between the specified commencing level and the specified finished level of the top of the wall.

Itemisation

73 (05/01) Separate items shall be provided for contiguous bored pile walls in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Contiguous bored pile walls.
	2	Empty bores.
II	1	Different diameters of piles.
	2	Different spacings of piles.
III	1	Contiguous bored pile walls 0 metres to 5 metres in depth.
	2	Contiguous bored pile walls 0 metres to 10 metres in depth and so on in steps of 5 metres.

Contiguous Bored Pile Walls and Empty Bores

74 (05/01) The items for contiguous bored pile walls and empty bores shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) pre-boring or jetting;

(b) casing or lining;

(c) boring or augering to a given level and removing and disposing of surplus material;

(d) excavation, removal, and disposal of material (as Series 600 paragraphs 17, 18, 19, 23 and 39);

(e) support fluid and disposal;

(f) taking observations and maintaining the boring record and concreting or grouting record of each pile and supplying one copy to the Overseeing Organisation;

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(g) precautions to prevent ingress of surface water and foreign matter;

(h) in situ concrete and precast members and the like (as Series 1700 paragraphs 5 and 10) and stripping concrete to required level and exposing reinforcement;

(i) trimming concrete at top of wall;

(j) formwork (as Series 1700 paragraph 15);

(k) taking undisturbed soil samples from the bore at any level;

(l) filling of empty bore and around the top of piles and subsequent removal and disposal;

(m) additional measures for water retention;

(n) systems for monitoring construction of the piles;

(o) measures for reduction of friction;

(p) cleaning and treatment of faces.

Reinforcement for Embedded Retaining Walls

Units

75 (05/01) The unit of measurement shall be:

(i) bar and helical reinforcement ..... tonne.

(ii) rolled sections ..... tonne.

Measurement

76 (05/01) The mass of plain bar reinforcement to embedded retaining walls shall be calculated on the basis that the nominal density of steel is 0.00785 kilogrammes per square millimetre of cross-sectional area per linear metre; the mass of deformed bar reinforcement shall be calculated on the basis of the nominal rolling mass of the reinforcement.

The mass of rolled sections shall be calculated on the basis that the density of steel is 7850 kilogrammes per cubic metre.

Itemisation

77 (05/01) Separate items shall be provided for reinforcement for embedded retaining walls in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Bar reinforcement.
	2	Helical reinforcement.
	3	Rolled sections.
II	1	Nominal size 16 millimetres and under.
	2	Nominal size 20 millimetres and over.
III	1	Different types and grade of steel.
IV	1	Bars or sections not exceeding 12 metres in length.
	2	Bars or sections exceeding 12 metres in length but not exceeding 13.5 metres and so on in steps of 1.5 metres.

Note: Group I Feature 3 Rolled Sections shall not be separately identified by any Group II Feature.

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Reinforcement for Embedded Retaining Walls

78 (05/01) The items for reinforcement for embedded retaining walls shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) reinforcement (as Series 1700 paragraph 26);

(b) bending projecting reinforcement;

(c) rolled sections (as Series 1800 paragraphs 6 and 9);

(d) guides and hole spacers.

King Post Wall Plant

Units

79 (05/01) The units of measurement shall be:

(i) establishment of piling plant for king posts ..... item.

(ii) moving piling plant for king posts ..... number.

Measurement

80 (05/01) The establishment of piling plant for king posts shall be measured once only for each king post wall.

Itemisation

81 (05/01) Separate items shall be provided for piling plant for king posts in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Establishment of piling plant for king posts.
	2	Moving piling plant for king posts.
II	1	Bored cast-in-place piles.
	2	Driven cast-in-place piles.
III	1	Different types.
IV	1	Different diameters.
V	1	Different locations.

Establishment of Piling Plant for King Posts

82 (05/01) The items for establishment of piling plant for king posts shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) establishment of piling plant (as this Series paragraph 5).

Moving Piling Plant for King Posts

83 (05/01) The items for moving piling plant for king posts shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) moving piling plant (as this Series paragraph 6).

King Posts

Units

84 (05/01) The unit of measurement shall be:

(i) king post pile shafts, empty bores ..... linear metre.

Measurement

85 (05/01) The measurement of king post pile shafts shall be the length of the pile measured along the axis from the toe of the shoe or the bottom of the excavation, whichever is appropriate, to the specified finished level of the concrete pile head.

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Where an empty bore is specified above a pile shaft, the length classification of the pile shaft shall be based on the overall bored or driven depth including the empty bore.

86 (05/01) Empty bores shall only be measured where a particular level is specified from which boring or driving shall commence and shall be the length of empty bore or drive measured from the specified finished level of the concrete pile head, to that particular commencing level.

Itemisation

87 (05/01) Separate items shall be provided for king post piles in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	King post pile shafts.
	2	King post empty bores.
II	1	Vertical.
	2	Raking.
III	1	Different types.
IV	1	Different materials.
V	1	Different cross-sections.
VI	1	King post pile shafts not exceeding 5 metres in length.
	2	King post pile shafts exceeding 5 metres in length but not exceeding 10 metres and so on in steps of 5 metres.

King Post Pile Shafts and Empty Bores

88 (05/01) The items for king post pile shafts and empty bores shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) pile shafts and empty bores (as this Series paragraph 23).

Reinforcement for King Post Piles

Units

89 (05/01) The units of measurement shall be:

(i) bar and helical reinforcement ..... tonne.

(ii) rolled section members ..... tonne.

(iii) precast concrete members ..... linear metre.

Measurement

90 (05/01) The mass of plain bar reinforcement to king post piles shall be calculated on the basis that the nominal density of steel is 0.00785 kilogrammes per square millimetre of cross-sectional area per linear metre; the mass of deformed bar reinforcement shall be calculated on the basis of the nominal rolling mass of the reinforcement.

The mass of rolled section members shall be calculated on the basis that the density of steel is 7850 kilogrammes per cubic metre.

The measurement of precast concrete members shall be the length required by the Contract.

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Itemisation

91 (05/01) Separate items shall be provided for reinforcement for king post piles in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Bar reinforcement.
	2	Helical reinforcement.
	3	Rolled section members.
	4	Precast concrete members.
II	1	Nominal size 16 millimetres and under.
	2	Nominal size 20 millimetres and over.
III	1	Different grades of steel and types of steel and concrete.
IV	1	Bars or members not exceeding 12 metres in length.
	2	Bars or members exceeding 12 metres in length but not exceeding 13.5 metres and so on in steps of 1.5 metres.

Note: Group I Features 3 and 4 shall not be separately identified by any Group II Feature.

Reinforcement for King Post Piles

92 (05/01) The items for reinforcement for king post piles shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) reinforcement (as Series 1700 paragraph 26);

(b) bending projecting reinforcement;

(c) rolled section members (as Series 1800 paragraphs 6 and 9);

(d) guides and hole spacers;

(e) precast concrete members (as Series 1700 paragraph 10).

King Post Walling

Units

93 (05/01) The unit of measurement shall be:

(i) king post walling ..... square metre.

Measurement

94 (05/01) The measurement shall be the superficial area of king post walling required by the Contract.

Itemisation

95 (05/01) Separate items shall be provided for king post walling in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	King post walling.
II	1	Different types.
III	1	Different thicknesses.

King Post Walling

96 (05/01) The items for king post walling shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) excavation, removal and disposal of material (as Series 600 paragraphs 17, 18, 19, 23 and 39);

(b) preservation of timber.

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Series 1700: Structural Concrete

1 (05/01) Surface impregnation of concrete shall be measured under Series 2000: Waterproofing for Structures.

In Situ Concrete

Units

2 (05/01) The unit of measurement shall be:

(i) in situ concrete ..... cubic metre.

Measurement

3 (05/01) No deduction shall be made for:

(a) holes, ducts, pockets, sockets, mortices and the like not exceeding 0.15 cubic metres each in volume;

(b) reinforcement;

(c) individual chamfers, splays, rebates, recesses, drips, grooves and the like of 100 mm total girth or less when measured overall the faces of the individual feature formed in the concrete;

(d) in the case of concrete with a patterned profile face, any indentations of 100 mm total girth or less when measured overall the faces of the indentations formed in the concrete;

(e) cast in components not exceeding 0.15 cubic metres each in volume.

Itemisation

4 (05/04) Separate items shall be provided for in situ concrete in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	In situ concrete.
II	1 2	Different designs. Different classes.
III	1	Blinding concrete 75 mm or less in thickness.

In Situ Concrete

5 (05/04) The items for in situ concrete shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) design;

(b) trial design;

(c) mixing, placing in or against any surface, including soil faces, compaction, finishing and unformed surface finishes;

(d) curing and protection;

(e) formwork (as this Series paragraph 15) to upper surfaces inclined at an angle of less than 15° to the horizontal;

(f) trial panels;

(g) falls, cambers, and shaped profiles;

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(h) construction joints, (whether or not shown on the Drawings) water bars and stops including formwork (as this Series paragraph 15);

(i) weep pipes, pipe sleeves and the like;

(j) holes, ducts, pockets, sockets, mortices and the like not exceeding 0.15 cubic metres each in volume including formwork (as this Series paragraph 15);

(k) formwork (as this Series paragraph 15) to edges of blinding concrete 75 mm or less in thickness;

(l) filling to overbreak and working space;

(m) measures to control alkali - silica reaction;

(n) air entrainment;

(o) facilities and assistance for the Overseeing Organisation's cover meter survey;

(p) admixtures and additives.

Precast Concrete

Definition

6 (05/01) The term "precast" applies to a concrete unit cast on Site but not in its final position, and to concrete units manufactured off the Site.

Units

7 (05/01) The units of measurement shall be:

(i) precast members, slabs, segmental units, hinges, specially moulded blocks ..... number.

(ii) precast copings, capping units, plinths and the like of uniform cross section ..... linear metre.

(iii) precast facing units ..... square metre.

Measurement

8 (05/01) The measurement of precast facing units shall be the flat undeveloped area.

The measurement of precast copings, capping units, plinths and the like shall be the measurement along the centre line.

Itemisation

9 (05/01) Separate items shall be provided for precast concrete in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Precast members, slabs, segmental units, hinges, specially moulded blocks.
	2	Precast copings, capping units and plinths.
	3	Precast facing units.
II	1	Different types.
III	1	Different sizes.
IV	1	Curved.

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Precast Members, Slabs, Segmental Units, Hinges, Specially Moulded Blocks, Copings, Capping Units, Plinths and Facing Units

Item coverage

10 (05/04) The items for precast members, slabs, segmental units, hinges, specially moulded blocks, copings, capping units, plinths and facing units shall in accordance with the Preambles to Bill of Quantities General Directions include for:

(a) design;

(b) trial design;

(c) reinforcement (as this Series paragraph 26);

(d) formwork (as this Series paragraphs 15, 16 and 21);

(e) mixing, placing in or against any surface; including soil faces, compaction finishing and unformed surface finishes;

(f) curing and protection;

(g) individual chamfers, splays, rebates, recesses, drips, grooves, and the like;

(h) holes, ducts, pockets, sockets, mortices and the like;

(i) matching members;

(j) marking members for identification and delivery in matching sequence;

(k) lifting devices including removal and bearing plates;

(l) temporary bracing or stays to prevent displacement;

(m) trial panels;

(n) bedding, jointing and pointing including cramps, dowels or other fixing devices;

(o) caulking and sealing between and under units and members;

(p) infilling to joints between adjacent units and members where the maximum width of the joint is less than 150 mm including surface finish and formwork;

(q) cutting and trimming;

(r) in the case of precast prestressed members and the like, and in the case of precast and precast prestressed members and the like for incorporation in in situ post-tensioned prestressed construction, tendons (as this Series paragraph 37) and stressing (including partially stressing) and grouting internal tendons (as this Series paragraph 38);

(s) in the case of facing units, units for top, bottom, ends, changes in direction, battering, waterproofing, weep pipes, pipe sleeves and the like;

(t) air entrainment;

(u) admixtures and additives;

(v) measures to control alkali-silica reaction;

(w) facilities and assistance for the Overseeing Organisation's cover meter survey.

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Surface Finish of Concrete - Formwork

Units

11 (05/01) The units of measurement shall be:

(i) formwork ..... square metre.

(ii) void formers ..... linear metre.

Measurement

12 (05/01) The measurement shall be the area of formwork which is in contact with the finished concrete but measured over the face of openings of 1 square metre or less and features described in (c) below.

Formwork shall not be measured to:

(a) construction joints whether or not shown on the Drawings;

(b) holes, ducts, pockets, sockets, mortices and the like, not exceeding 0.15 cubic metres each in volume;

(c) individual fillets, chamfers, splays, drips, rebates, recesses, grooves and the like of 100 mm total girth or less when measured overall the faces in contact with the concrete;

(d) edges of blinding concrete 75 mm or less in thickness;

(e) upper surfaces of concrete inclined at an angle of less than 15° to the horizontal;

(f) unformed surfaces.

Where concrete, other than blinding concrete 75 mm or less in thickness, is placed in structural foundations, formwork shall be measured to the sides of such concrete foundations regardless of whether or not any formwork is used, except where it is expressly stated on the Drawings that the concrete is to be cast against the soil face.

For measurement of formwork:

(i) "horizontal" shall include formwork horizontal or inclined at any angle up to and including 5° to the horizontal.

(ii) "inclined" shall include formwork inclined at any angle more than 5° up to and including 85° to the horizontal.

(iii) "vertical" shall include formwork inclined at any angle more than 85° up to and including 90° to the horizontal.

(iv) "at any inclination" shall include formwork horizontal or inclined at any angle up to and including 90° to the horizontal.

13 (05/01) The measurement of void formers shall be the length measured along the centre line of the void former, and shall be measured whether of a permanent or temporary nature.

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Itemisation

14 (05/01) Separate items shall be provided for formwork in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Formwork.
	2	Void formers.
II	1	Horizontal more than 300 mm wide.
	2	Inclined more than 300 mm wide.
	3	Vertical more than 300 mm wide.
	4	300 mm wide or less at any inclination.
	5	Curved of both girth and width more than 300 mm at any inclination.
	6	Curved of girth or width of 300 mm or less at any inclination.
	7	Domed.
	8	Void formers of different cross section.
III	1	Different classes of surface finish.
	2	Permanent formwork of different types.
	3	Void formers of different types.

Formwork

15 (05/01) The items for formwork shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) trial panels;

(b) falsework, centering, fabricating, assembling, cutting, fitting, and fixing in position and taking measures to produce the required shapes of concrete;

(c) forming cambers and falls;

(d) linings and taking measures to produce the required finish to the surfaces of the concrete;

(e) cutting and fitting around projecting members, pipes, reinforcement and the like;

(f) individual fillets, chamfers, splays, drips, rebates, recesses, grooves and the like of 100 mm total girth or less when measured overall the faces in contact with the concrete;

(g) maintaining in place until striking and allowing for any variation from the minimum period for striking arising from prevailing weather conditions;

(h) striking, taking down and removing;

(i) concrete provided in lieu of formwork to fill overbreak and working space.

Void Formers

16 (05/01) The items for void formers shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) fixing to avoid displacement during concreting operations;

(b) capping or blocking off ends;

(c) sealing ends and joints;

(d) proving holes.

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Surface Finish of Concrete - Patterned Profile Formwork

Definition

17 (05/01) The term "patterned profile formwork" shall be formwork designed to produce a concrete face with a specified patterned profile comprising ribs, corrugations, troughs or other patterns in relief.

Formwork with a specified regular pattern of formwork joints shall not be classified as patterned profile formwork.

Units

18 (05/01) The unit of measurement shall be:

(i) patterned profile formwork ..... square metre.

Measurement

19 (05/01) The measurement shall be the flat undeveloped area of the patterned concrete required by the Contract and measured over the face of openings of 1 square metre or less and features described in (c) below. Patterned profile formwork shall not be measured to:

(a) construction joints whether or not shown on the Drawings;

(b) holes, ducts, pockets, sockets, mortices and the like, not exceeding 0.15 cubic metres each in volume;

(c) individual fillets, chamfers, splays, drips, rebates, recesses, grooves and the like, not forming part of the pattern and of 100 mm total girth or less when measured overall the faces in contact with the concrete;

(d) edge of blinding concrete 75 mm or less in thickness;

(e) upper surfaces of concrete inclined at an angle of less than 15° to the horizontal.

For measurement of patterned profile formwork:

(i) "horizontal" shall include patterned profile formwork horizontal or inclined at any angle up to and including 5° to the horizontal.

(ii) "inclined" shall include patterned profile formwork inclined at any angle more than 5° up to and including 85° to the horizontal.

(iii) "vertical" shall include patterned profile formwork inclined at any angle more than 85° up to and including 90° to the horizontal.

(iv) "at any inclination" shall include patterned profile formwork horizontal or inclined at any angle up to and including 90° to the horizontal.

Itemisation

20 (05/01) Separate items shall be provided for patterned profile formwork in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Patterned profile formwork.
II	1	Horizontal.
	2	Inclined.
	3	Vertical.
	4	Curved at any inclination.
III	1	Different types.

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Patterned Profile Formwork

21 (05/01) The items for patterned profile formwork shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) formwork (as this Series paragraph 15).

Steel Reinforcement for Structures

Units

22 (05/01) The units of measurement shall be:

(i) bar and helical reinforcement ..... tonne.

(ii) fabric reinforcement ..... square metre.

(iii) dowels ..... number.

Measurement

23 (05/01) The mass of plain bar reinforcement shall be calculated on the basis that the nominal density of steel is 0.00785 kilogrammes per square millimetre of cross sectional area per linear metre; the mass of deformed bar reinforcement shall be calculated as the nominal rolling mass of the reinforcement. Steel bar supports to reinforcement where described in the Contract shall be measured as reinforcement.

No allowance shall be made for the mass of welds and mechanical connections.

24 (05/01) Fabric reinforcement shall be measured as the area of work covered, the BS reference being stated.

Itemisation

25 (05/01) Separate items shall be provided for steel reinforcement for structures in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Bar reinforcement.
	2	Fabric reinforcement of different BS references.
	3	Helical reinforcement.
	4	Dowels of different diameters and lengths.
II	1	Nominal size 16 millimetres and under.
	2	Nominal size 20 millimetres and over.
III	1	Different types and grades of steel.
IV	1	Bars not exceeding 12 metres in length.
	2	Bars exceeding 12 metres in length but not exceeding 13.5 metres and so on in steps of 1.5 metres.
V	1	Bars threaded through holes in members.
VI	1	Different types of deformed bars.

Reinforcement

26 (05/01) The items for reinforcement shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) cleaning, cutting and bending;

(b) binding with wire or other material;

(c) supports, cover blocks and spacers (except for steel bar supports to reinforcement where shown on the Drawings);

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(d) extra fabric reinforcement at laps;

(e) welding;

(f) mechanical connections.

Dowels

27 (05/01) The items for dowels shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) drilling or forming holes and pockets, casting in and grouting;

(b) protective caps, sleeves and wrappings.

Reinforcement for Reinforced and Anchored Earth Structures

Units

28 (05/01) The units of measurement shall be:

(i) vertical rods, strip and bar reinforcing elements ..... linear metre.

(ii) sheet, grid, mesh reinforcing elements ..... square metre.

Measurement

29 (05/01) The measurement of vertical rods shall be the length from the top surface of the strip footing to the top of the facing unit or the top of the rod whichever is the higher.

The measurement of strip and bar reinforcing elements shall be the overall length including connections and, where applicable, the turn down for end anchorages. Provided that where a strip element comprises more than one leg measurement shall be of all legs, the number of legs measured being stated in the item description.

Measurement of sheet, grid or mesh reinforcing elements shall be the summation of the areas of each layer.

Itemisation

30 (05/01) Separate items shall be provided for reinforcement for reinforced and anchored earth structures in accordance with Chapter II paragraphs 3 and 4 and the following:

Group		Feature
I	1	Vertical rods of nominal size 16 millimetres and under.
	2	Vertical rods of nominal size 20 millimetres and over.
	3	Strip and bar reinforcing elements of different cross-sections or load carrying capacity.
	4	Sheet, grid, mesh reinforcing elements of different references.
II	1	Different materials.
III	1	Vertical rods of different lengths.
	2	Strip and bar reinforcing elements of different lengths.

Vertical Rods

31 (05/01) The items for vertical rods shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) cleaning and cutting;

(b) measures to prevent displacement including adjustments and removal;

(c) protective treatment including tubes and grouting.

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Strip, Bar, Sheet, Grid or Mesh Reinforcing Elements

32 (05/01) The items for strip, bar, sheet, grid or mesh reinforcing elements shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) examining and checking steel for segregation, laminations, cracks and surface flaws;

(b) cutting, marking off, drilling, notching, machining, bending, connection within the length and preparing for connection to vertical rod facing unit or capping unit;

(c) marking elements for identification;

(d) protective system (as Series 1900 paragraph 4);

(e) extra sheeting, grid or mesh at laps;

(f) bolts, nuts, washers and connecting to facing units;

(g) threading over of fixing to vertical rods;

(h) casting in ends to in situ capping units.

In Situ Post-tensioned Prestressing for Structures

Units

33 (05/01) The unit of measurement shall be:

(i) tendons, stressing and grouting, protective covering to external tendons ..... number.

Definition

34 (05/01) For the purpose of this Series a tendon is defined as all the permanent components of a system which imparts a compressive load to a concrete member through a single anchorage or bearing plate at each end of the system.

Measurement

35 (05/01) Lengths of tendons shall be measured along the line of the tendon between the outside faces of those parts of the anchorage units cast into the concrete. Tendons shall be grouped so that no member of the group differs in length from the stated length by more than 5%.

Itemisation

36 (05/01) Separate items shall be provided for in situ post-tensioned prestressing for structures in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Tendons.
	2	Stressing and grouting internal tendons.
	3	Stressing external tendons.
	4	Final stressing and grouting tendons of members supplied partially prestressed.
II	1	Tendons for in situ concrete construction.
	2	Tendons for segmental construction.
III	1	Tendons of different types.
IV	1	Tendons of different stated lengths.
V	1	Protective covering of different types or size to external tendons.

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Tendons

37 (05/01) The items for tendons shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) forming, installing and sealing tendon ducts, sheaths and duct formers to profile or between precast segmental units;

(b) steel bars, cables, wires or strands with couplers, tagging, binders, spacers and proving that tendons are free to move between anchorages in ducts;

(c) tendon anchorages, bearing plates, reinforcing helices, grout inlets, vents and other components except where these are supplied complete with precast members or segments;

(d) electrical bonding and proving electrical continuity of structure;

(e) forming recesses in the concrete for anchorages and jack seatings;

(f) allowing for variations of length in tendons contained in the same bill item;

(g) cutting;

(h) cleaning ducts;

(i) marking, labelling, grouting and vent points with tendon identification.

Stressing and Grouting Internal Tendons, Stressing External Tendons and Final Stressing and Grouting Tendons of Members Supplied Partially Prestressed

38 (05/01) The items for stressing and grouting internal tendons, stressing external tendons and final stressing and grouting tendons of members supplied partially prestressed shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) checking the accuracy of load measuring equipment and adjusting;

(b) applying prestress in one or more stages;

(c) gripping and trimming tendons;

(d) taking observations and compiling a record of stressing and grouting operations and supplying one copy to the Overseeing Organisation;

(e) in the case of internal tendons, grouting trials, grouting, sealing vent holes and end anchorages, treating ends of tendons and filling anchorages and jack seating recesses with in situ concrete (as this Series paragraph 5);

(f) in the case of external tendons, tying or binding to main structure and sealing at joints;

(g) accommodating and adjusting for differences between tendons included in the same bill item;

(h) calculation in respect of the required jacking force and extension;

(i) releasing tension and re-tensioning where pull-in is greater than that agreed by the Overseeing Organisation;

(j) flushing-out of grout.

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Protective Covering to External Tendons

39 (05/01) The items for protective covering to external tendons shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) tying or bonding to main structure;

(b) sealing at joints.

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Series 1800: Steelwork for Structures

Fabrication and Erection of Steelwork

Units

1 The units of measurement shall be:

(i) fabrication, permanent erection ..... tonne.

(ii) trial erection at the place of fabrication ..... item.

Measurement

2 The measurement shall be the computed mass of the finished member comprising plates, rolled sections, shear connectors, stiffeners, cleats, packs, splice plates and all fittings, without allowance for tolerances for rolling margin and other permissible deviations from standard masses or nominal dimensions, and excluding the masses of welds, bolts, nuts, washers, rivets and protective coatings. No deductions shall be made for notches, cope holes, bolt and rivet holes, and the like, which are each less than 0.03 square metres.

The computed mass of rolled and cast steel and cast iron shall be determined from the dimensions shown on the Drawings on the following basis:

(a) rolled or cast steel, 7850 kilogrammes per cubic metre;

(b) cast iron, 7210 kilogrammes per cubic metre.

3 Deck panels shall be measured separately only when the deck panel is not integral with the main member. Bracings, external diaphragms and the like shall be measured separately as subsidiary steelwork only when they are not integral with main members or deck panels.

4 Main members and deck panels shall be inclusive of connectors, stiffeners, internal diaphragms and other integral components.

Fabrication of Steelwork

Itemisation

5 Separate items shall be provided for fabrication of steelwork in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Fabrication.
II	1	Main members.
	2	Deck panels.
	3	Subsidiary steelwork.
III	1	Rolled sections.
	2	Plated rolled sections.
	3	Plated girders.
	4	Box girders.
IV	1	Comprised of different combinations of grades of steel.
V	1	Curved on plan or elevation.
VI	1	Tapering.

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Fabrication

6 (05/01) The items for fabrication shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) examining and checking for segregation, laminations, cracks and surface flaws and carrying out any remedial measures required by the Overseeing Organisation in respect of such defects;

(b) cutting, marking off, drilling, notching, machining, treatment of outside arrises, smoothing to slopes, form fitting, end and edge preparation and cambering;

(c) riveting, bolting, assembling and pre-heating;

(d) welds, packing plates, rivets, bolts (including holding down bolts), nuts and washers required to fabricate and to complete the erection and installation on Site, together with spares and service bolts, drifts, draw up cleats and the like;

(e) pre-production procedural trials;

(f) welder approval trials and provision of certificates;

(g) allowance for rolling margins, over-runs and other permissible deviations;

(h) checking of deviations in plate panels and rolled and built-up sections and of alignment at joints, including taking measurements and observations and recording and supplying one copy of the records to the Overseeing Organisation;

(i) preparation and supply of marked erection drawings, marking members for identification and delivery in matching sequence;

(j) in the case of weathering steel blast cleaning after fabrication.

Erection of Steelwork

Itemisation

7 Separate items shall be provided for erection of steelwork in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Trial erection at the place of fabrication.
	2	Permanent erection.
II	1	Different forms of steel substructure construction.
	2	Different forms of steel superstructure construction.

Trial Erection at the Place of Fabrication

8 The items for trial erection at the place of fabrication shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) temporary bracing or stays to prevent displacement including the provision and removal of temporary attachments;

(b) proving dimensions, cambers and profiles and alignment at joints;

(c) match-marking members as required for permanent erection;

(d) dismantling;

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(e) modifications and refitting of members as a result of the trial erection;

(f) bolts, nuts, washers, sockets, base plates, anchorage assemblies, drilling or forming holes and pockets and casting in.

Permanent Erection

9 (05/01) The items for permanent erection shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) temporary bracing or stays to prevent displacement including the provision and removal of temporary attachments;

(b) welder approval trials and provision of certificates;

(c) procedural trials;

(d) permanent bolted, riveted and welded connections including the provision of preheat and shelters for welding;

(e) checking of deviations in plate panels and rolled and built-up sections and of alignment at joints, including taking measurements and observations and recording and supplying one copy of the records to the Overseeing Organisation;

(f) drilling or forming holes and pockets and casting in bars, sockets, base plates and anchorage assemblies;

(g) adhesives and epoxy or polyester mortar, bedding mortar or grout.

Miscellaneous Metalwork

Definition

10 Miscellaneous metalwork shall comprise items of metalwork incorporated into structures and shall include ladders, brackets, handrails, access covers and frames, mesh panels, walkway panels, screens, grilles and the like.

Units

11 The unit of measurement shall be:

(i) miscellaneous metalwork ..... number.

Measurement

12 Items of metalwork which are:

(a) included in the computed weight of fabricated items; or

(b) included in other measured items; or

(c) separately measured elsewhere;

shall not be measured as miscellaneous metalwork.

Itemisation

13 Separate items shall be provided for miscellaneous metalwork in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Miscellaneous metalwork.
II	1	Different types.
III	1	Different materials.
IV	1	Different sizes.

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Miscellaneous Metalwork

14 (05/01) The items for miscellaneous metalwork shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) fabrication (as this Series paragraph 6);

(b) erection (as this Series paragraphs 8 and 9);

(c) protective system (as Series 1900 paragraph 4);

(d) in situ concrete (as Series 1700 paragraph 5);

(e) formwork (as Series 1700 paragraph 15).

Corrugated Steel Buried Structures

Units

15 The unit of measurement shall be:

(i) corrugated steel buried structures (stating the length) ..... number.

Measurement

16 The length stated shall be the extreme length of the corrugated steel buried structure.

Itemisation

17 Separate items shall be provided for corrugated steel buried structures in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Corrugated steel buried structures.
II	1	Different types.
III	1	Different sizes.
IV	1	Different thicknesses or gauge.

Corrugated Steel Buried Structures

18 The items for corrugated steel buried structures shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) cutting, marking off, drilling, notching, bevels, skews, bends, edge preparation, cambering, riveting, bolting and fabricating;

(b) marking members for identification and delivery in matching sequence;

(c) laps, rivets, bolts, nuts, washers and the like, spares and service bolts, drifts, draw up cleats and the like;

(d) protective system (as Series 1900 paragraph 4);

(e) channels;

(f) awaiting the results of tests;

(g) paved invert.

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Metal Facing Units for Reinforced Earth Structures

Units

19 The units of measurement shall be:

(i) metal facing units ..... square metre.

(ii) metal capping units and the like ..... linear metre.

Measurement

20 The measurement of metal facing units shall be the plane undeveloped area of the facing.

The measurement of metal capping units and the like shall be the measurement along the centre line.

Itemisation

21 Separate items shall be provided for metal facing and capping units in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Metal facing units.
	2	Metal capping units and the like.
II	1	Different materials.
III	1	Different types.
IV	1	Different thicknesses or gauge.
V	1	Curved on plan.
VI	1	Built to a batter.

Metal Facing Units and Capping Units

Item coverage

22 The items for metal facing units and capping units shall in accordance with the Preambles to the Bill of Quantities General Directions include for:

(a) fabrication (as this Series paragraph 6);

(b) permanent erection (as this Series paragraph 9);

(c) protective system (as Series 1900 paragraph 4);

(d) threading over vertical rods;

(e) sealing joints;

(f) connection to reinforcing elements;

(g) matching as required.

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Series 1900: Protection of Steelwork Against Corrosion

Protective System

Units

1 The unit of measurement shall be:

(i) protective system ..... square metre.

Measurement

2 The measurement shall be the surface area to be treated.

Itemisation

3 Separate items shall be provided for protection of steelwork against corrosion in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Protective system.
II	1	Different types.

Protective System

4 (05/03) The items for protective system shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) despatching paint samples to testing authority;

(b) shop procedural trials;

(c) site procedural trials;

(d) masking and other measures to protect adjacent untreated work and the removal of masking and other measures upon completion;

(e) joint fillers and treatment of joints;

(f) preparing materials for application;

(g) preparation of surfaces and coating at the place of fabrication and on Site;

(h) complying with any special requirements in respect of ambient conditions including the containment of dust and debris and for intervals between successive operations and applications;

(i) labelling;

(j) storage;

(k) stripe coats;

(l) de-nibbing;

(m) heat treatment;

(n) obtaining the correct dry film thickness of paint or other coating;

(o) measures to protect uncoated steelwork;

(p) preparation and supply of system and data sheets;

(q) facilities and assistance for Overseeing Organisation's inspection.

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Series 2000: Waterproofing for Structures

Waterproofing

Units

1 The unit of measurement shall be:

(i) waterproofing ..... square metre.

Measurement

2 The measurement shall be the area of surface covered by the waterproofing. No deduction shall be made for openings of 1 square metre or less.

Itemisation

3 Separate items shall be provided for waterproofing for structures in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Waterproofing.
II	1	Different types.
III to	1	More than 300 mm wide horizontal or at any inclination up and including 30° to the horizontal.
	2	More than 300 mm wide at any inclination more than 30° up to and including 90° to the horizontal.
	3	300 mm wide or less at any inclination.
	4	Domed.

Waterproofing

4 (05/02) The items for waterproofing shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) preparing, cleaning and drying;

(b) priming and bonding agents;

(c) laying to cambers, falls and crowns;

(d) protective layers;

(e) additional protection;

(f) levelling courses;

(g) formwork (as Series 1700 paragraph 15);

(h) additional base or binder course required as a result of the Contractor's choice of waterproofing;

(i) nibs, angle fillets, external angles, mitres, stops and the like;

(j) sealing and making good at edges and chases, around interruptions and projections and up to abutting surfaces including cleaning and priming;

(k) cutting out and rectifying imperfections;

(l) joints and laps;

(m) preparing surfaces at gullies and the like;

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(n) masking and other measures to protect adjacent untreated areas;

(o) complying with any special requirements in respect of ambient conditions and for intervals between successive operations and applications.

Surface Impregnation of Concrete

Units

5 The unit of measurement shall be:

(i) surface impregnation of concrete ..... square metre.

Measurement

6 The measurement shall be the area of the surface to be impregnated of any width or at any inclination. No deduction shall be made for openings of 1 square metre or less. For patterned surfaces the measurement shall be the flat undeveloped area and measured over the face of individual fillets, chamfers, splays, drips, rebates, recesses, grooves and the like, not forming part of the pattern and of 100 mm total girth or less when measured overall the faces in contact with the concrete. Surfaces shall be measured once only, irrespective of the number of applications specified in the treatment.

Itemisation

7 Separate items shall be provided for surface impregnation of concrete in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Surface impregnation.
II	1	Patterned surfaces.
	2	Plain surfaces.
III	1	Different types of systems.

Surface Impregnation of Concrete

Item coverage

8 (05/01) The items for surface impregnation of concrete shall in accordance with the Preambles to Bill of Quantities General Directions include for:

(a) preparing, cleaning and drying;

(b) protection from precipitation and spray;

(c) masking and other measures to protect adjacent untreated materials;

(d) disposal of material (as Series 600 paragraph 39);

(e) facilities and assistance for the Overseeing Organisation's inspection;

(f) complying with any special requirements in respect of ambient conditions and for intervals between successive operations and applications;

(g) preparation and supply of data sheets;

(h) trial control panels;

(i) removal of graffiti.

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Removal of Existing Waterproofing (05/01)

Units

9 (05/01) The unit of measurement shall be:

(i) removal of existing waterproofing .....square metre

Measurement

10 (05/01) The measurement of removal of existing waterproofing shall be the area of surface covered by the existing waterproofing.

No deduction shall be made for openings of 1 square metre or less.

Itemisation

11 (05/01) Separate items shall be provided for removal of existing waterproofing in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Removal of existing waterproofing.
II to	1	More than 300mm wide horizontal or at any inclination up and including 30° to the horizontal.
	2	More than 300mm wide at any inclination more than 30° up to and including 90° to the horizontal.
	3	300mm wide or less at any inclination.
	4	Domed.

Removal of Existing Waterproofing (05/01)

12 (05/01) The items for removal of existing waterproofing shall in accordance with the Preamble to Bill of Quantities General Directions include for:

Item coverage

(a) marking out the areas of waterproofing to be removed;

(b) removal of protective layer;

(c) removal of primer;

(d) preparation of existing surfaces to receive new waterproofing;

(e) disposal of materials (as Series 600 paragraph 39);

(f) trials and approval tests;

(g) measures to prevent damage to existing surfaces;

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Series 2100: Bridge Bearings

Bearings

Units

1 The unit of measurement shall be:

(i) bearings, installation of bearings ..... number.

Measurement

2 The measurement shall be the complete unit.

Itemisation

3 Separate items shall be provided for bearings in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Bearings.
	2	Installation of bearings.
II	1	Different types.

Bearings

4 The items for bearings shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) design;

(b) certificates;

(c) provision of data and drawings;

(d) resubmissions and modifications;

(e) amendments to the Works;

(f) nuts, bolts, washers, dowels, protective caps, dust covers, sockets, sleeves, wrapping, adhesives and lubricants;

(g) protective system (as Series 1900 paragraph 4);

(h) marking bearings for identification purposes.

Installation of Bearings

5 The items for installation of bearings shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) drilling or forming holes and pockets and casting in bolts, dowels, sockets, base plates and anchorage assemblies;

(b) forming plinths including formwork (as Series 1700 paragraph 14);

(c) setting and releasing locking mechanisms;

(d) adhesives and epoxy mortar, cement mortar or grout and surface preparation therefor;

(e) greasing;

(f) alterations to concrete, formwork, reinforcement and the like to suit selected bearings.

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Series 2200: Not Taken Up

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Series 2300: Bridge Expansion Joints and Sealing of Gaps

Bridge Deck Expansion Joints

Definition

1 The term "bridge deck expansion joint" covers all types of permanent joint which allow expansion, contraction, shrinkage or angular rotation to take place in decks of structures.

Units

2 The unit of measurement shall be:

(i) bridge deck expansion joints ..... number.

Measurement

3 The measurement of bridge deck expansion joints shall be the complete installation. The stated length shall be measured along the centre line of the joint.

Itemisation

4 Separate items shall be provided for bridge deck expansion joints in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Bridge deck expansion joints.
II	1	Different types or materials.
III	1	Different lengths.
IV	1	Different gap widths.

Bridge Deck Expansion Joints

5 The items for bridge deck expansion joints shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) design;

(b) certificates;

(c) provision of data and drawings;

(d) resubmissions and modifications;

(e) amendments to the Works;

(f) preparing and cleaning surfaces;

(g) installing or constructing the joint, sub-surface drainage, below joint drainage, in situ nosings, and waterproofing complete with fittings at kerbs, footways, service ducts and the like including the use of templates, guides and the like to retain the joint system in position;

(h) setting the joint having regard to temperature and other constraints;

(i) priming surfaces to be sealed, joint filler material, sealing strips, inserting, protecting and sealing;

(j) adhesives and the like;

(k) forming, cutting and sealing grooves and edges in surfacings and bridge deck waterproofing;

(l) protective system (as Series 1900 paragraph 4);

(m) greasing;

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(n) measures to protect the joint against damage or displacement;

(o) drilling or forming holes and pockets and casting in bolts, sockets, base plates and anchorage assemblies;

(p) preparation and supply of data sheets.

Sealing of Gaps

Units

6 The units of measurement shall be:

(i) joint filler ..... square metre.

(ii) joint sealant, water bar, water stop ..... linear metre.

Measurement

7 The measurement of joint filler shall be the area of the surface to be covered as stated in the Contract.

The measurement of joint sealant shall be the length of the joint on the external face of the sealant.

The measurement of water bar or water stop shall be the length along the axis.

Joint filler and joint sealant shall not be measured to bridge deck expansion joints.

Itemisation

8 Separate items shall be provided for sealing of gaps in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Joint filler.
	2	Joint sealant.
	3	Water bar or water stop.
II	1	Different types or materials.
III	1	Different sizes.
IV	1	Different thicknesses.

Joint Filler

9 The items for joint filler shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) cutting and shaping;

(b) preparing, cleaning and priming surfaces;

(c) adhesives and the like;

(d) applying, inserting and casting in.

Joint Sealant

10 The items for joint sealant shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) preparing and cleaning surfaces;

(b) priming the surface of the joint;

(c) compressible strip;

(d) masking and protection;

(e) complying with temperature constraints.

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Water Bars or Water Stops

11 The items for water bars or water stops shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) cutting, notching, welding, fittings and jointing;

(b) cutting joint filler up to water bar or water stop;

(c) casting in.

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Series 2400: Brickwork, Blockwork and Stonework

Brickwork

Units

1 The units of measurement shall be:

(i) brickwork ..... square metre.

(ii) copings, string courses and the like ..... linear metre.

Measurement

2 The measurement shall be the superficial area of brickwork required by the Contract. No deduction shall be made for openings of 0.10 square metre or less.

The measurement of copings, string courses and the like shall be the length of the work required by the Contract.

Facings shall be measured as extra over brickwork except where brickwork is built entirely of facings.

Itemisation

3 Separate items shall be provided for brickwork in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Brickwork.
II	1	Copings, string courses and the like of different sizes.
III	1	Different types of bricks.
IV	1	Different thicknesses.
V	1	Different bonds.
VI	1	Different types of mortar.
VII	1	Curved on plan.
VIII	1	With a battered face.
IX	1	In walls.
	2	In facework to concrete.
	3	In arches.
	4	In alteration work.

Brickwork, Copings, String Courses and the Like

Item coverage

4 (05/01) The items for brickwork, copings, string courses and the like shall in accordance with the Preambles to Bill of Quantities General Directions include for:

(a) bedding, jointing, pointing, raking out, wetting and fair-faced work,

including rough and fair cutting;

(b) plinths, corbels, bull-noses, chases, rebates, quoins and the like, grouting;

(c) ties, dowels, cramps, joggles and the like, including sinkings, mortices and running in;

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(d) bonding into existing work;
(e) forming cavity;
(f) reinforcement (as Series 1700 paragraph 26);
(g) cavity filling between the brickwork and the backing;
(h) building in pipes, holdfasts, bolts and the like and forming small openings;
(i) sample panels;
(j) damp proof courses and membranes;
(k) removing loose material from the backing and washing clean;
(l) curing and protection;
(m) admixtures and additives.

Blockwork and Stonework

Units

5 The units of measurement shall be:

(i) blockwork and stonework ..... cubic metre.
(ii) copings, string courses and the like ..... linear metre.
(iii) individual blocks, features or stones ..... number.

Measurement

6 The measurement of blockwork and stonework shall be the volume of the work excluding the volume of the cavity and associated filling.

The measurement of copings, string courses and the like shall be the length of the work required by the Contract.

No deduction shall be made from the measurement for holes or voids of 0.15 cubic metre or less.

Itemisation

7 Separate items shall be provided for blockwork and stonework in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Blockwork.
	2	Stonework.
II	1	Copings, string courses and the like of different sizes.
	2	Individual blocks, features or stones of different sizes and shape.
III	1	Different types of construction.
IV	1	Different materials.
V	1	Different types of mortar.
VI	1	Curved on plan.
VII	1	With a battered face.
VIII	1	In walls.
	2	In facework to concrete.
	3	In arches.
	4	In alteration work.

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Blockwork, Stonework, Copings, String Courses and the Like, Individual Blocks, Features or Stones

8 (05/01) The items for blockwork, stonework, copings, string courses and the like, individual blocks, features or stones shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) dressing including in situ dressing;

(b) setting, bedding, jointing, coursing, raking out, quoins, grouting, pointing, wetting and fair-faced work including rough and fair cutting;

(c) bonding into existing work;

(d) ties, dowels, cramps, joggles and the like including sinkings, mortices and running in;

(e) forming cavity;

(f) cavity filling between the blockwork or stonework and the backing;

(g) building in pipes, holdfasts, bolts and the like and forming small openings;

(h) sample panels;

(i) damp-proof courses and membranes;

(j) removing loose material from the backing and washing clean;

(k) reinforcement (as Series 1700 paragraph 26);

(l) grooves, rebates, recesses, stoolings and weatherings;

(m) marking for identification and delivery in any matching sequence;

(n) manufacturer's certificate and supplying a copy to the Overseeing Organisation;

(o) curing and protection;

(p) admixtures and additives.

Remove from Store and Relay Brickwork, Blockwork and Stonework

Units

9 The units of measurement shall be:

(i) remove from store and relay blockwork and stonework ..... cubic metre.

(ii) remove from store and relay brickwork ..... square metre.

(iii) remove from store and relay copings, string courses and the like ..... linear metre.

(iv) remove from store and relay individual blocks, features or stones ..... number.

Measurement

10 The measurement of remove from store and relay blockwork and stonework shall be the volume of the work required by the Contract. No deduction shall be made for holes or voids of 0.15 cubic metre or less.

The measurement of remove from store and relay brickwork shall be the superficial area of re-used brickwork required by the Contract. No deductions shall be made for openings of 0.1 square metre or less.

The measurement of remove from store and relay copings, string courses and the like shall be the length of the work required by the Contract.

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Brick facings shall be measured as extra over remove from store and relay brickwork except where the brickwork is built entirely of facings.

Itemisation

11 Separate items shall be provided for remove from store and relay brickwork, blockwork and stonework in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Remove from store and relay brickwork.
	2	Remove from store and relay blockwork.
	3	Remove from store and relay stonework.
II	1	Copings, string courses and the like of different sizes.
	2	Individual blocks, features or stones of different sizes and shape.
III	1	Different types of construction.
	2	Different types of bond.
IV	1	Different types of bricks.
	2	Different materials.
V	1	Different thicknesses.
VI	1	Different types of mortar.
VII	1	Curved on plan.
VIII	1	With a battered face.
IX	1	In walls.
	2	In facework to concrete.
	3	In arches.
	4	In alteration work.

Remove from Store and Relay Brickwork, Blockwork or Stonework

12 The items for remove from store and relay brickwork, blockwork and stonework shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) loading, transporting from store unloading and positioning for relaying;

(b) replacing items damaged during the foregoing operation;

(c) modifications and new materials;

(d) brickwork, copings, string courses and the like (as this Series paragraph 4);

(e) blockwork, stonework, copings, string courses and the like, individual blocks, features or stones (as this Series paragraph 8).

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Series 2500: Special Structures

1 Unless stated otherwise in the Contract these items shall be used only when the Contract provides for special structures to be designed by the Contractor.

Notwithstanding the provisions for measurement of the Works set forth elsewhere all the Works (with the exception of those works scheduled as not to be included) within the Designated Outlines shall be deemed to be measured and included within the single items in the Bill of Quantities priced by the Contractor.

The measurement of the remainder of the Works shall exclude all Works contained within the Designated Outlines except for those works scheduled as stated above.

Units

2 The unit of measurement shall be:

(i) special structures designed by the Contractor ..... item.

Measurement

3 The measurement of special structures designed by the Contractor shall be the complete construction within the Designated Outlines with the exception of those works scheduled as not to be included.

Itemisation

4 (05/01) Separate items shall be provided for special structures designed by the Contractor in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Special structures designed by the Contractor.
II	1	Buried structure.
	2	Earth retaining structure.
	3	Environmental barrier.
	4	Underbridge up to 8 m span.
	5	Footbridge.
	6	Piped culverts
	7	Box culverts
	8	Drains exceeding 900mm internal diameter
	9	Other structures
III	1	Different locations.

Special Structures Designed by the Contractor

Item coverage

5 The items for special structures designed by the Contractor shall in accordance with the Preambles to Bill of Quantities General Directions include for:

(a) design;

(b) provision of design calculations and details;

(c) certificates;

(d) preparation and submission of priced schedule of quantities;

(e) provision of data, drawings and details of fabrication;

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(f) re-submissions and modifications;

(g) amendments to the Works;

(h) obtaining aesthetic approval;

(i) everything necessary for the completion of the Works within the Designated Outlines, as shown in the relevant item coverages in the Chapters and Series of the Method of Measurement, with the exception of those works scheduled as not to be included;

(j) completing an Approval in Principle Form and submitting to the Overseeing Organisation for acceptance.

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Series 2600 is not taken up

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Series 2700: Accommodation Works, Works for Statutory Undertakers, Provisional Sums and Prime Cost Items

1 Accommodation Works and Works for Statutory Undertakers (05/01)

The method of measurement for Accommodation Works and Works for Statutory Undertakers shall be in accordance with the various Series of this Method of Measurement.

2 Provisional Sums (05/01)

Where Provisional Sums are to be included in the Bill of Quantities they shall be allocated to a particular construction heading and measured within the relevant Series of this Method of Measurement. Where this is not possible they shall be included under a separate division within the Bill of Quantities in accordance with Volume 4 of the Manual of Contract Documents for Highway Works, Chapter III Table 1.

Where a Daywork Schedule is to be included in the Bill of Quantities it shall be in accordance with the recommendations contained within Volume 0 of the Manual of Contract Documents for Highway Works Section 1: Part 1, Annex A.

3 Prime Cost Items (05/01)

Where Prime Cost Items are to be included in the Bill of Quantities they shall be in accordance with Volume 4 of the Manual of Contract Documents for Highway Works Chapter II, Paragraph 2(b).

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Series 3000: Landscape and Ecology (05/01)

Definitions

1 Landscape and ecology works in this Series shall comprise new works and maintenance of existing areas.

Ground Preparation and Cultivation

Units

2 The unit of measurement shall be:

(i) vegetation clearance, subsoil treatment, final preparation of soils, final cultivations ….. square metre.

Measurement

3 The measurement of ground preparation and cultivation shall be the plan area.

Vegetation clearance shall be measured in addition to any items of general site clearance measured in accordance with Series 200.

Itemisation

4 Separate items shall be provided for ground preparation and cultivation in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Vegetation clearance.
	2	Subsoil treatment.
	3	Final preparation of soils.
	4	Final cultivations.
II	1	Surfaces sloping at 10º or less to the horizontal.
	2	Surfaces sloping at more than 10º to the horizontal.

Ground Preparation and Cultivation

5 The items for ground preparation and cultivation shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) cutting;

(b) removal of weeds;

(c) ripping and ploughing;

(d) herbicide;

(e) fertiliser, soil ameliorants;

(f) achieving tilth;

(g) grading and re-grading to contours and levels;

(h) removal of stones, undesirable and deleterious material;

(i) disposal of material (as Series 600 paragraph 39);

(j) notices.

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Seeding and Turfing

Units

6 The unit of measurement shall be:

(i) grass seeding, wildflower seeding, turfing …. square metre.

Measurement

7 The measurement of grass seeding, wildflower seeding and turfing shall be the plan area.

Itemisation

8 Separate items shall be provided for seeding and turfing in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Grass seeding.
	2	Wildflower seeding.
	3	Turfing.
II	1	Different mixtures.
III	1	Different seeding methods.
IV	1	Surfaces sloping at 10º or less to the horizontal.
	2	Surfaces sloping at more than 10º to the horizontal.

Seeding and Turfing

9 The items for seeding and turfing shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item Coverage

(a) establishment cutting;

(b) reseeding;

(c) importing turf;

(d) removal of turf from stockpile;

(e) pegging and pinning of turves;

(f) laying, levelling, infilling, bonding, cutting, tamping and dressing;

(g) temporary removal and replacement of seats, litter bins and the like;

(h) herbicide;

(i) marking out and awaiting approval;

(j) raking;

(k) mixing;

(l) stirring;

(m) strimming;

(n) sweeping;

(o) dispersal;

(p) cutting edges;

(q) cutting around obstacles;

(r) re-forming edges;

(s) scarifying including sample areas;

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(t) watering including water supply;

(u) disposal of material (as Series 600 paragraph 39);

(v) weed control (as this Series paragraph 20);

(w) maintenance of grassed areas (as this Series paragraph 34);

(x) maintenance of wildflower areas (as this Series paragraph 38);

(y) supply of certificates;

(z) notices.

Planting

Units

10 The units of measurement shall be:

(i) trees, shrubs and plants …..... number.

(ii) bulbs …… square metre.

Measurement

11 The measurement of bulbs shall be the plan areas of bulb planting.

Itemisation

12 Separate items shall be provided for planting in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Trees.
	2	Shrubs.
	3	Wildflower plants.
	4	Hedge plants.
	5	Emergent, marginal and aquatic plants.
	6	Bulbs.
II	1	Species and type.
III	1	Different sizes.
IV	1	In pits.
	2	In trenches.
	3	In beds.
	4	In grassed areas.
	5	In or adjacent to water areas.
V	1	Surfaces sloping at 10º or less to the horizontal.
	2	Surfaces sloping at more than 10º to the horizontal.

Planting

Item coverage

13 The items for planting shall in accordance with the Preambles to Bill of Quantities General Directions include for:

(a) notices, inspections, provenance and reporting;

(b) transportation, packing and unpacking;

(c) storage, handling and distribution;

(d) making arrangements for selection;

(e) treatment of nursery stock;

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(f) protection;

(g) stakes, labelling, ties, strapping, spacers, anchors, timber frames, root barriers, cables and the like;

(h) marker posts;

(i) tubes, guards and ties;

(j) excavation, breaking up subsoil, backfilling, compaction and firming;

(k) topsoil;

(l) reinstatement;

(m) multiple handling;

(n) compost, fertiliser and mixing;

(o) cultivation;

(p) sprays, dips and additives;

(q) drainage layers;

(r) ameliorants;

(s) root spreading and other measures;

(t) measures to avoid root disturbance of adjacent plants;

(u) support;

(v) pruning roots;

(w) planting through turf and mulch mats;

(x) disposal of material (as Series 600 paragraph 39);

(y) anchors;

(z) irrigation pipes;

(aa) measures for planting in or adjacent to water areas;

(bb) protective posts;

(cc) additional ground preparation for wildflower planting;

(dd) establishment maintenance of new planting;

(ee) marking out and awaiting approval;

(ff) anti-desiccant measures;

(gg) notch planting;

(hh) watering including water supply;

(ii) weed control (as this Series paragraph 20);

(jj) pruning shrubs and climbers (as this Series paragraph 24);

(kk) scrub control (as this Series paragraph 26);

(ll) hedge cutting, hedge laying (as this Series paragraph 27);

(mm) maintenance of trees (as this Series paragraph 28);

(nn) maintenance of grassed areas (as this Series paragraph 34);

(oo) maintenance of wildflower areas (as this Series paragraph 38);

(pp) management of waterbodies (as this Series paragraph 45).

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Mulching

Units

14 The units of measurement shall be:

(i) organic mulching, mulch mats, sheet mulch …….square metre.

(ii) sheet mulch collars …… number.

Itemisation

15 Separate items shall be provided for mulching in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Organic mulching.
	2	Mulch mats.
	3	Sheet mulch.
	4	Sheet mulch collars.
II	1	Different thickness, gauge or weight.
III	1	Different types.
IV	1	Different sizes.
V	1	Different tree locations.
VI	1	Surfaces sloping at 10º or less to the horizontal.
	2	Surfaces sloping at more than 10º to the horizontal.

Note: Group V Feature 1 shall only be measured in connection with Group I Feature 4.

Mulching

16 The items for mulching shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) preparation;

(b) spreading and levelling;

(c) working in and around plants;

(d) hollowing out;

(e) placing around plants;

(f) splitting and cutting;

(g) securing edges;

(h) lapping and joints;

(i) pegging;

(j) stapling;

(k) disposal of material (as Series 600 paragraph 39);

(l) inspections.

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Weed Control

Units

17 The units of measurement shall be:

(i) weed control to hardstandings and paved areas, topsoil heaps, planted beds, open ditches, filter drains, grassed areas and waterbodies …….. square metre.

(ii) weed control to individual trees and shrubs …… number.

Measurement

18 The measurement of weed control to hardstandings and paved areas, topsoil heaps, planted beds, open ditches, filter drains and grassed areas shall be the plan area.

The measurement of weed control to individual trees and shrubs shall be the number of trees or shrubs irrespective of girth.

Weed control shall be measured separately only when required to be carried out in connection with any landscape and ecology areas that have been established prior to the commencement of the Contract.

Itemisation

19 Separate items shall be provided for weed control in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Total weed control.
	2	Selective weed control.
	3	Weed control by spot application.
	4	Hand weeding.
	5	Cutting weeds.
II	1	To hardstandings and paved areas.
	2	To topsoil heaps.
	3	To planted beds.
	4	To open ditches.
	5	To filter drains.
	6	To grassed areas.
	7	To wildflower areas.
	8	To waterbodies.
	9	To individual trees.
	10	To individual shrubs.
III	1	Different types of waterbody.
IV	1	Different types of herbicide.
V	1	Surfaces sloping at 10° or less to the horizontal.
	2	Surfaces sloping at more than 10° to the horizontal.

Note: Group V shall be applied only to Group II Features 1 to 6.

Weed Control

Item coverage

20 The items for weed control shall in accordance with the Preambles to Bill of Quantities General Directions include for:

(a) protective measures;

(b) destruction;

(c) herbicides;

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(d) disposal of material (as Series 600 paragraph 39);

(e) inspections and reports.

Maintenance of Established Trees and Shrubs

Units

21 The units of measurement shall be:

(i) pruning shrubs and climbers, thinning and coppicing and scrub control …..… square metre.

(ii) hedge cutting, hedge laying …….. linear metre.

(iii) maintenance of trees in urban streets, tree surgery and tree felling …….. number.

Measurement

22 The measurement of pruning shrubs and climbers, thinning and coppicing and scrub control shall be the plan area.

The measurement of hedge cutting and hedge laying shall be the plan length.

Maintenance of established trees and shrubs shall be measured separately only when required to be carried out in connection with areas of trees and shrubs that have been established prior to the commencement of the Contract.

Itemisation

23 Separate items shall be provided for maintenance of established trees and shrubs in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Pruning shrubs and climbers.
	2	Thinning and coppicing.
	3	Scrub control.
	4	Hedge cutting.
	5	Hedge laying.
	6	Maintenance of trees in urban streets.
	7	Tree surgery.
	8	Tree felling.
II	1	Different species and type.
III	1	Different tree size categories.
IV	1	Different types of felling.
V	1	Different styles of hedge laying.
VI	1	Different locations.
VII	1	Surfaces sloping at 10° or less to the horizontal.
	2	Surfaces sloping at more than 10° to the horizontal.

Note: Group VII features shall be applied only to Group I Features 1 to 5.

Pruning Shrubs and Climbers

24 The items for pruning shrubs and climbers shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) coppicing;

(b) removal of suckers;

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(c) repairs or replacement of supports;
(d) re-attaching;
(e) chipping;
(f) windrowing;
(g) processing for mulch;
(h) dealing with infected prunings or timber arisings;
(i) disposal of material (as Series 600 paragraph 39);
(j) inspections and reports.

Thinning and Coppicing

25 The items for thinning and coppicing shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) selection;
(b) dealing with infected prunings or timber arisings;
(c) chipping;
(d) windrowing;
(e) processing for mulch;
(f) disposal of material (as Series 600 paragraph 39);
(g) inspections and reports.

Scrub Control

26 The items for scrub control shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) herbicide;
(b) cutting;
(c) furrowing and frilling;
(d) disposal of material (as Series 600 paragraph 39);
(e) allowing for re-growth;
(f) inspections and reports.

Hedge Cutting, Hedge Laying

27 The items for hedge cutting and hedge laying shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) pruning;
(b) coppicing;
(c) grubbing out or treating stumps;
(d) selection;
(e) stakes and binders;
(f) removing clippings, litter, debris and foreign objects;
(g) disposal of material (as Series 600 paragraph 39);
(h) inspections and reports.

Maintenance of Trees in Urban Streets

28 The items for maintenance of trees in urban streets shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) pruning;
(b) adjusting supports, stakes, ties, anchor systems, guards and grilles;

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(c) removal of stakes and ties;
(d) backfilling stake holes;
(e) making up levels beneath grilles;
(f) disposal of material (as Series 600 paragraph 39);
(g) inspections and reports.

Tree Surgery

29 The items for tree surgery shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) pruning;
(b) dealing with damage to limbs and boles;
(c) repairing bark wounds;
(d) probing cavities;
(e) removal of debris and loose decayed wood from cavities;
(f) wire netting including felt tacks;
(g) removal of foreign objects;
(h) severance of climbing plants;
(i) crown lifting, thinning, reduction and reshaping;
(j) disposal of material (as Series 600 paragraph 39);
(k) sterilising tools and the like;
(l) inspections and reports.

Tree Felling

30 The items for tree felling shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) herbicide;
(b) drilling and frill girdling;
(c) treating re-growth;
(d) stump grinding;
(e) filling voids with topsoil;
(f) reinstatement of paved areas;
(g) grubbing up stumps;
(h) dealing with infected timber arisings;
(i) disposal of material (as Series 600 paragraph 39);
(j) sterilising tools and the like;
(k) inspections and reports.

Maintenance of Established Grassed Areas

Units

31 The unit of measurement shall be:

(i) Grass cutting …..….. square metre.

Measurement

32 Maintenance of grassed areas shall be measured separately only when required to be carried out in connection with grassed areas that have been established prior to the commencement of the Contract.

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Grass cutting shall be measured once only for each feature in Group II irrespective of the total number of cuts required to be carried out during the contract period.

The measurement of grass cutting shall be the plan area.

Itemisation

33 Separate items shall be provided for maintenance of established grassed areas in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Grass cutting.
II	1	Central reserves.
	2	Verges.
	3	Visibility splays.
	4	Islands and roundabouts.
	5	Areas outside the highway boundary.
	6	Banks and ditches.
	7	Planting areas.
	8	Side slopes to embankments and cuttings.
	9	Other stated areas.
III	1	High frequency.
	2	Medium frequency.
	3	Low frequency.
	4	Minimal frequency.

Note: Group III Features 1 to 4 shall be applied only to Feature 1 of Group I.

Maintenance of Established Grassed Areas

34 The items for the maintenance of established grassed areas shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) temporary removal and replacement of seats, litter bins and the like;

(b) removal of stones, litter, undesirable and deleterious material;

(c) cutting around obstacles and between plants;

(d) strimming;

(e) sweeping;

(f) cutting edges;

(g) re-forming edges;

(h) raking;

(i) dispersal;

(j) disposal of material (as Series 600 paragraph 39);

(k) inspections and reports.

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Maintenance of Established Wildflower Areas, Areas of Nature Conservation Value and Ornamental Planting Areas

Units

35 The unit of measurement shall be:

(i) maintenance of wildflower areas, areas of nature conservation value and ornamental planting areas …….. square metre.

Measurement

36 Maintenance of wildflower areas, areas of nature conservation value and ornamental planting areas shall be measured separately only when required to be carried out in connection with wildflower areas, areas of nature conservation value and ornamental planting areas which have been established prior to the commencement of the Contract.

The measurement of maintenance of wildflower areas and maintenance of areas of nature conservation value and ornamental planting areas shall be the plan area.

Itemisation

37 Separate items shall be provided for maintenance of wildflower areas, areas of nature conservation and ornamental planting areas in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Maintenance of wildflower areas.
	2	Maintenance of areas of nature conservation value.
	3	Maintenance of ornamental planting areas.
II	1	Different locations.
III	1	Surfaces sloping at 10° or less to the horizontal.
	2	Surfaces sloping at more than 10° to the horizontal.

Maintenance of Established Wildflower Areas, Areas of Nature Conservation Value and Ornamental Planting Areas

Item coverage

38 The items for maintenance of wildflower areas, areas of nature conservation value and ornamental planting areas shall in accordance with the Preambles to Bill of Quantities General Directions include for:

(a) temporary removal and replacement of seats, litter bins and the like;

(b) removal of stones, litter, undesirable and deleterious material;

(c) hoeing and raking;

(d) cutting;

(e) cutting edges;

(f) re-forming edges;

(g) strimming;

(h) sample areas;

(i) chopping and dispersal;

(j) cutting and scarifying;

(k) cutting around obstacles and between plants;

(l) measures to avoid uprooting desirable vegetation;

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(m) sweeping;

(n) disposal of material (as Series 600 paragraph 39);

(o) inspections and reports.

Control of Rabbits and Deer

Units

39 The units of measurement shall be:

(i) rabbit control within the highway boundary, rabbit clearance in fenced areas of planting, deer clearance in fenced areas of planting ……item.

Itemisation

40 Separate items shall be provided for control of rabbits and deer in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Rabbit control within the highway boundary.
	2	Rabbit clearance in fenced areas of planting.
	3	Deer clearance in fenced areas of planting.
II	1	Different locations.

Note: Group II shall be applied only to Group I Features 2 and 3.

Control of Rabbits and Deer

41 The items for control of rabbits and deer shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item Coverage

(a) providing evidence of operative training;

(b) pesticides;

(c) cutting brambles and herbage;

(d) marking badger setts and fox earths and subsequent removal of markers;

(e) blocking entry and exit holes;

(f) filling, reinstatement and re-forming;

(g) dealing with arisings;

(h) disposal of material (as Series 600 paragraph 39);

(i) inspections;

(j) reports, records and registers.

Management of Established Waterbodies

Units

42 The units of measurement shall be:

(i) removal of rubbish and debris, inspections of inlets and outlets, silt inspection, reed bed inspection …..... item.

(ii) silt removal …….. cubic metre.

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Measurement

43 Management of established waterbodies shall be measured separately only when required to be carried out in connection with waterbodies that have been established prior to the commencement of the Contract.

Itemisation

44 Separate items shall be provided for management of waterbodies in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Removal of rubbish and debris.
	2	Inspections of inlets and outlets.
	3	Silt inspection.
	4	Reed bed inspection.
	5	Silt removal.
II	1	Different types of waterbody.
III	1	Different locations.

Management of Established Waterbodies

45 The items for management of waterbodies shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) notices and reports;

(b) excavation (as Series 600 paragraphs 18 and 19);

(c) deposition and spreading;

(d) disposal of material (as Series 600 paragraph 39).

Special Ecological Measures

Units

46 The units of measurement shall be:

(i) installation of tunnels and underpasses, maintenance of tunnels and underpasses……. item.

(ii) installation, maintenance of otter ledges, otter-proof grilles, reflectors, artificial nests, boxes, perches and other stated habitat creation measures …… number.

Measurement

47 The measurement of installation of tunnels and underpasses shall be the complete installation at each stated location.

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Itemisation

48 Separate items shall be provided for special ecological measures in accordance with Chapter II paragraph 3 and 4 and the following:

Group	Feature	
I	1	Installation.
	2	Maintenance.
II	1	Tunnels and underpasses.
	2	Otter ledges.
	3	Otter-proof grilles.
	4	Reflectors.
	5	Artificial nests.
	6	Boxes.
	7	Perches.
	8	Other stated habitat creation measures.
III	1	Different locations.
IV	1	Different types.
V	1	Different sizes.

Installation of Tunnels and Underpasses, Otter Ledges

49 The items for installation of tunnels and underpasses and otter ledges shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) drains and service ducts (as Series 500 paragraph 16);

(b) excavation of acceptable material (as Series 600 paragraphs 17 & 18);

(c) excavation of unacceptable material (as Series 600 paragraph 19);

(d) excavation in hard material (as Series 600 paragraph 23);

(e) deposition of fill and compaction (as Series 600 paragraphs 33 and 52);

(f) disposal of material (as Series 600 paragraph 39);

(g) imported fill (as Series 600 paragraph 45);

(h) concrete (as Series 1700 paragraphs 5 and 10);

(i) formwork (as Series 1700 paragraph 15);

(j) reinforcement (as Series 1700 paragraph 26);

(k) miscellaneous metalwork (as Series 1800 paragraph 14);

(l) waterproofing (as Series 2000 paragraph 4);

(m) sealants (as Series 2300 paragraph 10);

(n) waterbars and waterstops (as Series 2300 paragraph 11);

(o) brickwork (as Series 2400 paragraph 4);

(p) blockwork and stonework (as Series 2400 paragraph 8).

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Installation of Otter-proof Grilles

50 The items for installation of otter-proof grilles shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) miscellaneous metalwork (as Series 1800 paragraph 14).

Installation of Reflectors, Artificial Nests, Boxes, Perches and Other Stated Habitat Creation Measures

51 The items for installation of reflectors, artificial nests, boxes, perches and other stated habitat creation measures shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) licences;

(b) fabrication and construction;

(c) fixings.

Maintenance of Tunnels and Underpasses, Otter Ledges, Otter-proof Grilles, Reflectors, Artificial Nests, Boxes, Perches and Other Stated Habitat Creation Measures

52 The items for maintenance of tunnels and underpasses, otter ledges, otter-proof grilles, reflectors, artificial nests, boxes, perches and other stated habitat creation measures shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) reports;

(b) cleaning and clearing;

(c) removal of obstructions;

(d) repairs;

(e) disposal of material (as Series 600 paragraph 39);

(f) licences;

(g) inspections.

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Series 5000: Maintenance Painting of Steelwork (05/03)

Surface Preparation and Protective System

1 The items in this Series are for the measurement of maintenance painting work. Protective systems to new steelwork shall be measured under Series 1900.

Units

2 The units of measurement shall be:

(i) surface preparation and protective system to general surfaces …… square metre;

(ii) surface preparation and protective system to parapets, pedestrian guardrails and the like …… linear metre;

(iii) surface preparation and protective system to bearings, CCTV masts, steel lighting columns, bracket arms, equipment boxes, cabinets and the like …… number.

Measurement

3 The measurement of surface preparation and protective system to general surfaces shall be the surface area to be treated.

The measurement of surface preparation and protective system to parapets, pedestrian guardrails and the like shall be the developed length (on plan) to be treated.

The measurement of surface preparation and protective system to bearings, CCTV masts, steel lighting columns, bracket arms, equipment boxes, cabinets and the like shall be the complete unit.

Itemisation

4 Separate items shall be provided for surface preparation and protective system, in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Surface preparation.
	2	Protective system.
II	1	General surfaces.
	2	Parapets, pedestrian guardrails and the like.
	3	Bearings, CCTV masts, steel lighting columns, bracket arms, equipment boxes, cabinets and the like.
III	1	Different sizes.
IV	1	Different methods.
V	1	Different types.
VI	1	Different locations.

Note: Group VI shall be applied only to Group II Feature 1.

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Surface Preparation

5 The items for surface preparation shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) procedure trials;

(b) masking and other measures to protect adjacent untreated work and the removal of masking and other measures upon completion;

(c) complying with any special requirements in respect of ambient conditions including the containment of dust and debris and for intervals between successive operations and applications;

(d) joint fillers and sealant and treatment of joints and plies;

(e) removal of water, condensation, oil, grease, residues, encrusted rust, foreign matter and contaminants;

(f) cleaning;

(g) rinsing, washing;

(h) feathering edges;

(i) profiling;

(j) protection of prepared areas;

(k) drying;

(l) disposal (as Series 600 paragraph 39);

(m) facilities and assistance for inspection by the Overseeing Organisation.

Protective System

6 The items for protective system shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

(a) procedure trials, trial panels and reference panels;

(b) protective system (as Series 1900 paragraph 4);

(c) patch coats.

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