

## 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.

### Erection of Temporary Accommodation

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

#### Item coverage

- (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**

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

Item coverage

- (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**

**6** The items for dismantling temporary accommodation 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 equipment, furniture, fittings and supplies off Site;
- (b) disconnecting, removing and sealing off disused services;
- (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       | <b>7</b> | The unit of measurement shall be: <ul style="list-style-type: none"> <li>(i) vehicles for the Overseeing Organisation ..... vehicle day.</li> </ul> |
| Measurement | <b>8</b> | The measurement of vehicles for the Overseeing Organisation shall be each day or part thereof during which a vehicle is provided.                   |
| Itemisation | <b>9</b> | 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**      The items for vehicles for the Overseeing Organisation shall in accordance with the Preambles to Bill of Quantities General Directions include for:

- |               |  |
|---------------|--|
| Item coverage | <ul style="list-style-type: none"> <li>(a) equipment;</li> <li>(b) taxing for use on public highways and for the carriage of goods and samples;</li> <li>(c) comprehensive insurance;</li> <li>(d) suitable replacement including equipment;</li> <li>(e) depreciation;</li> <li>(f) maintaining in a roadworthy condition and in conformity with the vehicle manufacturer's recommendations;</li> <li>(g) fuel, oil and other consumable items;</li> <li>(h) keeping clean inside and out;</li> <li>(i) collecting from Site when the vehicle is returned.</li> </ul> |
|---------------|--|

### 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** The unit of measurement shall be:
- (i) operatives for the Overseeing Organisation ..... operative day.
- Measurement **15** The measurement of operatives for the Overseeing Organisations 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.
- 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**      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);
  - (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**      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		Traffic safety and management shall be measured once only for all works excluding landscape and ecology measured in accordance with Series 3000.
	23		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		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		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.
<b>Traffic Safety and Management and Traffic Safety and Management for Landscape and Ecology</b>	26		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 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** The items for taking measures for or construction, maintenance, removal of contraflow arrangements shall in accordance with 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** The unit of measurement shall be:

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

Measurement

**29** 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.

**30** 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** 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) site clearance, fencing, safety fencing, 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**

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.

**Removal of Measures for or Construction of Temporary Diversion for Traffic**

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** 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	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	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:												
<table> <tr> <th>Group</th><th colspan="2">Feature</th></tr> <tr> <td>I</td><td>1</td><td>Establishment of each type of recovery vehicle.</td></tr> <tr> <td></td><td>2</td><td>Maintenance of each type of recovery vehicle</td></tr> <tr> <td></td><td>3</td><td>Removal of each type of recovery vehicle.</td></tr> </table>			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.
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.												
<b>Establishment of Recovery Vehicles</b>	37	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.												
<b>Maintenance of Recovery Vehicles</b>	38	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;												
	(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**      **39**      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**      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**      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.

Itemisation      **42**      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,**      **43**      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:

**Additonal Progress Photographs and Additional Aerial Progress Photographs**

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	<b>44</b>	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	<b>45</b>	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.
Itemisation	<b>46</b>	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

		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) housings, camera poles and supports, associated safety fencing, 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);
- (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 48  
Closed Circuit Television  
(CCTV) System for the  
Monitoring of Traffic**

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**

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**

- Units
- 50** 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** 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.
- 52** 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**

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);
- (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**

Item coverage

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:

- (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 55  
Automatic Speed Camera  
System for the Enforcement  
of Mandatory Speed Limits  
at Roadworks**

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).

**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 6** (05/01) The items for demolition of individual or groups of buildings or

**Groups of Buildings or** structures shall in accordance with the Preambles to Bill of Quantities General

**Structures** 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 7 (05/01)** The items for partial demolition of individual structures shall in

**Individual Structures** 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 (05/01)** 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 fences, safety barriers and pedestrian guardrails 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 (05/01)** 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 fences, safety barriers and pedestrian guardrails 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 (05/01)** 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 fences, safety barriers and pedestrian guardrails 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 11 (05/01)** The items for take up or down and set aside for re-use or remove

**Set Aside for Re-use or** to store or tip off Site shall in accordance with the Preambles to Bill of

**Remove to Store or Tip Off** Quantities General Directions include for:

**Site**

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 curves and turfing (as Series 3000 paragraph 9);
- (x) patrolling.

**Concrete Foundation 5 (05/01)** The items for concrete foundation to timber posts shall in

**to Timber Posts** 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 10** The items for remove from store and re-erect fencing shall in accordance

**Re-erect Fencing** 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 11** (05/01) The items for concrete foundation to timber posts shall in

**to Timber Posts** 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 12** The items for remove from store and re-erect gates and stiles shall in

**Re-erect Gates and Stiles** 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 16** (05/01) The items for extra over excavation for excavation in Hard

**Excavation in Hard Material** 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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Safety Fences, Safety Barriers and Pedestrian Guardrails

**Series 400: Safety Fences, Safety Barriers and Pedestrian Guardrails**

**Definition 1** The term “beam” shall mean a longitudinal member spanning posts and mounting brackets within the limits defined in paragraph 4 below. The term “mounting bracket” shall be deemed to include the term “bridge pier or concrete parapet mounting connection”.

**2** The term “wire rope” shall mean the complete rope system for the wire rope safety fence comprising upper and lower ropes together with inherent component ropes of all types and tail ropes but excluding safety check ropes.

**Beam Safety Fences**

**Units 3** The units of measurement shall be:

(i) beams ..... linear metre.

(ii) posts, mounting brackets, terminal sections, full height anchorages, expansion joint anchorages, connections to bridge parapets, connection pieces, concrete foundations and socketed foundations to posts ..... number.

**Measurement 4** The measurement of beams shall be the developed length along the centre

line of the beams or in the case of double sided fences and double rail fences, measured once only along the centre line of the posts, between the following points:

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

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

**5** (05/01) The measurement of 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 4 shall be measured. Concrete foundations and socketed foundation to posts, between those points defined in paragraph 4, shall only be measured for those locations stated in the Contract.

**6** The measurement of connection pieces shall be the complete installation.

**7** The measurement of expansion joint anchorages shall be for each anchorage on each side of the expansion joint.

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**Itemisation 8** Separate items shall be provided for beam safety fences in accordance with Chapter II paragraphs 3 and 4 and the following:

Group Feature

I 1 Each type of beam.

2 Each type of post.

3 Each type of mounting bracket.

4 Each type of terminal section.

- 5 Each type of full height anchorage.
- 6 Each type of expansion joint anchorage.
- 7 Each type of connection to bridge parapet.
- 8 Each type of connection piece.
- 9 Each type of concrete foundation to post.
- 10 Each type of socketed foundation to 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.
- III 1 Double rail.
- IV 1 Double sided.

**Beams 9** The items for beams 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) attachments, adjuster assemblies, expansion assemblies, fixings, closure pieces and stiffeners;  
(d) adjustment of beams to flowing alignment;  
(e) tensioning or retensioning;  
(f) flaring;  
(g) painting.

**Posts 10** The items for posts 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) driving in any material;  
(d) fixing to structures including attachment systems;  
(e) fixing to beam including spacers;  
(f) drilling or forming holes and pockets and casting in bolts, base plates and anchorage assemblies;  
(g) bedding;  
(h) filling.

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**Mounting Brackets 11** The items for mounting brackets 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) fixing to structures including adaptor platforms;  
(d) fixing to beam;  
(e) drilling or forming holes and pockets and casting in bolts, base plates and anchorage assemblies.

**Terminal Sections, Full 12** (05/01) The items for terminal sections, full height anchorages, expansion

**Height Anchorages**, joint anchorages, connections to bridge parapets and connection pieces shall in

**Expansion Joint Anchorages**, accordance with the Preambles to Bill of Quantities General Directions include

**Connections to Bridge** for:

**Parapets and Connection**

**Pieces**

- Item coverage (a) posts (as this Series paragraph 10);  
(b) beams (as this Series paragraph 9);  
(c) excavation in any material (as Series 600 paragraphs 17, 18, 19 and 23);  
(d) concrete (as Series 1700 paragraphs 5 and 10);

- (e) formwork (as Series 1700 paragraph 15);
- (f) reinforcement (as Series 1700 paragraph 26);
- (g) disposal of material (as Series 600 paragraph 39);
- (h) fixing to or setting in concrete;
- (i) terminal end shoes;
- (j) precast concrete fairings;
- (k) in the case of terminal sections to untensioned corrugated beam, acceptable material, ramp, backfilling and compaction;
- (l) casings and plastic sheeting;
- (m) sockets, socket covers and filling.

**Concrete Foundations to 13** (05/01) The items for concrete foundations to posts shall in accordance

**Posts** 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) plastic sheeting;
  - (g) casings.

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**Socketed Foundations to 14** The items for socketed foundations to posts shall in accordance with the

**Posts** 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) concrete foundations to posts (as this Series paragraph 13);
  - (d) socket covers and filling.

**Remove from Store and Re-erect Beam Safety Fences**

**Units 15** The units of measurement shall be:

- (i) remove from store and re-erect beams ..... linear metre.
- (ii) remove from store and re-erect posts, mounting brackets, terminal sections, full height anchorages, expansion joint anchorages, connections to bridge parapets, connection pieces ..... number.
- (iii) concrete foundations and socketed foundations to re-erected posts ..... number.

**Measurement 16** The measurement of re-erected beam safety fences shall be in accordance

with paragraphs 4, 5, 6 and 7 of this Series.

**Itemisation 17** Separate items shall be provided for remove from store and re-erect beam

safety fences in accordance with Chapter II paragraphs 3 and 4 and the following:

Group Feature

- I 1 Each type of re-erected 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 18** The items for remove from store and re-erect beams shall in accordance

**Re-erect Beams** 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) beams (as this Series paragraph 9);

(e) making good to protective system.

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**Remove from Store and 19** The items for remove from store and re-erect posts shall in accordance

**Re-erect Posts** 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) posts (as this Series paragraph 10);

(e) making good to protective system.

**Remove from Store and 20** The items for remove from store and re-erect mounting brackets shall in

**Re-erect Mounting** accordance with the Preambles to Bill of Quantities General Directions include

**Brackets** 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) mounting brackets (as this Series paragraph 11);

(e) making good to protective system.

**Remove from Store and 21** The items for remove from store and re-erect terminal sections, full

**Re-erect Terminal Sections**, height anchorages, expansion joint anchorages, connections to bridge parapets

**Full Height Anchorages**, and connection pieces shall in accordance with the Preambles to Bill of

**Expansion Joint Anchorages**, Quantities General Directions include for:

**Connections to Bridge**

**Parapets and Connection**

**Pieces**

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) terminal sections, full height anchorages, expansion joint anchorages, connections to bridge parapets and connection pieces (as this Series paragraph 12);

(e) making good to protective system.

**Concrete Foundations and 22** The items for concrete foundations and socketed foundations to

**Socketed Foundations** to re-erected posts shall in accordance with the Preambles to Bill of Quantities

**Re-erected Posts** General Directions include for:

Item coverage (a) concrete foundations to posts (as this Series paragraph 13);

(b) socketed foundations to posts (as this Series paragraph 14).

**Post Extension Units**

Units **23** The unit of measurement shall be:

(i) post extension units ..... number.

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Itemisation **24** 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 25** 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 **26** The unit of measurement shall be:

(i) raising existing sockets ..... number.

Itemisation **27** 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 28** (05/01) 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 19);

(g) replacing items damaged during the foregoing operations;

(h) making good to protective systems.

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**Wire Rope Safety Fence**

Units **29** The units of measurement shall be:

(i) wire rope ..... linear metre.

(ii) posts, intermediate anchorages, end anchorages, concrete foundations and socketed foundations to posts ..... number.

Measurement **30** The measurement of wire rope shall be the undeveloped length measured

once only along the centre line of the fence on plan from midway between the anchor blocks at one end to midway between the anchor blocks at the other end.

**31** The measurement of intermediate anchorages and end anchorages shall be the complete installation.

Concrete foundations and socketed foundations shall only be measured for those locations stated in the Contract.

Itemisation **32** Separate items shall be provided for wire rope safety fences in accordance with Chapter II paragraphs 3 and 4 and the following:

Group Feature

- I 1 Wire rope.
- 2 Each type of post.
- 3 Each type of intermediate anchorage.
- 4 Each type of end anchorage.
- 5 Each type of concrete foundation to post.
- 6 Each type of socketed foundation to posts.

**Wire rope 33** The items for wire rope 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) rigging screws, threaded terminals, attachments, fittings and fixings;  
(d) adjustments and tensioning;  
(e) threading ropes into and around posts.

**Posts 34** The items for posts 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) driving in any material;  
(d) fixing to structures including attachment systems;  
(e) post caps, excluders, hooks and fittings;  
(f) drilling or forming holes and pockets and casting in bolts, base plates, sockets and anchorage assemblies;  
(g) bedding;  
(h) filling.

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**Intermediate Anchorages 35** (05/01) The items for intermediate anchorages and end anchorages shall in

**and End Anchorages** 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) excavation in any material (as Series 600 paragraphs 17, 18, 19 and 23);  
(d) concrete (as Series 1700 paragraphs 5 and 10);  
(e) formwork (as Series 1700 paragraph 15);  
(f) reinforcement (as Series 1700 paragraph 26);  
(g) disposal of material (as Series 600 paragraph 39);  
(h) safety check ropes, fork terminals, pins, thimbles, ferrules, attachments, fixings and fittings;  
(i) anchor frames, surface mounted anchors and sockets;  
(j) fixing to anchor block including attachment systems;  
(k) drilling or forming holes and pockets and casting in bolts, base plates, sockets and anchorage assemblies.

**Concrete Foundations to 36** (05/01) The items for concrete foundations to posts shall in accordance

**Posts** 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) plastic sheeting;  
(g) casings.

**Socketed Foundations to 37** The items for socketed foundations to posts shall in accordance with the

**Posts** 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) concrete foundations to posts (as this Series paragraph 36);
- (d) socket covers and filling.

**Concrete Safety Barriers**

**Units 38** The units of measurement shall be:

- (i) concrete safety barriers ..... linear metre.
- (ii) concrete safety barrier terminations, transitions ..... number.

**Measurement 39** The measurement of concrete safety barriers shall be the developed length along the centre line of the barriers between terminations.

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**Itemisation 40** Separate items shall be provided for concrete safety barriers in accordance with Chapter II paragraphs 3 and 4 and the following:

Group Feature

I 1 Each type of barrier.

2 Each type of termination.

3 Each type of transition.

II 1 Straight or curved exceeding 50 metres radius.

2 Curved not exceeding 50 metres radius.

**Concrete Safety Barriers 41 (05/01)** The items for concrete safety barriers 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 paragraph 5 and 10);

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

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

(f) joints and gaskets including movement joints;

(g) foundations and bases;

(h) filling;

(i) attachment systems and fixings;

(j) adjustment to flowing alignment;

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

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

(m) cast-in sockets, bolts, nuts, washers;

(n) make-up units;

(o) dowel bars;

(p) treatment at lighting columns and the like including cover plates, sub-frames, plates and fixings.

**Concrete Safety Barrier 42** The items for concrete safety barrier terminations and transitions shall in

**Terminations and Transitions** accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage (a) concrete safety barriers (as this Series paragraph 41);

(b) fixing to or setting in concrete;

(c) attachment systems and connectors for fixing to beam safety fences.

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### **Pedestrian Guardrails and Handrails**

Units **43** The unit of measurement shall be:

(i) pedestrian guardrails, handrails ..... linear metre.

Measurement **44** The measurement of pedestrian guardrails and handrails shall be the developed length along the centre line. The height of pedestrian guardrails shall be the height between the top of the top rail and the finished level of the surface directly beneath the guardrail.

Itemisation **45** Separate items shall be provided for pedestrian guardrails and handrails in accordance with Chapter II paragraphs 3 and 4 and the following:

Group Feature

I 1 Each type of pedestrian guardrail.

2 Each type of handrail.

II 1 Different heights.

III 1 Elements curved in plan to different radii.

**Pedestrian Guardrails and Handrails** **46** (05/01) The items for pedestrian guardrails and handrails shall in

**Handrails** 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) 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) metal parapets (as Series 2200 paragraph 5);

(h) gates (as Series 300 paragraph 6);

(j) rivets, nuts, bolts, shims, washers, welds, clamps and the like.

**Loading Tests on Post Foundations** (05/01)

Units **47** (05/01) The unit of measurement for loading test on post foundation shall be:

(i) loading test on post foundation carried out by Contractor, loading test on post foundation carried out by Overseeing Organisation

..... number.

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Itemisation **48** (05/01) Separate items shall be provided for loading test on post foundation in accordance with Chapter II paragraphs 3 and 4 and the following:

Group Feature

I 1 Loading test on post foundation carried out by Contractor.

2 Loading test on post foundation carried out by Overseeing Organisation.

II 1 Different types of safety fence posts.

III 1 Different sizes of safety fence posts.

**Loading Test on Post** **49** (05/01) The items for loading test on post foundation carried out by

**Foundation Carried out by Contractor** shall in accordance with the Preambles to Bill of Quantities

**Contractor** General Directions include for:

Item coverage (a) posts (as this Series paragraph 10);

(b) concrete foundations to posts (as this Series paragraph 13);

(c) socketed foundations to posts (as this Series paragraph 14);

(d) provision, maintenance and subsequent removal of test equipment;

(e) provision, maintenance and subsequent removal of reaction vehicle;

(f) preparation and submission of results to the Overseeing Organisation;

- (g) removal of test posts and foundations;
- (h) disposal of material (as Series 600 paragraph 39);
- (i) reinstatement and making good;
- (j) traffic safety and management (as Series 100 paragraph 26).

**Loading Test on Post 50** (05/01) The items for loading test on post foundation carried out by

**Foundation Carried out by** Overseeing Organisation shall in accordance with the Preambles to Bill of

**Overseeing Organisation** Quantities General Directions include for:

Item coverage (a) posts (as this Series paragraph 10);

(b) concrete foundations to posts (as this Series paragraph 13);

(c) socketed foundations to posts (as this Series paragraph 14);

(d) provision, maintenance and subsequent removal of reaction vehicle;

(e) removal of test posts and foundations;

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

(g) reinstatement and making good;

(h) traffic safety and management (as Series 100 paragraph 26).

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Drainage and Service Ducts

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

**Filter Material Contiguous 23** (05/01) The items for filter material contiguous with filter drains, sub-base

**with Filter Drains, Sub-base** material and lightweight aggregate infill shall in accordance with the Preambles

**Material and Lightweight** to Bill of Quantities General Directions include for:

**Aggregate Infill**

- Item coverage (a) compaction;
- (b) formwork (as Series 1700 paragraph 15);
  - (c) geotextiles;
  - (d) mesh.

**Excavate and Replace Filter 24** (05/01) The items for excavate and replace filter material shall in

**Material** (05/01) 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 28** (05/01) The items for fin drains and narrow filter drains shall in

**Drains** 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 32** (05/01) The items for connection to existing drains, existing piped

**Drains, Existing Piped** culverts, existing chambers, permanently severed land or mole drains shall in

**Culverts, Existing** accordance with the Preambles to Bill of Quantities General Directions include

**Chambers, Permanently** for:

**Severed Land or Mole**

**Drains** (05/01)

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 42** (05/01) The items for headwalls and outfall works shall in accordance with

**Outfall Works** 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) 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 46 (05/01)** The items for excavation of soft spots and other voids shall in

**Other Voids** 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 47 (05/01)** The items for filling of soft spots and other voids shall in

**Other Voids** 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 55** (05/01) The items for drainage and service ducts in structures shall in

**in Structures** 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 59** (05/01) The items for filling to pipe bays and verges on bridges shall in

**Verges on Bridges** 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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**Replacement, Raising or Lowering of Covers and Gratings on Existing Chambers and Gullies (05/01)**

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

(i) replacement 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** (05/01) When an existing cover or grating is to be raised/lowered and replaced, separate items shall be measured for raising/lowering and replacement.

**Itemisation 63** (05/01) Separate items shall be provided for replacement, 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 Replacement.

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.

**Replacement, Raising or 64** (05/01) The items for replacement, raising or lowering of covers and

**Lowering of Covers and** gratings on existing chambers and gullies shall in accordance with the

**Gratings on Existing** Preambles to Bill of Quantities General Directions include for:

**Chambers and Gullies**

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 68** (05/01) The items for remove from store and reinstall chamber covers

**Reinstall Chamber Covers** and frames and gully gratings and frames shall in accordance with the

**and Frames and Gully** Preambles to Bill of Quantities General Directions include for:  
**Gratings and Frames**

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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) replacement, 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 72** (05/01) The items for grouting up of existing drains and service ducts shall

**Drains and Service Ducts** 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) Excavation in hard material shall not be measured separately in connection with replacement 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 76** (05/01) The items for extra over excavation for excavation in Hard

**Excavation in Hard Material** Material in drainage 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).

**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 84** (05/01) The items for cleaning existing drainage systems shall in

**Systems** 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) flushing;
- (e) water supply;
- (f) mandrelling;
- (g) disposal of material (as Series 600 paragraph 39);
- (h) recording and reporting;
- (i) greasing;
- (j) cleaning covers, gratings and frames, offlets and the like;
- (k) filling with water;
- (l) vacuum/air suction;
- (m) locating obstructions and the like;
- (n) contamination prevention measures;
- (o) locating chambers and gullies.

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Earthworks

### **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 5** (05/01) The items for prescribed temporary traffic signs shall in

**Traffic Signs** 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.

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 8** The items for remove from store and re-erect traffic signs shall in

**Re-erect Traffic Signs** accordance with the Preambles to Bill of Quantities General Directions include for:

- Item coverage (a) loading, transporting from store, unloading and positioning for reerection;
- (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) 22 (05/01)** The items for road studs shall in accordance with the Preambles to

Bill of Quantities General Directions include for:

Item coverage (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 reinstall

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 25** The items for remove from store and re-install road studs shall in

**Re-install Road Studs (05/01)** 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 30 (05/01)** The items for permanent traffic signal installations shall in

**Installations** (05/01) 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 31** (05/01) The items for prescribed temporary traffic signal installations shall

**Signal Installations** (05/01) 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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Chapter IV Series 1200

Traffic Signs and Road Markings

**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 35** (05/01) The items for permanent controlled and uncontrolled crossings

**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 36** (05/01) The items for prescribed temporary controlled and uncontrolled

**Controlled and Uncontrolled** crossings shall in accordance with the Preambles to Bill of Quantities General

**Crossings** 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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Traffic Signs and Road Markings

**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 39** (05/01) The items for marker posts shall in accordance with the Preambles

to Bill of Quantities General Directions include for:

Item coverage (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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Method of Measurement for Highway Works

Chapter IV Series 1300

Road Lighting Columns, Brackets and CCTV

Masts

**Series 1300: Road Lighting Columns, Brackets and CCTV**

**Masts** (05/01)

**Road Lighting Columns, Brackets, Wall Mountings and CCTV**

**Masts** (05/01)

Units **1** (05/01) The unit of measurement shall be:

(i) road lighting columns, brackets, wall mountings, CCTV masts..... number.

Measurement **2** (05/01) The measurement of road lighting columns, brackets, wall mountings and CCTV masts shall be the complete installation except for earth electrodes which shall be measured separately (under Series 1400 paragraphs 24 to 27).

Itemisation **3** (05/01) Separate items shall be provided for road lighting columns, brackets, wall mountings and CCTV 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.

II 1 Different height of lighting columns.

2 Different height of CCTV masts.

III 1 Different projection of brackets.

IV 1 Different luminaires.

V 1 Different types.

**Road Lighting Columns, 4** (05/01) The items for road lighting columns, brackets, wall mountings

**Brackets, Wall Mountings** and CCTV masts shall in accordance with the Preambles to Bill of

**and CCTV Masts (05/01)** 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 and 18);
- (h) excavation of unacceptable material (as Series 600 paragraph 19);

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Chapter IV Series 1300

Road Lighting Columns, Brackets and CCTV Masts

- (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, Brackets, and Wall Mountings**

Units **5** The unit of measurement shall be:

- (i) remove from store and re-erect road lighting columns, brackets and wall mountings ..... number.

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Method of Measurement for Highway Works

Chapter IV Series 1300

Road Lighting Columns, Brackets and CCTV

Masts

Itemisation **6** Separate items shall be provided for remove from store and re-erect road

lighting columns, brackets and wall mountings 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.

II 1 Different height of columns.

III 1 Different projections of brackets.

IV 1 Different luminaires.

V 1 Different types.

**Remove from Store and 7** The items for remove from store and re-erect road lighting columns,

**Re-erect Road Lighting** brackets and wall mountings shall in accordance with the Preambles

**Columns, Brackets and** to Bill of Quantities General Directions include for:

**Wall Mountings**

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, brackets and wall mountings

(as this Series paragraph 4).

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Chapter IV Series 1400

Electrical Work for Road Lighting and Traffic Signs

## Series 200: Site Clearance

**1** 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	<b>2</b>	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	<b>3</b>	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	<b>4</b>	Separate items shall be provided for site clearance in accordance with Chapter II paragraphs 3 and 4 and the following:												
	<table border="1"> <thead> <tr> <th>Group</th><th colspan="2">Feature</th></tr> </thead> <tbody> <tr> <td rowspan="4">I</td><td>1</td><td>General site clearance.</td></tr> <tr> <td>2</td><td>General site clearance of separate sections.</td></tr> <tr> <td>3</td><td>Demolition of individual or groups of buildings or structures.</td></tr> <tr> <td>4</td><td>Partial demolition of individual structures.</td></tr> </tbody> </table>		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.
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.												
<b>General Site Clearance</b>	<b>5</b>	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;												
	(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**

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 7  
of Individual  
Structures**

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

#### Units

**8** 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 fences, safety barriers and pedestrian guardrails and the like, copings, string courses and the like ..... linear metre;
- (iv) cable ..... linear metre;
- (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** 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 fences, safety barriers and pedestrian guardrails 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** 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 fences, safety barriers and pedestrian guardrails 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.

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

**11** 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.

## Series 300: Fencing

### Fencing, Gates and Stiles

Units	<p><b>1</b> The units of measurement shall be:</p> <ul style="list-style-type: none"> <li>(i) fencing ..... linear metre.</li> <li>(ii) concrete foundation to timber posts ..... number.</li> <li>(iii) gates, stiles ..... number.</li> <li>(iv) wire, wire mesh to existing fencing, gates and the like ..... linear metre.</li> <li>(v) fenced tree guards ..... number.</li> </ul>															
Measurement	<p><b>2</b> 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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>Concrete foundation to timber posts shall only be measured for those locations stated in Appendices 1/15 or 3/1 of the Specification.</p>															
Itemisation	<p><b>3</b> Separate items shall be provided for fencing in accordance with Chapter II paragraphs 3 and 4 and the following:</p> <table border="1"> <thead> <tr> <th>Group</th><th>Feature</th></tr> </thead> <tbody> <tr> <td rowspan="7">I</td><td>1 Each type of fencing.</td></tr> <tr> <td>2 Concrete foundation to each type of timber post for each type of fencing.</td></tr> <tr> <td>3 Each type of gate.</td></tr> <tr> <td>4 Each type of stile.</td></tr> <tr> <td>5 Each type of wire to existing fencing, gates and the like.</td></tr> <tr> <td>6 Each type of wire mesh to existing fencing, gates and the like.</td></tr> <tr> <td>7 Each type of fenced tree guard.</td></tr> <tr> <td rowspan="2">II</td><td>1 Fencing of different heights.</td></tr> <tr> <td>2 Gates of different heights and widths.</td></tr> <tr> <td>III</td><td>1 Painted fencing, gates or stiles.</td></tr> </tbody> </table>	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.
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.															
<b>Fencing</b>	<p><b>4</b> The items for fencing shall in accordance with the Preambles to Bill of Quantities General Directions include for:</p>															
Item coverage	<p>(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);</p>															

- (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 5  
to Timber Posts**

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).

**Gates and Stiles**

**6** 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** 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** 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.

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

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.

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).

Item coverage	(a) concrete foundation to timber posts (as this Series paragraph 5).
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Item coverage	<ul style="list-style-type: none"> <li>(a) loading, transporting from store, unloading and positioning for re-erection;</li> <li>(b) replacing items damaged during the foregoing operations;</li> <li>(c) modification and new materials;</li> <li>(d) painting existing painted items;</li> <li>(e) gates and stiles (as this Series paragraph 6).</li> </ul>
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Units **13** The unit of measurement shall be:

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

**Measurement**      **14**      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**      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**      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).

**Series 400: Safety Fences, Safety Barriers and Pedestrian Guardrails**

**Definition**

**1** The term “beam” shall mean a longitudinal member spanning posts and mounting brackets within the limits defined in paragraph 4 below. The term “mounting bracket” shall be deemed to include the term “bridge pier or concrete parapet mounting connection”.

**2** The term “wire rope” shall mean the complete rope system for the wire rope safety fence comprising upper and lower ropes together with inherent component ropes of all types and tail ropes but excluding safety check ropes.

**Beam Safety Fences**

**Units**

**3** The units of measurement shall be:

- (i) beams ..... linear metre.
- (ii) posts, mounting brackets, terminal sections, full height anchorages, expansion joint anchorages, connections to bridge parapets, connection pieces, concrete foundations and socketed foundations to posts ..... number.

**Measurement**

**4** The measurement of beams shall be the developed length along the center line of the beams or in the case of double sided fences and double rail fences, measured once only along the centre line of the posts, between the following points:

- (a) the end of each beam type at a connection to bridge parapet or within a connection piece assembly;
- (b) the connection of beams to terminal sections, full height anchorages and expansion joint anchorages.

**5** The measurement of 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 4 shall be measured. Concrete foundations and socketed foundation to posts, between those points defined in paragraph 4, shall only be measured for those locations stated in the Contract.

**6** The measurement of connection pieces shall be the complete installation.

**7** The measurement of expansion joint anchorages shall be for each anchorage on each side of the expansion joint.

**Itemisation**

**8** Separate items shall be provided for beam safety fences in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature	
I	1	Each type of beam.
	2	Each type of post.
	3	Each type of mounting bracket.
	4	Each type of terminal section.
	5	Each type of full height anchorage.
	6	Each type of expansion joint anchorage.
	7	Each type of connection to bridge parapet.
	8	Each type of connection piece.
	9	Each type of concrete foundation to post.
	10	Each type of socketed foundation to 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.
III	1	Double rail.
IV	1	Double sided.

#### Beams

**9** The items for beams 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) attachments, adjuster assemblies, expansion assemblies, fixings, closure pieces and stiffeners;
- (d) adjustment of beams to flowing alignment;
- (e) tensioning or retensioning;
- (f) flaring;
- (g) painting.

#### Posts

**10** The items for posts 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) driving in any material;
- (d) fixing to structures including attachment systems;
- (e) fixing to beam including spacers;
- (f) drilling or forming holes and pockets and casting in bolts, base plates and anchorage assemblies;
- (g) bedding;
- (h) filling.

#### Mounting Brackets

**11** The items for mounting brackets 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) fixing to structures including adaptor platforms;
- (d) fixing to beam;
- (e) drilling or forming holes and pockets and casting in bolts, base plates and anchorage assemblies.

#### Terminal Sections, Full Height Anchorages, Expansion Joint Anchorages,

**12** The items for 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

**Connections to Bridge  
Parapets and Connection  
Pieces**

for:

Item coverage

- (a) posts (as this Series paragraph 10);
- (b) beams (as this Series paragraph 9);
- (c) excavation in any material (as Series 600 paragraphs 17, 18, 19 and 23);
- (d) concrete (as Series 1700 paragraphs 5 and 10);
- (e) formwork (as Series 1700 paragraph 15);
- (f) reinforcement (as Series 1700 paragraph 26);
- (g) disposal of material (as Series 600 paragraph 39);
- (h) fixing to or setting in concrete;
- (i) terminal end shoes;
- (j) precast concrete fairings;
- (k) in the case of terminal sections to untensioned corrugated beam, acceptable material, ramp, backfilling and compaction;
- (l) casings and plastic sheeting;
- (m) sockets, socket covers and filling.

**Concrete Foundations to  
Posts**

**13** The items for concrete foundations to 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) plastic sheeting;
- (g) casings.

**Socketed Foundations  
to Posts**

**14** The items for socketed foundations to posts 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) concrete foundations to posts (as this Series paragraph 13);
- (d) socket covers and filling.

Units	<b>15</b>	The units of measurement shall be:
		(i) remove from store and re-erect beams ..... linear metre.
		(ii) remove from store and re-erect posts, mounting brackets, terminal sections, full height anchorages, expansion joint anchorages, connections to bridge parapets, connection pieces ..... number.
		(iii) concrete foundations and socketed foundations to re-erected posts.... number.

Itemisation	<b>17</b>	Separate items shall be provided for remove from store and re-erect beam safety fences in accordance with Chapter II paragraphs 3 and 4 and the following:
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Group	Feature
I	1 Each type of re-erected 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.

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)	beams (as this Series paragraph 9);
	(e)	making good to protective system.

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) posts (as this Series paragraph 10);
- (e) making good to protective system.

**Remove from Store and Re-erect Mounting Brackets**      **20**      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) mounting brackets (as this Series paragraph 11);
  - (e) making good to protective system.

**Remove from Store and Re-erect Terminal Sections Full Height Anchorages Expansion Joint Anchorages Connections to Bridge parapets and Connection Pieces**      **21**      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) terminal sections, full height anchorages, expansion joint anchorages, connections to bridge parapets and connection pieces (as this Series paragraph 12);
  - (e) making good to protective system.

**Concrete Foundations and Socketed Foundations to Re-erected Posts**      **22**      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) concrete foundations to posts (as this Series paragraph 13);
  - (b) socketed foundations to posts (as this Series paragraph 14).

#### **Post Extension Units**

Units      **23**      The unit of measurement shall be:

- (i) post extension units ..... number.

Itemisation      **24**      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**      **25**      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      **26**      The unit of measurement shall be:

(i) raising existing sockets ..... number.

Itemisation      **27**      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 28**      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 19);
  - (g) replacing items damaged during the foregoing operations;
  - (h) making good to protective systems.

**Wire Rope Safety Fence**

Units      **29**      The units of measurement shall be:

(i) wire rope ..... linear metre.

- (ii) posts, intermediate anchorages, end anchorages, concrete foundations and socketed foundations to posts ..... number.

**Measurement** **30** The measurement of wire rope shall be the undeveloped length measured once only along the centre line of the fence on plan from midway between the anchor blocks at one end to midway between the anchor blocks at the other end.

**31** The measurement of intermediate anchorages and end anchorages shall be the complete installation.

Concrete foundations and socketed foundations shall only be measured for those locations stated in the Contract.

**temisation** **32** Separate items shall be provided for wire rope safety fences in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature
I	1 Wire rope.
	2 Each type of post.
	3 Each type of intermediate anchorage.
	4 Each type of end anchorage.
	5 Each type of concrete foundation to post.
	6 Each type of socketed foundation to posts.

**Wire rope** **33** The items for wire rope 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) rigging screws, threaded terminals, attachments, fittings and fixings;
  - (d) adjustments and tensioning;
  - (e) threading ropes into and around posts.

**Posts** **34** The items for posts 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) driving in any material;
  - (d) fixing to structures including attachment systems;
  - (e) post caps, excluders, hooks and fittings;
  - (f) drilling or forming holes and pockets and casting in bolts, base plates, sockets and anchorage assemblies;
  - (g) bedding;
  - (h) filling.

**Intermediate Anchorages and End Anchorages** **35** The items for intermediate anchorages and end anchorages shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage		<ul style="list-style-type: none"> <li>(a) fabrication (as Series 1800 paragraph 6);</li> <li>(b) protective system (as Series 1900 paragraph 4);</li> <li>(c) excavation in any material (as Series 600 paragraphs 17, 18, 19 and 23);</li> <li>(d) concrete (as Series 1700 paragraphs 5 and 10);</li> <li>(e) formwork (as Series 1700 paragraph 15);</li> <li>(f) reinforcement (as Series 1700 paragraph 26);</li> <li>(g) disposal of material (as Series 600 paragraph 39);</li> <li>(h) safety check ropes, fork terminals, pins, thimbles, ferrules, attachments, fixings and fittings;</li> <li>(i) anchor frames, surface mounted anchors and sockets;</li> <li>(j) fixing to anchor block including attachment systems;</li> <li>(k) drilling or forming holes and pockets and casting in bolts, base plates, sockets and anchorage assemblies.</li> </ul>
<b>Concrete Foundations To Posts</b>	<b>36</b>	The items for concrete foundations to posts shall in accordance with the Preambles to Bill of Quantities General Directions include for:
Item coverage		<ul style="list-style-type: none"> <li>(a) excavation in any material (as Series 600 paragraphs 17, 18, 19 and 23);</li> <li>(b) disposal of material (as Series 600 paragraph 39);</li> <li>(c) concrete (as Series 1700 paragraphs 5 and 10);</li> <li>(d) formwork (as Series 1700 paragraph 15);</li> <li>(e) reinforcement (as Series 1700 paragraph 26);</li> <li>(f) plastic sheeting;</li> <li>(g) casings.</li> </ul>
<b>Socketed Foundations to Posts</b>	<b>37</b>	The items for socketed foundations to posts shall in accordance with the Preambles to Bill of Quantities General Directions include for:
Item coverage		<ul style="list-style-type: none"> <li>(a) fabrication (as Series 1800 paragraph 6);</li> <li>(b) protective system (as Series 1900 paragraph 4);</li> <li>(c) concrete foundations to posts (as this Series paragraph 36);</li> <li>(d) socket covers and filling.</li> </ul>
<b>Concrete Safety Barriers</b>		
Units	<b>38</b>	The units of measurement shall be: <ul style="list-style-type: none"> <li>(i) concrete safety barriers ..... linear metre.</li> <li>(ii) concrete safety barrier terminations, transitions ..... number.</li> </ul>
Measurement	<b>39</b>	The measurement of concrete safety barriers shall be the developed length along the centre line of the barriers between terminations.

Itemisation **40** Separate items shall be provided for concrete safety barriers in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature
I	1 Each type of barrier.
	2 Each type of termination.
	3 Each type of transition.
II	1 Straight or curved exceeding 50 metres radius.
	2 Curved not exceeding 50 metres radius.

**Concrete Safety Barriers 41** The items for concrete safety barriers 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 paragraph 5 and 10);
  - (d) formwork (as Series 1700 paragraph 15);
  - (e) reinforcement (as Series 1700 paragraph 26);
  - (f) joints and gaskets including movement joints;
  - (g) foundations and bases;
  - (h) filling;
  - (i) attachment systems and fixings;
  - (j) adjustment to flowing alignment;
  - (k) fabrication (as Series 1800 paragraph 6);
  - (l) protective system (as Series 1900 paragraph 4);
  - (m) cast-in sockets, bolts, nuts, washers;
  - (n) make-up units;
  - (o) dowel bars;
  - (p) treatment at lighting columns and the like including cover plates, sub-frames, plates and fixings.

**Concrete Safety Barrier Terminations and Transitions 42** The items for concrete safety barrier terminations and transitions shall in accordance with the Preambles to Bill of Quantities General Directions included for:

- Item coverage
- (a) concrete safety barriers (as this Series paragraph 41);
  - (b) fixing to or setting in concrete;
  - (c) attachment systems and connectors for fixing to beam safety fences.

#### Pedestrian Guardrails and Handrails

Units	<b>43</b>	The unit of measurement shall be:	
	(i)	pedestrian guardrails, handrails ..... linear metre.	
Measurement	<b>44</b>	The measurement of pedestrian guardrails and handrails shall be the developed length along the centre line. The height of pedestrian guardrails shall be the height between the top of the top rail and the finished level of the surface directly beneath the guardrail.	
Itemisation	<b>45</b>	Separate items shall be provided for pedestrian guardrails and handrails in accordance with Chapter II paragraphs 3 and 4 and the following:	
		Group	Feature
		I	1 Each type of pedestrian guardrail.
			2 Each type of handrail.
		II	1 Different heights.
		III	1 Elements curved in plan to different radii.
<b>Pedestrian Guardrails and Handrails</b>	<b>46</b>	The items for pedestrian guardrails and handrails 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)	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)	metal parapets (as Series 2200 paragraph 5);
		(h)	gates (as Series 300 paragraph 6);
		(j)	rivets, nuts, bolts, shims, washers, welds, clamps and the like.

#### Loading Tests on Post Foundations

Units

47

The unit of measurement for loading test on post foundation shall be:

(i)

loading test on post foundation carried out by Contractor, loading test on post foundation carried out by Overseeing Organisation ..... number.

Itemisation

48

Separate items shall be provided for loading test on post foundation in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature
I	1 Loading test on post foundation carried out by Contractor.
	2 Loading test on post foundation carried out by Overseeing Organisation.
II	1 Different types of safety fence posts.
III	1 Different sizes of safety fence posts.

Loading Test on Post Foundation Carried Out by Contractor

49

The items for loading test on post foundation carried out by Contractor shall in accordance with the Preambles to Bill of Quantities General Directions include for:

- Item coverage
- (a) posts (as this Series paragraph 10);
  - (b) concrete foundations to posts (as this Series paragraph 13);
  - (c) socketed foundations to posts (as this Series paragraph 14);
  - (d) provision, maintenance and subsequent removal of test equipment;
  - (e) provision, maintenance and subsequent removal of reaction vehicle;
  - (f) preparation and submission of results to the Overseeing Organisation;
  - (g) removal of test posts and foundations;
  - (h) disposal of material (as Series 600 paragraph 39);
  - (i) reinstatement and making good;
  - (j) traffic safety and management (as Series 100 paragraph 26).

**Loading Test on Post Foundation Carried Out by Overseeing Organisation**

**50** The items for loading test on post foundation carried out by Overseeing Organisation shall in accordance with the Preambles to Bill of Quantities General Directions include for:

- Item coverage
- (a) posts (as this Series paragraph 10);
  - (b) concrete foundations to posts (as this Series paragraph 13);
  - (c) socketed foundations to posts (as this Series paragraph 14);
  - (d) provision, maintenance and subsequent removal of reaction vehicle;
  - (e) removal of test posts and foundations;
  - (f) disposal of material (as Series 600 paragraph 39);
  - (g) reinstatement and making good;
  - (h) traffic safety and management (as Series 100 paragraph 26).

### Series 500: Drainage and Service Ducts

#### Definitions

- 1 Any reference to 'drain' shall be deemed to include sewers and piped culverts.
- 2 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 Trenches and ducts in connection with electrical work for road lighting and traffic signs cabling shall be measured in accordance with Series 1400.
- 4 Trenches and ducts in connection with motorway communications cabling shall be measured in accordance with Series 1500.
- 5 The Earthworks Outline is defined in Series 600 Earthworks paragraphs 1 to 6 inclusive and shall apply equally to this Series.
- 6 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 Sub-soil Level is defined as the level of the ground after the removal of topsoil required by the Contract.
- 8 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)

#### Unit

- 9 The unit of measurement for drains and service ducts shall be:
  - (i) drains, service ducts ..... linear metre.

#### Measurement

- 10 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 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;
  - (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** 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** 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** Drains and service ducts required to be designed by the Contractor shall be measured in accordance with Series 2500.

**Itemisation**

**15** 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.

### **Drains and Service Ducts**

- 16** 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** 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.
<b>Measurement</b>	<b>18</b>	<p>The measurement of filter drains, excluding narrow filter drains, shall be the summation of their individual lengths measured along the center lines of the pipe (or trench where no pipe is provided), between any of the following:</p> <p>(a) the internal faces of chambers;</p> <p>(b) the external faces of headwalls;</p> <p>(c) the intersection of centre lines at junctions;</p> <p>(d) the centre of gully gratings (or where no grating is provided the centre of the gully);</p> <p>(e) the position of terminations shown in the Contract;</p> <p>(f) the point of change of stage depth.</p>
	<b>19</b>	<p>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:</p> <p>(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;</p> <p>(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.</p> <p>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.</p> <p>Narrow filter drains shall be measured in accordance with paragraphs 25 to 28 of this Series.</p>
	<b>20</b>	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>
<b>Itemisation</b>	<b>21</b>	<p>Separate items shall be provided for filter drains in accordance with Chapter II paragraphs 3 and 4 and the following:</p>

Group 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** 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;
- (m) topsoiling, seeding and turfing;
- (n) mesh;
- (o) pipe schedules;
- (p) protective system (as Series 1900 paragraph 4).

**Filter Material Contiguous with Filter Drains, Sub-base Material and Lightweight** **23** 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 **Aggregate Infill**  
Directions include for:

- Item coverage
- (a) compaction;
  - (b) formwork (as Series 1700 paragraph 15);
  - (c) geotextiles;
  - (d) mesh.

**Excavate and Replace Filter Material** **24** 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** The unit of measurement shall be:
- (i) fin drains ..... linear metre.
  - (ii) narrow filter drains ..... linear metre.
- Measurement **26** 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** 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.

**Fin Drains and Narrow Filter Drains**

Item coverage

**28** The items for fin drains and narrow filter drains shall in accordance with the Preambles to Bill of Quantities General Directions include for:

- (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** 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** 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** 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**

Item coverage

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 for:

- (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;
- (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	<b>33</b>	The unit of measurement shall be:
		(i) chambers, gullies ..... number.
Measurement	<b>34</b>	The measurement shall be of the complete chamber or gully.
	<b>35</b>	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** 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
	3	and so on in steps of 1 metre
IV	1	Different types of covers or gratings.

**Chambers**

**37** 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;
- (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

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.

## Headwalls and Outfall Works

### Measurement

39

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

The unit of measurement shall be:

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

### Itemisation

41

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.
<b>Headwalls and Outfall Works</b>	<b>42</b>	The items for headwalls and outfall works shall in accordance with the Preambles to Bill of Quantities General Directions include for:	
Item coverage		<p>(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);</p> <p>(b) excavation of unacceptable material (as Series 600 paragraph 19);</p> <p>(c) concrete (as Series 1700 paragraphs 5 and 10);</p> <p>(d) formwork (as Series 1700 paragraph 15);</p> <p>(e) backfilling and compaction;</p> <p>(f) disposal of material (as Series 600 paragraph 39);</p> <p>(g) brickwork, copings, string courses and the like (as Series 2400 paragraph 4);</p> <p>(h) blockwork, stonework, copings, string courses, individual blocks, features or stones (as Series 2400 paragraph 8);</p> <p>(i) lining of watercourses (as Series 600 paragraph 89);</p> <p>(j) drainage channel blocks (as Series 1100 paragraph 4);</p> <p>(k) building in pipes and fin drain connections;</p> <p>(l) reinforcement (as Series 1700 paragraph 26);</p> <p>(m) miscellaneous metalwork (as Series 1800 paragraph 14);</p> <p>(n) waterproofing (as Series 2000 paragraph 4);</p> <p>(o) flap valves.</p>	
		<b>Soft Spots and Other Voids</b>	
Units	<b>43</b>	The unit of measurement shall be:	
		(i) soft spots, other voids ..... cubic metre.	
Measurement	<b>44</b>	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** 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**

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** 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).

**Supports Left in Excavation**

Units **48** The unit of measurement shall be:  
(i) supports left in excavation ..... square metre.

Measurement **49** The measurement shall be the area of face required by the Contract to be left with supports in position

Itemisation **50** 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** 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** The unit of measurement shall be:

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

Measurement **53** The components comprising the items of drainage and service ducts in structures shall be identified and scheduled in the Contract.

Itemisation **54** 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.

**Drainage and Service Ducts in Structures** **55** 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	<b>56</b>	The unit of measurement shall be:
	(i)	filling to pipe bays and verges on bridges ..... cubic metre.
Measurement	<b>57</b>	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	<b>58</b>	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.

<b>Filling to Pipe Bays and Verges on Bridges</b>	<b>59</b>	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.

#### **Replacement, Raising or Lowering of Covers and Gratings on Existing Chambers and Gullies**

<b>Definition</b>	<b>60</b>	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	<b>61</b>	The units of measurement shall be:
	(i)	replacement 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	<b>62</b>	When an existing cover or grating is to be raised/lowered and replaced, separate items shall be measured for raising/lowering and replacement.
Itemisation	<b>63</b>	Separate items shall be provided for replacement, 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	Replacement.
	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.

**Replacement, Raising  
or Lowering of Covers  
Existing** the Preambles to  
**Chambers and Gullies**

Item coverage

**64** The items for replacement, raising or lowering of covers and gratings on existing chambers and gullies shall in accordance with **and gratings on** 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) 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;
- (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	<b>65</b>	The unit of measurement shall be:  (i) remove from store and reinstall chamber covers and frames, and gully gratings and frames ..... number.
Measurement	<b>66</b>	The measurement of remove from store and reinstall chamber covers and frames and gully gratings and frames shall be the complete installation.
Itemisation	<b>67</b>	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.

<b>Remove from Store and Reinstall Chamber and Frames and Gully Gratings and Frames</b> Item coverage	<b>68</b>	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:  (a) loading, transporting from store, unloading and positioning for reinstallation;  (b) replacing items damaged during the foregoing operations;  (c) modification and new materials;  (d) replacement, raising or lowering of covers and gratings on existing chambers and gullies (as this Series paragraph 64).
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**Grouting Up of Existing Drains and Service Ducts**

Units	<b>69</b>	The unit of measurement shall be:  (i) grouting up of existing drains and service ducts ..... linear metre.
Measurement	<b>70</b>	The measurement of grouting up of existing drains and service ducts shall be the length to be grouted as stated in the Contract.
Itemisation	<b>71</b>	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**

	<b>72</b>	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	<b>73</b>	The unit of measurement shall be:  (i) extra over excavation for excavation in Hard Material in drainage ..... cubic metre.
Measurement	<b>74</b>	The measurement shall be the volume of the voids formed by the removal of the Hard Material.  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 300mm

(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) Excavation in hard material shall not be measured separately in connection with replacement and raising or lowering of covers and gratings on existing chambers and gullies.

Itemisation                      **75**      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
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I	1	Extra over excavation for excavation in Hard Material in drainage.
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**Extra Over Excavation for Excavation in Hard Material**

**76**      The items for extra over excavation for excavation in Hard Material in drainage 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).

**Concrete Bagwork**

Units                                  **77**      The unit of measurement shall be:

(i) Concrete bagwork .....cubic metre.

Measurement                      **78**      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**      Separate items shall be provided for concrete bagwork in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature
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I	1	Concrete bagwork.
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II	1	In headwalls.
	2	Other stated location.

III	1	With battered face.
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**Concrete Bagwork**

**80**      The items for concrete bagwork shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item Coverage	<ul style="list-style-type: none"> <li>(a) excavation (as Series 600 paragraphs 18 and 19);</li> <li>(b) disposal of material (as Series 600 paragraph 39);</li> <li>(c) trials and trial panels;</li> <li>(d) deposition, fill and compaction (as Series 600 paragraphs 33, 45 and 52);</li> <li>(e) filling bags with concrete and tucking in ends of bags;</li> <li>(f) shaping bags and soaking;</li> <li>(g) dowel bars (as Series 1700 paragraph 27);</li> <li>(h) building in pipes;</li> <li>(i) tying into existing work;</li> <li>(j) construction of bagwork in more than one lift;</li> <li>(k) in situ concrete (as Series 1700 paragraph 5);</li> <li>(l) formwork (as Series 1700 paragraph 15);</li> <li>(m) reinforcement (as Series 1700 paragraph 26);</li> <li>(n) geotextiles (as Series 600 paragraph 60);</li> <li>(o) water supply.</li> </ul>
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#### **Cleaning Existing Drainage Systems**

Units	<p><b>81</b> The units of measurement shall be:</p> <ul style="list-style-type: none"> <li>(i) cleaning of piped drainage systems, drainage channels, linear drainage channel systems, combined drainage and kerb systems.....linear metre.</li> <li>(ii) cleaning of bridge drainage system .....item.</li> <li>(iii) cleaning of chambers, gullies .....number.</li> </ul>
Measurement	<p><b>82</b> 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:</p> <ul style="list-style-type: none"> <li>(a) the internal faces of chambers;</li> <li>(b) the external faces of headwalls;</li> <li>(c) the intersections of the centre lines at pipe junctions;</li> <li>(d) the centre of gully gratings (or where no grating is provided, the centre of the gully);</li> <li>(e) the position of terminations shown in the Contract.</li> </ul>

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.

Itemisation **83** 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** 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) flushing;
- (e) water supply;
- (f) mandrelling;
- (g) disposal of material (as Series 600 paragraph 39);
- (h) recording and reporting;
- (i) greasing;
- (j) cleaning covers, gratings and frames, offlets and the like;
- (k) filling with water;
- (l) vacuum/air suction;
- (m) locating obstructions and the like;
- (n) contamination prevention measures;
- (o) locating chambers and gullies.



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## **Series 600: Earthworks**

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### **Definitions**

**1** 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, screening mounds, 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**

**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.

**12** 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** 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, screening mounds, 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;
- (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.

Itemisation

**16** 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 U1.
	4	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** 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, sewers, services, instrumentation and the like;
- (g) grading beds and trimming side slopes of watercourses and the like;
- (h) replacing acceptable material rendered unacceptable.
- (i) facilitating Archaeologist

**Excavation of Acceptable  
Material Excluding Class 5A**

**18** 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) taking precautions to avoid damage to property, structures, drains, sewers, 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)
- (q) disposal of surcharge material rendered unacceptable (as this Series paragraph 39);
- (r) haulage, deposition and compaction in temporary stockpiles including provision of sites for stockpiles;
- (s) replacing acceptable material rendered unacceptable;
- (t) breaking down and processing material necessary to comply with the requirements of fill;
- (u) complying with special requirements for materials requiring special treatments.
- (v) excavation difficulties due to the presence of traffic on public road
- (w) facilitating installation of permanent drainage before excavation reaches 300mm before formation.

**Excavation of Unacceptable Material Classes U1 and U2**

**19** The items for excavation of unacceptable material U1 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 Class U2 material.

**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.

**Processing of Unacceptable Material Class U1**

**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** The unit of measurement shall be:
- (i) processing of unacceptable material Class U1 ..... cubic metre.
- Measurement **26** The processing of unacceptable material Class U1 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 Class U1 shall be the volume of the void required to be filled with the processed material.
- Itemisation **27** Separate items shall be provided for processing of unacceptable material Class U1 in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature
I	1 Processing of unacceptable material Class U1.
II	1 Different locations.
III	1 Into different classes of acceptable material.

**Processing of Unacceptable Material Class U1**

**28** The items for processing of unacceptable material Class U1 shall in accordance with the Preambles to Bill of Quantities General Directions include for:

- Item coverage
- (a) selection and separation of materials;
- (b) taking precautions to avoid damage to property, structures, drains, sewers, services, instrumentation and the like;
- (c) loading into transport;
- (d) multiple handling of material;
- (e) replacing acceptable material rendered unacceptable;
- (f) haulage, deposition and compaction in temporary stockpiles including provision of sites for stockpiles;
- (g) crushing, screening, mixing, grading, drying, wetting and sieving;
- (h) mechanical, chemical, hydraulic and other methods;
- (i) producing the required classification of material from Site-won materials;
- (j) obtaining permissions and approvals.

**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.
- 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** 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** 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 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) taking precautions to avoid damage to property, structures, sewers, drains, services, instrumentation and the like;
- (h) haulage;
- (i) replacing acceptable material rendered unacceptable;
- (j) selection of material of stated Classes and layering or depositing in locations stated in the Contract;
- (k) depositing fill to slope away from vertical drainage layers and measures to prevent surface water entering such layers;

- (l) treatment of soil as the Contractor may require to facilitate the use of particular plant;
- (m) trimming and shaping to levels and contours;
- (n) 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** The measurement of disposal of unacceptable material Class U1 shall be the volume of unacceptable material Class U1 excavated from within the Site and measured under this Series less the volume of processed unacceptable material Class U1 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** 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 U1.
	4	Unacceptable material Class U2.

### Disposal of Material

**39** 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 provide by the Contractor;
- (b) multiple handling of material;
- (c) special measures for dealing with Class 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** 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.

#### Itemisation

**44** 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** 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 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) taking precautions to avoid damage to property, structures, sewers, 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;
- (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** The measurement of compaction of:

- (a) fill to structures;
- (b) fill on sub-base material, base course 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.

**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** 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 course 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** 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 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) taking precautions to avoid damage to property, structures, sewers, drains, services, instrumentation and the like;
- (h) spreading and levelling;
- (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.

### 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 stabilization 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 Peambles 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;
- (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.
- (g)     turn ups and overlaps at edges

### 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.
- 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.
<b>Excavation of Soft Spots and Other Voids</b>	<b>64</b>	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.
<b>Filling of Soft Spots and Other Voids</b>	<b>65</b>	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).
		<b>Disused Sewers, Drains, Cables, Ducts, Pipelines and the Like Occurring at Formation or Sub-formation Level; Disused Basements, Cellars and the Like and Gullies</b>
<b>Definition</b>	<b>66</b>	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
	<b>67</b>	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.
Measurement	<b>68</b>	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

**71** The items for removal of disused services shall be 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.

#### Backfilling, Disused Services, Basements, Cellars and the Like and Gullies

**72** The items for backfilling disused services, basements, cellars and the like and gullies shall in accordance with the Preambles to Bill of 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, wallings 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**     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.
- 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 10o or less to the horizontal.
	2	Surfaces sloping at more than 10o to the horizontal.

Note: Group I feature 2 shall not be identified by any Group II feature.

### Topsoiling

**80** 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.

### Grass seeding and Turfing

Units

**82** Unit of measurement shall be:

- (i) grass seeding, turfing ..... square metre

Itemisation

**83** Separate items shall be provided for grass seeding and turfing in accordance with Chapter II paragraphs 3 and 4 and the following:

Group Feature		
I	1	Grass Seeding
	2	Turfing
	3	Hydraulic mulch grass seeding
II	1	Surfaces sloping at 10 °C or less to the horizontal
	2	Surface slopping at more than 10 °C to the horizontal
III	1	Turfing in two layers
IV	1	Different mixture

### Grass seeding and Turfing

**84** The item for grass seeding and turfing topsoil shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item Coverage

- (a) freeing surfaces of areas to be grassed or turfed from stones and other debris and reducing the soil to a tilth immediately prior to grassing;
- (b) fertilising including additional plant nutrients
- (c) mowing and clearance of grass cuttings;

- (d) pegging and wiring of turfs;
- (e) raking, watering, retaining agent and herbicide treatment;
- (f) additives;

#### Completion of Formation and Sub-formation

Units

**85** The unit of measurement shall be:

- (i) completion of formation, sub-formation ..... square metre.

Measurement

**86** 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.

Itemisation

**87** 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

**88** 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

**89** The unit of measurement shall be:

- (i) lining of watercourses ..... square metre.

**Measurement** **90** 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** **91** 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.

**Lining of Watercourses** **92** 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.
  - (h) blinding concrete (as series 1720 Paragraph 4)

#### Clearing of Existing Ditches

**Units** **93** The unit of measurement shall be:

- (i) clearing of existing ditches ..... linear metre.

**Measurement** **94** The measurement of clearing of existing ditches shall be the length along the centre line of the ditch.

**Itemisation** **95** 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** **96** 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

**97** The unit of measurement shall be:

- (i) establishment of ground improvement plant ..... item.

Measurement

**98** 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.

Itemisation

**99** 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

**100** 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

**101** The units of measurement shall be:

- (i) dynamic compaction ..... linear metre.
- (ii) dynamic compaction plant standing time ..... hour.
- (iii) granular blanket ..... tonne.

Measurement

**102** 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.

**103** 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.

**104** 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.

Itemisation

**105** 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

**106** 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

**107** 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**

**108** 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

**109** The units of measurement shall be:

- (i) vibrated stone columns ..... linear metre.
- (ii) vibrated stone column plant standing time ..... hour.

Measurement

**110** 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.

**111** 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

**112** 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**

**113** 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.

**Vibrated Stone Columns  
Plant Standing Time**

**114** 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

**115** The unit of measurement shall be:

- (i) gabion walling, mattresses ..... cubic metre.

Measurement

**116** 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

**117** 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 10o or less to the horizontal.
	2	Mattresses installed at more than 10o to the horizontal.
VI	1	In environmental bunds.

**Gabion Walling and  
Mattresses**

**118** 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**                      **119**    The unit of measurement shall be:
- (i)     crib walling ..... square metre.
- Measurement**                      **120**    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.
- Itemisation**                      **121**    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**                      **122**    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**                      **123**    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**                      **124**    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.

- 125**    The measurement of caps to mine working, well, swallow hole and the like shall be the volume of concrete forming the caps.

Itemisation

**126** 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**

**127** 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 and the like. 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

**128** The unit of measurement shall be:

- (i) establishment of ground anchorage plant ..... item.

Measurement

**129** 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.

Itemisation

**130** 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**

**131** 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 **132** The unit of measurement shall be:

- (i) ground anchorages ..... linear metre.

Measurement **133** 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 **134** 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.

**Ground Anchorages** **135** 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.
- (q) proof loading
- (r) facilities for Engineers's poof loading;

#### **Ground Anchorages - Waterproofing Anchorage Boreholes**

Units

**136** The unit of measurement shall be:

- (i) waterproofing of boreholes ..... linear metre.

Measurement

**137** The measurement of waterproofing of boreholes shall be the total length of waterproofing operation instructed by the Overseeing Organisation.

Itemisation

**138** 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.

#### **Waterproofing of Boreholes**

**139** 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

**140** The unit of measurement shall be:

- (i) establishment of boring plant ..... item.

Measurement

**141** 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

**142** 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**

**143** 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

**144** The unit of measurement shall be:

- (i) boring holes ..... linear metre.

Measurement

**145** 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.

Itemisation

**146** 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**

**147** 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

**148** 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

**149** 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.

#### Itemisation

**150** 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

**151** 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**

**152** 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).

**Grouting**

**153** 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;
- (g) disposal of material (as this Series paragraph 39);
- (h) covers, frames, seatings and bedding;
- (i) locks and keys.

**Instrumentation and Monitoring - Instrument Hut or Cabinet**

Units

**154** The unit of measurement shall be:

- (i) erection, servicing, dismantling of instrument hut or cabinet .  
..... item.

Itemisation

**155** 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**

**156** 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**

**157** 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.

**Dismantling Instrument Hut**

**158** 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**

**159** 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**

**160** 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**

**161** 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

**162** The unit of measurement shall be:

- (i) monitoring equipment ..... item.

Itemisation

**163** 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.

**Monitoring Equipment**

**164** 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

**165** The unit of measurement shall be:

- (i) ground water lowering ..... item.

Measurement

**166** 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

**167** 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**

**168** 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.

**Trial Pits**

Units

**169** The unit of measurement shall be:

- (j) trial pits ..... cubic metre.

Measurement

**170** 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

**171** 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**

**172** 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

**173** The unit of measurement shall be:

- (i) breaking up of redundant pavements, perforation of redundant pavements ..... square metre.

Measurement

**174** 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.

Itemisation

**175** 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

**176** 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

**177** The unit of measurement shall be:

- (i) perforation of redundant slabs, basements and the like ..... square metre.

Measurement

**178** 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

**179** 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.

**Perforation of Redundant  
Slabs, Basements and the  
Like**

**180** 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:

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.

## Series 700: Pavements

### Sub-base (Foundation Course CBM)

Units	1	The unit of measurement shall be:														
	(i)	sub-base ..... square metre.														
Measurement	2	The measurement of sub-base shall be calculated using the width and thickness required by the contractor.														
		Note: See note paragraph 7														
	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:														
		<table><tr><th>Group</th><th colspan="2">Feature</th></tr><tr><td>I</td><td>1</td><td>Each group or type of sub-base.</td></tr><tr><td rowspan="3">II</td><td>1</td><td>In carriageway, hardshoulder and hardstrip.</td></tr><tr><td>2</td><td>In emergency crossing.</td></tr><tr><td>3</td><td>In lay-by and bus bay.</td></tr></table>		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.
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	The items for sub-base shall in accordance with the Preambles to Bill of Quantities General Directions include for:														
Item coverage		<div><div>(a)</div>trial areas and trials;</div> <div><div>(b)</div>making good after sampling and testing;</div> <div><div>(c)</div>protection of material in transit and while awaiting tipping;</div> <div><div>(d)</div>designing and verifying mixes</div> <div><div>(e)</div>grading, measuring, mixing and depositing materials;</div> <div><div>(f)</div>spreading and compaction;</div> <div><div>(g)</div>cleaning, preparing and working on or up to existing surfaces and features;</div> <div><div>(h)</div>curing and protection;</div> <div><div>(i)</div>edge support;</div> <div><div>(j)</div>maintenance of surface;</div> <div><div>(k)</div>induced cracking;</div> <div><div>(l)</div>taking measures to protect the subgrade and sub-base from deterioration due to the ingress of water and the use of constructional plant;</div>														

- (m) 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;
- (n) shaping to cambers, falls and crowns;
- (o) provision of soundness test certificate.

Note: As the pavement according to the Directive for the standardization of Pavements for Traffic Areas' includes also the foundation course and the CBM layer, this paragraph 5 may also need items of paragraph 9 of this series.

### Pavement

#### Units

**6** The unit of measurement shall be:

- (i) base course, lower base course (unbound material), upper base course (asphalt), binder course, surface course, concrete slab ..... square metre.

#### Measurement

**7** The measurement of base course, lower base course, upper base course, binder course, surface course and concrete slab shall be calculated using the width of the top surface of the course or slab and the required thickness.

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** Separate items shall be provided for base course, lower base course, upper base course, 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 Course.
	2 Lower base Course.
	3 Upper base Course.
	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 Course, Lower Base Course Upper Base course, Binder Course, Surface Course and Concrete Slab

**9** The items for base course, lower base course, upper base course, surface course and concrete slab shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage	<ul style="list-style-type: none"><li>(a) trial areas and trials;</li><li>(b) making good after sampling and testing;</li><li>(c) protection of material in transit and while awaiting tipping;</li><li>(d) designing and verifying mixes;</li><li>(e) grading, measuring, reclaiming, mixing and depositing materials;</li><li>(f) air entrainment;</li><li>(g) spreading and compaction;</li><li>(h) cutting back, saw cutting, cleaning, preparing and working on or up to existing surfaces and features;</li><li>(i) edge support;</li><li>(j) reinforcement (as Series 1700 paragraph 26);</li><li>(k) waterproof and separation membranes;</li><li>(l) chippings;</li><li>(m) surface texturing;</li><li>(n) formwork (as Series 1700 paragraph 15);</li><li>(o) making joints;</li><li>(p) forming or sawing grooves, cleaning, grit blasting, priming, caulking, temporary and permanent sealing of joints;</li><li>(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;</li><li>(r) shaping to cambers, falls and crowns;</li><li>(s) forming sockets, recesses, openings, and bays;</li><li>(t) curing and protection;</li><li>(u) protection and masking and unmasking of kerbs, drainage channels, chamber covers, gully gratings, expansion joints, and the like;</li><li>(v) maintenance of surface;</li><li>(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;</li></ul>
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- (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.
- (ff) Construction of longitudinal and transversal joints (edge rolling, joint cutting, blade cutting; hot bitumen)

### Regulating Course

#### Units

**10** The units of measurement shall be:

- (i) bituminous regulating course ..... tonne, cubic metre, or square metre.
- (ii) cement bound regulating course ..... tonne, cubic metre or square metre.

#### Measurement

**11** The measurement of bituminous regulating course by tonne shall be calculated from the tonnage of material certified by the Overseeing Organisation.

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 or square metres shall be the volume of material or layer thickness 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** 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 course.
	2 Upper base course.
	3 Base course.
	4 Binder course.
	5 Surface course.

#### Bituminous and Cement Bound Regulating Course

**14** 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. No deductions shall be made for openings of 1 square metre or less.

Itemisation **18** 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** 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.

#### **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:							
		<table><tr><th>Group</th><th>Feature</th></tr><tr><td>I</td><td>1 Milling.</td></tr><tr><td>II</td><td>1 Different thicknesses or depths.</td></tr></table>		Group	Feature	I	1 Milling.	II	1 Different thicknesses or depths.
Group	Feature								
I	1 Milling.								
II	1 Different thicknesses or depths.								
Milling	28	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;							
	(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.							
	(m)	haulage and deposition in tip off site							

### Insitu Recycling - The Remix and Repave Processes

- Units**                      **29**    The unit of measurement shall be:
- (i)     reshape recycle process ..... square metre
  - (ii)    repave recycle process ..... square metre.
  - (iii)   remix 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     Reshape recycle process.
	2     Repave recycle process.
	3     Remix recycle process.
II	1     Different thicknesses or depths.

### Insitu Recycling - The Remix and Repave Processes

**32**    The items for insitu recycle processes shall in accordance with the Preambles to Bill of Quantities General Directions include for:

- Item coverage**
- (a)     milling (as this Series paragraph 28);
  - (b)     heating and scarifying;
  - (c)     base course, lower base course, upper base course, 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**    The measurement of reinstatement of paved area shall be calculated using the width of the top surface to be reinstated excluding sides and edges.

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** 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 course, lower base course, upper base course, 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.

**Thin Bonded Repairs and Joint Repairs to Existing Concrete Carriageway**

Units

**37** 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** The measurement of saw-cutting grooves shall be the summation of the lengths of saw-cutting grooves stated in the Contract.

**41** The measurement of sealing grooves shall be the summation of the lengths of the sealed grooves stated in the Contract.

Itemisation

**42** 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** 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 course, lower base course, upper base course, binder course, surface course and concrete slab (as this Series paragraph 9);
- (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) wetting and 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**

**44** 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**

Units

**45** The units of measurement shall be:

- (i) full depth repairs, bay replacement repairs ..... square metre.
- (ii) reinstatement of sub-base ..... cubic metre, tonne or square metre.

Measurement

**46** 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** 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.

**Full Depth Repairs and Bay Replacement Repairs to Existing Concrete Carriageway**

**48** 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	<ul style="list-style-type: none"> <li>(a) saw cutting and drilling to full depth;</li> <li>(b) excavation of acceptable material (as Series 600 paragraph 18);</li> <li>(c) excavation of unacceptable material (as Series 600 paragraph 19);</li> <li>(d) excavation in hard material (as Series 600 paragraph 23);</li> <li>(e) disposal of material (as Series 600 paragraph 39);</li> <li>(f) completion of formation (as Series 600 paragraph 88);</li> <li>(g) dowel bars and tie bars including drilling and supports, cleaning, plugging with resin mortar and de-bonding and compressive discs;</li> <li>(h) sub-base (as this Series paragraph 5);</li> <li>(i) separation layer;</li> <li>(j) joint filler board;</li> <li>(k) joint groove forming strip;</li> <li>(l) concrete slab (as this Series paragraph 9).</li> </ul>
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#### **Saw Cutting, Cracking and Seating Existing Jointed Reinforced Concrete Pavements**

Units	<p><b>49</b> The units of measurement shall be:</p> <ul style="list-style-type: none"> <li>(i) removal of existing bituminous overlay ..... square metre.</li> <li>(ii) main trial ..... item.</li> <li>(iii) re-assessment trial ..... number.</li> <li>(iv) saw cutting existing pavement ..... square metre.</li> <li>(v) cracking existing pavement ..... square metre.</li> <li>(vi) seating existing pavement ..... square metre.</li> </ul>
Measurement	<p><b>50</b> The main trial shall be measured once only for the main trial area stated in the Contract.</p> <p><b>51</b> 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.</p> <p><b>52</b> 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.</p>
Itemisation	<p><b>53</b> 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:</p>

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 exceeding 100mm 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

**54** 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

**55** 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

**56** 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.

**Saw-cutting**

**57** 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**

**58** 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.

<b>Seating</b>	<b>59</b>	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;
		<b>Cracking and Seating Existing Jointed Unreinforced Concrete Pavements and CBM Bases</b>
Units	<b>60</b>	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	<b>61</b>	The main trial shall be measured once only for the stated area.
	<b>62</b>	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.
	<b>63</b>	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	<b>64</b>	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 exceeding 100mm 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.

#### Removal of Existing Bituminous Overlay

**65** 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

**66** 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

**67** 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

**68** 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** **69** 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

**Units** **70** 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** 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.

**Itemisation** **72** 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

**73** 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

Units

**74** The unit of measurement shall be:

- (i) maintenance of arrester bed ..... item.

Itemisation

**75** 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.

### Maintenance of Arrester Beds

**76** The items for maintenance of arrester beds shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item Coverage

- (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

Units

**77** The units of measurement shall be:

- (i) repairs to potholes, repairs to depressions .....kilogramme.
- (ii) patching ..... square metre.

Measurement

**78** The measurement of repairs to potholes and repairs to depressions shall be the mass of specified material placed in the voids.

**79** The measurement of patching shall be the area of the top surface of the patch.

Itemisation

**80** 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.

**Repairs and Patching 81**

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.

## **Series 800 is not taken up**

**Series 900 is not taken up**

## **Series 1000 is not taken up**

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**Series 1100: Kerbs, Footways and Paved Areas**

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**Kerbs, Channels, Edgings, Combined Drainage and Kerb Blocks and Linear Drainage Channel Systems**

Units	<b>1</b>	The unit of measurement shall be:
	(i)	kerbs, channels, edgings, combined drainage and kerb blocks and linear drainage channel systems ..... linear metre.
Measurement	<b>2</b>	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	<b>3</b>	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:

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Group Feature

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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.

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**Kerbs, Channels, Edgings, Combined Drainage and Kerb Blocks and Linear Drainage Channel Systems**

Item coverage	<b>4</b>	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:
	(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;
- (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) reinstatement of surfaces.

**Additional Concrete for Kerbs, Channels, Edgings, Combined Drainage and Kerb Blocks and Linear Drainage Channel Systems**

Units

**5** 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      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.

Itemisation                      7      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  
Channel Systems**

8      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**

Units	<b>9</b>	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	<b>10</b>	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.
Itemisation	<b>11</b>	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	<ol style="list-style-type: none"> <li>1 Remove from store and relay kerbs.</li> <li>2 Remove from store and relay channels.</li> <li>3 Remove from store and relay edgings.</li> <li>4 Remove from store and relay combined drainage and kerb blocks.</li> <li>5 Remove from store and relay linear drainage channel systems.</li> </ol>
II	<ol style="list-style-type: none"> <li>1 Different materials and designs.</li> </ol>
III	<ol style="list-style-type: none"> <li>1 Straight or curved exceeding 12 metres radius.</li> <li>2 Curved not exceeding 12 metres radius.</li> </ol>

<b>Remove from Store and Relay Kerbs, Channels, Edgings, Combined Drainage Kerb Blocks and Linear Drainage Channel Systems</b>	<b>12</b>	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		<ol style="list-style-type: none"> <li>(a) loading, transporting from store, unloading and positioning for relaying;</li> <li>(b) replacing items damaged during the foregoing operations;</li> <li>(c) modification and new materials;</li> <li>(d) kerbs, channels, edgings, combined drainage and kerb blocks and</li> </ol>

linear drainage channel systems (as this Series paragraph 4).

### Footways and Paved Areas

Units	<b>13</b>	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	<b>14</b>	The measurement of footways and paved areas shall be calculated using the width of the top surface stated in the Contract.
	<b>15</b>	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.
	<b>16</b>	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.
	<b>17</b>	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.
	<b>18</b>	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.
	<b>19</b>	No deduction shall be made for openings of 1 square metre or less.
Itemisation	<b>20</b>	Separate items shall be provided for footways and paved areas in accordance with Chapter II paragraphs 3 and 4 and the following:

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### Group Feature

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I	1	Footways.
	2	Paved areas.
II	1	Different types of construction.
III	1	Different thicknesses.

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IV	1	Different sizes, groups or types.
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V	1	Surfaces sloping at 10o or less to the horizontal.
	2	Surfaces sloping at more than 10o to the horizontal.

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VI	1	Regulating course of different groups or types.
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**Footways and Paved Areas**

Item coverage

**21** The items for footways and paved areas shall in accordance with the Preambles to Bill of Quantities General Directions include for:

- (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).

**Bituminous and Cement Bound Regulating Course**

Item coverage

**22** The items for bituminous and cement bound regulating course shall in accordance with the Preambles to Bill of Quantities General Directions include for:

- (a) bituminous and cement bound regulating course (as Series 700 paragraph 14).

**Remove from Store and Relay Paving Flags, Slabs and Blocks**

Units	23	The unit of measurement shall be:																							
		(i) remove from store and relay paving flags, slabs and blocks ..... square metre.																							
Measurement	24	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	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:																							
		<table><tr><th>Group</th><th colspan="2">Feature</th></tr><tr><td rowspan="2">I</td><td>1</td><td>Remove from store and relay paving in footways.</td></tr><tr><td>2</td><td>Remove from store and relay paving in paved areas.</td></tr><tr><td>II</td><td>1</td><td>Different types of construction.</td></tr><tr><td>III</td><td>1</td><td>Different thicknesses.</td></tr><tr><td>IV</td><td>1</td><td>Different sizes groups or types.</td></tr><tr><td rowspan="2">V</td><td>1</td><td>Surfaces sloping at 10o or less to the horizontal.</td></tr><tr><td>2</td><td>Surfaces sloping at more than 10° to the horizontal.</td></tr></table>		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 10o or less to the horizontal.	2	Surfaces sloping at more than 10° to the horizontal.
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 10o or less to the horizontal.																							
	2	Surfaces sloping at more than 10° to the horizontal.																							
<b>Remove from Store and Relay Paving Flags, Slabs and Blocks</b>	26	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

- |             |           |  |
|-------------|-----------|--|
|             | <b>27</b> | The unit of measurement shall be:<br><br>(i) flights of steps ..... number.                                    |
| Measurement | <b>28</b> | The measurement of steps shall be the complete flight including landings.                                      |
| Itemisation | <b>29</b> | 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. |
| <b>Steps</b>  | <b>30</b> | The items for steps shall in accordance with the Preambles to Bill of Quantities General Directions include for:   |                      |
| Item coverage |           | <p>(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);</p> <p>(b) excavation of unacceptable material (as Series 600 paragraph 19);</p> <p>(c) excavation in Hard Material (as Series 600 paragraph 23);</p> <p>(d) backfilling, compaction and reinstatement;</p> <p>(e) disposal of material (as Series 600 paragraph 39);</p> <p>(f) completion of formation (as Series 600 paragraph 85)</p> <p>(g) brickwork, blockwork and stonework (as Series 2400 paragraphs 4 and 8);</p> <p>(h) kerbs, channels, edgings, combined drainage and kerb blocks and linear drainage channel systems (as this Series paragraph 4);</p> <p>(i) footways and paved areas (as this Series paragraph 21);</p> <p>(j) surface finishing and non-slip treatment;</p> <p>(k) tread nosings;</p> <p>(l) pedestrian guardrails and handrails (as Series 400 paragraph 46);</p> <p>(m) fencing (as Series 300 paragraph 4);</p> <p>(n) concrete foundation to timber posts (as Series 300 paragraph 5);</p> <p>(o) gates and stiles (as Series 300 paragraph 6);</p> <p>(p) reinstatement of surfaces.</p> |                      |

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**Series 1200: Traffic Signs and Road Markings**

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**Traffic Signs**

Units	<b>1</b>	The unit of measurement shall be:  (i) traffic signs ..... number.
Measurement	<b>2</b>	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	<b>3</b>	Separate items shall be provided for traffic signs in accordance with Chapter II paragraphs 3 and 4 and the following:

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Group	Feature
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I	1	Permanent traffic signs.
	2	Prescribed temporary traffic signs.

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II	1	Particular sign reference.
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III	1	Retroreflective.
	2	Non-retroreflective.
	2	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**

	<b>4</b>	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);
- (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 5** 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	<b>6</b>	The unit of measurement shall be:  (i) remove from store and re-erect traffic signs ..... number.
Itemisation	<b>7</b>	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:
<hr/>		
	Group	Feature
<hr/>		
	I	1 Remove from store and re-erect traffic signs.
<hr/>		
	II	1 Retroreflective. 2 Non-retroreflective. 3 Enhanced retroreflective.
<hr/>		
	III	1 Lit Sign Units. 2 Non Lit Sign Units.
<hr/>		
	IV	1 Different types.
<hr/>		
	V	1 Different sizes.
<hr/>		
	VI	1 Different posts or supports.
<hr/>		
<b>Remove from Store Re-erect Traffic Signs</b>	<b>8</b>	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 reerection;  (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	<b>9</b>	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.)
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- 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.
- 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.
- 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.
	2	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 **Markings** 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;
  - (e) 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;
  - (d) apostrophes in the case of letters and numerals;
  - (e) markings down the face of kerbs;

(f) adhesives;

#### Road Studs

Units	<b>19</b>	The unit of measurement shall be:  (i) road studs ..... number.
Measurement	<b>20</b>	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	<b>21</b>	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.

---

<b>Road Studs</b>	<b>22</b>	The items for road studs shall in accordance with the Preambles to Bill of Quantities General Directions include for:
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Item coverage	(a) cutting or forming holes;
	(b) milling;
	(c) adhesives and grout;
	(d) reinstatement of surfaces;
	(e) disposal of material (as Series 600 paragraph 39).

#### Remove from Store and Re-install Road Studs

Units	<b>23</b>	The unit of measurement shall be:  (i) remove from store and re-install road studs ..... number.
Itemisation	<b>24</b>	Separate items shall be provided for remove from store and reinstall 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.
<b>Remove from Store and Re-install Road Studs</b>	<b>25</b>	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

Definitions	26	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	The unit of measurement shall be:  (i) traffic signal installations ..... item.
Measurement	28	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	Separate items shall be provided for traffic signal installations in accordance with Chapter II paragraphs 3 and 4 and the following:
<hr/>		
Group Feature		
<hr/>		
	I	1 Permanent traffic signal installations. 2 Prescribed temporary traffic signal installations.
<hr/>		
	II	1 Different locations.

<b>Permanent Traffic Signal Installations</b>	<b>30</b>	The items for permanent traffic signal installations shall in accordance with the Preambles to Bill of Quantities General Directions include for:
Item coverage		<ul style="list-style-type: none"> <li>(a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);</li> <li>(b) excavation of unacceptable material (as Series 600 paragraph 19);</li> <li>(c) excavation in hard material (as Series 600 paragraph 23);</li> <li>(d) in situ concrete (as Series 1700 paragraph 5);</li> <li>(e) backfilling and compaction;</li> <li>(f) disposal of material (as Series 600 paragraph 39);</li> <li>(g) detectors;</li> <li>(h) detector loops (as Series 1500 paragraph 31);</li> <li>(i) detector feeders;</li> <li>(j) trench for cable (as Series 1400 paragraph 8) excluding network cabling;</li> <li>(k) cable (as Series 1400 paragraph 13) excluding network cabling;</li> <li>(l) control equipment;</li> <li>(m) electrical equipment, wiring, and connections, excluding network cabling;</li> <li>(n) marking out, cutting or forming slots, drying, damming, backfilling, cleaning and sealing;</li> <li>(o) road markings (as this Series paragraph 18);</li> <li>(p) notices and recording;</li> <li>(q) numbering and lettering;</li> <li>(r) complying with wiring regulations and earthing (other than earth electrodes);</li> <li>(s) reinstatement of surfaces;</li> <li>(t) preparation and supply of record drawings;</li> <li>(u) road studs;</li> <li>(v) ducts;</li> <li>(w) chambers (as Series 500 paragraph 37);</li> <li>(x) protective system (as Series 1900 paragraph 4).</li> </ul>
<b>Prescribed Temporary</b>	<b>31</b>	The items for prescribed temporary traffic signal installations shall

**Signal Installations**

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);
- (a) maintaining and servicing equipment.

**Controlled and Uncontrolled Crossings**

Units

**32** The unit of measurement shall be:

- (i) controlled crossings ..... item.
- (ii) uncontrolled crossings ..... item.

Measurement

**33** The measurement of controlled and uncontrolled crossings shall be the complete installation.

Itemisation

**34** 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 35  
and Uncontrolled  
Crossings**

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 36  
Controlled and  
Uncontrolled Crossings**

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.

**Marker Posts**

- Units                      **37**        The unit of measurement shall be:  
(i) marker posts ..... number.

- Itemisation              **38**        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**              **39**        The items for marker posts shall in accordance with the Preambles to Bill of Quantities General Directions include for:

- Item coverage
- (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.

**Permanent Bollards**

Units	40	The unit of measurement shall be:	
		(i) permanent bollards ..... number.	
Itemisation	41	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 2	Internally illuminated. Non-illuminated.
	III	1	Different types.
	IV	1	Different sizes.
Permanent Bollards	42	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	The unit of measurement shall be:	
		(i) node markers ..... number.	
Itemisation	44	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	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.

**Series 1300: Road Lighting Columns, Brackets and CCTV Masts**

**Road Lighting Columns, Brackets, Wall Mountings and CCTV Masts**

Units	<b>1</b>	The unit of measurement shall be:
		(i) road lighting columns, brackets, wall mountings, CCTV masts..... number.
Measurement	<b>2</b>	The measurement of road lighting columns, brackets, wall mountings and CCTV masts shall be the complete installation except for earth electrodes which shall be measured separately (under Series 1400 paragraphs 24 to 27).
Itemisation	<b>3</b>	Separate items shall be provided for road lighting columns, brackets, wall mountings and CCTV 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.                         |

- |    |   |                                       |
|----|---|---------------------------------------|
| II | 1 | Different height of lighting columns. |
|    | 2 | Different height of CCTV masts.       |

III 1 Different projection of brackets.

IV 1 Different luminaires.

V 1 Different types.

**Road Lighting Columns 4 Brackets, Wall Mountings and CCTV Masts**

The items for road lighting columns, brackets, wall mountings and CCTV 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 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,  
Brackets, and Wall Mountings**

Units	5	The unit of measurement shall be:	
		(i) remove from store and re-erect road lighting columns, brackets and wall mountings ..... number.	
Itemisation	6	Separate items shall be provided for remove from store and re-erect road lighting columns, brackets and wall mountings 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.
		II	1 Different height of columns.
		III	1 Different projections of brackets.
		IV	1 Different luminaires.
		V	1 Different types.
<b>Remove from Store and Re-erect Road Lighting Columns, Brackets and Wall Mountings</b>	7	The items for remove from store and re-erect road lighting columns, brackets and wall mountings 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, brackets and wall mountings (as this Series paragraph 4).	

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**Series 1700: Structural Concrete**

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**1** Surface impregnation of concrete shall be measured under Series 2000: Waterproofing for Structures.

**In Situ Concrete**

Units

**2** The unit of measurement shall be:

- (i) in situ concrete ..... cubic metre.

Measurement

**3** 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** Separate items shall be provided for in situ concrete in accordance with Chapter II paragraphs 3 and 4 and the following:

---

Group Feature

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I	1	In situ concrete.
II	1	Different design mixes.
	2	Different classes or grades.
III	1	Blinding concrete 75 mm or less in thickness.

**In Situ Concrete**

**5** The items for in situ concrete shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

- (a) mix design;
- (b) trial mixes;
- (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;
- (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** 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** 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, culverts (excluding piped culverts measured under Series 500: Drainage) ..... linear metre.
- (iii) precast facing units ..... square metre.

#### Measurement

**8** The measurement of precast facing units shall be the flat undeveloped area.

The measurements of culverts (excluding piped culvert measured under Series 500: Drainage) shall be the length measured at the invert level, along the centre line.

The measurement of precast copings, capping units, plinths and the like shall be the measurement along the centre line.

#### Itemisation

**9** 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 and culverts.
	3	Precast facing units.
II	1	Different types.
III	1	Different sizes.
IV	1	Curved.

**Precast Members, Slabs, Segmental Units, Hinges, Specially Moulded Blocks, Copings, Plinths, Capping Units and Facing Units**

**10** 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:

Item coverage

- (a) mix design;
- (b) trial mixes;
- (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.
- (x) awaiting Overseeing Organisation's approval of trial panels.

#### Surface Finish of Concrete - Formwork

##### Units

**11** The units of measurement shall be:

- (i) formwork ..... square metre.
- (ii) void formers ..... linear metre.

##### Measurement

**12** 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 5o to the horizontal.
- (ii) “inclined” shall include formwork inclined at any angle more than 5o up to and including 85o to the horizontal.
- (iii) “vertical” shall include formwork inclined at any angle more than 85o up to and including 90o to the horizontal.
- (iv) “at any inclination” shall include formwork horizontal or inclined at any angle up to and including 90o to the horizontal.

**13** 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.

Itemisation

**14** 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** 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** 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.

**Surface Finish of Concrete - Patterned Profile Formwork**

**Definition**

**17** 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** The unit of measurement shall be:

- (i) patterned profile formwork ..... square metre.

Measurement

**19** 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** 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.

**Patterned Profile Formwork**

**21** 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** The units of measurement shall be:

- (i) bar and helical reinforcement ..... tonne.
- (ii) fabric reinforcement ..... square metre.
- (iii) dowels ..... number.

Measurement

**23** 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** Fabric reinforcement shall be measured as the area of work covered, the BS reference being stated.

Itemisation

**25** 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** 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);
- (d) extra fabric reinforcement at laps;
- (e) welding;
- (f) mechanical connections.

## Dowels

**27** 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** 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** 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** 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** 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.

**Strip, Bar, Sheet, Grid or Mesh Reinforcing Elements**

**32** 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** The unit of measurement shall be:

- (i) tendons, stressing and grouting, protective covering to external tendons ..... number.

**Definition**

**34** 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** 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** 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.

**Tendons**

**37** 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 supporting 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.
- (j) photographing and anchorage on removal of end caps;
- (k) replacement and sealing of end caps against ingress of contamination

**Stressing and Grouting  
Internal Tendons, Stressing  
External Tendons and Final  
Stressing and Grouting  
Tendons of Members  
Supplied Partially  
Prestressed**

**38** 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.

**Protective covering to  
External Tendons**

(39) The items for protective covering to external tendon shall in accordance with the Preambles to Bill of Quantities General Directions include for

- (a) tying or bonding to main structure;
- (b) sealing at joints

**Grouting Trials**

(40) The items for grouting trials 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) concrete (as this Series paragraph 5 and 10);
- (c) formwork (as this Series paragraph 15);
- (d) reinforcement (as this Series paragraph 26);
- (e) tendons (as this Series paragraph 37)
- (f) Stressing and grouting (as this Series paragraph 38);
- (g) Protective covering to external tendons (as this Series paragraph 39);
- (h) Pressure testing of systems;
- (i) Cutting and sectioning of member;
- (j) Reporting of results to Engineer and photographs
- (k) Retrials as instructed by Engineer
- (l) Breaking up and disposal;



## 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:																		
<table border="1"> <thead> <tr> <th>Group</th><th colspan="2">Feature</th></tr> </thead> <tbody> <tr> <td>I</td><td>1</td><td>Waterproofing.</td></tr> <tr> <td>II</td><td>1</td><td>Different types.</td></tr> <tr> <td rowspan="4">III</td><td>1</td><td>More than 300 mm wide horizontal or at any inclination up to and including 30° to the horizontal.</td></tr> <tr> <td>2</td><td>More than 300 mm wide at any inclination more than 30° up to and including 90° to the horizontal.</td></tr> <tr> <td>3</td><td>300 mm wide or less at any inclination.</td></tr> <tr> <td>4</td><td>Domed.</td></tr> </tbody> </table>			Group	Feature		I	1	Waterproofing.	II	1	Different types.	III	1	More than 300 mm wide horizontal or at any inclination up to 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.
Group	Feature																			
I	1	Waterproofing.																		
II	1	Different types.																		
III	1	More than 300 mm wide horizontal or at any inclination up to 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	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;
- (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.
- (ii) Surface impregnation and coatings 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 plain surfaces the measurement shall be the area over the face of individual fillets, chamfers, splays, drips, rebates, recesses, grooves and the like of 100mm total girth or less when measured overall the faces of the concrete. 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.
	2	Surface impregnation and coatings of concrete
II	1	Patterned surfaces.
	2	Plain surfaces.
III	1	Different types of systems.

### Surface Impregnation of Concrete and surface Impregnation and coatings of Concrete

**8** The items for surface impregnation of concrete shall in accordance with the Preambles to Bill of Quantities General Directions include for:

#### Item coverage

- (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.
- (j) obtaining the correct dry film thickness of coatings
- (k) complying fully with the manufacturer's recommendations

### Removal of Existing Waterproofing

Units

**9** The unit of measurement shall be:

- (i) removal of existing waterproofing .....square metre

Measurement

**10** 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** 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	1	More than 300mm wide horizontal or at any inclination up to and including 30o to the horizontal.
	2	More than 300mm wide at any inclination more than 30o up to and including 90o to the horizontal.
	3	300mm wide or less at any inclination.
	4	Domed.

### Removal of Existing Waterproofing

**12** 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;

## 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	<p>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.</p> <p>The measurement of copings, string courses and the like shall be the length of the work required by the Contract.</p> <p>Facings shall be measured as extra over brickwork except where brickwork is built entirely of facings.</p>																																				
Itemisation	3	<p>Separate items shall be provided for brickwork in accordance with Chapter II paragraphs 3 and 4 and the following:</p> <table border="1"> <thead> <tr> <th colspan="3">Group Feature</th></tr> </thead> <tbody> <tr> <td>I</td><td>1</td><td>Brickwork.</td></tr> <tr> <td>II</td><td>1</td><td>Copings, string courses and the like of different sizes.</td></tr> <tr> <td>III</td><td>1</td><td>Different types of bricks.</td></tr> <tr> <td>IV</td><td>1</td><td>Different thicknesses.</td></tr> <tr> <td>V</td><td>1</td><td>Different bonds.</td></tr> <tr> <td>VI</td><td>1</td><td>Different types of mortar.</td></tr> <tr> <td>VII</td><td>1</td><td>Curved on plan.</td></tr> <tr> <td>VIII</td><td>1</td><td>With a battered face.</td></tr> <tr> <td rowspan="4">IX</td><td>1</td><td>In walls.</td></tr> <tr> <td>2</td><td>In facework to concrete.</td></tr> <tr> <td>3</td><td>In arches.</td></tr> <tr> <td>4</td><td>In alteration work.</td></tr> </tbody> </table>	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.
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IX	1	In walls.																																				
	2	In facework to concrete.																																				
	3	In arches.																																				
	4	In alteration work.																																				
<b>Brickwork, Copings, String Courses and the Like</b>	4	The items for brickwork, copings, string courses and the like shall in accordance with the Preambles to Bill of Quantities General Directions include for:																																				
Item coverage	(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;																																				
	(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.
IX	1	Plastering and finishes

#### Blockwork, Stonework, Copings, String Courses and the Like, Individual Blocks, Features or Stones

Item coverage

**8** 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:

- (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.
- (q) plastering and finishes

**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.

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  
Brickwork, Blockwork  
or Stonework**

Item coverage

**12** The items for remove from store and relay brickwork, blockwork **Relay** and stonework shall in accordance with the Preambles to Bill of Quantities 1 General Directions include for:

- (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).

**Series 2600 is not taken up**

**Series 2700 is not taken up**