

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.
- Measurement** **18** 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:
- (a) the internal faces of chambers;
 - (b) the external faces of headwalls;
 - (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** 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** 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.
- Itemisation** **21** Separate items shall be provided for filter drains in accordance with Chapter II paragraphs 3 and 4 and the following:

| | | |
|-----|---|---|
| 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 | 33 | The unit of measurement shall be: (i) chambers, gullies number. |
| Measurement | 34 | The measurement shall be of the complete chamber or gully. |
| | 35 | 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. |

Headwalls and Outfall Works

Item coverage

- 42** The items for headwalls and outfall works shall in accordance with the Preambles to Bill of Quantities General Directions include for:
- (a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);
 - (b) excavation of unacceptable material (as Series 600 paragraph 19);
 - (c) concrete (as Series 1700 paragraphs 5 and 10);
 - (d) formwork (as Series 1700 paragraph 15);
 - (e) backfilling and compaction;
 - (f) disposal of material (as Series 600 paragraph 39);
 - (g) brickwork, copings, string courses and the like (as Series 2400 paragraph 4);
 - (h) blockwork, stonework, copings, string courses, individual blocks, features or stones (as Series 2400 paragraph 8);
 - (i) lining of watercourses (as Series 600 paragraph 89);
 - (j) drainage channel blocks (as Series 1100 paragraph 4);
 - (k) building in pipes and fin drain connections;
 - (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** The unit of measurement shall be:
- (i) soft spots, other voids cubic metre.

Measurement

- 44** 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 | 56 | The unit of measurement shall be: (i) filling to pipe bays and verges on bridges cubic metre. |
| Measurement | 57 | 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 | Separate items shall be provided for filling to pipe bays and verges on bridges in accordance with Chapter II paragraphs 3 and 4 and the following: |

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

| | | |
|---|-----------|---|
| Filling to Pipe Bays and Verges on Bridges | 59 | 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

| | | |
|-------------------|-----------|---|
| Definition | 60 | 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 | 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 | 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 | 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 Bill of Quantities 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** the Preambles to Bill of Quantities General Directions include for:

- (a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);
- (b) excavation of unacceptable material (as Series 600 paragraph 19);
- (c) 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 **65** The unit of measurement shall be:
- (i) remove from store and reinstall chamber covers and frames, and gully gratings and frames number.
- Measurement **66** The measurement of remove from store and reinstall chamber covers and frames and gully gratings and frames shall be the complete installation.
- Itemisation **67** Separate items shall be provided for remove from store and reinstall chamber covers and frames and gully gratings and frames in accordance with Chapter II paragraphs 3 and 4 and the following:

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

- Remove from Store and Reinstall Chamber and Frames and Gully Gratings and Frames**
Item coverage **68** 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).

Grouting Up of Existing Drains and Service Ducts

| | | |
|-------------|-----------|---|
| Units | 69 | The unit of measurement shall be: (i) grouting up of existing drains and service ducts linear metre. |
| Measurement | 70 | 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 | 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

| | | |
|---------------|-----------|---|
| Item coverage | 72 | 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: (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 | The unit of measurement shall be: (i) extra over excavation for excavation in Hard Material in drainage cubic metre. |
| Measurement | 74 | 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 |
|-------|---|
| I | 1 Extra over excavation for excavation in Hard Material in drainage. |

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 bagworkcubic 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 |
|-------|---|
| I | 1 Concrete bagwork. |
| II | 1 In headwalls. 2 Other stated location. |
| III | 1 With battered face. |

Concrete Bagwork 80 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

- Units
- 81** 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 systemitem.
 - (iii) cleaning of chambers, gulliesnumber.
- Measurement
- 82** 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.

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.

