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Civil Engineering Specification

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for

DB Symmetry

Waitrose, Banbury

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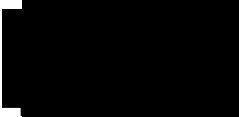
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Q10 Kerbs/ edgings/ channels/ paving accessories

TYPES OF KERBS/EDGINGS AND CHANNELS

- 112 PRECAST CONCRETE HALF BATTERED KERBS
- Standard: To BS EN 1340.
 - Recycled content: Contractor's choice.
 - Designations: HB2 Kerb, half battered.
 - Size (width x height x length): 255 x 125 x 915 mm.
 - Special shapes:
 - Dropper kerbs DL1 and DR1 to footway crossings;
 - Dropper kerbs DL2 and DR2 to footway crossings; and
 - Quadrant kerbs as shown on drawings.
 - Finish: As Landscape specification.
 - Colour: As Landscape specification.
 - Bending strength: Class 2.
 - Weathering resistance: Class 3.
 - Abrasion resistance: Class 1.
 - Slip/ skid resistance: No requirement.
 - Bedding: As standard detail.
 - Joints generally: Dry, 2-3 mm gap.
 - Sealant movement joints: Not required.
 - Accessories: None.
- 112B PRECAST CONCRETE CHANNEL KERBS
- Standard: To BS EN 1340.
 - Recycled content: Contractor's choice.
 - Designations: CS2 Channel, square.
 - Size (width x height x length): 150 x 125 x 915 mm.
 - Special shapes:
 - Refer kerbing drawing.
 - Finish: As Landscape specification.
 - Colour: As Landscape specification.
 - Bending strength: Class 2.
 - Weathering resistance: Class 3.
 - Abrasion resistance: Class 1.
 - Slip/ skid resistance: No requirement.
 - Bedding: As standard detail.
 - Joints generally: Dry, 2-3 mm gap.
 - Sealant movement joints: Not required.
 - Accessories: None.

180 DRAINAGE CHANNEL SYSTEMS WITH GRATINGS

- Manufacturer: Submit proposals.
 - Product reference: As designed by Contractors choice of supplier .
- Size: As designed by Contractors choice of supplier .
- Type of fall: Constant depth.
- Finish: As designed by Contractors choice of supplier .
- Colour: As designed by Contractors choice of supplier .
- Accessories: As designed by Contractors choice of supplier .
- Bedding: As designed by Contractors choice of supplier .
- Joints generally: As designed by Contractors choice of supplier .
- Cover gratings: Galvanized steel, slotted, with 8mm heelguard or similar .
 - Fixings: As designed by Contractors choice of supplier .
 - Loading grade to BS EN 124: Dependant on location, Refer to drainage plan .
 - Finish/ Colour: As designed by Contractors choice of supplier .

LAYING

510 LAYING KERBS, EDGINGS AND CHANNELS

- Cutting: Neat, accurate and without spalling. Form neat junctions.
 - Long units (450 mm and over) minimum length after cutting: 300 mm.
 - Short units minimum length after cutting: The lower of one third of their original length or 50 mm.
- Bedding of units: Positioned true to line and levelled along top and front faces, in a mortar bed on accurately cast foundations or on a race of fresh concrete.
- Securing of units: After bedding has set, secured with a continuous haunching of concrete or on a race of fresh concrete with backing concrete cast monolithically.

520 ADVERSE WEATHER

- Conditions: Do not construct if the temperature is below 3°C on a falling thermometer or 1° C on a rising thermometer. Adequately protect foundations, bedding and haunching against frost and rapid drying by sun and wind.

530 CONCRETE FOR FOUNDATIONS, RACES AND HAUNCHING

- Standard: To BS 8500-2.
- Designated mix: Not less than GEN0 or Standard mix ST1.
- Workability: Very low.

540 CEMENT MORTAR BEDDING

- General: To section Z21.
- Mix (Portland cement:sand): 1:3.
 - Portland cement: Class CEM I 42.5 to BS EN 197-1.
 - Sand: to BS EN 12620, grade 0/4 or 0/2 (MP).
- Bed thickness: 12-40 mm.

547 BEDDING/BACKING OF UNITS ON FRESH CONCRETE RACES

- Standard: To BS 7533-6.

570 CHANNELS

- Installation: To an even gradient, without ponding or backfall.
- Lowest points of channels: 6 mm above drainage outlets.

580 DRAINAGE CHANNEL SYSTEMS

- Installation: To an even gradient, without ponding or backfall. Commence laying from outlets.
- Silt and debris: Removed from entire system immediately before handover.
- Washing and detritus: Safely disposed without discharging into sewers or watercourses.

600 RADIUS KERBS/ CHANNELS

- Usage: Radii of 15 m or less.

610 ANGLE KERBS

- Usage: Internal and external 90° changes of direction.
- Cutting of mitres: Not permitted.

620 ACCURACY

- Deviations (maximum):
 - Level: ± 6 mm.
 - Horizontal and vertical alignment: 3 mm in 3 m.

625 REGULARITY OF PAVED SURFACES

- Maximum undulation of (non-tactile) paving surface: 3 mm.
 - Method of measurement: Under a 1 m straight edge placed anywhere on the surface (where appropriate in relation to the geometry of the surface).
- Difference in level between adjacent units (maximum):
 - Joints flush with the surface: Twice the joint width (with 5 mm max difference in level).
 - Recessed, filled joints: 2 mm.
 - Recess depth (maximum): 5 mm.
 - Unfilled joints: 2 mm.
- Sudden irregularities: Not permitted.

Q20 Granular sub-bases to roads/ pavings

- 110 THICKNESSES OF SUB-BASE/ SUBGRADE IMPROVEMENT LAYERS
- Thicknesses: See sections:
 - Q22 Coated macadam/asphalt roads/pavings and Q24 Interlocking brick/block roads/pavings.
- 120 CHECKING OF SUBGRADES
- Anticipated subgrade conditions:
 - Soil type: Varies.
 - Plasticity index: TBC.
 - CBR (minimum): 2%. Report to Engineers if found to be different.
 - Depth below formation level to groundwater table: Varies.
 - Subgrade variation: If material appears to vary from anticipated conditions, or if there are extensive soft spots, test subgrade CBR to BS 1377-4.
 - Submit: Results and obtain instructions before proceeding.
- 130 HERBICIDES
- Type: Contractor's choice.
 - Application: To subgrade of footpath.
- 140 EXCAVATION OF SUBGRADES
- Final excavation to formation or subformation level: Carry out immediately before compaction of subgrade.
 - Soft spots and voids: Give notice.
 - Old drainage and service trenches: Give notice.
 - Wet conditions: Do not excavate or compact when the subgrade may be damaged or destabilized.
- 145 PREPARATION AND COMPACTION OF SUBGRADES
- Timing: Immediately before placing sub-base.
 - Soft or damaged areas: Excavate and replace with sub-base material, compacted in layers 300 mm (maximum) thick.
 - Compaction: Thoroughly, by roller or other suitable means, adequate to resist subsidence or deformation of the subgrade during construction and of the completed roads/ pavings when in use. Take particular care to compact fully at intrusions, perimeters and where local excavation and backfilling has taken place.
- 150 SUBGRADES FOR VEHICULAR AREAS
- Preparation and treatment: To Highways Agency 'Specification for highway works', clauses 616 and 617.
- 180 NOTICE
- Give notice: After preparation and compaction of subgrades.
 - Period of notice: 2 working days.
- 210 HIGHWAYS AGENCY TYPE 1 UNBOUND MIXTURE FOR SUB-BASE
- Material: Type 1 unbound mixture to Highways Agency 'Specification for highway works', clauses 801 and 803.
 - Recycled aggregate: Permitted.

211 GRANULAR MATERIAL

- Quality: Of a known suitability for use in sub-bases, free from excessive dust, well graded, all pieces less than 75 mm in any direction, minimum 10% fines value of 50 kN when tested in a soaked condition to BS 812-111 or a resistance to fragmentation of LA50 for the Los Angeles test to BS EN 1097-2, and in any one layer only one of the following:
 - Crushed rock (other than argillaceous rock) or quarry waste with not more binding material than is required to help hold the stone together.
 - Crushed concrete, crushed brick or tile, free from plaster, timber and metal.
 - Gravel or hoggin with not more clay content than is required to bind the material together, and with no large lumps of clay.
 - Natural gravel.
 - Natural sand.
- Filling: Spread and levelled in 150 mm maximum layers, each layer thoroughly compacted.

220 FROST SUSCEPTIBLE GRANULAR MATERIAL

- Definition (non frost susceptible material): To Highways Agency 'Specification for highway works' clause 801.8.
- Depth of frost susceptible material below final surface of paving (minimum): 450 mm.
- Testing: Test materials used if required and supply certificates.

225 PLACING OF MATERIAL WITH HIGH SULFATE CONTENT

- Standard: To Highways Agency 'Specification for highway works', clauses 801.2 and 801.3.
 - Separation distance (minimum): 500 mm.

230 PLACING GRANULAR MATERIAL GENERALLY

- Preparation: Loose soil, rubbish and standing water removed.
- Structures, membranes and buried services: Ensure stability and avoid damage.

240 LAYING GRANULAR SUB-BASES FOR VEHICULAR AREAS

- General: Spread and levelled in layers. As soon as possible thereafter compact each layer.
- Standard: To Highways Agency 'Specification for highway works' clause 802.
- At drainage fittings, inspection covers, perimeters and where local excavation and backfilling has taken place: Take particular care to compact fully.

250 LAYING GRANULAR SUB-BASES FOR PEDESTRIAN AREAS

- General: Spread and levelled.
- Compaction:
 - Timing: As soon as possible after laying.
 - Method: By roller or other suitable means, adequate to resist subsidence or deformation of the sub-base during construction and of the completed paving when in use. Take particular care to compact fully at intrusions, perimeters and where local excavation and backfilling has taken place.

310 ACCURACY

- Permissible deviation from required levels, falls and cambers (maximum):
 - Subgrades:
 - Roads and parking areas: +20 -30 mm.
 - Footways and recreation areas: ± 20 mm.
 - Sub-bases:
 - Roads and parking areas: +20 -15 mm.
 - Footways and recreation areas: ± 12 mm .

330 COLD WEATHER WORKING

- Frozen materials: Do not use.
- Freezing conditions: Do not place fill on frozen surfaces. Remove material affected by frost. Replace and recompact if not damaged after thawing.

340 PROTECTION

- Sub-bases: As soon as practicable, cover with subsequent layers, specified elsewhere.
- Subgrades and sub-bases: Prevent degradation by construction traffic, construction operations and inclement weather.

Q22 Asphalt roads/ pavings

TYPES OF PAVING

- 110 ASPHALT CONCRETE PAVING TO CAR PARK ENTRANCE AND AISLES
- Standard: To BS EN 13108-1.
 - Subgrade improvement layer: Not required.
 - Compacted thickness: Not applicable.
 - Geotextile: GEOGRID REQUIRED.
 - Manufacturer: TENSAR.
Product reference: As drawing C14461/C/005.
 - Granular sub-base: Highways Agency Type 1 unbound mixture, as section Q20.
 - Compacted thickness: As drawing C14461/C/005.
 - Base: AC 32 dense base.
 - Paving grade: 40/60.
 - Compacted thickness: 100 mm, nominal.
 - Binder course: AC 20 dense bin.
 - Paving grade: 100/150.
 - Compacted thickness: 60 mm, nominal.
 - Surface course: AC 10 close surf.
 - Paving grade: 100/150.
 - Slip/ Skid resistance: No requirement.
 - Compacted thickness: 30 mm, nominal.
 - Reclaimed content:
 - Standard: To BS EN 13108-8.
 - Value (maximum): Contractor's choice.
 - Surface treatment: Not required.
 - Other requirements: N/A.
- 110A ASPHALT CONCRETE PAVING TO CAR PARK BAYS
- Standard: To BS EN 13108-1.
 - Subgrade improvement layer: Not required.
 - Compacted thickness: Not applicable.
 - Geotextile: Geogrid required.
 - Manufacturer: TENSAR.
Product reference: As drawing C14461/C/005.
 - Granular sub-base: Highways Agency Type 1 unbound mixture, as section Q20.
 - Compacted thickness: As drawing C14461/C/005.
 - Base: N/A.
 - Paving grade: Not applicable.
 - Compacted thickness: N/A.
 - Binder course: AC 20 dense bin.
 - Paving grade: 100/150.
 - Compacted thickness: 90 mm, nominal.
 - Surface course: AC 10 close surf.
 - Paving grade: 100/150.
 - Slip/ Skid resistance: No requirement.
 - Compacted thickness: 30 mm, nominal.
 - Reclaimed content:
 - Standard: To BS EN 13108-8.
 - Value (maximum): Contractor's choice.
 - Surface treatment: Not required.
 - Other requirements: N/A.

110B ASPHALT CONCRETE PAVING TO SERVICE YARD ACCESS ROAD

- Standard: To BS EN 13108-1.
- Subgrade improvement layer: Not required.
 - Compacted thickness: Not applicable.
- Geotextile: Geogrid required.
 - Manufacturer: TENSAR.
Product reference: As drawing C14461/C/005.
- Granular sub-base: Highways Agency Type 1 unbound mixture, as section Q20.
 - Compacted thickness: As drawing C14461/C/005.
- Base: AC 32 dense base.
 - Paving grade: 40/60.
 - Compacted thickness: 150mm.
- Binder course: AC 20 dense bin.
 - Paving grade: 100/150.
 - Compacted thickness: 60 mm, nominal .
- Surface course: SMA 10 SURF.
 - Paving grade: 100/150.
 - Slip/ Skid resistance: No requirement.
 - Compacted thickness: 30 mm, nominal.
- Reclaimed content:
 - Standard: To BS EN 13108-8.
 - Value (maximum): Contractor's choice.
- Surface treatment: Not required.
- Other requirements: N/A.

115A ASPHALT CONCRETE PAVING TO MEDIAN

- Standard: To BS EN 13108-1.
- Subgrade improvement layer: Not required.
 - Compacted thickness: Not applicable.
- Geotextile: Not required.
 - Manufacturer: Not required.
Product reference: Not required.
- Granular sub-base: Highways Agency Type 1 unbound mixture, as section Q20.
 - Compacted thickness: As drawing C14461/C/005.
- Binder course: AC 20 dense bin.
 - Paving grade: 100/150.
 - Compacted thickness: 50mm.
- Surface course: AC 6 dense surf.
 - Paving grade: 100/150.
 - Slip/ Skid resistance: No requirement.
 - Compacted thickness: 20 mm.
- Reclaimed content:
 - Standard: To BS EN 13108-8.
 - Value (maximum): Contractor's choice.
- Surface treatment: Not required.
- Other requirements: N/A.

PREPARATORY WORK/ REQUIREMENTS

220 BITUMINOUS MATERIALS GENERALLY

- Suppliers names: Submit.
 - Timing (minimum): Two weeks before starting work.
- Test certificates: At the time of delivery for each manufacturing batch submit certificate:
 - Confirming compliance with this specification and the relevant standard.
 - Stating full details of composition of mix.

240 ACCEPTANCE OF SURFACES

- Surface: Sound, clean and suitably close textured.
- Level tolerances: To BS 594987.
- Kerbs and edgings: Complete, adequately bedded and haunched and to the required levels.

250 ABUTMENTS

- Vertical edges of manholes, gullies, kerbs and other abutments: Clean and paint with a thin uniform coating of hot applied 40/60 paving grade bitumen .
- Finishing: Tamp surface around projections.
 - Level: Flush or not more than 3 mm above projections.

LAYING

310 LAYING GENERALLY

- Preparation: Remove all loose material, rubbish and standing water.
- Adjacent work: Form neat junctions. Do not damage.
- Channels, kerbs, inspection covers etc: Keep clean.
- New paving:
 - Keep traffic free until it has cooled to prevailing atmospheric temperature.
 - Do not allow rollers to stand at any time.
 - Prevent damage.
 - Lines and levels: With regular falls to prevent ponding.
 - Overall texture: Smooth, even and free from dragging, tearing or segregation.
 - State on completion: Clean.

320 ADVERSE WEATHER

- Frozen materials: Do not use.
- Suspend laying:
 - During freezing conditions
 - If the air temperature reaches 0°C, or in calm dry conditions -3°C, on a falling thermometer.
 - Hot rolled asphalt: During periods of continuous or heavy rain or if there is standing water on the base.

330 LEVELS

- Permissible deviation from the required levels, falls and cambers (maximum): In accordance with BS 594987, clause 5.2.

350 CONTRACTOR'S USE OF PAVEMENTS

- Before use:
 - Timing: allow newly laid sections to cool before trafficking.
 - Open-grained surface: Fill with 0/4 mm size coated grit. Remove surplus.
 - Finish: Uncoated chipping and binder surface treatment.
- Preparation for final surfacing:
 - Timing: Defer laying until as late as practicable.
 - Immediately before laying final surfacing: Clean and make good the base/ binder course. Allow to dry.
 - Adhesion: Tack coat to BS 434-1 or BS EN 13808.
Application rate: As manufacturer's recommendation.
Accuracy: Uniform, without puddles.
 - Finishing: Allow emulsion to break completely before applying surface.

COMPLETION

390 DOCUMENTATION

- Standard: BS EN 13108-1.
 - Declaration of conformity: Submit.
- Number of copies: 1.
- Submission: Two weeks prior to date when Contractor expects work to be complete.

Q25 Slab/ brick/ sett/ cobble pavings

GENERAL

PRODUCTS

315 CONCRETE FLAGS TO PEDESTRIAN AREAS

- Standard: To BS EN 1339.
 - Manufacturer: Marshalls.
 - Product reference: Perfecta.
- Recycled content: Contractor's choice.
- Colour: As specified by architect.
 - Finish: As specified by architect.
 - Nominal sizes: As specified by architect, 35mm thick.
- Arrises: As specified by architect.
- Water absorption and freeze/ thaw resistance class: As specified by architect.
- Bending strength class: As specified by architect.
- Abrasion resistance class: As specified by architect.
- Slip/ Skid resistance: As specified by architect.
- Breaking load class: As specified by architect.

320 TACTILE FLAGS AND SLABS Hazard paving to steps

- Standard: To DD CEN/TS 15209.
- Material: Precast concrete.
 - Manufacturer: Submit proposals.
 - Product reference: Submit proposals.
- Recycled content: Submit proposals.
- Nominal sizes: 400 x 400 mm.
- Colour: As specified by architect.
- Type of surface: As specified by architect.

420 FINE AGGREGATE FOR LAYING COURSE OF CONCRETE SETT PAVING

- Material: Laying course sand to BS 7533-4 .

EXECUTION

620 ADVERSE WEATHER

- General:
 - Temperature: Do not lay or joint paving if the temperature is below 3°C on a falling thermometer or below 1°C on a rising thermometer.
 - Frozen materials: Do not use. Do not lay bedding on frozen or frost covered bases.
- Paving with mortar joints and/ or bedding:
 - Protect from frost damage, rapid drying out and saturation until mortar has hardened.
- Paving laid and jointed in sand:
 - Stockpiled bedding sand: Protect from saturation.
 - Exposed areas of sand bedding and uncompacted areas of sand bedded paving: Protect from heavy rainfall.
 - Saturated sand bedding: Remove and replace, or allow to dry before proceeding.
 - Laying dry-sand jointed paving in damp conditions: Brush in as much jointing sand as possible. Minimize site traffic over paving. As soon as paving is dry, top up joints and complete compaction.

625 LAYING PAVINGS - GENERAL

- Appearance: Smooth and even with regular joints and accurate to line, level and profile.
- Falls: To prevent ponding.
- Bedding of paving units: Firm so that rocking or subsidence does not occur or develop.
 - Bedding/ Laying course: Consistently and accurately graded, spread and compacted to produce uniform thickness and support for paving units.
- Slopes: Lay paving units upwards from the bottom of slopes.
- Paving units: Free of mortar and sand stains.
- Cutting: Cut units cleanly and accurately, without spalling, to give neat junctions with edgings and adjoining finishes.

630 LEVELS OF PAVING

- Permissible deviation from specified levels:
 - Generally: ± 6 mm.
- Height of finished paving above features:
 - At gullies: +6 to +10 mm.
 - At drainage channels and kerbs: +3 to +6 mm.

635 REGULARITY OF PAVED SURFACES

- Maximum variation in gap under a 3 m straight edge placed anywhere on the surface (where appropriate in relation to the geometry of the surface):
 - Precast concrete paving blocks and clay pavers for flexible pavements: 10 mm.
 - Precast concrete flags or natural stone slabs: 3 mm.
- Difference in level between adjacent paving units (maximum): 2 mm.
- Sudden irregularities: Not permitted.

650 CEMENTITIOUS BASES AND SUB-BASES

- General: Protect from moisture loss, if not covered by another pavement course within 2 hours of completion.

655 CONDITION OF SUB-BASES/ BASES BEFORE SPREADING LAYING COURSE

- Trenches and excavation of soft or loose spots in subgrade: Fill and thoroughly compact.
- Granular surfaces: Lay and compact so as to be sound, clean, smooth and close-textured enough to prevent migration of bedding/ laying course materials into the sub-base during compaction and use, free from movement under compaction plant and free from compaction ridges, cracks and loose material.
- Prepared existing and new bound bases (roadbases): Sound, clean, free from rutting or major cracking. Remove sharp stones, projections and debris.
- Sub-base/ Roadbase level tolerances: To BS 7533-7, Annex A.
- Levels and falls: Accurate and within the specified tolerances.
- Drainage outlets: Within 0-10 mm of the required finished level.
- Features in sand bedded paving (including mortar bedded restraints and drainage ironwork): Complete to required levels; adequately bed and haunch in mortar.
- Sub-bases containing cement/ hydraulic binder: Cure for minimum times specified in BS 7533-4.

710 LAYING FLAG AND SLAB PAVING - SAND LAYING COURSE AND JOINTING

- Standard: In accordance with BS 7533-4.
- Flag installation and cutting: To Interpave 'Concrete flag paving'.
- Laying course:
 - Nominal thickness after compaction: 30 mm with a tolerance of -10 to + 5 mm.
- Joint width: 2-5 mm.

COMPLETION

- 915 COMPLETION OF PAVING WITH DRY SAND OR FINE AGGREGATE FILLED JOINTS
- Sand dressing: Not required.
 - Final compaction of the surface course: In accordance with BS 7533-3.
 - Vacuum cleaning machines: Not allowed.

R12 Below ground drainage systems

GENERAL

110 BELOW GROUND DRAINAGE SYSTEM TO SITE

- Surface water and rainwater drainage sources: One piece gullies and Rainwater downpipes (nonsiphonic), as section R10.
 - Foul drainage sources: Discharge stack and branch pipes, as section R11.
 - Land drainage sources: None .
 - Pressure relief drainage sources: None .
 - Pipes, bends and junctions:
 - Clay - flexible joints;
 - Plastics - structured wall; and
 - PVC-U - solid wall.
 - Accessories:
 - Access points;
 - Connectors - saddle;
 - Flexible couplings; and
 - Rodding points.
 - Manholes, inspection chambers, traps, and separators:
 - Inspection chambers - plastics;
 - Manholes and inspection chambers - concrete; and
 - Oil and petrol separator units - plastics .
 - Accessories:
 - Manhole channels and branches - conventional;
 - Manhole steps;
 - Sealing for concrete manholes - bituminous strips; and
 - Vortex flow control units.
 - Disposal: To sewers.
- Accessories – general:
- Access covers and frames;
 - Access ladders;
 - Concrete;
 - Granular material; and
 - Granular sub-base material.

PRODUCTS

311 ADAPTORS TO CLAY DRAINAGE

- Material and standard: Polypropylene to BS EN 295-1 and Kitemark certified.
- Type: DN 100 rainwater pipe to DN 150 clay.
- Manufacturer: Contractor's choice.
 - Product reference: Contractor's choice.

312 ADAPTORS TO PLASTICS DRAINAGE ____

- Material and standard: Plastics to BS 4660 and Kitemark certified or to BS EN 1401-1 and Kitemark certified.
- Type: DN 100 rainwater pipe to DN 150 plastics .
- Manufacturer: Contractor's choice.
 - Product reference: Contractor's choice.

- 315 ONE PIECE GULLIES AND COVERS - PAVED AREAS
- Standards: To BS EN 1253-1, -2, -3, -4 and -5; or
 - Cast iron: To BS 437 and Kitemark certified, or Agrément certified.
 - Clay: To BS EN 295-1 and Kitemark certified, or Agrément certified.
 - Concrete: To BS 5911-6 and Kitemark certified, or Agrément certified.
 - Plastics: To BS 4660 and Kitemark certified, or Agrément certified.
 - Polypropylene: To BS EN 1852-1.
 - Material: As atandard details.
 - Manufacturer: Contractor's choice.
 - Product reference: Contractor's choice.
 - Sizes: As standard details.
 - Outlet sizes: DN 150.
 - Covers: As standard detail.
 - Product reference: Contractor's choice.
 - Type: Hinged grating.
 - Material: Ductile cast iron.
 - Sizes: As standard detail.
 - Loading grades to BS EN 124: D400.
 - Silt buckets: None.
 - Product reference: N/A.
- 329 PIPES, BENDS AND JUNCTIONS - SUPPLY
- Pipes and fittings: From same manufacturer for each pipeline.
- 336 PIPES, BENDS AND JUNCTIONS - CLAY - FLEXIBLE JOINTS SURFACE AND FOUL WATER
- Material and standard: Vitrified clay to BS EN 295-1, Kitemark certified.
 - Manufacturer: Contractor's choice.
 - Product reference: Contractor's choice.
 - Sizes:
 - DN 100;
 - DN 150; and
 - DN 225.
 - Crushing strength (minimum): FN 40.
 - Jointing type: To manufacturers recommendations.
- 342 PIPES, BENDS AND JUNCTIONS - CONCRETE - SURFACE WATER DRAINAGE
- Standards: To BS 5911-1 and BS EN 1916, with flexible joints.
 - Manufacturer: Contractor's choice.
 - Product reference: Contractor's choice.
 - Sizes: DN 300 and DN 375.
 - Shapes: Circular.
 - Cement type and content: To BS 5911-1 and BS EN 1916.
 - Accessories: Cast in lifting anchors.
- 346 PIPES, BENDS AND JUNCTIONS - PVC-U - SOLID WALL Foul and surface water drainage
- Standard: BS EN 1401-1 with flexible joints.
 - Class: SN4.
 - Manufacturer: Contractor's choice.
 - Product reference: Contractor's choice.
 - Recycled content: Contractor's choice.
 - Sizes: As drainage plan.
 - Application area code: UD.

- 359 FLEXIBLE COUPLINGS
- Standard: To BS EN 295-4 or WIS 4-41-01 and Kitemark certified, or Agrément certified.
 - Manufacturer: Contractor's choice.
 - Product reference: Contractor's choice.
- 371 RODDING POINTS Refer drainage drawing
- Standards:
 - Cast iron: To BS 437 and Kitemark certified, or Agrément certified.
 - Clay: To BS EN 295-1 and Kitemark certified, or Agrément certified.
 - Concrete: To BS 5911-6 and Kitemark certified, or Agrément certified.
 - Plastics: To BS 4660 and Kitemark certified, to BS EN 13598-1 or Agrément certified.
 - Material: To match pipework.
 - Manufacturer: Contractor's choice.
 - Product reference: Contractor's choice.
 - Sizes: DN 150.
- 401 INSPECTION CHAMBERS - PLASTICS Refer drainage plan
- Standard: To BS 7158, BS EN 13598-1, BS EN 13598-2 or Agrément certified.
 - Diameter: 450 mm.
 - Manufacturer: Contractor's choice.
 - Bases:
 - Product reference: Contractor's choice.
 - Shaft units:
 - Product reference: Contractor's choice.
 - Access covers and frames:
 - Product reference: Contractor's choice.
 - Loading grades to BS EN 124: Refer drainage drawing.
- 407 MANHOLES AND INSPECTION CHAMBERS - CONCRETE
- Standards:
 - To BS 5911-3 and BS EN 1917 and Kitemark certified; or
 - To BS 5911-4 and BS EN 1917.
 - Manufacturer: Contractor's choice.
 - Shape: Circular.
 - Sizes: Refer drainage drawing.
 - Cement type and content: To BS 5911-1 and BS EN 1916.
 - Chamber sections:
 - Product reference: Contractor's choice.
 - Jointing type: Bituminous strips.
 - Cover slabs:
 - Product reference: Contractor's choice.
 - Thickness: Refer SFA7.
 - Loading grades to BS EN 124: Refer drainage drawings.
 - Openings: To suit access covers.
 - Steps: Required in chambers over 900 mm deep.
 - Vortex flow control unit: Refer drainage plan.
- 421 OIL AND PETROL SEPARATOR UNITS - PLASTICS
- Standards: To Environment Agency PPG 3 and BS EN 858-1, with oil level alarm.
 - Manufacturer: Contractor's choice.
 - Product reference: Contractor's choice.
 - Type: Class 1.
 - Size: Refer drainage drawing.
 - Inlet pipe size: Refer drainage plan.
 - Outlet pipe size: Refer drainage plan.
 - Accessories: Access covers and frames.

- 433 MANHOLE CHANNELS AND BRANCHES - CONVENTIONAL
- Material: Clay.
 - Manufacturer: Contractor's choice.
 - Product reference: Contractor's choice.
- 435 MANHOLE CHANNELS AND BRANCHES - PREFORMED PLASTICS
- Manufacturer: Contractor's choice.
 - Product reference: Contractor's choice.
- 437 VORTEX FLOW CONTROL UNITS Refer drainge drawing.
- Manufacturer: Contractor's choice.
 - Product reference: Contractor's choice.
 - Material: Stainless steel.
 - Drain down secondary outlet pipe: Integral.
 - Control type: Refer drainge drawing.
 - Operation: From surface.
- 439 MANHOLE STEPS Refer standard detail
- Standard: To BS EN 13101.
 - Type: D.
 - Manufacturer: Contractor's choice.
 - Product reference: Contractor's choice.
 - Material: Galvanized steel.
- 444 SEALING FOR CONCRETE MANHOLES - BITUMINOUS STRIPS
- Manufacturer: Contractor's choice.
 - Product reference: Contractor's choice.
- 464 MODULAR STORMWATER ATTENUATION UNITS Refer to drawing.
- Manufacturer: Submit proposals.
 - Product reference: Submit proposals.
 - Unit size: Refer to drainage drawing.
 - Tank capacity/ size (minimum): Refer to drainage drawing.
- 468 PRECAST CONCRETE COVER SLABS
- Standard: To BS 5911-3 and BS EN 1917 and Kitemark certified.
 - Manufacturer: Contractors choice.
 - Product reference: Contractor's choice.
 - Size: Refer drainge drawing.
 - Openings: Refer drainge drawing.
- 471 ACCESS COVERS AND FRAMES IN GENERAL
- Standard: To BS EN 124.
 - Types: Refer drainge drawing.
 - Manufacturer: Contractor's choice.
 - Product reference: Contractor's choice.
 - Materials: Ductile cast iron.
 - Finishes: Black bitumen painted.
 - Sizes: Refer drainge drawing.
 - Loading grades to BS EN 124: Refer drainge drawing.
 - Edging trims: Not required.
 - Accessories: Refer drainge drawing.

- 483 CONCRETE GENERAL
 - Standard: To BS 8500-2.
 - Concrete: Refer drawings.

- 496 GRANULAR MATERIAL – NATURAL
 - Standards: To Water Industry Specification WIS 4-08-02 (as amended by WIS 4-08-02A, 2008).
 - Supplier : Contractor's choice.
 - Recycled content: Contractor's choice.
 - Size: Dependent on location – see Execution clauses in this section, and in sections R16, R17 and R18, if used.

- 498 GRANULAR SUB-BASE MATERIAL
 - Standard: To Highways Agency Volume 1, 'Specification for Highway Works', Type 1 Unbound mixtures for sub-base.
 - Recycled content: Contractor's choice.

EXECUTION

- 610 STRIPPING OUT
 - Extent of stripping out: As shown.
 - Exposed ends of existing drainage to be abandoned: Seal with concrete (general).

- 611 EXISTING DRAINS
 - Setting out: Before starting work, check invert levels and positions of existing drains, sewers, inspection chambers and manholes against drawings. Report discrepancies.
 - Protection: Protect existing drains to be retained and maintain normal operation if in use.

- 613 EXCAVATED MATERIAL
 - Turf, topsoil, hardcore, etc: Set aside for use in reinstatement.

- 616 SELECTED FILL FOR BACKFILLING
 - Selected fill: As-dug material, free from vegetable matter, rubbish, frozen soil and material retained on a 40 mm sieve.
 - Compaction: By hand in 100 mm layers.

- 623 LOWER PART OF TRENCH – GENERAL
 - Trench up to 300 mm above crown of pipe: Vertical sides, width as small as practicable.
 - Width (minimum): External diameter of pipe plus 300 mm.

- 625 LOWER PART OF TRENCH - TRANSITION DEPTH
 - Trench widths up to 300 mm above crown of pipe (maximum):
 - DN 100 pipelines more than 6.0 m deep: 600 mm.
 - DN 150 pipelines more than 5.4 m deep: 700 mm.
 - DN 225 pipelines more than 4.0 m deep: 800 mm.
 - DN 300 pipelines more than 2.9 m deep: 900 mm.

- 631 TYPE OF SUBSOIL
 - General: Where type of subsoil at level of crown of pipe differs from that stated for the type of bedding, surround or support, give notice.

635 FORMATION FOR BEDDINGS

- Timing: Excavate to formation immediately before laying beddings or pipes.
- Mud, rock projections, boulders and hard spots: Remove. Replace with consolidated bedding material.
- Local soft spots: Harden by tamping in bedding material.
- Inspection of excavated formations: Give notice.

641 PIPES AT DIFFERENT LEVELS IN COMMON TRENCH

- Subtrench: Permissible provided soil of step is stable and unlikely to break away.
 - Subtrench not permissible: Trench depth as required for lower pipe. Increase thickness of bedding to upper pipe as necessary.
- Lower pipe: Backfill with compacted granular material to at least half way up higher pipe.
- Clear horizontal distance between pipes (minimum):
 - Pipes up to DN 700: 350 mm.
 - Pipes exceeding DN 700: 500 mm.

663 CLASS P SUPPORT TO PLASTIC DRAINAGE

- Type of subsoil: varies.
- Granular material: Contractor's choice.
 - Sizes: To Water Industry Specification WIS 4-08-02 (as amended by WIS 4-08-02A, 2008).
- Bedding:
 - Material: Granular, compacted over full width of trench.
 - Thickness (minimum): 100 mm.
- Pipes: Dig slightly into bedding, rest uniformly on barrels and adjust to line and gradient.
- Initial testing before placing support: Required.
- Support:
 - Material: Granular.
 - Depth: To slightly above crown of pipe.
 - Compaction: By hand.
- Backfilling:
 - Material and depth:
Protective cushion of selected fill to 300 mm above crown of pipe; or
Additional granular material, to 100 mm above crown of pipe.
 - Compaction: By hand in 100 mm layers.

665 CLASS Q SURROUND TO PLASTIC DRAINAGE IF COVER IS LESS THAN 1.2m

- Type of subsoil: Varies.
- Granular material: Contractor's choice.
 - Sizes: To Water Industry Specification WIS 4-08-02 (as amended by WIS 4-08-02A, 2008).
- Bedding:
 - Material: Granular, compacted over full width of trench.
 - Thickness (minimum): 100 mm.
- Pipes: Dig slightly into bedding, rest uniformly on barrels and adjust to line and gradient.
- Initial testing before placing support: Required.
- Surround:
 - Material: Granular.
 - Depth (minimum): To 75 mm above crown of pipe.
 - Compaction: By hand.
- Flexible filler:
 - Material: Contractors choice.
 - Laying: Continuously over completed surround before laying protection slabs.
- Protection slabs:
 - Material: Concrete.
 - Type: Reinforced.
 - Thickness: 75 mm.
 - Reinforcement: A193.
 - Minimum bearing: 300 mm.
- Backfilling: Soil or topsoil, as appropriate.

667 CLASS S SURROUND TO CLAY AND CONCRETE PIPES

- Type of subsoil: Varies.
- Trench width up to 300 mm above crown of pipe (maximum):
 - DN 100 nominal pipe size: 600 mm.
 - DN 150 nominal pipe size: 700 mm.
 - DN 225 nominal pipe size: 800 mm.
 - DN 300 nominal pipe size: 900 mm.
- Granular material: Contractor's choice.
 - Sizes: To Water Industry Specification WIS 4-08-02 (as amended by WIS 4-08-02A, 2008).
- Bedding:
 - Material: Granular, compacted over full width of trench.
 - Thickness (minimum): 50 mm for sleeve jointed pipes, 100 mm for socket jointed pipes.
 Where trench bottom is uneven, increase depth by 100 mm.
- Pipes: Dig slightly into bedding, rest uniformly on barrels and adjust to line and gradient.
- Initial testing before placing surround: Required.
- Surround:
 - Material: Granular.
 - Depth: To 50 mm above crown of pipe.
 - Compaction: By hand in 100 mm layers.
- Backfilling:
 - Material: Protective cushion of selected fill.
 - Depth: 150 mm (250 mm for adoptable sewers) above crown of pipe.
 - Compaction: By hand in 100 mm layers.

- 678 CLASS Z SURROUND TO ALL PIPES WHERE COVER IS LESS THAN 1.2m
- Type of subsoil: VARIES.
 - Blinding:
 - Material: Concrete (general).
 - Thickness (minimum): 25 mm.
 - Width: Full width of trench.
 - Allow to set before proceeding.
 - Pipes:
 - Temporary support: Folding wedges of compressible board. Prevent flotation.
 - Clearance under pipes (minimum): 100 mm.
 - Adjust pipes to line and gradient.
 - Initial testing before placing surround: Required.
 - Surround:
 - Material: Concrete.
 - Depth: To 150 mm above crown of pipe.
 - Width: Full width of trench.
 - Vertical construction joints:
 - Location: At face of flexible pipe joints.
 - Material: 18 mm thick compressible board precut to profile of pipe.
 - Socketed pipes: Fill gaps between spigots and sockets with resilient material to prevent entry of concrete.
- 680 CONCRETE SURROUND FOR PIPE RUNS NEAR FOUNDATIONS
- Class Z surround: Provide in locations where bottom of trench is lower than bottom of foundation and as follows (horizontal clear distance between nearest edges of foundations and pipe trenches):
 - Trenches less than 1 m from foundations: Top of concrete surround not lower than bottom of foundation.
 - Trenches more than 1 m from foundations: Top of concrete surround not lower than D mm below bottom of foundation, where D mm is horizontal distance of trench from foundation, less 150 mm.
- 683 LAYING PIPELINES
- Laying pipes: To true line and regular gradient on even bed for full length of barrel with sockets (if any) facing up the gradient.
 - Ingress of debris: Seal exposed ends during construction.
 - Timing: Minimize time between laying and testing.
- 685 JOINTING PIPELINES
- Connections: Durable, effective and free from leakage.
 - Junctions, including to differing pipework systems: With adaptors intended for the purpose.
 - Cut ends of pipes: Clean and square. Remove burrs and swarf. Chamfer pipe ends before inserting into ring seal sockets.
 - Jointing or mating surfaces: Clean and, where necessary, lubricate immediately before assembly.
 - Allowance for movement: Provide and maintain appropriate clearance at ends of spigots as fixing and jointing proceeds.
 - Jointing material: Do not allow to project into bore of pipes and fittings.
- 687 CONCRETE SURROUND FOR CROSSOVERS
- Class Z surround: Provide where two pipelines (other than plastics pipes) cross with less than 300 mm separation.
 - Extent, on both pipes: 1 m centred on the crossing point, and beyond as necessary to come within 150 mm of nearest flexible joints.

689 PIPELINES PASSING THROUGH STRUCTURES

- Pipelines that must be cast in or fixed to structures (including manholes, catchpits and inspection chambers): Provide 600 mm long rocker pipes adjacent to the external face of the structure (or both faces where appropriate, e.g. walls to footings), with flexible joints at both ends.
 - Distance to rocker pipe from structure (maximum): 150 mm.
- Provision for movement for pipelines that need not be cast in or fixed to structures (e.g. walls to footings):
 - Rocker pipes as specified above; or
 - Openings in the structures to give 50 mm minimum clearance around the pipeline. Closely fit a rigid sheet to each side of opening to prevent ingress of fill or vermin.

691 BENDS AT BASE OF SOIL STACKS

- Type: Nominal 90° rest bends.
 - Radius to centreline of pipe (minimum): 200 mm.
- Height of invert of horizontal drain at base of stack below centreline of lowest branch pipe (minimum): 450 mm.
- Bedding: Do not impair flexibility of pipe couplings.
 - Material: Concrete (general).

693 DIRECT CONNECTION OF GROUND FLOOR WCS TO DRAINS

- Drop from crown of WC trap to invert of drain (maximum): 1.3 m.
- Horizontal distance from the drop to a ventilated drain (maximum): 6 m.

695 BACKDROP PIPES OUTSIDE MANHOLE WALLS

- Excavation beneath backdrop pipe: Backfill.
 - Material: Concrete.
- Pipe encasement:
 - Material: Concrete.
 - Thickness (minimum): 150 mm.

697 INSTALLING FLEXIBLE COUPLINGS

- Ends of pipes to be joined: Cut cleanly and square.
- Outer surfaces of pipes to be joined: Clean and smooth. Where necessary, e.g. on concrete or iron pipes, smooth out mould lines and/ or apply a cement grout over the sealing area.
- Clamping bands: Tighten carefully to make gastight and watertight seals.

699 CONNECTIONS TO SEWERS

- General: Connect new pipework to existing adopted sewers to the requirements of the adopting authority or its agent.

705 INITIAL TESTING OF PIPELINES

- Before testing:
 - Cement mortar jointing: Leave 24 h.
 - Solvent welded pipelines: Leave 1 h.
- Method: Block open ends of pipelines to be tested and pressurise. Air test short lengths to BS EN 1610.

711 TRENCH SUPPORTS

- Removal of trench supports and other obstacles: Sufficient to permit compacted filling of all spaces.

- 715 BACKFILLING TO PIPELINES
- Backfilling above top of surround or protective cushion: Material excavated from trench, compacted in layers 300 mm (maximum) thick.
 - Heavy compactors: Do not use before there is 600 mm (total) of material over pipes.
- 718 BACKFILLING OVER CONCRETE
- Minimum times from placing concrete:
 - Backfilling generally: 24 h.
 - Heavy compactors and traffic loads: 72 h.
- 720 BACKFILLING UNDER ROADS AND PAVINGS
- Backfilling from top of surround or protective cushion up to formation level: Granular sub-base material, laid and compacted in 150 mm layers.
- 722 PUBLIC ROADS AND PAVINGS – ENG, WALES, SCOT
- Excavating and backfilling of trenches: To Department for Transport 'Specification for the reinstatement of openings in highways'.
- 732 TEMPORARY BRIDGES
- Trench bridges: As necessary to prevent construction traffic damaging pipes after backfilling.
- 734 INSTALLING ACCESS POINTS AND GULLIES
- Bedding:
 - Material: Granular - natural, size 4/10 to BS EN 13242.
 - Thickness (minimum): 150 mm.
 - Surround:
 - Material: Concrete.
 - Thickness (minimum): 150 mm.
 - Height: Full height.
 - Backfilling: General.
 - Material: Granular - natural, size 4/10 to BS EN 13242, to 100 mm above crown of pipes, then selected fill.
 - Compaction: By hand in 100 mm layers.
 - Setting out relative to adjacent construction features: Square and tightly jointed.
 - Permissible deviation in level of external covers and gratings: +0 to -6 mm.
 - Raising pieces (clay and concrete units): Joint with 1:3 cement:sand mortar.
 - Exposed openings: Fit purpose made temporary caps. Protect from traffic.
- 736 INSTALLING RODDING POINTS
- Bedding and surround:
 - Material: Concrete (general).
 - Thickness (minimum): 150 mm..
 - Permissible deviation in level of external covers and gratings: +0 to -6 mm.

741 INSTALLING INSPECTION CHAMBERS - PLASTICS

- Bedding:
 - Material: Granular - natural, size 4/10 to BS EN 13242.
 - Thickness (minimum): 150 mm.
- Surround:
 - Material: Concrete.
 - Thickness (minimum): 150 mm.
- Backfilling: Granular material - natural, size 4/10 to BS EN 13242, to 100 mm above crown of pipes, then selected fill.
 - Compaction: By hand in 100 mm layers.
- Concrete collar:
 - Material: Concrete.
 - Thickness (minimum): 200 mm.
 - Width (minimum): 300 mm.
- Seating: Not required.

743 INSTALLING CONCRETE MANHOLES

- Bases:
 - Material: Concrete.
 - Thickness (minimum): 225 mm.
- Surround:
 - Material: Concrete.
 - Thickness (minimum): 150 mm.
 - Height: Full height.
- Backfilling:
 - Material: Granular - natural, size 4/10 to BS EN 13242, to 100 mm above crown of pipes, then selected fill.
 - Compaction: By hand in 100 mm layers.

747 INSTALLING OIL AND PETROL SEPARATOR UNITS

- Base:
 - Material: Concrete (general).
 - Thickness (minimum): To manufacturers recommendations.
- Surround:
 - Material: To manufacturers recommendations.
 - Thickness (minimum): To manufacturers recommendations.
- Backfilling: To manufacturers recommendations.
 - Compaction: By hand in 100 mm layers.
- Installation: Fill tank with water then encase tank and access shafts with concrete to fully support tank.
- Vent pipe termination: To manufacturers recommendations.

750 INSTALLING VORTEX FLOW CONTROL UNITS

- Benching:
 - Material: Concrete.
 - Profile: Rise from manhole base to a level not lower than soffit of outlet pipe, then slope upwards at 10% towards soffit of inlet pipe.
 - Topping:
 - Material: Concrete.
 - Application: Before benching concrete has set, and with dense smooth uniform finish.
- Vortex flow control mounting block (cast in situ):
 - Material: Concrete.
 - Profile: Rise from manhole base vertically to provide plane surface for attachment of unit.
- Outlet pipe: Build in.
- Drain down secondary outlet pipe: Build in.

- 753 FIXING MANHOLE STEPS
- Fixing: As standard detail.
 - Positioning: 300 mm vertical centres staggered 300 mm horizontally, with lowest step 300 mm (maximum) above benching and top step 450 mm (maximum) below top of cover.
- 755 JOINTING CONCRETE MANHOLE CHAMBER SECTIONS
- Jointing and sealing: bituminous strips.
 - Inner joint surface: Trim surplus jointing material extruded into chamber and point neatly.
- 757 LAYING CONVENTIONAL CHANNELS, BRANCHES AND BENCHING
- Main channel: Bed solid in 1:3 cement:sand mortar.
 - Branches: Connect to channel, preferably at half pipe level, so that discharge flows smoothly in direction of main flow.
 - Branches greater than nominal size 150 mm: Connect the branch soffit level with the main drain soffit.
 - Connecting angles more than 45° to direction of flow: Use three-quarter section channel bends.
 - Benching:
 - Material: Concrete.
 - Profile: Rise vertically from top of main channel to a level not lower than soffit of outlet pipe, then slope upwards at 10% to walls.
 - Topping:
Material: Concrete.
 - Application: Before benching concrete has set, and with dense smooth uniform finish.
- 759 LAYING PREFORMED PLASTICS CHANNELS, BRANCHES AND BENCHING
- Main channel: Bed solid in 1:3 cement:sand mortar.
 - Branches: Connect to channel, preferably at half pipe level, so that discharge flows smoothly in direction of main flow.
 - Connecting angles more than 45° to direction of flow: Use three-quarter section channel bends.
 - Bedding: 1:3 cement:sand mortar. Use clips or ensure adequate mechanical key.
 - Benching:
 - Material: Concrete (general).
 - Profile: Rise vertically from top of main channel to a level not lower than soffit of outlet pipe, then slope upwards at 10% to walls.
 - Topping:
Material: Concrete.
Application: Before benching concrete has set, and with dense smooth uniform finish.
- 761 LAYING SEALED ACCESS FITTINGS, BRANCHES AND BENCHING
- Unused branches: Fit caps.
 - Bedding: 1:3 cement:sand mortar.
 - Benching:
 - Material: Concrete (general).
Profile: 10% fall from manhole walls to component rim.
 - Topping:
Material: Concrete.
Application: Before benching concrete has set, and with dense smooth uniform finish.

773 INSTALLING ACCESS COVERS AND FRAMES

- Seating: Precast concrete.
- Bedding and haunching of frames: Continuously.
 - Material: 1:3 cement:sand mortar.
 - Top of haunching: 30 mm below surrounding surfaces.
- Horizontal positioning of frames:
 - Centred over openings.
 - Square with joints in surrounding paving.
- Vertical positioning of frames:
 - Level; or
 - Marry in with levels of surrounding paving.
- Permissible deviation in level of external covers and frames: +0 to -6 mm.

776 EXPOSED OPENINGS IN INSPECTION CHAMBERS, ACCESS POINTS, FITTINGS AND EQUIPMENT

- General: Fit purpose made temporary caps. Protect from site traffic.

COMPLETION

901 REMOVAL OF DEBRIS AND CLEANING

- Preparation: Lift covers to manholes, inspection chambers and access points. Remove mortar droppings, debris and loose wrappings.
 - Timing: Before cleaning, final testing, CCTV inspection if specified, and immediately before handover.
- Cleaning: Thoroughly flush pipelines with water to remove silt and check for blockages. Rod pipelines between access points if there is any indication that they may be obstructed.
- Washings and detritus: Do not discharge into sewers or watercourses.
- Covers: Securely replace after cleaning and testing.

903 TEMPORARY MEASURES

- Water used to stabilize tanks and the like during installation: Drain.

911 TESTING AND INSPECTION

- Dates for testing and inspection: Give notice.
 - Period of notice: 3 working days.

921 FINAL TESTING OF PRIVATE GRAVITY DRAINS AND SEWERS UP TO DN 300

- Before testing:
 - Cement mortar jointing: Leave 24 h.
 - Solvent welded pipelines: Leave 1 h.
- Standard: To Building Regulations.
- Method: Contractor's choice.

931 FINAL TESTING OF ADOPTABLE AND LARGE PRIVATE SEWERS

- Standard (sewers up to and including size DN 750):
 - England, Wales and Northern Ireland: To WRc 'Sewers for adoption'.
 - Scotland: To WRc 'Sewers for Scotland'.
- Method: Water.

941 WATER TESTING OF MANHOLES AND INSPECTION CHAMBERS

- Timing: Before backfilling.
- Standard:
 - Exfiltration: To BS EN 1610.
 - Method: Testing with water (method W).
 - Infiltration: No identifiable flow of water penetrating the chamber.

971 CCTV INSPECTION OF PRIVATE PIPELINES

- General: Carry out and record internal inspection using CCTV equipment.
 - Locations to be inspected: Foul and surface water drains.
- Illumination: Of adequate intensity.
- Recording: Provide continuous position recording, still photographs and stopping of the camera at any point.
 - Copy of videotape recording: Submit.

978 LIFTING KEYS

- Lifting keys: Supply suitable keys for each type of access cover.
 - Timing: At completion.

R13 Land drainage

GENERALLY

100 EXISTING DRAINS AND WATERCOURSES

- Setting out: Before starting work, check invert levels and positions of existing drainage against drawings. Report any discrepancies.
- Drains to be retained: Protect. Maintain normal operation.

CULVERTS

411 PRECAST CONCRETE BOX CULVERTS

- Drawing reference: Refer drawing C14461/C/009.
- Bedding: Granular material to BS EN 13242, size 4/10.
 - Recycled content of granular material: Submit proposals.
- Box culverts:
 - Standard: To Box Culvert Association Standard Specification.
 - Manufacturer: Submit proposals.
Product reference: Submit proposals.
 - Sizes: 1500 wide 1000 deep.
 - Cement type and content: To above standard.
- Jointing material: Bituminous sealing strip.
- Water depth:
 - Minimum -.
 - Maximum -.
- Surface loading: Car park.
- Surround and backfill: Granular material to BS EN 13242, size 4/10.
 - Recycled content of granular material: Submit proposals.
Installation: In accordance with Box Culvert Association 'Guide to site practice.'
- Backfilling over top of culvert: In layers not exceeding 300 mm thick with mechanical compaction up to formation level for construction over. Do not overload culvert when compacting.

ANCILLARY CONSTRUCTIONS AND WORK

640 CAST IRON ACCESS COVERS AND SEATING

- Covers: Grey cast iron or ductile cast iron.
 - Standard: To BS EN 124.
 - Manufacturer: Contractor's choice.
Product reference: Contractor's choice.
 - Types: C250, for slow-moving heavy traffic use.
 - Sizes: 600 x 600.
- Seating: Either:
 - Brickwork: Engineering brickwork, or
 - Precast concrete cover frame units, to BS 5911-3.
- Bedding and haunching of frame:
 - Solidly in 1:3 cement:sand mortar over whole area.
 - Centrally over opening, top level and square with joints in surrounding finishes.
 - Cut back top of haunching to 30 mm below top of surface material.

800 CLEANING

- General: Thoroughly flush out the whole of the installation with clean water to remove silt and debris immediately before handover.
- Washings and detritus: Dispose of safely. Do not discharge into sewers or watercourses.