

Construction (Design and Management) Regulations 2015

**STRUCTURAL ENGINEERING
NBS SPECIFICATION**

for

PROPOSED CARE HOME

**Normandy Way
Havant**

Prepared by

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D20 Excavating and filling

To be read with Preliminaries/General conditions

GENERALLY/THE SITE

112 SITE INVESTIGATION REPORT

- Refer to Omnia Geo Environmental Site Assessment ref A11840/1.0 June 2022

145 VARIATIONS IN GROUND WATER LEVEL

- Give notice: If levels encountered are significantly different from levels in the site investigation report or previously measured.

150 EXISTING SERVICES, FEATURES AND STRUCTURES

- Services: See section A12 for locations.
- Site features to be retained: See section A12 for details.
- Structures: See section A34 for details of protection.

CLEARANCE/EXCAVATING

170 REMOVING SMALL TREES, SHRUBS, HEDGES AND ROOTS

- Identification: Clearly mark trees to be removed.
- Small trees, shrubs and hedges: Cut down
- Roots: Grub up and dispose of without undue disturbance of soil and adjacent areas
- Safety: Comply with HSE/ Arboriculture and Forestry Advisory Group safety leaflets.

220 STRIPPING TOPSOIL

- General: Before beginning general excavation or filling, strip topsoil from areas where there will be regrading, buildings, pavings/ roads and other areas shown on drawings.
- Depth:
 - Give notice where the depth of topsoil is difficult to determine.
- Handling: Handle topsoil for reuse or sale in accordance with clause 225.
- Around trees: Do not remove topsoil from below the spread of trees to be retained.

221 TREATING TOPSOIL

- Treatment: Apply a suitable translocated nonresidual herbicide.
- Timing: Not less than two weeks before excavating topsoil.

225 HANDLING TOPSOIL

- Standard: To BS 3882.
- Aggressive weeds:
 - Species: Included in the Weeds Act, section 2 or the Wildlife and Countryside Act, Schedule 9, part II.
 - Give notice: Obtain instructions before moving topsoil.
- Contamination: Do not mix topsoil with:
 - Subsoil, stone, hardcore, rubbish or material from demolition work.
 - Other soil or material containing aggressive weeds, sharps, plastics and non soil forming materials and notifiable animal or plant diseases.
 - Oil, fuel, cement or other substances harmful to plant growth.
 - Other classifications of topsoil.
- Multiple handling: Keep to a minimum. Use topsoil immediately after stripping.

240 ADJACENT EXCAVATIONS

- Requirement: Where an excavation encroaches below a line drawn at an angle from the nearest formation level of another higher excavation, the lower excavation, all work within it and backfilling thereto, must be completed before the higher excavation is made.

- Angle of line below horizontal: 45 degrees.
 - Backfill material: as shown on drawings.
- 242 EXCAVATIONS ADJACENT TO EXISTING BACKFILLED TRENCHES
- Proximity: When width of undisturbed ground between the two excavations will be less than 10m
 - Action: Assume that the ground between the trenches is unstable and provide side support accordingly.
- 244 EXCAVATIONS ADJACENT TO EXISTING FOUNDATIONS
- Prior to commencing excavation:
 - Excavate trial pits adjacent to existing foundations to determine extent and formation levels.
 - Allow for inspection of trial pits.
 - Allow time for amendment of details if required.
- 250 PERMISSIBLE DEVIATIONS FROM FORMATION LEVELS
- Beneath mass concrete foundations: ± 25 mm.
 - Beneath ground bearing slabs and r.c. foundations: ± 15 mm.
 - Embankments and cuttings: ± 50 mm.
 - Ground abutting external walls: ± 50 mm, but such as to ensure that finished level is not less than 150 mm below dpc.
- 267 INSPECTION OF FORMATIONS IN SHRINKABLE SOILS
- Inspect formation: For signs of conducting and fine moisture absorbing roots.
 - Give notice: If significant quantities of roots are visible in the formation or in the bottom 75mm of the walls of the excavation.
- 270 FOUNDATIONS GENERALLY
- Give notice if:
 - A natural bearing formation of undisturbed subsoil is not obtained at the depth shown on the drawings.
 - The formation contains soft or hard spots or highly variable material.
- 280 TRENCH FILL FOUNDATIONS
- Excavation: Form trench down to formation in one operation.
 - Safety: Prepare formation from ground level.
 - Inspection of formations: Give notice before commencing excavation.
 - Period of notice: 48 hours.
 - Shoring: Where inspection of formation is required, provide localised shoring to suit ground conditions.
 - Concrete fill: Place concrete immediately after inspection and no more than four hours after exposing the formation.
- 290 FOUNDATIONS IN MADE UP GROUND
- Depth: Excavate down to a natural formation of undisturbed subsoil.
 - Discrepancy: Give notice if this is greater or less than depth given.
- 310 UNSTABLE GROUND
- Generally: Ensure that the excavation remains stable at all times.
 - Give notice: Without delay if any newly excavated faces are too unstable to allow earthwork support to be inserted.
 - Take action: If instability is likely to affect adjacent structures or roadways, take appropriate emergency action.
- 320 RECORDED FEATURES
- Recorded foundations, beds, drains, manholes, etc: _____.
 - Contaminated earth: Remove and disinfect as required by local authority.

330 UNRECORDED FEATURES

- Give notice: If unrecorded foundations, beds, voids, basements, filling, tanks, pipes, cables, drains, manholes, watercourses, ditches, etc. not shown on the drawings are encountered.

350 EXISTING WATERCOURSES

- Diverted watercourses which are to be filled: Before filling, remove vegetable growths and soft deposits.

360 EXCESS EXCAVATION

- Excavation taken wider than required:
 - Backfill: imported granular fill.
- Excavation taken deeper than required:
 - Backfill: GEN 1 concrete.

370 UNDERGROUND STRUCTURES IN LANDSCAPE AREAS

- Generally: Remove walls, roads, foundations, disused services, drains, manholes and the like to minimum depth.
- Minimum depth below finished levels:
 - Grass, ground cover and perennial planting: 500 mm.
 - Shrub planting: 750 mm.
 - Within 2 m of tree planting: 1000 mm.
- Walls and slabs remaining: In every 10 m² of wall or slab, make a drainage hole at least 600 mm diameter.

DISPOSAL OF MATERIALS

415 EXCAVATED TOPSOIL REMOVAL

- General: Remove from site.

450 WATER

- Generally: Keep all excavations free from water until:
 - Formations are covered.
 - Below ground constructions are completed.
 - Basement structures and retaining walls are able to resist leakage, water pressure and flotation.
- Drainage: Form surfaces of excavations and fill to provide adequate falls.
- Removal of water: Provide temporary drains, sumps and pumping as necessary. Do not pollute watercourses with silt laden water.

454 GROUND WATER LEVEL, SPRING OR RUNNING WATER

- Give notice: If it is considered that the excavations are below the water table.
- Springs/ Running water: Give notice immediately if encountered.

457 PUMPING

- General: Do not disturb excavated faces or stability of adjacent ground or structures.
- Pumped water: Discharge without flooding the site or adjoining property.
- Sumps: Construct clear of excavations. Fill on completion.

FILLING

500 PROPOSED FILL MATERIALS

- Details: Submit full details of proposed fill materials to demonstrate compliance with specification, including:
 - Type and source of imported fill.
 - Proposals for processing and reuse of material excavated on site.
 - Test reports as required elsewhere.
- Timing: 5 working days notice.

- 510 **HAZARDOUS, AGGRESSIVE OR UNSTABLE MATERIALS**
- General: Do not use fill materials which would, either in themselves or in combination with other materials or ground water, give rise to a health hazard, damage to building structures or instability in the filling, including material that is:
 - Frozen or containing ice.
 - Organic.
 - Contaminated or noxious.
 - Susceptible to spontaneous combustion.
 - Likely to erode or decay and cause voids.
 - With excessive moisture content, slurry, mud or from marshes or bogs.
 - Clay of liquid limit exceeding 80 and/or plasticity index exceeding 55.
 - Unacceptable, class U2 as defined in the Highways Agency 'Specification for highway works', clause 601.
- 520 **FROST SUSCEPTIBILITY**
- General: Except as allowed below, fill must be non-frost susceptible as defined in Highways Agency 'Specification for Highway Works', clause 801.8.
 - Test reports: If the following fill materials are proposed, submit a laboratory report confirming they are non-frost susceptible:
 - Fine grained soil with a plasticity index less than 20%.
 - Coarse grained soil or crushed granite with more than 10% retained on a 0.063 mm sieve.
 - Crushed chalk.
 - Crushed limestone fill with average saturation moisture content in excess of 3%.
 - Burnt colliery shale.
 - Frost-susceptible fill: May only be used:
 - At depths below the finished ground surface greater than: 450mm.
 - Within the external walls of buildings below spaces that will be heated. Protect from frost during construction.
 - Where frost heave will not affect structural elements.
- 530 **PLACING FILL**
- Surfaces of excavations and areas to be filled: Free from loose soil, topsoil, organic material, rubbish and standing water.
 - Freezing conditions: Do not place fill on frozen surfaces. Remove material affected by frost. Replace and recompact if not damaged after thawing.
 - Adjacent structures, membranes and buried services:
 - Do not overload, destabilise or damage.
 - Submit proposals for temporary support necessary to ensure stability during filling.
 - Allow 14 days (minimum) before backfilling against in situ concrete structures.
 - Layers: Place so that only one type of material occurs in each layer.
 - Earthmoving equipment: Vary route to avoid rutting.
- 535 **COMPACTION GENERALLY**
- General: Compact fill not specified to be left loose as soon as possible after placing.
 - After compaction: Surface of each layer must be well closed, showing no movement under compaction plant, and without cracks, holes, ridges, loose material and the like.
 - Defective areas: Remove and recompact to full thickness of layer using new material.
- 540 **BENCHING IN FILL**
- Adjacent areas: If, during filling the difference in level between adjacent areas of filling exceeds 600 mm, cut into edge of higher filling to form benches 600 mm minimum width and height equivalent to depth of a layer of compacted filling.
 - New filling: Spread and compact to ensure maximum continuity with previous filling.
- 610 **COMPACTED FILLING FOR LANDSCAPE AREAS**
- Fill: Material capable of compaction by light earthmoving plant.

- Filling: Layers not more than 200 mm thick. Lightly compact each layer to produce a stable soil structure.
- 615 LOOSE TIP FILLING FOR LANDSCAPE AREAS
- Filling: Do not firm, consolidate or compact when laying. Tip and grade to approximate levels in one operation with minimum of trafficking by plant.
- 617 HIGHWAYS AGENCY TYPE 1 UNBOUND MIXTURE
- Fill: To Highways Agency 'Specification for highway works', clauses 801 and 803:
 - Crushed rock (other than argillaceous rock).
 - Crushed concrete.
 - Recycled aggregates.
 - Crushed non-expansive slag.
 - Well-burned non-plastic colliery shale.
 - Amendments to requirements in Highways Agency 'Specification for highway works':
 - Filling: To Highways Agency 'Specification for highway works', clause 802.
- 618 HIGHWAYS AGENCY TYPE 2 UNBOUND MIXTURE
- Fill: To Highways Agency 'Specification for highway works', clauses 801 and 804:
 - Crushed rock (other than argillaceous rock).
 - Crushed concrete.
 - Crushed non-expansive slag.
 - Well-burned non-plastic colliery shale.
 - Natural gravel.
 - Natural sand.
 - Amendments to requirements in Highways Agency 'Specification for highway works':
 - Filling: To Highways Agency 'Specification for highway works', clause 802.
- 620 SUBGRADE IMPROVEMENT LAYER (CAPPING)
- Fill: To Highways Agency 'Specification for highway works', Table 6/1, Class 6F1 or 6F2.
 - Filling: Place and compact to Highways Agency Specification for highway works, Table 6/1, clause 612 and clause 613.3, 613.9 and 613.10.
- 626 COMPACTED GENERAL FILL
- Suitable material: hardcore.
 - Excavated material: Select suitable material and keep separate.
 - Filling: Spread and level material in layers. As soon as possible thoroughly compact each layer.
- 650 PROTECTION OF COMPACTED FILLING
- Temporary protective filling: Before allowing construction traffic, raise level of compacted cohesive soil filling at least 150 mm above formation level using properly compacted temporary filling.
 - Removal: Remove temporary protective filling from site before permanent construction.
- 700 BACKFILLING AROUND FOUNDATIONS
- Under oversite concrete and pavings: Hardcore as clause 710.
 - Under grassed or soil areas: Material excavated from the trench, laid and compacted in 300 mm maximum layers.

710 HARDCORE FILLING

- Fill: Granular material, 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, 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.
 - Crushed non-expansive slag.
 - Gravel or hoggin with not more clay content than is required to bind the material together, and with no large lumps of clay.
 - Well-burned non-plastic colliery shale.
 - Natural gravel.
 - Natural sand.
- Filling: Spread and level in 150 mm maximum layers. Thoroughly compact each layer.

730 BLINDING

- Surfaces to receive sheet overlays or concrete:
Blind with:
 - Concrete where shown on drawings; or
 - Sand, fine gravel, or other approved fine material applied to fill interstices. Moisten as necessary before final rolling to provide a flat, closed, smooth surface.
- Sand for blinding: To BS EN 12620, grade 0/4 or 0/2 (MP).
- Permissible deviations on surface level: +0 -25 mm.

E05 In situ concrete construction generally

To be read with Preliminaries/General conditions.

- 222 **EUROCODES**
- United Kingdom National Annexes: Deemed to be included. Nationally determined parameters shall apply.
- 235 **OPENINGS, INSERTS AND FIXINGS**
- Requirement: Collate all information.
 - Submit: Details where openings, inserts and fixings can only be accommodated by adjustments to reinforcement.
 - Locate reinforcement: To ensure specified minimum cover at openings and inserts and to be clear of fixing positions.
- 290 **ACCURACY OF CONSTRUCTION**
- Reference system: To BS 5964-1
 - Substitution of alternative requirements: None.
- 310 **SURFACE REGULARITY OF CONCRETE FLOORS TO BS 8204 - GENERAL**
- Standard: To BS 8204-1 or -2 – class SR2.
 - Measurement: From underside of a 2 m straightedge (between points of contact) placed anywhere on surface and using a slip gauge.

E10 Mixing/casting/curing in situ concrete

To be read with Preliminaries/General conditions.

CONCRETE

101 SPECIFICATION

- Concrete generally: To BS 8500-2.
- Exchange of information: Provide concrete producer with information required by BS 8500-1, clauses 4 and 5.

105 DESIGNATED CONCRETE

- Designation: Blinding – FND 3Z.
- Fibres: No.
- Aggregates:
 - Size (maximum): 20.
 - Coarse recycled aggregates: Yes.
 - Additional aggregate requirements: None.
- Special requirements for cement/ combinations: None.
- Consistence class: S3.
- Chloride class: N/A.
- Admixtures:
- Additional mix requirements: None.

106 DESIGNATED CONCRETE

- Designation: Mass Concrete – REINFORCED CONCRETE FOUNDATIONS – FND3Z.
- Fibres: No.
- Aggregates:
 - Size (maximum): 20.
 - Coarse recycled aggregates: Yes.
 - Additional aggregate requirements: None.
- Special requirements for cement/ combinations: None.
- Consistence class: S3.
- Chloride class: N/A.
- Admixtures:
- Additional mix requirements: None.

107 DESIGNED MIX TO WATERPROOF CONCRETE LIFT PIT

Structural concrete which required being waterproof, where specified, shall incorporate SIKa 1 + Integral waterproofer, or equivalent and approved in writing, dosed in accordance with the manufacturer's detailed specification. The concrete shall have corrected 30 minute water absorption of not greater than 1% as measured in accordance with BS1881: Part 122: 1983, except that the age at test shall be 7 days. One Random Sample shall be taken on each day that concrete is placed and tested to confirm compliance.

Any proposed alternative must conform to the water absorption requirement above and meet the following criteria:

1. Must be shown by an independent authority to have had no reduction in performance after field exposure to hydrostatic pressure for a minimum of 15 years.
2. Must not contain any chlorides or any other substances which may be detrimental to long term performance of the concrete.
3. Must hold a current Agreement certificate for use as an integral waterproofer in structural concrete.

4. The manufacturer must supply a 12 year waterproofing guarantee for the concrete structure containing the additive, inclusive construction joints.
 - Mix RC35 to BS 8500
 - The concrete will be reinforced
 - Nominal maximum size of aggregate 20mm – sand content to have min 10kg/m³ of fines less than 75microns
 - Admixtures: Visco Crete or Sikaplast high range water reducing admixture.
 - Min cement content 350kg/m³
 - Max w/c ratio – 0.45
 - Consistence Class – S3

- 125 SUBSTITUTION OF STANDARDIZED PRESCRIBED CONCRETE FOR DESIGNATED CONCRETE
 - General: Conform to BS 8500-2, clause 9.
 - Substitution: In accordance with BS 8500-1, table A. 13.
 - Proposals: Submit for each substitution, stating reasons.
 - Site mixing: Not Applicable.

- 132 DESIGNED CONCRETE: PROPOSAL TO BE SUBMITTED FOR APPROVAL

- MATERIALS, BATCHING AND MIXING**

- 215 READY-MIXED CONCRETE
 - Production plant: Currently certified by a body accredited by UKAS to BS EN 45011 for product conformity certification of ready-mixed concrete.
 - Source of ready-mixed concrete: Obtain from one source if possible. Otherwise, submit proposals.
 - Name and address of depot: Submit before any concrete is delivered.
 - Delivery notes: Retain for inspection.
 - Declarations of nonconformity from concrete producer: Notify immediately.

- 221 INFORMATION ABOUT PROPOSED CONCRETES
 - Submit when requested:
 - Details listed in BS 8500-1, clause 5.2.
 - Additional information: _____.

- 230 INTERRUPTION OF SUPPLY DURING CONCRETING
 - Elements without joints: Where elements are detailed to be cast in a single pour without joints, make prior arrangements for a back-up supply of concrete.
 - Elsewhere:
 - Preparation: Manage pour to have a full face, and have materials available to form an emergency construction joint while concrete can still be worked.
 - Before pour is completed: Submit location and details of joint, make proposals for joint preparation.

- 415 ADMIXTURES
 - Calcium chloride and admixtures containing calcium chloride: Do not use.

- 490 PROPERTIES OF FRESH CONCRETE
 - Adjustments to suit construction process: Determine with concrete producer. Maintain conformity to the specification.

PROJECT TESTING/ CERTIFICATION

- 505 PROJECT TESTING OF CONCRETE - GENERAL
- Testing: To General.
 - Nonconformity: Obtain instructions immediately.
 - Recording: Maintain complete correlated records including:
 - Concrete designation.
 - Sampling, site tests, and identification numbers of specimens tested in the laboratory.
 - Location of the parts of the structure represented by each sample.
 - Location in the structure of the batch from which each sample is taken.
- 508 REGULAR PROJECT TESTING OF CONCRETE
- Tests: 7 / 28 day Compressive Strength.
 - Sampling:
 - Point: Site.
 - Rate: 1 per concrete type per day.
 - Other requirements: None.
- 520 TESTING LABORATORY
- Laboratory: Accredited by UKAS or other national equivalent.
 - Name and UKAS reference number: Submit well in advance of making trial mixes or concrete for use in the works.
- 530 TESTS RESULTS
- Submission of reports: Within one day of completion of each test.
 - Number of copies: _____.
 - Reports on site: A complete set, available for inspection.
- 550 BROKEN CUBES FROM FAILED STRENGTH TESTS
- Nonconformity: Keep separately the pieces of each cube which fail to meet the conformity requirements for individual results.
 - Period for keeping cubes: Obtain instructions.

PLACING/ COMPACTING/ CURING AND PROTECTING

- 610 CONSTRUCTION/ SEQUENCE/ TIMING REQUIREMENTS
- _____.
- 630 PREMATURE WATER LOSS
- Requirement: Prevent water loss from concrete laid on absorbent substrates.
 - Underlay: Select from:
 - Polyethylene sheet: 250 micrometres thick.
 - Building paper: To BS 1521, grade B1F.
 - Installation: Lap edges 150 mm.
- 640 CONSTRUCTION JOINTS
- Location of joints: to be agreed with structural consultant.
 - Preparation of joint surfaces: _____.
- 648 ADVERSE TEMPERATURE CONDITIONS
- Requirement: Submit proposals for protecting concrete when predicted ambient temperatures indicate risk of concrete freezing or overheating.
- 650 SURFACES TO RECEIVE CONCRETE
- Cleanliness of surfaces immediately before placing concrete: Clean with no debris, tying wire clippings, fastenings or free water.

670 TRANSPORTING

- General: Avoid contamination, segregation, loss of ingredients, excessive evaporation and loss of workability. Protect from heavy rain.
- Entrained air: Anticipate effects of transport and placing methods in order to achieve specified air content.

680 PLACING

- Records: Maintain for time, date and location of all pours.
- Timing: Place as soon as practicable after mixing and while sufficiently plastic for full compaction.
- Temperature limitations for concrete: 30°C (maximum) and 5°C (minimum), unless otherwise specified. Do not place against frozen or frost covered surfaces.
- Continuity of pours: Place in final position in one continuous operation up to construction joints. Avoid formation of cold joints.
- Discharging concrete: Prevent uneven dispersal, segregation or loss of ingredients or any adverse effect on the formwork or formed finishes.
- Thickness of layers: To suit methods of compaction and achieve efficient amalgamation during compaction.
- Poker vibrators: Do not use to make concrete flow horizontally into position, except where necessary to achieve full compaction under void formers and cast-in accessories and at vertical joints.

690 COMPACTING

- General: Fully compact concrete to full depth to remove entrapped air. Continue until air bubbles cease to appear on the top surface.
- Areas for particular attention: Around reinforcement, under void formers, cast-in accessories, into corners of formwork and at joints.
- Consecutive batches of concrete: Amalgamate without damaging adjacent partly hardened concrete.
- Methods of compaction: To suit consistence class and use of concrete.

720 VIBRATORS

- General: Maintain sufficient numbers and types of vibrator to suit pouring rate, consistency and location of concrete.
- External vibrators: Obtain approval for use.

730 PLASTIC SETTLEMENT

- Settlement cracking: Inspect fresh concrete closely and continuously wherever cracking is likely to occur, including the top of deep sections and at significant changes in the depth of concrete sections.
- Timing: During the first few hours after placing and whilst concrete is still capable of being fluidized by the vibrator.
- Removal of cracks: Revibrate concrete.

810 CURING GENERALLY

- Requirement: Keep surface layers of concrete moist throughout curing period, including perimeters and abutments, by either restricting evaporation or continuously wetting surfaces of concrete.
- Surfaces covered by formwork: Retain formwork in position and, where necessary to satisfy curing period, cover surfaces immediately after striking.
- Top surfaces: Cover immediately after placing and compacting. If covering is removed for finishing operations, replace it immediately afterwards.
- Surface temperature: Maintain above 5°C throughout the specified curing period or four days, whichever is longer.
- Records: Maintain details of location and timing of casting of individual batches, removal of formwork and removal of coverings. Keep records on site, available for inspection.

811 COVERINGS FOR CURING

- Sheet coverings: Suitable impervious material.
- Curing compounds: Selection criteria:
 - Curing efficiency: Not less than 75% or for surfaces exposed to abrasion 90%.
 - Colouring: Fugitive dye.
 - Application to concrete exposed in the finished work: Readily removable without disfiguring the surface.
 - Application to concrete to receive bonded construction/ finish: No impediment to subsequent bonding.
- Interim covering to top surfaces of concrete: Until surfaces are in a suitable state to receive coverings in direct contact, cover with impervious sheeting held clear of the surface and sealed against draughts at perimeters and junctions.

812 PREVENTING EARLY AGE THERMAL CRACKING

- Deep lifts or large volume pours: Submit proposals for curing to prevent early age thermal cracking, taking account of:
 - Temperature differentials across sections.
 - Coefficient of thermal expansion of the concrete.
 - Strain capacity of the concrete mix (aggregate dependent).
 - Restraint.

815 ADDITIONAL CURING REQUIREMENT - WATER CURING

- Commencement of water curing: As soon as practicable after placing and compacting concrete.
- Surfaces covered by formwork: Expose to water curing as soon as practicable.
- Top surfaces: Cover immediately with impermeable sheeting to prevent evaporation before commencement of water curing.
- Water curing: Wet surfaces continuously throughout curing period.
- Select methods from:
 - Mist spray.
 - Wet hessian covered with impermeable sheeting.

818 CURING PERIODS GENERALLY

- Minimum periods: When not otherwise indicated to 7 days.

840 PROTECTION

- Prevent damage to concrete, including:
 - Surfaces generally: From rain, indentation and other physical damage.
 - Surfaces to exposed visual concrete: From dirt, staining, rust marks and other disfiguration.
 - Immature concrete: From thermal shock, physical shock, overloading, movement and vibration.
 - In cold weather: From entrapment and freezing expansion of water in pockets, etc.

E20 Formwork for in situ concrete

To be read with Preliminaries/ General conditions.

GENERALLY/ PREPARATION

- 110 **LOADINGS**
- Requirement: Design and construct formwork to withstand the worst combination of the following:
 - Total weight of formwork, reinforcement and concrete.
 - Construction loads including dynamic effects of placing, compacting and construction traffic.
 - Wind and snow loads.
- 145 **PERMANENT FORMWORK**
- Location and materials: Submit proposals.
- 178 **FORMATION OF OPENINGS IN COMPOSITE ACTION SLABS**
- Generally: Except as otherwise agreed, box out for openings in concrete.
 - Forming holes in profiled steel sheet:
 - Timing: 7 days after casting.
 - Method: Saw cut.
- 190 **SUBSTRUCTURE FORMWORK FOR GROUND BEAMS AND PILE CAPS**
- Manufacturer: CONTRACTORS CHOICE.

CONSTRUCTION

- 310 **ACCURACY**
- General requirement for formwork: Accurately and robustly constructed to produce finished concrete in the required positions and to the required dimensions.
 - Formed surfaces: Free from twist and bow (other than any required cambers).
 - Intersections, lines and angles: Square, plumb and true.
- 315 **SUBSTRUCTURE FORMWORK AND UNDERSLAB INSULATION**
- Cutting: Neat and accurate to edges, and around penetrations and downstands.
 - Laying: Tightly butted and fully supported on firm, even substrate.
 - Vertical faces: Stiffen as necessary to act as shutter.
 - Formwork/ insulation surfaces: Protect from indentation by spacers and other items.
 - Joints in formwork/ insulation and with edge structure and penetrations: Seal to prevent penetration of concrete.
 - Concrete placement: Restrain formwork/ insulation against movement.
- 320 **JOINTS IN FORMS**
- Requirements including joints in form linings and between forms and completed work:
 - Prevent loss of grout, using seals where necessary.
 - Prevent formation of steps. Secure formwork tight against adjacent concrete.
- 330 **INSERTS, HOLES AND CHASES**
- Positions and details:
 - Dimensioned on drawings provided on behalf of the Employer: Do not change without consent.
 - Undimensioned or from other sources: Submit proposals.
 - Positioning relative to reinforcement: Give notice of any conflicts well in advance of placing concrete.
 - Method of forming: Fix inserts or box out as required. Do not cut hardened concrete without approval.

350 FORM TIES

- Metal associated with form ties/ devices: Prohibited within cover to reinforcement. Compatible with reinforcement metal.

470 RELEASE AGENTS

- Use: _____.
- General: Achieve a clean release of forms without disfiguring the concrete surface.
- Product types: Compatible with formwork materials, specified formed finishes and subsequent applied finishes. Use the same product throughout the entire area of any one finish.
- Protection: Prevent contact with reinforcement, hardened concrete, other materials not part of the form face, and permanent forms.

480 SURFACE RETARDERS

- Use: Obtain approval.
- Reinforcement: Prevent contact with retarder.

STRIKING

510 STRIKING FORMWORK

- Timing: Prevent any disturbance, damage or overloading of the permanent structure.

610 BASIC FINISH

- Requirements: Face fully compacted and to tolerance, otherwise no particular requirements.
- Use: _____.

E30 Reinforcement for in situ concrete

To be read with Preliminaries/ General conditions.

REINFORCEMENT

110 QUALITY ASSURANCE OF REINFORCEMENT

- Standards:
 - Reinforcement: To BS 4449, BS 4482, BS 4483 or BS 6744.
 - Cutting and bending: To BS 8666.
- Source of reinforcement: Companies holding valid certificates of approval for product conformity issued by the UK Certification Authority for Reinforcing Steels (CARES).

140 PLAIN BAR REINFORCEMENT

- Standard: To BS 4482.
- Strength grade: 250.

150 RIBBED BAR REINFORCEMENT

- Standard: To BS 4449.
- Strength grade: 500.

210 STANDARD FABRIC REINFORCEMENT

- Standard: To BS 4483.
- Strength grade: _____.

WORKMANSHIP

310 CUTTING AND BENDING REINFORCEMENT

- General: To schedules and to BS 8666.
- Bending on site, including minor adjustments: to be agreed.

320 PROTECTION OF REINFORCEMENT

- Dropping from height, mechanical damage and shock loading: Prevent.
- Cleanliness of reinforcement at time of pouring concrete: Free from corrosive pitting, loose millscale, loose rust and contaminants which may adversely affect the reinforcement, concrete, or bond between the two.

410 LAPS OR SPLICES

- Details not shown on drawings: Obtain instructions.

425 LAPS NOT DETAILED ON DRAWINGS

- Laps in bar reinforcement (minimum): 40 x bar diameter.
- Laps in fabric reinforcement (minimum): 400mm.
- Laps at corners: Avoid four layer build-up.

E41 Worked finishes to in situ concrete

To be read with Preliminaries/ General conditions.

- 150 FINISHING
 - Timing: Carry out at optimum times in relation to setting and hardening of concrete.
 - Prohibited treatments to concrete surfaces:
 - Wetting to assist surface working.
 - Sprinkling cement.
- 210 TAMPED FINISH
 - Surface on completion: Foundations / Floor Slab.
- 230 BRUSHED FINISH
 - Surface on completion: Light even texture.
- 310 SMOOTH FLOATED FINISH
 - Surface on completion: Even with no ridges or steps.
- 320 TROWELLED FINISH
 - Surface on completion: Uniform, smooth but not polished, free from trowel marks and blemishes, and suitable to receive specified flooring material.

E60 Precast/ composite concrete floors/ roof decks

To be read with Preliminaries/ General conditions.

PERFORMANCE SPECIFIED FLOORS/ ROOF DECKS

- 211 FLOOR _____
- Type of construction: HOLLOW PRE-CAST PLANKS – Lower & Upper Ground Floors and First Floor (where applicable please refer to Drawing No: 11063 series
 - Overall depth (excluding finishes): 150mm all floors except balconies where 200mm planks are noted. (where planks are used).
 - Span: Refer to drawings
 - Self weight: Refer to drawings
 - In situ continuity reinforcement: By Specialist
 - Void formers: By Specialist
 - In situ concrete topping to composite construction: None
 - Finish to soffit: As cast
 - Other requirements: None

GENERAL/ PERFORMANCE

- 240 DETAILING OF PROPRIETARY SYSTEM
- Installation details: Submit location and assembly drawings showing every aspect of the construction, incorporated components and features, trimming for voids, holes for services, and related work by others.
 - Purpose: To allow checking of compatibility with surrounding structure and coordination of services.
 - Method statement and risk assessment for installation: Submit.
 - Programme: Submit well in advance of construction.
- 250 CONTRACTOR DESIGN
- Standard: Complete the design in accordance with BS 8110.
 - Fully precast construction: TO LOWER GROUND, GROUND & FIRST.
- 265 STRUCTURAL PERFORMANCE OF FLOORS
- Loads: The floors must safely support the maximum combination of dead and imposed loads both in the finished building and during construction.
 - Dead loads: Refer to drawings and design calc.
 - Distributed loads of finishes/ fixtures: REFER TO DRAWINGS.
 - Concentrated loads: REFER TO DRAWINGS.
 - Imposed loads: Refer to drawings and design calc.
 - Distributed loads: REFER TO DRAWINGS.
 - Concentrated loads: REFER TO DRAWINGS.
 - Deflection (maximum): REFER TO DRAWINGS.
 - Diaphragm/ tie action: REFER TO DRAWINGS.
- 280 BASIC FIRE RESISTANCE
- Duration: 1.0 HR.
 - Method of determination: To BS 8110-2, section 4 or by testing to BS 476-21 or BS EN 1365-2.
 - Finishes: Determine fire resistance without regard to applied finishes.
 - Data: Submit certificates, tabulated data or calculations.
- 290 STANDARD PRECAST CONCRETE INFILL BLOCKS _____
- Type: Solid block to BS EN 771-3.

- Size: 440 x 215 x 100 mm.
- Density: 1500kg/m³.
- Compressive strength (minimum): 10.4N/mm².
- Transverse load capacity (minimum): 3.5 kN/m² measured on a 420 mm span.
- Other requirements: None.

INSTALLATION

315 INFILLING BEAM BEARINGS

- Type: BLOCKWORK AS SPECIFIED ON DRAWINGS.
- Installation: Infill gaps in walling below built in standard flooring blocks.

320 CONCRETE INFILL

- Designated concrete: To BS 8500-2.
- Designation: C25/30.
- Aggregate size (maximum): 10mm.
- Preparation: Thoroughly clean and wet surfaces of precast units.
- Placing: Avoid segregation and compact thoroughly to eliminate voids.
- Extent: Fill troughs and other holes.
- Finish: Flush with top of precast units.
- Protection: Prevent movement of units until concrete has gained sufficient strength.

325 GROUTING

- Mix: C25/30 CONCRETE, 10mm AGGREGATE.
- Preparation: -.
- Fill all joints and surface irregularities.

340 LATERAL RESTRAINT STRAPS

- Preparation: Floors/ roof decks must tightly abut walls.
- Manufacturer: REFER TO DRAWINGS.
- Product reference: REFER TO DRAWINGS.
- Material: REFER TO DRAWINGS.
- Size:
- Section: Minimum 30 x 5 mm cross section.
- Length: To extend minimum 800 mm from inside face of wall.
- Form: Both ends cranked 100 mm.
- Position: REFER TO DRAWINGS.
- Build in:
- External cavity walls: One cranked end in tight contact with cavity face of wall inner leaf, the other cranked end grouted into floor/ roof deck joint.

350 LEVELS OF STRUCTURAL CONCRETE FLOORS

- Tolerances: See Preliminaries section A33.

G10 Structural steel framing

To be read with Preliminaries/ General conditions.

GENERAL REQUIREMENTS/ INFORMATION

- 110 DESIGN
- Design concept: Design Concept: 2+3 storey load bearing masonry and steel structure.
 - Design standard: The structural steelwork has been designed to BS5950 Part 1:2000.
 - Supplementary requirements: None.
 - Completion of design: Detail steelwork and design connections.
 - Loading requirements: Refer to drawings.
 - Design parameters: Refer to drawings.
 - Fixings to foundations/ walls: Detailed on drawings.
 - Other requirements: None.
- 115 DESIGN CONSTRAINTS - GENERAL
- Members forming bracing systems or girders of lattice construction: Unless detailed or instructed otherwise, position so that their lines of action intersect at a point.
 - Bolts:
 - Diameter (minimum): 20mm.
 - Number per connection (minimum): Two, unless otherwise indicated.
 - Other requirements: None.
- 120 DRAWINGS AND CALCULATIONS
- Information required: Prior to fabrication.
 - Requirement: Before preparing detailed fabrication drawings, submit:
 - General arrangement drawings with individual steel members clearly identified.
 - Calculations for major connections.
- 125 SPECIFICATION STANDARD
- Standard: Comply with latest edition of National Structural Steelwork Specification (NSSS).
 - Additional requirements: None.
 - Document availability: For the duration of the work, at fabrication shop and on site.
 - References to Engineer in NSSS: For the purpose of this contract, interpret such references as being to NJP.
 - Exceptions: None.
- 130 GENERAL STEEL SECTIONS AND PLATES _____
- Standard: BS EN 10025.
 - Grade: S275 JO to S355 JO.
 - Options: Refer to drawings.
 - Source: Obtain steel from a source accredited to a national or internationally accepted quality standard.
 - Other requirements: None.
- 135 HOLLOW STEEL SECTIONS _____
- Standard: BS EN 10210.
 - Grade: S275 JOH to S355 JOH.
 - Options: Refer to drawings.
 - Source: Obtain steel from a source accredited to a national or internationally accepted quality standard.
 - Other requirements: None.

FRAME SYSTEMS

FABRICATION

- 180 NOTIFICATION OF COMMENCEMENT
- Notice: Give notice before fabrication is due to start.
 - Period of notice (minimum): 5 working days.
- 190 MARKING
- Identifying and recording materials and components: Submit details of proposed methods.
 - Location of marks:
 - Generally: Visible for checking after erection.
 - Weathering steel: On surfaces not exposed to open view in the completed work.
 - Steel to be blast cleaned, pickled, metal sprayed or galvanized: Marked so that subsequent treatment cannot obliterate the marking.
- 195 HARD STAMPING
- Usage: Not permitted except as indicated on drawings.
- 210 END CONNECTIONS
- Angle cleats: Project 10 mm beyond ends of simply supported members.
- 215 HOLLOW SECTIONS
- Insides of sections: Debris and moisture removed before sealing ends and openings.
- 220 ACCESS/ VENTILATION HOLES IN BASE PLATES
- Base plates larger than 1 m²: Make 25 mm diameter holes as necessary for pressure grouting, escape of entrapped air or direct compaction of filling/ bedding material.
- 225 STEELWORK TO BE GALVANIZED
- Cutting, drilling and shop welding: Complete before galvanizing.
 - Vent and drain holes: Provide as necessary.
 - Locations: Submit proposals.
 - Sealing: None.

WELDING

- 255 SITE WELDING
- Usage: Permitted only where indicated on drawings.
 - Working conditions: Suitable and safe. Do not weld when surfaces are wet or when ambient temperature is below 0°C.
- 270 ADDITIONAL WELDS
- Welds (including tack welds) not indicated on drawings: Not permitted without approval.

BOLT ASSEMBLIES

- 315 HOLDING DOWN SYSTEMS
- Bolts:
 - Standard: _____.
 - Type: _____.
 - Grade: 8.8.
 - Diameter: 20.
 - Coating: None.
 - Bolt boxes: Refer to drawings.

- Anchorage: Refer to drawings.
- Other requirements: Refer to drawings.

335 SPRING WASHERS

- Standard: To BS 4464.

375 SHERARDIZED COATING TO BOLT ASSEMBLIES

- Standard: To BS 7371-8.
- Class: Normal.
- Sherardizing: Applied by fastener manufacturer and passivated.
- Post treatment: None.
- Use/location: Central.

390 SEALED HOLLOW SECTIONS

- Holes: Sealed to prevent access of moisture.
- Method of sealing: _____.

ERECTION

410 PRE-ERECTION CHECKS

- Scope: At least 7 days before proposed erection start date, check the following:
- Foundations and other structures to which steelwork will be attached: Accuracy of setting out.
- Holding down bolts: Position, protruding length, slackness and condition.
- Inaccuracies and defects: Report without delay.
- Permission to commence erection: Obtain.

420 SETTING OUT

- Permissible deviations: In addition to the requirements of the NSSS, comply with the following:

Type of dimension and location	Permissible Deviation
None	

425 MODIFICATIONS

- Steelwork: Do not modify without approval.
- Temporary fabrication/ erection attachments: Remove and make good prior to handover.

440 COLUMN BASES

- Levels: Adjust using steel shims or folding wedges no larger than necessary.
- Location of shims/ wedges: Position symmetrically around perimeter of base plate. Do not use a single central pack.
- Give notice: If space beneath any column base is outside specified limits for bedding thickness.
- Accuracy of erection: Check, and correct errors before filling and bedding beneath bases and carrying out other adjacent work.

443 PROPRIETARY FILLING/ BEDDING OF COLUMN BASES

Bedding thickness range: 15-40mm.

- Preparation: Concrete surfaces scarified to provide a good mechanical key.
- Bolt pockets and spaces beneath base plates: Completely filled with proprietary non shrink grout.

TESTING

475 PRODUCTS

- Steel: Submit test certificates.

PROTECTIVE COATINGS

- 523 COMPATIBILITY OF SHOP PRIMER WITH SITE APPLIED INTUMESCENT COATING
- Intumescent coating: M61/ _____.
 - Primer: Compatible with coating under general and fire conditions.
 - Manufacturer's recommendations and test evidence: Submit before priming. Include fire test data to BS 476-20 and -21, or BS EN 1363-1 and BS EN 1365-2, -3, and/or -4 as appropriate.
- 535 INSPECTION OF COATING WORK
- Work in progress: Permit coating manufacturer to inspect and take samples of products.
 - Notice: Give notice of dates for:
 - Start of surface preparation and coating.
 - Coated members or components leaving the works.
 - Period of notice (minimum): 5 working days.

PROTECTIVE COATING SYSTEMS

- 638 SHOP PRIMING FOR STEELWORK HIDDEN FROM VIEW
- Use/ location: General steel framing.
 - Shop preparation:
 - Generally: Blast cleaning to BS EN ISO 8501-1, preparation grade SA2½ .
 - Welds/ edges/ areas with surface imperfections: To BS EN ISO 8501-3, preparation grade _____.
 - Primer: Epoxy zinc phosphate.
 - Manufacturer: Contractor to propose.
 - Product reference: N/A.
 - Dry film thickness: 85 microns.
 - Special requirements: None.
- 650 SITE PAINTING WITH HIGH BUILD BITUMINOUS PAINT
- Use/ location: Steel within cavities - inaccessible.
 - Paint manufacturer: Contractor to propose.
 - Site preparation: Primer.
 - Site primer: None.
 - Dry film thickness: .
 - Site intermediate coat: High build bituminous paint.
 - Dry film thickness: 50 microns.
 - Site top coat: High build bituminous paint.
 - Dry film thickness: 50 microns.

PREPARATION FOR PAINTING

- 710 OFFSITE PREPARATION AND PAINTING
- Working area: Covered and properly lit, heated and ventilated.
 - Sequence of working: Select from the following and submit proposals:
 - Fabricate, blast clean, prime.
 - Blast clean, fabricate, remove flash rust with a light overall sweep blast, prime.
 - Blast clean, apply weldable prefabrication primer, fabricate, prime.
 - Prefabrication primer (option 3): Type recommended by manufacturer of post fabrication primer.
 - Thickness of post fabrication primer coat: May be reduced if and as recommended by manufacturer.
 - Surfaces inaccessible after assembly: Apply full treatment and coating system including, if necessary, local application of site coatings.

- 725 **MANUAL CLEANING OF NEW STEELWORK**
- Preparation: Remove fins, burrs, sharp edges, weld spatter, loose rust and loose scale.
 - Surface finish: Clean but unpolished to BS EN ISO 8501-1, grade St 2.
 - Finishing: Thoroughly degrease and clean down. Remove any consequent rusting back to grade St 2. Prime without delay.
- 730 **PREPARATION FOR SITE WELDING OF SHOP PAINTED STEELWORK**
- Method: Select from the following:
 - Mask weld areas immediately after blast cleaning and before coating steelwork. If paint system comprises more than one coat, step each coat 30 mm back from edge of preceding coat and away from masked areas. Remove masking immediately before welding.
 - Prepare and paint steelwork including weld areas. Grind off to bare steel around each weld area immediately before welding.
- 735 **TREATMENT OF SITE WELDED JOINTS IN PAINTED STEELWORK**
- Preparation: After welding, and without delay, remove scale and weld spatter from weld areas. Remove traces of rust. Wash with clean water and allow to dry. Prime without delay.
 - Protective/ Decorative coatings: Apply to weld areas to match surrounding painted areas.
- 736 **TREATMENT OF SITE WELDED JOINTS IN GALVANIZED STEELWORK**
- Preparation: After welding, and without delay, remove scale and weld spatter from weld areas. Remove traces of rust. Wash with clean water and allow to dry.
 - Coating: Reinstate using one of the methods given in BS EN ISO 1461, clause 6.3.
- 740 **BOLTED JOINTS (OTHER THAN FRICTION GRIP JOINTS)**
- Steelwork to be shop painted: Apply full shop specification to joint faces.
 - Steelwork to be erected with mill finish then site painted: Before erection, prepare and prime joint faces and allow to dry.
 - Bolted joints in externally exposed steelwork:
 - Immediately before assembling, apply a further coat of primer and bring surfaces together while still wet.
 - After assembling and before applying site coatings, seal crevices to bolts and joint perimeters with a compatible sealant.
- 760 **GALVANIZED FASTENERS**
- Treatment: After steelwork erection and before applying site coatings, thoroughly degrease and clean. Etch prime.
- 765 **SITE PREPARATION OF SHOP PAINTED STEELWORK**
- Preparation: Touch in shop coats, as necessary, and allow to dry. Before applying site coats (when specified), abrade surfaces or wash down or both, as recommended by paint manufacturer.
- 770 **SITE PREPARATION OF GALVANIZED SURFACES FOR PAINTING**
- Preparation: Thoroughly degrease. Remove white corrosion products. Wash off and allow to dry before applying etching wash or primer.

PAINTING

- 810 **ENVIRONMENTAL CONDITIONS**
- General requirements prior to starting coating work:
 - Surfaces: Unaffected by moisture or frost.

- Steel temperature: At least 3°C above dew point, with conditions stable or improving, and not high enough to cause blistering or wrinkling of the coating.
- Relative humidity: Below 85%.

815 COATINGS

- Surfaces to be coated: Clean, dust free and suitably dry. Previous coats to be adequately cured.
- Multiple coats of same material: Use different tints to assist checking of complete coverage.
- Penultimate coat: Colour recommended by paint manufacturer to suit top coat colour.
- Finish required: Smooth and even, of uniform thickness and colour, free from defects.

820 FILM THICKNESS

- Wet film thickness: During application, check thickness of each coat with a wheel or comb gauge used in accordance with BS EN ISO 2808.
- Accumulated dry film thickness: After each coat has dried, check total accumulated film thickness.
 - Method: Magnetic or electromagnetic meter.
 - Number and position of measurements: As directed.
 - Validation: Measurements to be independently witnessed.
 - Meter calibration: Check against standard shims and recalibrate regularly against a smooth steel reference plate.
- Average dry film thickness:
 - At least specified thickness over any square metre.
 - No reading to be less than 75% of specified thickness.
- Top coat dry film thickness: Sufficient to give an even, solid, opaque appearance.

825 STRIPE COAT

- External angles, nuts, bolt heads, rough weld seams, and areas difficult to coat: Apply an additional stripe coat of _____ .

R12 Below ground drainage systems

To be read with Preliminaries/ General conditions.

GENERALLY

100 EXISTING DRAINS:

- Before starting work, check invert levels and positions of existing drains, offsite public sewers, inspection chambers and manholes against information shown on drawings and report any discrepancies to Engineer prior to beginning the works to allow changes to be made to the design.
- Adequately protect existing drains and maintain normal operation during construction.

106 IN SITU CONCRETE:

- - Unless specified otherwise, in situ concrete for use in drainage below ground to be to BS EN 206.1, mix GEN 1 or an equivalent or better mix subject to approval.
- - Different mixes may be used for different parts of the drainage work.

110 BELOW GROUND DRAINAGE SYSTEMS As drawing.

- Surface water and rainwater drainage sources: One piece gullies and covers and rainwater downpipes (non siphonic).
- Foul drainage sources: Discharge stack and branch pipes and floor gullies
- 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: as drawings.
- Manholes, inspection chambers, traps, and separators;
 - Inspection chambers – plastics
 - Manhole and inspection chambers – concrete
 - Oil and petrol separator units - plastics
- Accessories:
 - Manhole Channels and branches – conventional;
 - Manhole channel and branches – preformed plastics;
 - Manhole steps;
 - Sealing for concrete manholes – mortar.
- Disposal: to private drains, sewers, modular storage attenuation, drainage blanket
- Accessories – general:
 - Access covers and frames;
 - Access covers and frames- precast concrete seatings;
 - Concrete (general) and
 - Concrete (adoptable manhole benching's and surrounds).

PRODUCTS

311 CONNECTORS TO PLASTIC DRAINAGE

- Material and standard: Plastics to BS 4660 certified or to BS EN 1401-1 and Kitemark certified.
- Type: As drawings
- Manufacturer: Submit proposals
- Product reference: Submit proposals

313 ONE PIECE GULLIES ROADS AND CAR PARKS- Refer to site specific drawings

- Standards: To BS EN 1253-1, -2, -3, -4 and -5; or
 - 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: Concrete.
- Manufacturer: Contractors choice.
 - Product reference: Contractors choice.
- Sizes: 900 x 450 mm.
- Outlet sizes: DN 150.
- Silt buckets: None.
 - Product reference: N/A.

PRODUCTS

315 ONE PIECE GULLIES AND COVERS - required for plant room and kitchen areas

- Standards: To BS EN 1253-1, -2, -3, -4 and -5; or
 - 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: Clay.
- Manufacturer: Submit proposals.
- Product reference: Submit proposals.
- Sizes: 595x225mm minimum: Submit proposals
- Outlet sizes: DN 100 and DN 150.
- Covers: as drawing
- Product reference: Submit proposals.
- Type: Hinged Grating.
- Material: Ductile Cast Iron.
- Sizes: As drawing.
- Loading grades to BS EN 124: B125 and D400.
- Silt buckets:
- Product reference: Submit proposals

329 PIPES, BENDS AND JUNCTIONS - SUPPLY

- Pipes and fittings: From same manufacturer for each pipeline.

336 PIPES, BENDS AND JUNCTIONS - CLAY - FLEXIBLE JOINTS Not Required

- Material and standard: Vitrified clay to BS EN 295-1, Kitemark certified.
- Manufacturer: Submit proposals. Including approved by local water authority when offered for adoption under Sewers For Adoption 6th or 7th Edition
- Product reference: Submit proposals.
- Sizes: DN 100, DN150.
- Crushing strength (minimum): FN40.
- Jointing type: Spigot and socket joints with sealing ring.

342 PIPES, BENDS AND JUNCTIONS - CONCRETE SURFACE WATER DRAINAGE Not Required

- Standards: To BS 5911-1 and BS EN 1916, with flexible joints.
- Manufacturer: Submit proposals. Including approved by local water authority when offered for adoption under Sewer Sector Guidance
- Product reference: Submit proposals.
- Sizes: DN300; DN375; DN450; D600.
- Shapes: Circular.
- Cement type and content: To BS5911-1 and BS EN 1916

- Accessories: Cast in lifting anchors.
- 344 PIPES, BENDS AND JUNCTIONS - PLASTICS - STRUCTURED WALL SURFACE WATER DRAINAGE AND FOUL DRAINAGE
- Standard: To BS EN 13476-1 and -2 or -3 Kitemark or Agrément certified
 - Supplementary requirements: Puncture resistance, jetting resistance and longitudinal bending to requirements of WIS 4-35-01, issue 2.
 - Material: PVC-U.
 - Manufacturer: Submit proposals. Including approved by local water authority when offered for adoption under Sewers For Adoption 6th or 7th Edition
 - Product reference: Submit proposals.
 - Recycled content: Contractors choice.
 - Sizes: DN 110; DN 150; DN 225; DN 300; DN 450; DN 600
 - Jointing type: Spigot and socket.
- 346 PIPES, BENDS AND JUNCTIONS - PVC-U - PLAIN WALL SURFACE AND FOUL WATER DRAINAGE. PRIVATE ONLY NOT SUITABLE FOR ADOPTION BY WATER AUTHORITY
- Standard: BS EN 1401-1, class SN4, with flexible joints, Kitemark certified.
 - Manufacturer: Submit proposals.
 - Product reference: Submit proposals.
 - Recycled content: Contractors choice.
 - Sizes: DN 110; DN 150.
 - Application area code: UD
- 357 CONNECTORS - SADDLE
- 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, or Agrément certified.
 - Material: Clay & Concrete & Plastics.
 - Manufacturer: Submit proposals.
 - Product reference: Submit proposals.
- 359 FLEXIBLE COUPLINGS
- Standard: To BS EN 295-4 or WIS 04-41-01 and Kitemark certified, or Agrément certified.
 - Manufacturer: Submit proposals.
 - Product reference: Submit proposals.
- 371 RODDING POINTS Refer to site specific drawings
- 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, or Agrément certified.
 - Material: Clay & Plastics.
 - Manufacturer: Submit proposals.
 - Product reference: Submit proposals.
 - Sizes: DN 100; DN110; DN 150; DN 160.
- 379 WARNING MARKER TAPES SURFACE WATER DRAINAGE AND FOUL DRAINAGE Not Required
- Type: Heavy gauge polyethylene.
 - Manufacturer: Submit proposals.
 - Product reference: Submit proposals.

- Colour: Red with black lettering.
 - Widths: 200mm.
 - Message: FOUL SEWER BELOW or SURFACE WATER SEWER BELOW.
 - Wire detection aid: Not required.
- 401 INSPECTION CHAMBERS - PLASTICS As drawing
- Standard: To BS 7158 or BS EN 13598-1, or Agrément certified.
 - Diameter: 250mm: 315mm: 450mm: 600mm
 - Manufacturer: Osma Wavin or similar approved including approved by local water authority when offered for adoption under Sewer Sector Guidance.
 - Bases:
 - Product reference: Contractors choice.
 - Shaft units:
 - Product reference: Contractors choice
 - Access covers and frames:
 - Product reference: Contractors choice.
 - Loading grades to BS EN 124: As drawings.
- 407 MANHOLES AND INSPECTION CHAMBERS - CONCRETE Refer to site specific drawings
- Standards:
 - To BS 5911-3 and BS EN 1917 and Kitemark certified; or
 - To BS 5911-4 and BS EN 1917.
 - Including approved by local water authority when offered for adoption under Sewer Sector Guidance.
 - Manufacturer: Contractors choice
 - Shape: Circular
 - Sizes: DN 1050; DN 1200; DN 1350; DN 1500; DN 1800.
 - Cement type and content: to BS 5911-1 and BS EN 1916
 - Chamber sections:
 - Product reference: Contractors choice.
 - Jointing type: Proprietary sealant.
 - Cover slabs:
 - Product reference: Contractors choice.
 - Thickness: refer to clause 468
 - Loading grades to BS EN 124: As drawings
 - Openings: To suit access covers.
 - Steps: Required in chambers over 900mm deep. Refer to Sewer Sector Guidance. when offered for adoption
- 409 MANHOLES - CONCRETE - ADDITIONAL COMPONENTS FOR DEEP MANHOLES
- Refer to drawing Sewer Sector Guidance.
- 421 OIL AND PETROL SEPARATOR UNITS – PLASTICS Not required
- Standards: To Environment Agency PPG 3 and BS EN 858-1, with oil level alarm.
 - Manufacturer:
 - Product reference: NSFA255
 - Size:
 - Inlet pipe size:
 - Outlet pipe size:
 - Accessories:
- 433 MANHOLE CHANNELS AND BRANCHES – CONVENTIONAL Not Required
- Material: Clay.
 - Manufacturer: Submit proposals.
 - Product reference: Submit proposals.

- 435 MANHOLE CHANNELS AND BRANCHES - PREFORMED PLASTICS
- Manufacturer: Osma Wavin or similar approved.
 - Product reference: Submit proposals.
- 464 STORMWATER ATTENUATION UNITS
- Manufacturer: SDS Geolight System
 - Product reference: SDS Geolight System
 - Unit Size: Refer to drawings.
 - Tank capacity / size (minimum) refer to drawings.
 - Loading Grades: Product with minimum 61 Tonnes/m² compressive strength under vehicle areas. Minimum cover as recommended. Product with 20 Tonnes /m² compressive strength under soft landscaped areas. Minimum cover as recommended.
- 468 PRECAST CONCRETE COVER SLABS
- Standard: To BS 5911-3.
 - Manufacturer: Contractors choice.
 - Product reference: Submit proposals.
 - Size: 150mm depth for 900:1050:1200:1350: diameter
170mm depth for 1500: diameter
175mm depth for 1800: diameter
180mm depth for 210mm: 2400: diameter
225mm depth for 3000 diameter
 - Openings: To suit access covers.
- 471 ACCESS COVERS AND FRAMES SURFACE WATER MANHOLES AND FOUL MANHOLES
- Standard: To BS EN 124. . Refer to Sewer Sector Guidance. when offered for adoption
 - Types: As drawing.
 - Manufacturer: Contractors choice.
 - Product reference: Submit proposals.
 - Materials: Ductile cast iron
 - Finishes: Self finish.
 - Sizes: 450 x450 mm; 600x600 mm; 675 x675 mm.
 - Loading grades to BS EN 124: Refer to drawings
 - Edging trims: Not required
 - Accessories: None
- 483 CONCRETE (GENERAL)
- Standard: To BS 8500-2.
 - Concrete: Designated, GEN 1 or Standardised prescribed, ST2
- 487 CONCRETE (ADOPTABLE MANHOLE BENCHINGS AND SURROUNDS)
- Standard:
 - England and Wales: Refer to Sewer Sector Guidance. when offered for adoption
 - Concrete: In situ.
- 489 CONCRETE (ADOPTABLE MANHOLE BENCHING TOPPING)
- Standard:
 - England and Wales: Refer to Sewer Sector Guidance. when offered for adoption
 - Concrete: High strength.
- 492 GEOTEXTILE MEMBRANES – FILTER Not required
- Manufacturer: Lotrak1800: Terram 1000
 - Product reference: as above
- 494 GEOTEXTILE MEMBRANES – IMPERVIOUS Refer to site specific drawings
- Manufacturer: Contractors choice.

- Product reference: Submit proposals.
- Membrane to be high performance with fully welded joints

- 498 GRANULAR SUB-BASE MATERIAL
- Standard: To Highways Agency Volume 1, 'Specification for Highway Works', Type 1 Unbound mixtures for sub-base.
 - Recycled content: Contractors choice.
- 510 VERMIN GRATINGS FOR OUTFALLS AND OUTLET HEADWALLS Not required
- Construction: Mild steel frame extending 75 mm beyond pipe opening all around, with 25 mm maximum opening steel mesh grille. Top hinged on built-in fish-tail straps and with bottom pin lock.
 - Finish: Galvanized to BS EN ISO 1461 after fabrication.
 - Submit: Shop drawings.
 - Timing: Before manufacture.

EXECUTION

- 610 STRIPPING OUT
- Extent of stripping out: None apparent from survey.
 - 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.
- 667 CLASS S SURROUND As drawings
- Type of subsoil: Refer to SI.
 - 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: Contractors choice
 - Pipe sizes DN 100 and DN 150: Size 4/10.
 - Pipe sizes DN 225 and DN 300: Size 4/10, 10/20 or 4/20.
 - Pipe sizes DN 375-500: Size 10/20 or 4/20.
 - Pipe sizes DN 600 and above: Size 10/20, 20/40, 4/20 or 4/40.
 - 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 As drawings
- Type of subsoil: Refer to SI
 - 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: Refer to drawings.
 - 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 pre-cut 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: Long radius rest bends refer to drawings
 - Radius to centreline of pipe (minimum): 250mm
 - Height of invert of horizontal drain at base of stack below centreline of lowest branch pipe (minimum): 450mm
 - Bedding: Do not impair flexibility of pipe couplings.
 - Material: refer to drawings
- 693 DIRECT CONNECTION OF GROUND FLOOR WCS TO DRAINS
- Drop from crown of WC trap to invert of drain (maximum): 1.3m.

- Horizontal distance from the drop to a ventilated drain (maximum): 6 m.

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. A Section 106 Agreement under the Water Industry Act must be in place and correct notice period given to adopting authority

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.
- Refer to drawings for below ground floor testing regime

711 TRENCH SUPPORTS

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

713 INSTALLING ROOT BARRIERS

- Root barrier installation: Full depth of excavation. Fit closely to trench wall nearest the tree.

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 – E&W, SCOT

- Excavating and backfilling of trenches: To Department for Transport 'Specification for the reinstatement of openings in highways'.

726 FOAMED CONCRETE BACKFILL

- Preparation: Seal off openings in, and ends of, abandoned pipelines and ducts. Seal off cavities in or next to the excavation which are not to be filled.
- Backfilling: To British Cement Association 'Foamed concrete - specification for use in 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: refer to drawings
 - Thickness (minimum): refer to drawings
- Surround:
 - Material: refer to drawings
 - Thickness (minimum): refer to drawings.
 - Height: refer to drawings
- Backfilling: refer to drawings.
 - Material: refer to drawings
 - 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): 150mm.
- Permissible deviation in level of external covers and gratings: +0 to -3 mm.

741 INSTALLING INSPECTION CHAMBERS - PLASTICS

- Bedding:
 - Material: Concrete (general)
 - Thickness (minimum): 150mm.
- Surround: Highway Area only
 - Material: Concrete (general)
 - Thickness (minimum): 150mm.
- Backfilling: Selected fill.
 - Compaction: By hand in 100 mm layers.
- Concrete collar: To trafficked areas.
 - Material: Concrete (structural).
 - Thickness (minimum): 200mm.
 - Width (minimum): 300mm.
- Seating: Not required.

743 INSTALLING CONCRETE MANHOLES Refer to site specific drawings

- Bases:
 - Material: Concrete (structural).
 - Thickness (minimum): 225mm.
- Surround:
 - Material: Concrete (general)
 - Thickness (minimum): 150mm.
 - Height: Full height.
- Backfilling:
 - Material: Selected fill
 - Compaction: By hand in 100 mm layers.

753 FIXING MANHOLE STEPS Not required

- Fixing: Refer to Sewers for Adoption 7th Edition

755 JOINTING CONCRETE MANHOLE CHAMBER SECTIONS

- Jointing and sealing: Mortar
 - Inner joint surface: Trim surplus jointing material extruded into chamber and point neatly.
- 757 LAYING CONVENTIONAL CHANNELS, BRANCHES AND BENCHING
- Refer to Sewers for Adoption 7th Edition
- 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: refer to drawings
 - 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: refer to drawings
 - Application: Before benching concrete has set, and with dense smooth uniform finish.
- 771 INSTALLING OUTFALLS Not required
- Pipe outflow invert (minimum): Seasonal peak level or 150 mm above normal water level, whichever is the higher.
 - Pipe surround and backfill to the last 2 m run of drain: Excavated subsoil, rammed home.
- 773 INSTALLING ACCESS COVERS AND FRAMES
- Seating: Square with and tightly jointed to adjacent construction as appropriate
 - Bedding and haunching of frames: Continuously.
 - Material: Refer to drawings
 - 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; with adjacent finish
 - 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, 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: Refer to drawing
- 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: Block open ends of pipelines to be tested and pressurise. Air test short lengths to BS EN 1610
- 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'.
 - Method: Testing of the system should comply with the requirements of Sewer Sector Guidance
- 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: as instructed by engineer but allow for all I pipelines
 - Illumination: Of adequate intensity.
 - Recording: Provide continuous position recording, still photographs and stopping of the camera at any point.
 - Copy of videotape recording: Submit.
- 976 CCTV INSPECTION OF ADOPTABLE PIPELINES
- General: Permit the Adopting Authority or its agent to carry out and record internal CCTV inspection of pipelines and associated manholes after completion.
 - Locations to be inspected: as instructed by engineer but allow for all I pipelines

- Pipelines under highways: Complete construction, except for laying of wearing course, before inspection.

978 LIFTING KEYS

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

980 INSTRUCTIONS

- Manufacturer's user instructions: _____.