

KINGS CROSS S4

LANDSCAPE SPECIFICATION

KXC-S4-001-L-RAMXXX-90-0850

Project name **KINGS CROSS S4**
Project no. **1620006900**
Client **LOR**

Version **STAGE 4**
P03

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M

Surface finishes

M60

Painting/clear finishing

M60 Painting/clear finishing

- 16 DECORATIVE WOODSTAIN/ VARNISH/ PRESERVATIVE To timber benches B1 and B2
- Manufacturer: Contractor's choice.
 - Product reference: to bench manufacturer's requirements.
 - Surfaces: Timber slats.
 - Preparation: Remove all loose and defective coatings.
 - Initial coats: submit method statement.
 - Number of coats: As recommended by manufacturer.
 - Finishing coats: to bench manufacturer's requirements.
 - Number of coats: to bench manufacturer's requirements.
- 30 PREPARATION GENERALLY
- Standard: In accordance with BS 6150.
 - Refer to any pre-existing CDM Health and Safety File and CDM Construction Phase Plan where applicable.
 - Risk assessment and method statement for hazardous materials: Prepare for operations, disposal of waste, containment, and reoccupation, and obtain approval before commencing work.
 - Preparation materials: Types recommended by their manufacturers and the coating manufacturer for the situation and surfaces being prepared.
 - Substrates: Sufficiently dry in depth to suit coating.
 - Efflorescence salts, dirt, grease and oil: Remove.
 - Surface irregularities: Provide smooth finish.
 - Organic growths and infected coatings:
 - Remove with assistance of biocidal solution.
 - Apply residual effect biocidal solution to inhibit regrowth.
 - Joints, cracks, holes and other depressions: Fill with stoppers/ fillers. Provide smooth finish.
 - Dust, particles and residues from preparation: Remove and dispose of safely.
 - Doors, opening windows and other moving parts:
 - Ease, if necessary, before coating.
 - Prime resulting bare areas.
- 32 PREVIOUSLY COATED SURFACES GENERALLY
- Preparation: In accordance with BS 6150, clause 11.5.
 - Contaminated or hazardous surfaces: Give notice of:
 - Coatings suspected of containing lead.
 - Substrates suspected of containing asbestos or other hazardous materials.
 - Significant rot, corrosion or other degradation of substrates.
 - Risk assessment and method statement for hazardous materials: Prepare for operations, disposal of waste, containment and reoccupation, and obtain approval before commencing work.
 - Removing coatings: Do not damage substrate and adjacent surfaces or adversely affect subsequent coatings.
 - Loose, flaking or otherwise defective areas: Carefully remove to a firm edge.
 - Alkali affected coatings: Completely remove.
 - Retained coatings:
 - Thoroughly clean.
 - Gloss coated surfaces: Provide key.
 - Partly removed coatings: Apply additional preparatory coats.
 - Completely stripped surfaces: Prepare as for uncoated surfaces.

35 **FIXTURES AND FITTINGS**

- Risk assessment and method statement for hazardous materials: Prepare for operations, disposal of waste, containment and reoccupation, and obtain approval before commencing work.
- Removal: Before commencing work: Ironmongery, coverplates, grilles, wall clocks, and other surface mounted fixtures.
- Replacement: Refurbish as necessary, refit when coating is dry.

37 **WOOD PREPARATION**

- General: Provide smooth, even finish with lightly rounded arrises.
- Degraded or weathered surface wood: Take back surface to provide suitable substrate.
- Degraded substrate wood: Repair with sound material of same species.
- Heads of fasteners: Countersink sufficient to hold stoppers/ fillers.
- Resinous areas and knots: Apply two coats of knotting.
- Defective primer: Take back to bare wood and reprime.

39 **STEEL PREPARATION**

- Corrosion and loose scale: Take back to bare metal.
- Residual rust: Treat with a proprietary removal solution.
- Bare metal: Apply primer as soon as possible.

68 **STAINING WOOD**

- Primer: Apply if recommended by stain manufacturer.
- Application: Apply in flowing coats and brush out excess stain to produce uniform appearance.

Q

Paving/Planting/Fencing/Site furniture

Q25

Slab/brick/sett/cobble pavings

Q25 Slab/brick/sett/cobble pavings

To be read with Preliminaries/ General conditions.

GENERAL

- 127A PEDESTAL SUPPORTED PAVING SLAB/ FLAG SYSTEM [P1 Porcelain Paving].
- Preparation of existing base: Not required.
 - Paving support: Pedestals as clause Q25 480 .
 - Paving units: Glazed porcelain tiles, or equal approved
 - Manufacturer: Waxman Ceramics
 - Product name: Rockland Grey
 - Product range: Rockland
 - Size: 600 x 600 x 20mm
 - Finish: Grip R12 (tbc)
 - Laying pattern: Stack bond to match and align with adjacent internal areas. Refer to landscape details.
 - Accessories: None.

PRODUCTS

- 480A SUPPORT PEDESTALS [To support paving slabs]
- Manufacturer: Envirobuild.
 - Product reference: Mesa, or equal approved.
 - Type: Outdoor Steel Flat Pedestals.
 - Material: Class A fire-rated zinc coated steel.
 - Dimensions: Placed with 600mm centres, as needed to accommodate falls in architect's drawings.
 - Additional pedestals: Submit proposals.
 - Accessories: to work in system with Porcelain tiles (Q25 127A), , Roof trays (Q25 480C) and Spacers (Q25 480D) as per architects details.
- 480C ROOFTRAYS [To base of planters and benches as indicated on plans]
- Manufacturer: Kinley.
 - Product reference: Raaft Rooftray 321023, or equal approved
 - Type: Class A fire-rated to work with 30mm raaft joists 301013.
 - Material: Class A fire-rated Galvanized steel
 - Dimensions: 28mm (H), 540mm (W), 600mm (L). Roof trays to be fit wider than base of planters, oversized to support surrounding small paving cuts. As per KXC-S4-001-L-RAMXXX-90-0505.
 - Accessories: to work in system with Porcelain tiles (Q25 127A), Support pedestals (Q25 480A), Raaft Joists (Q25 480B) and Spacers (Q25 480D) as per architects details.
- 480D TILE SPACER [In between Porcelain tiles]
- Manufacturer: Kinley or equal approved.
 - Product reference: 2.5 mm spacing gasket
 - Material: as per architects spec
 - Dimensions: 3mm wide
 - Accessories: to work in system with Porcelain tiles (Q25 127A), Support pedestals (Q25 480A), Raaft Joists (Q25 480B) and Roof trays (Q25 480C) as per architects details.

EXECUTION

- 615 CONTROL SAMPLES
- Sample areas: Complete as part of the finished work.
 - Types of paving: P1 Porcelain Paving.

- Location: TBC.
- Size (minimum): 5m x 5m.
- Included features: Davit access panel.
- Approval of appearance and surface: Obtain before proceeding.

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.

637 REGULARITY OF PAVED SURFACES

- Maximum undulations in the surface of pavings (except tactile paving surfaces) under a 1 m straight edge placed anywhere on the surface (where appropriate in relation to the geometry of the surface): 3 mm.
- Joints between paving units or utility access covers:
 - Joints flush with the surface: difference in level between adjacent units to be no more than twice the joint width (with a 5 mm max difference in level).
 - Recessed, filled joints: difference in level between adjacent units to be no greater than 2 mm; the recess to be no deeper than 5 mm.
 - Unfilled joints: difference in level between adjacent units to be no greater than 2 mm.
- Sudden irregularities: Not permitted.

640 COLOUR BANDING

- General: Unless premixed by manufacturer, select from at least 3 separate packs in rotation to avoid colour banding.

645 PROTECTION

- Cleanliness: Keep paving clean and free from mortar droppings, oil and other materials likely to cause staining.
- Materials storage: Do not overload pavings with stacks of materials.
- Handling: Do not damage paving unit corners, arrises, or previously laid paving.
- Mortar bedded pavings: Keep free from traffic after laying:
 - Pedestrian traffic (minimum): N/A.
 - Vehicular traffic (minimum): N/A.
- Access: Restrict access to paved areas to prevent damage from site traffic and plant.

810 PEDESTAL INSTALLATION

- Surface to accept pedestals: Clean and free of debris.
- Setting out: Mark centre-point of pedestal on substrate surface, with perpendicular guidelines to ensure square layout.
 - Orientation: Align parallel with adjacent features.
 - Spacing: To suit paving material and dimensions as per manufacturers recommendations.

- Movement tolerance at perimeter of paver system (maximum): 5 mm.

COMPLETION

930 SLIP RESISTANCE TESTING

- Surfaces to be tested: P1 Porcelain Paving.
 - Surface condition: Dry.
- Timing: Two weeks prior to handover, but after initial cleaning.
- Period of notice (minimum): 3 working days.
- Test standard: To BS 7976-2.
 - Testing authority: An approved laboratory.
 - Witnessing/ Certification: Arrange for tests to be witnessed/ certified by: Contract administrator.
 - Report: Submit.
 - Format: As required under BS 7976.

Q28

Topsoil and soil ameliorants

Q28 Topsoil and soil ameliorants

To be read with Preliminaries/ General conditions.

SYSTEM OUTLINE

125A GROWING MEDIA SYSTEM TO INTENSIVE PLANTING BEDS [To all plant beds on roof terraces on level 1, 9 and 12]

- Composition:
 - Topsoil: Imported lightweight topsoil to BS 3882.
 - Maximum saturated weight: 1200kg/m³
 - Ameliorants: Sanitized and stabilized composted materials.
 - Accessories: Mycorrhizal inoculant.
- Max. depth: 300mm
- Note: below 300mm depth topsoil, lightweight subsoil should be used to make up levels

125B GREEN ROOF GROWING MEDIA SYSTEM TO EXTENSIVE GREEN ROOF - R1

- Composition:
 - Substrate: Extensive free draining, low nutrient and moisture retentive growing medium substrate tested to BS8616:2019.
 - Maximum saturated weight: 1360kg/m³
 - Ameliorants: None.
 - Accessories: None.

PRODUCTS

300 PREPARATION MATERIALS GENERALLY

- Purity: Free of pests and disease.
- Foreign matter: On visual inspection, free of fragments and roots of aggressive weeds, sticks, straw, subsoil, pieces of brick, concrete, glass, wire, large lumps of clay or vegetation, and the like.
- Contamination: Do not use topsoil contaminated with subsoil, rubbish or other materials that are:
 - Corrosive, explosive or flammable.
 - Hazardous to human or animal life.
 - Detrimental to healthy plant growth.
- Subsoil: In areas to receive topsoil or planting media, do not use subsoil contaminated with the above materials.
- Objectionable odour: None.
- Give notice: If any evidence or symptoms of soil contamination are discovered on the site or in topsoil or planting media to be imported.

305 PERMITTED MATERIALS

- Materials: Composted bark.
- Give notice: before ordering or using.
- Declaration of compliance in accordance with BS EN 13650: Required.

310 MATERIALS NOT PERMITTED

- Materials:
 - Peat;
 - Products containing peat; and
 - River and canal dredgings.

- 330 IMPORTED MANUFACTURED TOPSOIL/ GROWING MEDIUM FOR INTENSIVE AND EXTENSIVE GREEN ROOFS
- Type: Container planting medium.
 - Soil textural class: Any class.
 - Source: Contractor's choice.
 - Manufacturer: Contractor's choice.
 - Product reference: Contractor's choice.
- 345A AGGREGATES FOR EXTENSIVE GREEN ROOFS [PEBBLES]
- Source: Contractor's choice.
 - Product reference: Contractor's choice.
 - Material: Riverstone 20-40mm round washed pebbles.
 - Colour: grey (to be approved by Landscape Architect)
 - Recycled content: Submit proposals.
- 345B AGGREGATES FOR EXTENSIVE GREEN ROOFS [SAND]
- Source: Contractor's choice.
 - Product reference: Contractor's choice.
 - Material: Course sand for biodiverse roof.
 - Colour: buff.
 - Recycled content: Submit proposals.
- 355 ORGANIC MATERIALS FOR INTENSIVE GREEN ROOFS
- Type: Bark.
 - Source: Contractor's choice.
 - Product reference: Contractor's choice.
- 360 SANITIZED AND STABILIZED COMPOSTED MATERIALS CERTIFIED TO PAS 100 FOR INTENSIVE GREEN ROOFS
- Standard: In accordance with PAS 100.
 - Source: Contractor's choice.
 - Product reference: Contractor's choice.
 - Horticultural parameters:
 - pH (1:5 water extract): 6.5-8.7.
 - Electrical conductivity (maximum, 1:5 water extract): 200 mS/m.
 - Moisture content (m/m of fresh weight): 35-55%.
 - Organic matter content (minimum): 25%.
 - Grading (air dried samples): 95% passing 25 mm and 90% passing 10 mm screen mesh apertures.
 - Carbon:Nitrogen ratio (maximum): 20:1.
 - Texture: Friable.
 - Objectionable odour: Not permitted.
 - Compost Certification Scheme certification: Not required.
 - Declaration of analysis: Submit.
 - Additional analyses: Not required.
 - Samples: Not required.
- 370 EXTENSIVE SUBSTRATE FOR EXTENSIVE GREEN ROOFS
- Standard: Organic matter in accordance with PAS 100.
 - Source: SkyGarden or similar approved.
 - Product reference: SkyGarden or similar approved.
 - Horticultural parameters:
 - Ph:7.8
 - Organic matter (% weight): 2.60%
 - Electrical conductivity (maximum, 1:5 water extract): 2.22 mS/cm-1.
 - Moisture content (m/m of fresh weight): 35-55%.
 - Nitrogen: 0.04%. Potassium: 435mg/l-1. Phosphate: 127 mg/l-1.
 - Total porosity: 55.80%
 - Texture: Friable.
 - Objectionable odour: Not permitted.
 - Compost Certification Scheme certification: Not required.

- Declaration of analysis: Submit.
- Additional analyses: Not required.
- Samples: Not required.

380 MYCORRHIZAL INOCULANT FOR TREES AND SHRUBS

- Manufacturer: Contractor's choice.
 - Product reference: Contractor's choice.

EXECUTION

655 MECHANICAL TOOLS

- Restrictions: Do not use within 100 mm of tree and plant stems.

- 660 GRADING SUBSOIL FOR AMENITY PLANTING AREAS
- Standard: In accordance with BS 8601.
 - General: Grade to smooth flowing contours to achieve specified finished levels of topsoil.
 - Areas of thicker topsoil: Excavate locally.
 - Avoid compaction.
 - Excess subsoil: Remove.
- 700 GRADING OF TOPSOIL
- Topsoil condition: Reasonably dry and workable.
 - Contours: Smooth and flowing, with falls for adequate drainage.
 - Hollows and ridges: Not permitted.
 - Give notice: If required levels cannot be achieved by movement of existing soil.
- 705 HANDLING TOPSOIL
- Standard: In accordance with BS 3882.
 - Aggressive weeds: Give notice and obtain instructions before moving topsoil.
 - Plant: Select and use plant to minimize disturbance, trafficking and compaction.
 - Contamination: Do not mix topsoil with:
 - Subsoil, stone, hardcore, rubbish or material from demolition work.
 - Other grades of topsoil.
 - Multiple handling: Keep to a minimum. Use or stockpile topsoil immediately after stripping.
 - Wet conditions: Handle topsoil in the driest condition possible. Do not handle during or after heavy rainfall, or when the moisture content is greater than the plastic limit.
- 720 FINISHED LEVELS OF TOPSOIL AFTER SETTLEMENT
- In relation to adjoining paving, kerbs or hard surfaces: 50 mm below .
 - In relation to dpc of adjoining buildings: Not less than 150 mm below.
 - In relation to adjacent grass areas: N/A.
 - Seeded areas: Extend cultivation into existing adjacent grassed areas sufficient to ensure full marrying in of levels.
 - Sportsfields: To even levels and within the following permitted deviations:
 - From levels or gradients shown on drawings: ± 75 mm.
 - From line between boning rods 30 m apart: ± 25 mm.
 - Within root spread of existing trees and shrubs to be retained: Do not dig or cultivate.
 - Adjoining soil areas: Marry in.
 - Thickness of turf or mulch: Included.
- 730 GREEN ROOF GROWING MEDIUM INSTALLATION
- Handling: Minimize.
 - Conditions: Handle in the driest condition possible. Do not handle or install when wet or frozen.
 - Layers:
 - Depth (maximum): 150 mm.
 - Sequence: Gently firm each layer before spreading the next.
- 840 APPLYING MYCORRHIZAL INOCULANT for trees and shrubs.
- Depth: To maintain contact with root system.

- 845 APPLYING LOOSE MULCH to all shrubs and herbaceous planting
- Timing: Immediately after planting.
 - Preparation: Ensure that soil is thoroughly moistened, applying water where necessary.
 - Coverage of mulch (minimum):
 - Planting beds (depth): 50 mm depth.
 - Trees: 50 mm depth.
 - Container planting: 50 mm depth.
 - Finished level of mulch: 30 mm below adjacent grassed or paved areas.

COMPLETION

- 920 APPLYING MULCH
- Timing: At end of the maintenance period.
 - Watering: Ensure that soil is thoroughly moistened prior to mulching, applying water where necessary.
 - Planting beds: Re-mulch.
 - Depth (minimum): 50 mm.
 - Trees: Remulch.
 - Depth (minimum): 50 mm.
 - Container planting: Remulch.
 - Depth (minimum): 50 mm.

Q31

External planting

Q31 External planting

To be read with Preliminaries/General conditions.

GENERAL INFORMATION/ REQUIREMENTS

112 SITE CLEARANCE GENERALLY

- General: Remove rubbish, concrete, metal, glass, decayed vegetation and contaminated topsoil.
- Stones: Remove those with any dimension exceeding 50 mm.
- Contamination: Remove material containing toxins, pathogens or other extraneous substances harmful to plant, animal or human life.
- Vegetation: N/A.
- Large roots: Grub up and dispose of without undue disturbance of soil and adjacent areas.
- Additional requirements: N/A.

118 SOIL CONDITIONS

- Soil for cultivating and planting: Moist, friable and (except in aquatic/ marginal planting) not waterlogged.
- Frozen or snow covered soil: Give notice before planting. Provide additional root protection. Prevent planting pit sides and bases and backfill materials from freezing.

120 CLIMATIC CONDITIONS

- General: Carry out the work while soil and weather conditions are suitable.
 - Strong winds: Do not plant.
 - Hot days: Water soil before planting. Keep plant roots covered.

125 TIMES OF YEAR FOR PLANTING

- Deciduous trees and shrubs: Late October to late March.
- Conifers and evergreens: September/ October or April/ May.
- Herbaceous plants (including marginal): September/ October or March/ April.
- Container grown plants: At any time if ground and weather conditions are favorable.
 - Watering and weed control: Provide as necessary.
- Dried bulbs, corms and tubers: September/ October.
- Colchicum (crocus): July/ August.
- Green bulbs: After flowering in spring.
- Wildflower plugs: Late August to mid November or March/ April.
- Aquatic plants: May/ June or September/ October.

130 MECHANICAL TOOLS

- Restrictions: Do not use within 100 mm of tree and plant stems.

145 WATERING

- Quantity: Wet full depth of topsoil.
- Application: Even and without damaging or displacing plants or soil.
- Frequency: As necessary to ensure establishment and continued thriving of planting.

150 WATER RESTRICTIONS

- General: If water supply is or is likely to be restricted by emergency legislation, do not carry out planting until instructed. If planting has been carried out, obtain instructions on watering.

160 NOTICE

- Give notice before:
 - Setting out.
 - Applying herbicide.
 - Applying fertilizer.
 - Delivery of plants/ trees.
 - Planting shrubs.
 - Planting trees into previously dug pits.
 - Watering.
 - Visiting site during maintenance period.
- Period of notice: Two weeks.

170 SOIL REQUIREMENTS

- Type
 - Planted beds: Planting bed soil system, as section Q28.
 - Tree pits, shrub pits and other backfilling: Plant pit backfilling soil system, as section Q28 and landscape details.
 - External container planting: Container planting growing media system, as section Q28 and landscape details.
 - Mulch applied after planting: Mulching and top dressing system, as section Q28 and landscape details.

200 PLANTS/ TREES - GENERAL

- Condition: Materially undamaged, sturdy, healthy and vigorous.
- Appearance: Of good shape and without elongated shoots.
- Hardiness: Grown in a suitable environment and hardened off.
- Health: Free from pests, diseases, discoloration, weeds and physiological disorders.
- Budded or grafted plants: Bottom worked.
- Root system and condition: Balanced with branch system.
 - Standard: The National Plant Specification.
- Species: True to name.
- Origin/ Provenance: Grown in the United Kingdom for at least one growing season, unless otherwise approved.
Definition: Origin and Provenance have the meaning given in the National Plant Specification.

215 PLANTS/ TREES - SPECIFICATION CRITERIA

- Name, forms, dimensions, provenance and other criteria: As scheduled and defined in the National Plant Specification (available on CS Design Software Limited's website).

216 PLANTS/ TREES - SPECIFICATION CRITERIA

- Name, forms, dimensions and other criteria: To the relevant part of BS 3936.

225 BULBS/ CORMS/ TUBERS

- Condition: Firm, entire, not dried out or shrivelled.
- Health: Free from pests, diseases and fungus.
- Handling: Remove from packaging immediately.
- Storage: Permitted only when necessary.
 - Location: Well ventilated, dark, covered, rodent proof container, away from exhausts and fruit.
 - Duration: Minimum period.
 - Temperature: 18-21°C.

- 235 CONTAINER GROWN PLANTS/ TREES
- Growing medium: With adequate nutrients for plants to thrive until permanently planted.
 - Plants: Centred in containers, firmed and well watered.
 - Root growth: Substantially filling containers, but not root bound, and in a condition conducive to successful transplanting.
 - Hardiness: Grown in the open for at least two months before being supplied.
 - Containers: With holes adequate for drainage when placed on any substrate commonly used under irrigation systems.
- 245 LABELLING AND INFORMATION
- General: Provide each plant/ tree or group of plants/ trees of a single species or cultivar with supplier's labelling for delivery to site, showing:
 - Full botanical name.
 - Total number.
 - Number of bundles.
 - Part bundles.
 - Supplier's name.
 - Employer's name and project reference.
 - Plant specification, in accordance with scheduled National Plant Specification categories.
 - Additional information: Submit on request: N/A.
- 246 LABELLING AND INFORMATION
- Standard: To BS 3936.
- 255 PLANTS/ TREES RESERVED AT SUPPLIER'S PREMISES
- Types/ Species: As plant schedule.
 - Predelivery inspection: Give notice.
 - Labelling: Identify inspected plants/ trees as reserved for use on this project.
- 260 PLANT/ TREE SUBSTITUTION
- Plants/ trees unobtainable or known to be likely to be unobtainable at time of ordering: Submit alternatives, stating:
 - Price.
 - Difference from specified plants/ trees.
 - Approval: Obtain before making any substitution.
- 265 PLANT HANDLING, STORAGE TRANSPORT AND PLANTING
- Standard: To CPSE 'Handling and establishing landscape plants'.
 - Frost: Protect plants from frost.
 - Handling: Handle plants with care. Protect from mechanical damage and do not subject to shock, e.g. by dropping from a vehicle.
 - Plant packaging: biodegradable packaging where possible.
 - Packaging of bulk quantities: Pallets or bins sealed with polyethylene and shrink wrapped.
 - Planting: Upright or well balanced with best side to front.
- 280 TREATMENT OF TREE WOUNDS
- Cutting: Keep wounds as small as possible.
 - Cut cleanly back to sound wood using sharp, clean tools.
 - Leave branch collars. Do not cut flush with stem or trunk.
 - Set cuts so that water will not collect on cut area.
 - Fungicide/ Sealant: Do not apply unless instructed.

290 SURPLUS MATERIAL

- Subsoil, stones, debris, wrapping material, canes, ties, temporary labelling, rubbish, prunings and other arisings: Remove.

PLANT CONTAINERS

PREPARATION OF PLANTING BEDS/ PLANTING MATERIALS

305 WEED CONTROL FOR INVASIVE NON-NATIVE WEEDS

- Locations: All planting areas.
- General: Prevent weeds from seeding and perennial weeds from becoming established, by hand weeding.

385 MULCH MATTING/ GEOTEXTILE FABRIC [to planter beds and roof terraces]

- Manufacturer: Contractor's choice.
 - Product reference: Contractor's choice.
- Type: Woven polypropylene.
- Recycled content: Contractor's choice.
- Timing: Lay before planting.
- Watering: Water soil thoroughly before laying.
- Laying: In close contact with soil surface. Lap or butt joints as recommended by manufacturer, with no gaps.
- Planting: Cut neat slits or flaps. Refit closely around plant stems.
- Overlay: Not required.

PLANTING SHRUBS/ HERBACEOUS PLANTS/ BULBS

400A PLANT SETTING OUT TO BE CARRIED OUT BY LANDSCAPE ARCHITECT TO ALL BEDS

- Spacing: Evenly, avoiding straight lines.
- Density: As plant schedule.

405 SHRUB PLANTING PITS

- Timing: Excavate 1-2 days (maximum) before planting.
- Sizes: Wide enough to accommodate roots when fully spread and 75 mm deeper than root system.
- Pit bottom improvement Break up to a depth of 150 mm, incorporating 25 g of slow release fertilizer per planting pit.

420 CLIMBING PLANTS

- Planting: 150 mm clear of supporting structure (e.g. wall/ fence) with roots spread outward.
 - Branches: Lightly secured to supports. Placed as per locations on landscape plans.
- Climber supports: Wire rope, turnbuckle and tensioner kit
 - Extent: Entire length of planter adjacent to pergola.
 - Materials: Stainless steel PVC-coated metal cable, M5 screw buckles, wire rope eyelets, M2 wire rope sleeves, aluminum crimping ring.
 - Spacing: Stainless steel screw eyes fix directly into metal pergola, tensioner and turnbuckle kit pulled tight. Screw eyes used intermittently across pergola (approx. every 1m) to ensure wire stays firm.
 - Distance from wall: Attached directly into metal pergola.
- Fixings: Stainless steel screw eyes.
 - Centres: 1 m.

435 CLIMBING PLANTS USED AS GROUND COVER

- Planting:
 - Canes or other supports: Remove.
 - Arrangement: Spread stems.
- Fixing: Pinned to ground to ensure good contact.

445 PLANTING BULBS/ CORMS/ TUBERS

- Depth: Top of bulb/ corm/ tuber at a depth of approximately twice its height, base in contact with bottom of hole.
- Backfilling: Finely broken soil. Lightly firm to existing ground level.
- Naturalized planting in existing grassed areas:
 - Scattering: Random. Plant bulbs/ corms/ tubers where they fall.
 - Planting: Neatly remove a plug of turf and replace after planting.

480 AFTER PLANTING

- Watering: Immediately after planting, thoroughly and without damaging or displacing plants or soil.
- Firming: Lightly firm soil around plants and fork and/ or rake soil, without damaging roots, to a fine tilth with gentle cambers and no hollows.
- Top dressing: Mulching and top dressing system, as section Q28.
 - Depth: 50 mm.

PLANTING TREES

500 TREE PLANTING

- Standard: Prepare trees and transplant in accordance with BS 8545.

505 TREE PITS

- Sizes: 75 mm wider than the root spread, and same depth as the rootball.
- Sloping ground: Maintain horizontal bases and vertical sides with no less than minimum depth throughout.
- Excavated material: Separate topsoil and subsoil material and stockpile for backfilling.
- Pit bottoms: Excavate with slightly raised centre: Break up base to a depth of 150 mm.
 - Treatment: Soil ameliorant worked into pit bottoms.
- Pit sides: Scarify.
- Backfilling material: Excavated material from tree pit, installed to original soil profiles in accordance with BS 8545. Refer to soft landscape details KXC-S4-001-L-RAMXXX-90-0504.

510A TREE PIT ROOT BARRIERS

- Locations: Wherever the installed rootball will be within 3 m of an existing underground service route.
- Manufacturer: Greenleaf Horticulture.
 - Product: ReRoot Barrier, with root-deflecting ribs
 - Product reference: ReR1000.
- Top of root barrier in relation to finished topsoil level: 25 mm below ground level.
- Installation: With sides vertical. Remove all sharp objects adjacent to barrier.

512 TREE PIT IRRIGATION AND VENTILATION ACCESSORIES

- Locations: To all tree pits.
- Manufacturer: Greenblue, or approved equal by landscape architect.
 - Product reference: Rootrain Civic, or approved equal by landscape architect.
- Type: Perforated plastics irrigation pipe with inlet.
- Pipe diameter: 60 mm.
- Ring diameter: Submit proposals.
- Inlet: Black plastics.
- Installation:
 - Pipe: Lay in loop above root ball with slight fall away from inlet pipe. Trim length to ensure a close fit in the tree pit. Connect both ends of pipe securely into plastics tee junction on inlet.
 - Top cap of inlet: Protruding slightly above finished surround level.
 - Backfill material: Carefully compact in layers.

526 UNDERGROUND GUYING FOR ALL TREES.

- Manufacturer: Anchor Systems or similar approved by landscape architect
 - Product reference: Anchor System
- Anchoring system: 3 no. eye nut and bolt anchor fixing with 2 way ratchet strap tensioner, stainless steel wire choke with delta links. Anchor point located to the edge of the rootball, adjust to individual rootball size.
- Refer to landscape architects details KXC-S4-001-L-RAMXXX-90-0504.
- Accessories: Platimat rootball protection mat under cabling.
- Installation: Ensure tree is positioned correctly and vertically prior to tightening guy line tensioners.

530 ABOVE GROUND GUYING FOR STANDARD TREES AND AS DETAILED

- Manufacturer: anchorsystems.co.uk or approved equal by landscape architect.
 - Product reference: Submit proposals.
- Guy lines: Stainless steel with rubber collars.
- Anchoring system: Refer to landscape architects details KXC-S4-001-L-RAMXXX-90-0504
- Installation: Ensure tree is positioned correctly and vertically and that no rubbing occurs with guy lines prior to tightening guy line tensioners.

540 TREE TYING FOR ESPALIERED FRUIT TREE

- Manufacturer: Contractors choice
 - Product reference: Submit proposals.
- Guy lines: Stainless steel with rubber collars.
- Anchoring system: Adjustable soft rubber tree strap in black. Length 37cm, width 20mm. Biostretch plant ties, garden twine in black.
- Refer to landscape architects details KXC-S4-001-L-RAMXXX-90-0504

PROTECTING/ MAINTAINING/ MAKING GOOD DEFECTS

710 MAINTENANCE

- Duration: Carry out the operations in the following clauses from completion of planting until ractical completion.
- Frequency of maintenance visits: Submit proposals.

720 FAILURES OF PLANTING

- Defects due to materials or workmanship not in accordance with the Contract: Plants/

trees/ shrubs that have failed to thrive.

- Exclusions: Theft or malicious damage after completion.
- Rectification: Replace with equivalent plants/ trees/ shrubs.
- Replacements: To match size of adjacent or nearby plants of same species or match original specification, whichever is the greater.
- Timing of making good: During the next suitable planting season.

740 CLEANLINESS

- Soil and arisings: Remove from hard surfaces and grassed areas.
- General: Leave the works in a clean tidy condition at completion and after any maintenance operations.

750 PLANTING MAINTENANCE GENERALLY

- Weed control: Maintain weed free area around each tree and shrub.
 - Diameter (minimum): The larger of 1 m or the surface of original planting pit.
 - Keep planting beds clear of weeds: By maintaining full thickness of mulch.
- Planted areas: Fork over beds as necessary to keep soil loose, with gentle cambers and no hollows. Take care not to reduce depth or effect of mulch.
- Precautions: Ensure that trees and shrubs are not damaged by use of mowers, nylon filament rotary cutters and similar powered tools.
- Firming up: Gently firm loosened soil around trees/ shrubs. Straighten leaning trees/ shrubs.
- Trees: Spray crown when in leaf during warm weather.
 - Timing: After dusk.
- Tree accessories: Check condition of stakes, ties, guys, guards and irrigation and ventilation systems.
 - Broken or missing items: Replace.
 - Loose stakes: Re-firm in the ground or replace as necessary to provide support to the tree.
 - Loose guys: Re-firm anchor points and adjust as necessary to provide support to the tree.
 - Ties: Adjust to accommodate growth and prevent constriction or abrasion.
 - Damage to bark: Cut back neatly with sharp knife. Prevent further damage.
 - Frequency of checks: At each scheduled maintenance visit.
- Watering: As required for healthy establishment, depending on weather conditions.

760 PLANTING MAINTENANCE - PRUNING

- General: Prune to promote healthy growth and natural shape.
 - Dead, dying, diseased wood and suckers: Remove.
 - Timing: As appropriate to the species.
 - Trees: Favour a single central leading shoot.
- Arisings: Remove.

780 MAINTENANCE INSTRUCTIONS

- General: Before end of the maintenance period, submit printed instructions recommending procedures to be established by the Employer for maintenance of the planting work for one full year: Provide a schedule of any ongoing maintenance problems experienced during the rectification period.

790 FINAL MULCHING

- Timing: At end of the maintenance period.
- Watering: Ensure that soil is thoroughly moistened prior to remulching, applying water where necessary.
- Planting beds: Remulch.
Depth (minimum): 50 mm.
- Trees: Remulch.
Depth (minimum): 50 mm.

Q35

Landscape maintenance

Q35 Landscape maintenance

To be read with Preliminaries/ General conditions.

GENERALLY

105A MAINTENANCE OBJECTIVES

- Location: all external planting under contract.
 - Duration: 5 years.
- Aims:
 - Ensure continued health of planting
 - Ensure ongoing softworks maintenance is undertaken efficiently to limit disruption of end users
- Restrictions: As described in the landscape maintenance manual.
- Results: As scheduled in KXC-S4-001-L-RAMXXX-91-0900

110 NOTICE

- Give notice before:
 - Application of herbicide.
 - Application of fertilizer.
 - Watering.
 - Each site maintenance visit.
- Period of notice: 2 days.

130 REINSTATEMENT

- Damage or disturbance to soil structure, planting, grass, fencing, hard landscaping, structures or buildings: Reinstate to original condition.

140 CONTROL OF MAMMALIAN PESTS

- Specialist firms: Submit proposals.
 - Method: Submit proposals.

155 WATERING

- Supply: Potable mains water.
- Quantity: Wet full depth of topsoil. Irrigation specialist by contractor design to design automated system.
- Application: Do not damage or loosen plants.
- Compacted soil: Loosen or scoop out, to direct water to rootzone.
- Frequency: As necessary for the continued thriving of all planting.

160 WATER RESTRICTIONS

- General: If water supply is, or is likely to be, restricted by emergency legislation, submit proposals for an alternative suitable source of water. Obtain instructions before proceeding.

170 DISPOSAL OF ARISING

- General: Unless specified otherwise, dispose of arisings as follows:
 - Biodegradable arisings: Remove to recycling facility.
 - Grass cuttings: Remove to recycling facility.
 - Tree roots and stumps: Remove from site.
 - Shrub and tree prunings: Remove to recycling facility.
 - Litter and nonbiodegradable arisings: Remove from site.

180 CHIPPING OR SHREDDING

- General: Not permitted on site.

- 190 LITTER
- Extraneous rubbish not arising from the contract work: Collect and remove from site.

- 197 CLEANLINESS
- Soil and arisings: Remove from hard surfaces.
 - General: Leave the works in a clean, tidy condition at completion and after any maintenance operations.

FLOWER BEDS/ SEASONAL BEDDINGS

- 460 BEDS OF PERENNIALS OR PERENNIALS AND ANNUALS
- Plant supports: Stake and tie plants using N/A.
 - Length: N/A.
 - Maintain throughout the growing season.
 - Gaps in planting: Refill by replanting.
 - Watering:
 - New plants: Before and after planting out.
 - Ongoing: As necessary for the continued thriving of all planting.
 - Operations at end of growing season:
 - Trim: Older flowering stems of herbaceous perennials.
 - Remove: Redundant plant supports, litter, debris and arisings.
 - Cultivate: Fork over the soil, taking care not to cause undue disturbance to plants.
 - Top dress: Apply fertilizer at a rate of 60 g/m².

- 470 FLOWER BEDS GENERALLY
- Operations:
 - Remove: Dead flower heads, fallen leaves, litter and debris.
 - Weeds: Thoroughly hand weed.
 - Cultivate: Lightly hoe.
 - Trim: Clip grass edges.
 - Fungicide: as required, to be approved by landscape architect.
 - Insecticide: as required, to be approved by landscape architect.

- 490 THINNING BY REMOVAL OF SURPLUS PLANTS
- Plants to be thinned: as required.
 - Standard: BS 7370-4, clause 3.5.17.1.
 - Timing: Thin when foliage of adjacent plants has begun to touch.
 - Roots:
 - Disturbance to adjacent plants: Minimise.
 - Soil: Refill holes with topsoil to leave an even graded surface.
 - Mulch: Maintain mulch as original specification.
 - Adjacent plants: Make good any minor damage immediately.
 - Plants for retention: Select plants with a strong healthy habit.
 - Mature planting density: as suited to species and plant type.

- 495 BIODIVERSE ROOF LVL 11 AND 13
- Operations:
 - Remove: Litter and debris.
 - Weeds: Thoroughly hand weed.
 - Trim: Clip grass edges to not splay over roof lights and stone strip.
 - Watering: Thorough hand watering will be required for establishment period of minimum 10 weeks. Following this, hand watering necessary following periods of drought or high wind.
 - Cut: Cut grasses and remove arisings in autumn to prevent decaying organic matter and ensure nutrient levels are consistent.
 - Inspect: Log piles and stones are secure. Sand levels are consistent.
 - Fungicide: as required, to be approved by landscape architect.
 - Insecticide: as required, to be approved by landscape architect.

SHRUBS/TREES/HEDGES

500 ESTABLISHMENT OF NEW PLANTING

- Duration: 5 years.
- Weed control:
 - Method: Keep planting beds clear of weeds by hand weeding and maintaining mulch thickness.
 - Area: Maintain a weed free area around each tree and shrub, minimum diameter the larger of 1 m or the surface of the original planting pit.
- Soil condition: Fork over beds to keep soil loose, with gentle cambers and no hollows. Do not reduce depth or effect of mulch.
- Watering: as required.

502 ESTABLISHMENT OF NEW PLANTING - FERTILIZER

- Time of year: March or April.
- Type: Slow release.
- Spreading: Spread evenly.
 - Application rate: As manufacturer's recommendations.

510 TREE STAKES AND TIES

- Inspection/ Maintenance times: As scheduled and immediately after strong winds.
- Stakes:
 - Replace loose, broken or decayed stakes to original specification.
 - If longer than half of clear tree stem height, cut to this height in spring. Retie to tree firmly but not tightly with a single tie.
- Ties: Adjust, refix or replace loose or defective ties, allowing for growth and to prevent chafing.
 - Where chafing has occurred, reposition or replace ties to prevent further chafing.
- Removal of stakes and ties: During spring when no longer required to support the tree.
 - Fill stake holes with lightly compacted soil.

515 TREE GUY WIRES

- Inspection/ Maintenance times: Immediately after strong winds.
- Operations:
 - Replace or resecure loose or missing guy wires.
 - Adjust to suit stem growth and to provide correct and uniform tension.
- Removal: no sooner than 2 years after planting.

520 REFIRMING OF TREES AND SHRUBS

- Timing: After strong winds, frost heave and other disturbances.
- Refirming: Tread around the base until firmly bedded. Ensure mounding of earth around trees sufficiently covers rootball and irrigation system as per original details.
- Collars in soil at base of tree stems, created by tree movement: Break up by fork, avoiding damage to roots. Backfill with topsoil and refirm.

540 PRUNING GENERALLY

- Pruning: In accordance with good horticultural and arboricultural practice.
 - Removing branches: Do not damage or tear the stem or bark.
 - Wounds: Keep as small as possible and cut cleanly back to sound wood.
 - Cutting: Make cuts above and sloping away from an outward facing healthy bud, angled so that water will not collect on cut area.
 - Larger branches: Prune neither flush nor leaving a stub, but using the branch bark ridge or branch collar as a pruning guide.
- Appearance: Thin, trim and shape each specimen appropriately to species, location, season, and stage of growth, leaving a well balanced natural appearance.
- Tools: Use clean sharp secateurs, hand saws or other approved tools. Trim off ragged edges of bark or wood with a sharp knife.
- Disease or infection: Give notice if detected.
- Growth retardants, fungicide or pruning sealant: Do not use unless instructed.

545 PRUNING OF EXCESSIVE OVERHANG

- Timing: spring/autumn to suit species.
- Operations: Remove growth encroaching onto grassed areas, paths, roads, signs, sightlines and road lighting luminaires.
- Special requirements: None.

550 PRUNING OF EXCESSIVE HEIGHT

- Timing: spring/autumn to suit species.
- Operations: Remove excessive height as required to ensure stability and maintain size appropriate to loading requirements.

555 PRUNING TREES AND SHRUBS

- Standard: To BS 7370-4.
- Special requirements: None.

570 FORMATIVE PRUNING OF YOUNG TREES

- Standard: Type and timing of pruning operations to suit the plant species.
- Time of year: Do not prune during the late winter/ early spring sap flow period.
- Young trees up to 4 m high:
 - Crown prune by removing dead branches and reducing selected side branches by one third to preserve a well balanced head and ensure the development of a single strong leader.
 - Remove duplicated branches and potentially weak or tight forks. In each case cut back to live wood.
- Whips or feathered trees: Do not prune.
- Operatives: Approved specialist contractor.

575 PRUNING ORNAMENTAL SHRUBS

- General: Prune to encourage healthy and bushy growth and desirable ornamental features, e.g. flowers, fruit, autumn colour, stem colour.
- Suckers: Remove by cutting back level with the source stem or root.

580 PRUNING FLOWERING SPECIES OF SHRUBS AND ROSES

- Time of year:
 - Winter flowering shrubs: Spring.
 - Shrubs flowering between March and July: Immediately after the flowering period.
 - Shrubs flowering between July and October: Back to old wood in winter.
 - Rose bushes: Early spring to encourage basal growths and a balanced, compact habit.

- 620 REMOVAL OF DEAD PLANT MATERIAL
- Operations: At the end of the growing season, check all shrubs and remove all dead foliage, dead wood, and broken or damaged branches and stems.
- 625 CLIMBING PLANTS
- Pruning: Remove excess growth, to ensure that signs, light fittings, doors and windows are kept clear at all times.
 - Insecure growth: Attach to supporting wires or structures using Stainless steel wire.
 - Supporting structures: Check and repair as necessary.
- 630 DEAD AND DISEASED PLANTS
- Removal: As soon as possible.
 - Replacement: In the next suitable planting season.
- 635 REINSTATEMENT OF SHRUB/ HERBACEOUS AREAS
- Dead and damaged plants: Remove.
 - Mulch/ matting materials:
 - Carefully move to one side and dig over the soil, leaving it fit for replanting.
 - Do not disturb roots of adjacent plants.
 - Replacement plants:
 - Use pits and plants: To original specification or to match the size of adjacent or nearby plants of the same species, whichever is the greater.
 - Additional requirements: None.
 - Dressing: Slow release fertilizer:
 - Type: Contractor's choice.
 - Application rate: As manufacturer's recommendations.
- 645 WEED CONTROL GENERALLY
- Weed tolerance: weed cover less than 2% and no weed to exceed 100 mm high.
 - Adjacent plants, trees and grass: Do not damage.
- 650 HAND WEEDING
- General: Remove weeds entirely, including roots.
 - Disturbance: Remove the minimum quantity of soil, and disturb plants, bulbs and mulched surfaces as little as possible.
 - Completion: Rake area to a neat, clean condition.
 - Mulch: Reinstate to original depth.
- 655 WEED CUTTING BY HAND OR MACHINE
- Undesirable grass, brambles and herbaceous growth: Cut down cleanly to a maximum height of 25 mm.
 - Herbicides: Do not use.
- 680 SOIL AERATION
- Compacted soil surfaces:
 - Prick up: To aerate the soil of root areas and break surface crust.
 - Size of lumps: Reduce to crumb and level off.
 - Damage: Do not damage plants and their roots.
- 685 SOIL LEVEL ADJUSTMENT
- Level of soil/mulch at edges of beds: Reduce to 50 mm below adjacent grass or hard surface.
 - Arisings (if any): Spread evenly over the bed.

690 MAINTENANCE OF LOOSE MULCH

- Thickness (minimum): 50 mm.
 - Top up: Annually.
- Mulch spill on adjacent areas: Remove weeds and rubbish and return to planted area.
- Weeding: Remove weeds growing on or in mulch by hand weeding.

695 FERTILIZING ESTABLISHED TREES AND SHRUBS

- Time of year: During April or May.
- Type of fertilizer: Slow release.
- Application: Spread evenly.
 - Rate: As manufacturer's recommendations.

705 WINTER LEAF REMOVAL

- Operations: Take down temporary leaf fences. Collect accumulations of drifted leaves from the vicinity and from planting beds.
- Arisings: Remove to recycling facility.

TREE WORK

810 TREE WORK GENERALLY

- Identification: Before starting work agree which trees, shrubs and hedges are to be removed or pruned.
- Protection: Avoid damage to neighbouring trees, plants and property.
- Standard: To BS 3998.
- Removing branches: Cut vertical branches similarly, with no more slope on the cut surface than is necessary to shed rainwater.
- Appearance: Leave trees with a well-balanced natural appearance.
- Chain saw work: Operatives must hold a Certificate of Competence.
- Tree work: To be carried out by an approved member of the Arboricultural Association.

815 ADDITIONAL WORK

- Defective, diseased, unsafe or weak parts of trees additional to those scheduled for attention: Give notice if detected.

820 PREVENTION OF WOUND BLEEDING

- Standard: To BS 3998.

825 PREVENTION OF DISEASE TRANSMISSION

- Standard: To BS 3998.

830 CLEANING OUT AND DEADWOODING

- Remove:
 - Dead, dying, or diseased wood, broken branches and stubs.
 - Fungal growths and fruiting bodies.
 - Rubbish, wind blown or accumulated in branch forks.
 - Wires, clamps, boards and metal objects, if removable without causing further damage and not part of a support structure that is to be retained.
 - Other unwanted objects, e.g. tree houses, swings.
 - Climbing plants if required for health of tree.

835 CUTTING AND PRUNING GENERALLY

- Tools: Appropriate, well maintained and sharp.
- Final pruning cuts:
 - Chainsaws: Do not use on branches of less than 50 mm diameter.
 - Hand saws: Form a smooth cut surface.
 - Anvil type secateurs: Do not use.
- Removing branches: Do not damage or tear the stem.
- Wounds: Keep as small as possible, cut cleanly back to sound wood leaving a smooth surface, and angled so that water will not collect on the cut area.
- Cutting: Cut at a fork or at the main stem to avoid stumps wherever possible.
Large branches: Remove only if unavoidable.
 - Remove in small sections and lower to ground with ropes and slings.
- Dead branches and stubs: When removing, do not cut into live wood.
- Unsafe branches: Remove epicormic shoots and potentially weak forks that could fail in adverse weather conditions.
- Disease or fungus: Give notice if detected. Do not apply fungicide or sealant unless instructed.

840 CROWN REDUCTION/ SHAPING

- General: Cut back selectively to lateral or sublateral buds or branches to retain flowing branch lines without leaving stumps.
- Operations: Reduce crown by 15%.

845 CROWN LIFTING

- Clearances: Remove branch systems to give clearance.
 - Height: 2m above paved areas when size of tree allows .
- Removing branches: Remove whole branches back to the stem, or cut lower portions of branches back to lateral or sublateral buds or branches. Do not leave stumps.

850 CROWN THINNING

- Removing branches: Remove inward growing, crossing, rubbing, dead and damaged branches.
- Thinning: Selectively remove secondary and small live branch growth evenly throughout the crown.
 - Quantity: 10 %.
- Cutting: Make no cuts of more than 25 mm diameter.
 - Branches: Cut back to lateral or sublateral buds or branches without leaving stumps.
- Appearance: Leave a uniform and well balanced structure of branches and foliage.

860 REMOVING TREES, SHRUBS AND HEDGES

- Standard: To BS 3998.
- Existing services: Check for below and above ground services. Give notice if they may be affected.
- Shrubs and smaller trees: Cut down and grub up roots.
- Tree stumps:
 - Treatment: Remove mechanically to a minimum depth of 300 mm below ground level.
 - Removal by winching: Give notice. Do not use other trees as supports or anchors.
- Protection: Avoid damage to neighbouring trees, plants and property.
- Work near retained trees: Where tree canopies overlap and in confined spaces generally, take down trees carefully in small sections to avoid damage to adjacent trees that are to be retained.
- Filling holes:
 - Material: Use as-dug material and/ or imported soil as required.
 - Finishing: Consolidate and grade to marry in with surrounding ground level.

865 BARK DAMAGE

- Wounds:
 - Do not attempt to stop sap bleeding.
 - Bark: Remove ragged edges using a sharp knife.
 - Wood: Remove splintered wood from deep wounds.
 - Size: Keep wounds as small as possible.
- Liquid or flux oozing from apparently healthy bark: Give notice.

870 CAVITIES IN TREES

- Investigation: Remove rubbish and rotten wood. Probe the cavity to find the extent of any decay, and give notice.
- Water filled cavities: Do not drain.
- Sound wood inside cavities: Do not remove.
- Cavity openings: Do not cover.

HARD LANDSCAPE AREAS/FENCING

910 HARD SURFACES AND GRAVEL AREAS

- Herbicide: Apply a suitable foliar acting or residual herbicide. Allow recommended period for herbicide to take effect before clearing arisings.
- Hard surfaces: Remove litter, leaves and other debris.
- Surface gutters and channels: Remove mud, silt and debris.
- Drainage gullies: Empty traps and flush clean.
- Gravel areas: Rake over. Remove weeds, litter, leaves and debris, and level off.
- Repairs to flexible bituminous pavings: In accordance with the original paving specification or BS 7370-2, clause 4.12.
- Stain removal: In accordance with BS 7370-2, table 4.

920 FENCING

- Fences: Inspect and repair to maintain protection against as per architect's maintenance schedule.

930 GRAFFITI REMOVAL

- Method: Detergent.
- Subsequent treatment: Not required.
 - Finish: N/A.

Q37
Green roofs

Q37 Green roofs

To be read with Preliminaries/General conditions

GENERAL

110A INTENSIVE GREEN ROOF TO 1FL, 9FL, 12FL

- Roof type: to architect's specification.
 - Substrate: to architect's specification.
 - Slope: to architect's specification.
- Waterproofing: to architect's specification.
- Thermal insulation: to architect's specification.
- Protection: to architect's specification.
- Moisture control layers: to architect's specification.
- Growing medium: Topsoil as section Q28.
 - Depth: 300 mm max. depth.
 - Sub-soil: light weight sub-soil as required below 300mm topsoil
- Vegetation: Planting as section Q31.
- Accessories: None.

130A EXTENSIVE BIODIVERSE ROOF TO 10FL AND 13FL

- Roof type: to architect's specification.
 - Substrate: to architect's specification.
 - Slope: to architect's specification.
- Waterproofing: to architect's specification.
- Thermal insulation: to architect's specification.
- Protection: filter fleece and protection fleece to architect's specification.
- Moisture control layers: Drainage layer. 20mm drainage board.
- Growing medium: Extensive substrate as per Q28.
 - Depth: 80-150 mm.
- Vegetation: seed mixtures as per KXC-S4-001-L-RAMXXX-91-0900.
- Border: 300mm wide, 100mm deep Riverstone border to all extensive roof areas. Stones rounded, washed, 20-40mm wide.
- Accessories: None.

140 PAVING AND DECKING SYSTEMS

- Type: P1 paving as per Q25.
- Paving support: Pedestals as clause 460 .

PRODUCTS

330A PROTECTION LAYER TO EXTENSIVE GREEN ROOFS - R1

- Manufacturer: Bauder or equal approved
 - FSM 600
 - Depth: 4 mm .

350A DRAINAGE LAYER TO EXTENSIVE GREEN ROOFS - R1

- Manufacturer: Bauder or equal approved.
 - Product reference: DSE20 .
 - Depth: 20 mm .
- Infill: Not required .

350B DRAINAGE LAYER TO 1FL PLANTER

- Manufacturer: Sky-Garden HDPE cusped drainage board with filter fleece (or approved equal)
 - Product reference: Rigid Drainage Board with Filter Fleece.
 - Depth: 20 mm .
- Infill: Not required .

360A FILTER MEMBRANE TO EXTENSIVE GREEN ROOFS

- Manufacturer: Bauder or equal approved.
 - Product reference: Filter Fleece

420 EDGE RETAINING PROFILE TO EXTENSIVE GREEN ROOFS

- Manufacturer: Bauder or equal approved .
 - Product reference: AL150 aluminum .
- Material: Aluminium .
- Height: 150mm .

440 VEGETATION BARRIER TO EXTENSIVE GREEN ROOFS

- Material: See Q28 345A
- Depth: 8.5mm .
- Width: Minimum 300mm, as per KXC-S4-001-L-RAMXXX-9.1-1101 and KXC-S4-001-L-RAMXXX-91-1131 series

470A PLANTER TO 1FL, 9FL, AND 12FL INTENSIVE ROOF TERRACES.

- Manufacturer: Kinley.
 - Product reference: Perimeta, or equal approved
- Type: powder coated steel. To be used with Kinley rooftray, pedestals and joist as per section Q25.
- Material: Steel.
- Thickness: 6mm
- Colour: Green RAL9011HR colour
- Dimensions: as shown on landscape details.
- Height: varies, as shown on landscape details.
- Fixings: Fix down to plate using 4 no. stainless steel 4.5mm x 35mm self drilling screws. Brackets and base plates as per manufacturers recommendations. See detail series KXC-S4-001-L-RAMXXX-90-0500.
- Accessories:
 - Planter edging to be insulated with 20mm polystyrene to avoid root damage in extreme weather. Polystyrene to be cut neatly to fit below lip of planter top. Soil to cover so polystyrene isn't visible.
 - Walls of planter applied with liquid applied flexible waterproofing layer. All fixings and joins to be sealed with clear externally rated sealant as per manufacturers recommendations.
 - Kinley AluExcel edge fitted to roof tray in area next to ramp with A4 stainless steel 4.5mm x 35mm self-drilling screws as per manufacturers recommendations to make up levels change.

EXECUTION

710 INSTALLATION GENERALLY

- Preparation: Clear all surfaces of debris.
 - Timing: After certification of waterproof membrane integrity.
 - Surface condition: Visually inspect waterproof membrane, report any damage.
- Faults in waterproof membrane: Report.
- Contamination: Do not use materials detrimental to healthy plant growth.
- Storage: Do not overload.
 - Point loads: Avoid.
- Outlets: Do not block.
 - Outlet grilles: Installed.

720 ADVERSE WEATHER

- Unfinished work: Secure from damage and wind uplift.
- Conditions: Do not install or work with frozen materials.

755 SEPARATION LAYER INSTALLATION

- Joints: Minimize.
 - Overlaps (minimum): Manufacturer's recommendation .
- Upstands: Extend to top of growing medium.

770 DRAINAGE LAYER INSTALLATION

- Extent: Continuous over entire roof area.
- Fitting: Manufacturer's recommendation .
- Upstands: Fit closely around penetrations and outlets.

780 FILTER MEMBRANE INSTALLATION

- Joints: Minimize.
 - Overlaps (minimum): Manufacturer's recommendation .
- Fitting: Manufacturer's recommendation .
- Upstands: Extend to top of growing medium.

790 GROWING MEDIUM INSTALLATION

- Handling: Minimize.
 - Conditions: Handle in the driest condition possible. Do not handle or install when wet or frozen.
- Layers:
 - Depth (maximum): 150 mm.
 - Sequence: Gently firm each layer before spreading the next.

820 EDGE RETAINING PROFILE INSTALLATION

- Cutting: Neat, accurate and without spalling.
 - Junctions: vertical, secured using proprietary connectors.
- Position: True to line and level. Smooth continuous lines.
- Fixing: Manufacturer's standard .

840 PEDESTAL INSTALLATION

- Ensure that surface to accept pedestals is clean and free of debris.
- Setting out: Mark centre-point of pedestal on substrate surface, with perpendicular guidelines to ensure square layout.
 - Orientation: Align parallel with adjacent features.
 - Spacing: To suit paving material and dimensions.
- Overall movement tolerance (maximum): 3 mm.

COMPLETION

910 INSPECTION

- Timing: Before handover.
 - Give notice (minimum): 3 days.

920 COMPLETION

- General: Leave the works in a clean, tidy condition.
- Surfaces: Clean immediately before handover.
- Outlets: Clean and clear of obstructions.
- Completed green roof: Protect from adjacent or high level working.

930 DOCUMENTATION

- Timing: Submit at handover.
- Contents:
 - Growing medium declaration of analysis.
 - Manufacturers' guarantees and warranties.
 - Procedures for maintenance of the green roof.
 - Record drawings showing the location of planting and associated features.
- Number of copies: 2 .

Q50

Site/street furniture/equipment

Q50 Site/street furniture/equipment

To be read with Preliminaries/ General conditions.

GATES, BARRIERS AND PARKING CONTROLS

130 GATE TO ARCHITECT'S DETAIL AND SPECIFICATION

- Manufacturer: to architect's detail and specification.
 - Product reference: to architect's detail and specification.
- Size: to architect's detail and specification.
- Posts: to architect's detail and specification.
 - Treatment: to architect's detail and specification.
- Finish as delivered: to architect's detail and specification.
 - Colour: to architect's detail and specification.
- Fittings and accessories: to architect's detail and specification.
- Method of setting posts: to architect's detail and specification.

220A BENCHES B1 TIMBER BENCH

- Manufacturer: Kinley.
 - Product reference: Perimeta Inset Cantilever Bench, or equal approved.
- Material: Stainless steel.
 - Finish: powder coated.
 - Colour: to match planter edging to intensive green roofs.
- Size: 1200 x 450 and 1600 x 450mm.
- Accessories/ Special requirements: None.
- Method of fixing: Benches fixed level as per manufacturer's requirements.

220B BENCHES B2 FREESTANDING TIMBER BENCH

- Manufacturer: Kinley.
 - Product reference: Perimeta Freestanding Bench, or equal approved.
- Material: Stainless steel.
 - Finish: powder coated.
 - Colour: to match planter edging to intensive green roofs.
- Size: 2000 x 450mm.
- Accessories/ Special requirements: None.
- Method of fixing: Benches fixed level as per manufacturer's requirements. Refer to landscape architects details for paving cuts.

230A PERGOLA S1 STEEL PERGOLA

- Material: Stainless steel.
 - Finish: powder coated.
 - Colour: RAL9011HR
- Height: 2425mm.
- Fixings: 5mm stainless steel cable, swage toggle fork & adjustable swage turnbuckle
- Accessories/ Special requirements: as per detail in landscape architects drawings KXC-S4-001-L-RAMXXX-90-0506
- Method of fixing: Flange mounted to slab and fixed to engineer's detail and specification.

INSTALLATION

530 PRESERVATIVE TREATED TIMBER

- Surfaces exposed by minor cutting and drilling: Treated by immersion or with two flood coats of a solution recommended for the purpose by main treatment solution manufacturer.
- Heavily worked sections: Re-treat.

545 ERECTION OF TIMBER AND PREFABRICATED STRUCTURES

- Checking: 5 days (minimum) before proposed erection date, check foundations, holding down bolts, etc.
- Inaccuracies or defects in prepared bases or supplied structures: Report immediately. Obtain instructions before proceeding.

550 DAMAGE TO GALVANIZED SURFACES

- Minor damage in areas up to 40 mm² (including on fixings and fittings): Make good.
 - Material: Low melting point zinc alloy repair rods or powders made for this purpose or at least two coats of zinc-rich paint to BS 4652.
 - Thickness: Sufficient to provide a zinc coating at least equal to the original layer.

560 SITE PAINTING

- Timing: Prepare surfaces and apply finishes as soon as possible after fixing.

S

Piped supply systems

S14
Irrigation

S14 Irrigation

To be read with Preliminaries/ General conditions.

GENERAL

110 IRRIGATION SYSTEM FOR ALL EXTERNAL PLANTING

- Submit proposals for contractors design.
- Source: Mains water supply.
- Water meters: Submit proposals.
- Backflow prevention device: Submit proposals.
- Water storage tanks: Submit proposals.
- Pumps: Required.
- Pipelines: Submit proposals.
 - Insulation: Submit proposals.
- Draw-off taps/ valves: Contractor's choice.
- Filters: Submit proposals.
- Outlets: Submit proposals.
- Electrical supply: Submit proposals.
- Accessories:
 - Controllers ;
 - Electronic timer ;
 - Equipment enclosure ;
 - Pressure gauge ;
 - Valve boxes ; and
 - Water metering valves .

PERFORMANCE

210 DESIGN AND DETAILING

- Requirement: Specialist contractor design complete the design of the irrigation system.
- Standard: To BS 8558, BS EN 805 and BS EN 806-2, and in accordance with the HSE publication 'The control of legionella bacteria in water systems. Approved code of practice and guidance' and the relevant parts of BS 7562 and BS EN 12484.
- Proposals: Submit drawings (showing equipment positions and pipeline routes), technical information, calculations and manufacturer's literature.

220 PIPELINE DESIGN

- Sizes: Calculate to suit probable simultaneous demand for the entire system and to ensure:
 - Delivery pipeline flow rates (minimum): Submit proposals.
 - Lateral pipeline flow rates (minimum): Submit proposals.
 - Suitable discharge rates at distribution points.

230A DISCHARGE REQUIREMENTS FOR HERBACEOUS PLANTS

- Flow rates (minimum):
 - Dripper system: 4l/h.
- Operation of appliances: Provide adequate flow rates from available water pressure.

230B DISCHARGE REQUIREMENTS FOR SHRUBS

- Flow rates (minimum):
 - Dripper system: 2 - 3 drippers @ 6-8l/h to suit size of shrub.
- Operation of appliances: Provide adequate flow rates from available water pressure.

230C DISCHARGE REQUIREMENTS FOR TREES

- Flow rates (minimum):
 - Dripper system: 2-3 drippers @ 8l/h to suit size of tree.
- Operation of appliances: Provide adequate flow rates from available water pressure.

PRODUCTS

310 DEZINCIFICATION

- Fittings, pipelines and equipment located below ground or in concealed or inaccessible locations: Gunmetal or other material resistant to dezincification.

320 WATER METERS PER EACH TERRACE OR GARDEN

- Manufacturer: Submit proposals.
 - Product reference: Submit proposals.

325 BACKFLOW PREVENTION DEVICES PER ZONE

- Standard: To BS EN 13959.
- Type: Submit proposals.
- Manufacturer: Submit proposals.
 - Product reference: Submit proposals.
- Fluid Category: 3.

345 PUMP SELECTION

- General: Select pump at or near the most efficient part of the performance curve for required duty.

346 PUMPS

- Type: Submit proposals.
- Manufacturer: Submit proposals.
 - Product reference: Submit proposals.
- Power supply: Submit proposals.
- Operation: Submit proposals.
- Flow rate: Submit proposals.
- Head: Submit proposals.
- Priming: Submit proposals.
- Features: Submit proposals.

362 COPPER PIPELINE FOR GENERAL USE

- Standard: To BS EN 1057, Kitemark certified.
- Manufacturer: Submit proposals.
 - Product reference: Submit proposals.
- Temper: Half hard R250.
- Wall thickness (nominal):
 - OD 6, 8, 10 and 12 mm: 0.6 mm.
 - OD 15 mm: 0.7 mm.
 - OD 22 and 28 mm: 0.9 mm.
 - OD 35 and 42 mm: 1.2 mm.
- Jointing generally: Integral lead free solder ring capillary fittings to BS EN 1254-1, Kitemark certified.
- Connections to equipment: Select from:
 - Compression fittings: To BS EN 1254-2, Kitemark certified.
 - Fittings with threaded ends: To BS EN 1254-4.
- Supports: Submit proposals.

- 365 COPPER PIPELINE FOR UNDERGROUND USE
- Standard: To BS EN 1057, Kitemark certified.
 - Manufacturer: Submit proposals.
 - Product reference: Submit proposals.
 - Temper: Submit proposals.
 - Finish: Seamless polyethylene coated to BS 3412.
 - Colour: Submit proposals.
 - Wall thickness (nominal):
 - OD 6, 8, 10 and 12 mm: 0.8 mm.
 - OD 15 mm: 1.0 mm.
 - OD 22 and 28 mm: 1.2 mm.
 - OD 35 and 42 mm: 1.5 mm.
 - Jointing generally: Integral lead free solder ring capillary fittings to BS EN 1254-1, Kitemark certified.
 - Connections to equipment: Select from:
 - Compression fittings: To BS EN 1254-2, Kitemark certified.
 - Fittings with threaded ends: To BS EN 1254-4.
- 368 POLYETHYLENE PIPELINE FOR UNDERGROUND USE
- Standard: To BS EN 12201-2, Kitemark certified.
 - Jointing: Compression fittings to BS EN 12201-3.
 - Colour: Submit proposals.
- 372 THERMOPLASTICS PIPELINE FOR GENERAL USE
- Standard: To BS 7291-2.
 - Material: Submit proposals.
 - Jointing: Submit proposals.
 - Supports: Submit proposals.
- 378 INSULATION TO EXTERNAL SUPPLY PIPELINES
- Type: Preformed flexible closed cell or mineral fibre split tube.
 - Thickness: Submit proposals.
 - Recycled content: Submit proposals.
- 382 VALVES GENERALLY
- Types: Approved for the purpose by the local water supply undertaker and of the appropriate pressure rating.
 - Location: Adjacent to equipment to be isolated and where they can be readily operated and maintained.
 - Joints: To suit the pipe material.
 - Operation:
 - Handwheels: For control purposes.
 - Lockshields: For isolation or regulation of circuits or equipment.
- 383 STOP VALVES AND DRAW-OFF TAPS FOR ABOVE GROUND USE
- Type: Copper alloy.
- 384 STOP VALVES FOR BELOW GROUND USE
- Type: DZR Copper alloy CZ 132 to BS 5433.
- 392 FLOW REDUCING SERVICING VALVES
- Manufacturer: Submit proposals.
 - Product reference: Submit proposals.

- 393 PRESSURE REGULATORS
- Manufacturer: Submit proposals.
 - Product reference: Submit proposals.
 - Material/ Finish: Submit proposals.
 - Working pressure (maximum): Submit proposals.

- 394 SOLENOID VALVES
- Manufacturer: Submit proposals.
 - Product reference: Submit proposals.
 - Material/ Finish: Submit proposals.
 - Operation: Automatic, pressure sensing with manual override.
 - Operating pressure range (recommended): Submit proposals.
 - Flow control: Submit proposals.

- 395 FILTERS
- Type: Submit proposals.
 - Manufacturer: Submit proposals.
 - Product reference: Submit proposals.
 - Flow rate: Submit proposals.
 - Accessories: Submit proposals.

- 422 POROUS PIPE SYSTEMS
- Manufacturer: Submit proposals.
 - Product reference: Submit proposals.
 - Pipe size: Submit proposals.
 - Depth: Submit proposals.
 - Operating pressure: Submit proposals.
 - Discharge flow rate: as clause 230A-C.
 - Accessories: Submit proposals.

- 435 TAPE LINES/ DRIPPER SYSTEMS
- Manufacturer: Submit proposals.
 - Product reference: Submit proposals.
 - Operating pressure: Submit proposals.
 - Discharge flow rate: as clause 230A-C.
 - Emitters: Submit proposals.
 - Accessories: Submit proposals.

- 450 CONTROLLERS
- Type:
 - Digital;
 - Multi zone; and
 - Submit proposals.
 - Manufacturer: Submit proposals.
 - Product reference: Submit proposals.
 - Power: Mains operated with battery back up.
 - Features:
 - Automatic operation with manual override;
 - Frost sensor;
 - Lockable, weather resistant case; and
 - Submit proposals.

- 455 ELECTRONIC TIMERS
- Standard: To BS EN 60730-2-7.
 - Manufacturer: Submit proposals.
 - Product reference: Submit proposals.
 - Features:
 - Two on/ off periods;
 - 24 hour/ 7 day time mode;
 - Automatic operation with manual override;
 - Digital display; and
 - Submit proposals.
 - Switching capacity: Submit proposals.
- 460 EQUIPMENT ENCLOSURE FOR IRRIGATION SYSTEM CONTROLLERS
- Manufacturer: Submit proposals.
 - Product reference: Submit proposals.
 - Type: External.
 - Material: Steel.
 - Colour: to match external planters.
 - Classification: Submit proposals.
 - Features: Submit proposals.
- 475 PRESSURE GAUGE
- Type: Submit proposals.
 - Manufacturer: Submit proposals.
 - Product reference: Submit proposals.
 - Display: Digital.
 - Scale: Metric.
 - Range: Submit proposals.
- 480 VALVE BOXES
- Manufacturer: Submit proposals.
 - Product reference: Submit proposals.
- 485 WATER CONDITIONER
- Manufacturer: Submit proposals.
 - Product reference: Submit proposals.
 - Type: Submit proposals.
- 490 WATER METERING VALVES
- Manufacturer: Submit proposals.
 - Product reference: Submit proposals.

EXECUTION

610 INSTALLATION GENERALLY

- Standard: In accordance with BS 7562-5, BS 8558, BS EN 805, BS EN 806-4 and BS EN 12484-4, water supply regulations and the requirements of the water supply undertaker.
- Generally:
 - Fixing: Secure and neat in locations and depths suitable for the purpose.
 - Outlets and valves: Adequately support to prevent pipes being strained during operation.
 - Open ends of pipes: Temporarily seal with purpose made plugs or blanking caps to prevent ingress of dirt, insects or rodents during installation.
- Equipment, components and accessories:
 - Store in original packaging in dry conditions.
 - Where appropriate, securely fix parallel or perpendicular to the enclosing structure.
- Corrosion resistance: In locations where moisture is present or may occur, provide corrosion resistant fittings/ fixings and avoid contact between dissimilar metals by use of suitable washers, gaskets, etc.
- Performance: Free from leaks and the audible effects of expansion, vibration and water hammer.
- Access: Allow adequate space for inspection, servicing and maintenance.

611 INSTALLATION OF PUMPS

- Pipeline connections: Prevent transmission of pipeline forces to pump casing.
- Pipeline mounted pumps: Support on purpose made brackets lined with vibration absorbent material.
- Alignment: Align and balance to minimize vibration.
- Drive belts: Correctly tensioned.
- Access: Provide adequate space for service and maintenance.
- Identification plate: Engrave showing:
 - Manufacturer's name and address.
 - Serial number.
 - Duty and maximum head.
 - Speed.
 - Electrical loading.

612 PIPELINE INSTALLATION

- Appearance: Install pipes straight, and parallel or perpendicular to walls, floors, ceilings, and other building elements.
- Joints, bends and offsets: Minimize.
- Access: Locate runs to facilitate installation of equipment, accessories and insulation and allow access for maintenance.
- Electrical equipment: Install pipelines 150 mm (minimum) clear of electrical equipment. Do not run pipelines through electrical enclosures or above distribution boards, controllers or outlets.
- Insulation: Allow space around pipelines to fit insulation without compression.
- Drains and vents: Fix pipelines to falls. Fit draining taps at low points and vents at high points.
- Thermal expansion and contraction: Allow for thermal movement of pipelines. Isolate from structure. Prevent noise or abrasion of pipelines caused by movement. Sleeve pipelines passing through walls, floors or other building elements.

- 613 SUPPORTS FOR COPPER PIPELINES
- Spacing: Fix securely and true to line at the following maximum centres:
 - 15 and 22 mm pipe OD: 1.2 m horizontal, 1.8 m vertical.
 - 28 and 35 mm pipe OD: 1.8 m horizontal, 2.4 m vertical.
 - 42 and 54 mm pipe OD: 2.4 m horizontal, 3.0 m vertical.
 - Additional supports: Locate within 150 mm of connections, junctions and changes of direction.
- 614 SUPPORTS FOR THERMOPLASTICS PIPELINES
- Spacing: Fix securely and true to line at the following maximum centres:
 - Up to 16 mm pipe OD: 300 mm horizontal, 500 mm vertical.
 - 17–25 mm pipe OD: 500 mm horizontal, 800 mm vertical.
 - 26–32 mm pipe OD: 800 mm horizontal, 1000 mm vertical.
 - Additional supports: Locate within 150 mm of connections, junctions and changes of direction.
- 615 FITTING INSULATION TO EXTERNAL SUPPLY PIPELINES
- Location: Where exposed to air and where less than 750 mm below ground level.
 - Installation:
 - Fixing: Securely and neatly in accordance with manufacturer's recommendations and with the split on 'blind' side of pipeline.
 - Over fittings and at supports: Continuous leaving no gaps.
 - Timing: Do not fit insulation until completion of testing.
- 616 JOINTS IN COPPER PIPELINES
- Preparation: Cut pipes square. Remove burrs.
 - Joints: Neat, clean and fully sealed. Install pipe ends into joint fittings to full depth.
 - Bends: Do not use formed bends on exposed pipework, except for small offsets. Form changes of direction with radius fittings.
 - Adaptors for connecting dissimilar materials: Purpose designed.
 - Substrate and plastics pipes and fittings: Do not damage, e.g. by heat when forming soldered joints.
 - Flux residue: Clean off.
- 617 JOINTS IN THERMOPLASTICS PIPELINES
- Fittings and accessories for joints: Purpose designed.
 - Preparation: Cut pipes square. Remove burrs.
 - Joints: Neat, clean and fully sealed. Install pipe ends into joint fittings to full depth.
 - Compression fittings: Do not over tighten.
- 618 INSTALLATION OF VALVES
- Isolation and regulation valves: Provide on equipment and subcircuits.
 - Access: Locate where valves can be readily operated and maintained and next to equipment which is to be isolated.
 - Connection to pipework: Fit with joints to suit the pipe material.
- 630 SERVICE CONNECTIONS
- General: Covered elsewhere by a Provisional Sum.

COMPLETION

910 TESTING

- Standard: To BS EN 12484-5.
- Notice (minimum): Three days.
- Condition of pipework and equipment prior to testing: Correctly installed, secure and clean.
- Pressure testing: Joints, fittings and components must be free from leaks and signs of physical distress when tested for at least one hour as follows:
 - Systems fed directly from the mains: Apply a test pressure equal to 1.5 times the maximum pressure to which the installation or relevant part is designed to be subjected in operation.
 - Systems fed from storage: Apply a test pressure equal to the pressure produced when the storage cistern is filled to its normal maximum operating level.
- Other test procedures: As recommended by the manufacturer and required by the water undertaker.
- Test results: Submit.

911 INSPECTION TESTING

- Standard: To BS EN 805, section 11.

912 FLUSHING AND DISINFECTION

- Standard: To BS EN 805, section 12.

920 COMMISSIONING

- Equipment: Check and adjust operation of equipment and controls.
- Outlets: Check operation of outlets for satisfactory rate of flow.

930 DOCUMENTATION

- Submit prior to completion:
 - Full technical description of each system installed.
 - Manufacturers' operating and maintenance instructions for all equipment and controls.
 - Manufacturers' guarantees and warranties.
 - Operating instructions for the system as a whole giving optimum settings for all controls.
 - Record drawings showing the location of circuits, fittings, pipes, apparatus and operating controls.
 - Electrical inspection and completion certificates to BS 7671.
- Number of copies: Two.

940 OPERATING TOOLS

- Tools: Supply tools for operation, maintenance and cleaning purposes.
- Keys: Supply keys for valves, vents and cabinets.