

# Stephenson House, Camden

## Landscape Roof Terraces Specification

prepared by:

The Landscape Partnership

*L17412-RoofSpec*

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## Q28 Topsoil and soil ameliorants

To be read with Preliminaries/ General conditions.

### SYSTEM OUTLINE

#### 105A CONTAINER PLANTING / GREEN ROOF GROWING MEDIA SYSTEM Roof Terrace - Raised Planters

- Composition:
  - Soil: Imported lightweight topsoil, custom mix e.g Intensive Topsoil by Bourne Amenity.
  - Ameliorants: Sanitised and stabilized composted materials and Fertilizer to be incorporated into topsoil.
  - Accessories: Mycorrhizal inoculant (for Trees, bare root and hedging plants).

#### 155 MULCHING AND TOP DRESSING SYSTEM Roof Terrace - Raised Planters

- Composition:
  - Material: Granular Lightweight Expanded Clay Aggregates by Laterlite or similar agreed, 3/8 size.

### 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 green/ food waste certified to PAS 100.
- Give notice: before ordering or using.
- Declaration of compliance in accordance with BS EN 13650: Required.

#### 310 MATERIALS NOT PERMITTED

- Materials: Products containing peat.

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- 315A IMPORTED INTENSIVE ROOFGARDEN TOPSOIL For Roof Terrace raised planters
- Quantity: Provide as necessary to complete the work.
  - Standard: GRO compliant, soil components to BS 3882
  - Properties:
    - Lightweight, resistant to wind and water erosion, free from weeds, diseases and pests, good plant anchorage, fire resistance (low organic matter), appropriate water retention / release, good aeration at water saturation, resistance to compaction, appropriate supply of nutrients.
  - Classification: engineered lightweight soil for intensive green roof planting.
    - Soil components to be screened sandy loam.
    - pH value: 6.0 - 8.5
    - Organic content: <90 g/l
  - Source: Bourne Amenity.
    - Product reference: Intensive Lightweight Topsoil.
- 380 MYCORRHIZAL INOCULANT TO ALL TREES, BARE ROOT AND HEDGING PLANTS
- Manufacturer: Rootgrow.
    - Product reference: Rootgrow Professional or similar agreed, Submit proposals.
- 401 ORGANIC FERTILIZERS BONEMEAL FOR TREE PLANTING
- Manufacturer/ source: Submit proposals.
    - Product reference: Submit proposals.
  - Standard: In accordance with the Fertiliser Industry Assurance Scheme (FIAS).
  - Purpose: Establishment fertilizer.
  - Type: Blood and bone.
  - Availability to plants: Slow release.

**EXECUTION**

- 610 TOPSOIL ANALYSIS
- Soil to be analysed: Imported topsoil.
  - Soil analyst: Chemical analysis.
  - Samples: Collect in accordance with BS 3882.
  - Submit:
    - Declaration of analysis: In accordance with BS 3882, clause 6 and Table 1.
    - Additional analysis: Potentially toxic elements (PTEs)..
    - Report detailing soil analyst's recommendations.
- 620 IMPORTING TOPSOIL
- Give notice: Before stripping topsoil for transfer to site.
    - Notice period: 7 days.
- 625 SAMPLE LOADS FOR IMPORTED SOIL IMPROVER'S/ COMPOST
- Deliver to site a sample load: of 5 kg.
  - Give notice: Allow inspection before making further deliveries to site. Retain for comparison with subsequent loads.
    - Notice period: 7 days.

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- 630 DOCUMENTATION FOR IMPORTED TOPSOIL FOR ROOF TERRACE CONTAINER PLANTING
  - Timing: Submit at handover.
  - Contents:
    - Full description of all soil components.
    - Record of source for all soil components.
    - Record drawings showing the location and depth of all soils by type and grade.
    - Declaration of analysis: in accordance with BS 3882, clause 6 and Table 1.
  - Number of copies: Two.
  
- 635 DOCUMENTATION FOR COMPOST AND COMPOSTED MATERIALS FOR ROOF TERRACE CONTAINER PLANTING
  - Timing: Submit at handover.
  - Contents:
    - Full description of all compost components.
    - Record of source for all compost components.
    - Analyst's report for each test carried out.
    - Declaration of compliance: in accordance with PAS 100 and BSI PD CR 13456.
    - Quality Compost Protocol certification: Required.
  - Number of copies: Two.
  
- 650 NOTICE
  - Give notice before:
    - Setting out.
    - Spreading topsoil.
    - Applying herbicide.
    - Applying fertilizer.
    - Visiting site during maintenance period.
  - Period of notice: 1 week.
  
- 655 MECHANICAL TOOLS
  - Restrictions: Do not use within 100 mm of tree and plant stems.
  
- 655A MECHANICAL TOOLS
  - Restrictions: Do not use within 100 mm of tree and plant stems
  - Take care around irrigation and lighting, and green roof components such as waterproofing and drainage layers
  
- 670 INSPECTING FORMATIONS
  - Give notice: Before spreading topsoil for planting beds.
  - Notice period: 7 days.
  
- 685 SURPLUS MATERIALS TO BE REMOVED
  - Topsoil removal from site: Topsoil remaining after completion of all landscaping work.
  - Subsoil, stones, debris, wrapping material, canes, ties, temporary labelling, rubbish, prunings and other arisings: Remove.

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690 TOPSOIL STORAGE HEAPS

- Location: Submit proposals.
- Height (maximum): 1.0 m.
- Width (maximum): 2.0 m.
  - Formation: Loose tip and shape from the side only, without running machinery on the heap at any time.
- Protection:
  - Do not place any other material on top of storage heaps.
  - Do not allow construction plant to pass over storage heaps.
  - Prevent compaction and contamination, by fencing and covering as appropriate.

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 it is wetter than the plastic limit less 3%, to BS 1377-2.

710 SPREADING TOPSOIL ON ROOF TERRACE

- Standard: In accordance with BS 3882.
- Temporary roads/ surfacing: Remove before spreading topsoil.
- Layers:
  - Depth (maximum): 150 mm.
  - Gently firm each layer before spreading the next.
- Depth after firming and settlement: as shown on drawings.
- Crumb structure: Do not compact topsoil. Preserve a friable texture of separate visible crumbs wherever possible.

718 FINAL CULTIVATION FOR ROOF TERRACE PLANTING

- Compacted topsoil: Break up to full depth.
- Tilth: Loosen, aerate and break up topsoil to a tilth suitable for blade grading.
- Depth: 100 mm.
- Particle size (maximum): 5 mm.
- Timing: Within a few days before planting.
- Weather and ground conditions: Suitably dry.
- Surface: Leave regular and even.
- Levels: As drawing .
- Undesirable material brought to the surface:
  - Remove visible weeds.
  - Remove roots and large stones with any dimension exceeding 20 mm.

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- 720 FINISHED LEVELS OF TOPSOIL AFTER SETTLEMENT
- In relation to adjoining paving, kerbs or hard surfaces: As drawing .
  - In relation to dpc of adjoining buildings: Not less than As drawing .
  - In relation to adjacent grass areas: As drawing .
  - 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:  $\pm 75$  mm.
    - From line between boning rods 30 m apart:  $\pm 25$  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.
- 805 APPLYING SOIL AMELIORANT FOR ROOF TERRACE PLANTING
- Type: Organic materials.
  - Locations: All planting areas.
  - Fully incorporate into topsoil to a depth of 100 mm.
  - Application: Spread evenly.
    - Timing: Apply prior to cultivation.
    - Rate: To suit soil report recommendations.
  - Timing: Prior to cultivation.
  - Other requirements: Submit details of recent chemical and physical analysis before ordering.
- 810A APPLYING COMPOST FOR GREEN ROOFS and CONTAINER
- Application rate for trees and shrubs: 50 mm thick.
    - Timing: Apply prior to cultivation.
  - - Timing: Apply prior to cultivation.
  - Application rate for planters: 25 mm thick layer.
    - Timing: Apply prior to cultivation.
  - Other requirements: Submit details of recent chemical and physical analysis before ordering.
- 820 APPLYING GENERAL FERTILIZER FOR ROOF TERRACE PLANTING
- Application: Spread evenly, carefully incorporating below mulch materials.
    - Timing: Immediately before cultivation.
    - Application rate: at manufacturers recommended rates.
    - Other requirements: can be incorporated as part of a pit planting process. .
- 840 APPLYING MYCORRHIZAL INOCULANT TO ALL TREES, SPECIMIN SHRUBS (OVER 3L) AND HEDGING PLANTS .
- Depth: To manufacturer's/ supplier's recommendations.

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845 APPLYING LOOSE MULCH FOR ROOR TERRACE PLANTING

- Timing: Immediately after planting.
- Preparation: Ensure that soil is thoroughly moistened, applying water where necessary and clear all weeds.
- Coverage of mulch (minimum):
  - Planting beds (depth): 25 mm depth.
  - Trees: 25 mm depth.
  - Container planting: 25 mm depth.
- Finished level of mulch: min 50 mm below planter edge.

**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): 25 mm.
- Trees: Remulch.
  - Depth (minimum): 25 mm.
- Container planting: Remulch.
  - Depth (minimum): 25 mm.



## 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: Remove existing vegetation not to be retained and planting areas where weed growth has occurred before planting .
- Large roots: Grub up and dispose of without undue disturbance of soil and adjacent areas.
- Additional requirements: Remove street furniture and or paving/hard landscape elements no longer required.: ensure all planting and seeding areas are completely clear of weeds and other debris. All existing trees and shrubby vegetation to be retained undamaged, unless otherwise specified or instructed. Remove from planting areas any obstructions, including lime-stabilised earth, over-sized foundations or haunching, granular fill, and obsolete foundations, manholes, drains etc, and plug the ends of disused and undisturbed pipes. All contaminated earth recorded, unrecorded or as a result of earthworks, cultivation and ground preparation shall be removed from site. Ensure that the geotextile membranes in areas of contamination is retained, repaired or replaced as necessary to maintain the existing protective layer .

#### 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.

#### 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 favourable.
  - 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.

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- 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: One week.
- 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.
    - External container planting: Container planting growing media system, as section Q28.
    - Mulch applied after planting: Mulching and top dressing system, as section Q28.
- 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 relevant parts of BS 3936.
  - 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.

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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: Country of origin and Date supplied and consignment details or reference.

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.

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## 265A 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.
- Plants must not be lifted from the nursery until the site is ready for planting. Care must be taken to prevent drying out of roots, or heating up of bundles. Container grown plants are to remain in their pots and are to be kept in sheltered groups, out of drying winds until they are planted. If left unplanted overnight, they are to be protected from frost. Container grown and root-balled trees and shrubs to be kept moist at all times, to be watered, if necessary, immediately upon arrival on site, and always 1-4 hours before planting. Bare root material is to be heeled in immediately on arrival on site, in properly prepared trenches. Bundles are to be separated out and clearly labelled if the heeling in period is prolonged. All plants are to be carried in waterproof bags in order to keep their roots moist, and are to be removed one at a time. If roots appear unduly dry they shall be soaked in water.
- Plant packaging: Coextruded polyethylene bags with black interior and white exterior.
- Packaging of bulk quantities: Pallets or bins sealed with polyethylene and wrapped to protect from damage and drying out ..
- 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.

**PREPARATION OF PLANTING BEDS/ PLANTING MATERIALS**

## 300A HERBICIDE TO CLEAR EXISTING VEGETATION

- Locations: All planting areas.
- Type: Perennial weeds and weed growth that has developed on prepared planting beds shall be sprayed off with a translocated herbicide, suitable for suppressing perennial weeds prior to planting following manufacturer's guidelines.
- Timing: Allow fallow period before cultivation.
  - Duration (minimum): Three weeks.

## 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 and hoeing.

**PLANTING SHRUBS/ HERBACEOUS PLANTS/ BULBS**

## 400 RANDOM PLANT LAYOUT TO ALL BEDS

- Spacing: Evenly, avoiding straight lines (Except where indicated on drawings). Plant mixes: plants to be grouped in 2s and 3s of the same plant to create naturalistic groupings. Shrub and Herbaceous planting shall be distributed evenly over the areas indicated on the drawings at the centres indicated in the schedules, but not within 300mm radius of a tree trunk. (With the exception of herbaceous and ground cover species)..
- Density: As plant schedule.

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- 401 REGULAR PLANT LAYOUT HEDGES
  - Spacing: In regular, staggered rows.
  - 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 soil ameliorant/ conditioner at manufacturer's recommended rate.
  
- 415 ANTIDESICCANT FOR CONIFERS/ EVERGREENS
  - Manufacturer: Submit proposals.
    - Product reference: Submit proposals.
  - Application: Dip before delivering to site. Spray soon after planting.
    - Do not apply in wet or frosty weather.
    - Ensure full coverage of underside of foliage.
  
- 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.
  
- 470 FORMAL HEDGES
  - Shrubs for hedges: Consistent in species, cultivar and clone to ensure a uniform hedge.
  - Planting: In trenches large enough to take full spread of roots. Set out plants evenly.
  
- 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, with suitable mulch for site conditions; Lightweight expanded clay aggregate as Q28 .
    - Depth: 25 mm.

**PLANTING TREES**

- 500 TREE PLANTING
  - Standard: Prepare trees and transplant in accordance with BS 4428.
  
- 502 ANTIDESICCANT FOR CONIFERS/ EVERGREENS
  - Manufacturer: Submit proposals.
    - Product reference: Submit proposals.
  - Application: Dip or thoroughly spray before delivering to site. Spray again soon after planting.
    - Do not apply in wet or frosty weather.
    - Ensure full coverage of underside of foliage.

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512A TREE PLANTING IRRIGATION AND VENTILATION ACCESSORIES

- Locations: As drawings.
- Manufacturer: GreenBlue, 0800 018 7797 enquiries@greenblueurban.com .
  - Product reference: RRURBIA.
- Type: RootRain Urban.
- Pipe diameter: 60 mm..
- Ring diameter: As drawing and to suit tree size.
- Inlet: Black plastics, with cap.
- 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 TO ROOF TERRACES.

- Manufacturer: Platipus Anchors Limited.
  - Product reference: D-MAN Structural System Plati-Mat.
- Anchoring system: 9 no. D-Man cells (75cm x 75cm x 7.5cm) at base of planter beneath root ball, backfilled with soil medium, rootball anchored to D-man cells by 3 no. wire disc anchor points.
- Installation: Ensure tree is positioned correctly and vertically prior to tightening guy line tensioners.

576 TREE PIT SURFACING - LOOSE FILL

- Surfacing material: Mulch, as section Q28.
- Area: Full extent of tree pit surface.
- Depth: 25 mm.
- Watering: Water soil thoroughly before laying.
- Installation: Ensure the base of the tree stem is kept free from loose filled material.

605 EXISTING VEGETATION/ WEED CLEARANCE

- Surface vegetation clearance: all planting, areas are to be completely clear of weeds and other debris. All existing trees and shrubby vegetation to be retained undamaged, unless otherwise specified or instructed. Planting areas currently supporting grass or weed growth are either:
  - a) to be sprayed with translocated herbicide a minimum of 3 weeks prior to ground preparation and planting, or
  - b) to have vegetation complete with roots mechanically removed and composted .
- Arisings: Remove.

625 CULTIVATION

- General: cultivate by hand or using a suitable machine for the location and soil depth, to full depth of topsoil.
- Consolidation: Leave for a suitable period to allow for settlement.
- Soil within root spread of trees to be retained: Do not plough or cultivate.

## **PROTECTING/ MAINTAINING/ MAKING GOOD DEFECTS**

### 710 MAINTENANCE

- Duration: Carry out the operations in the following clauses from completion of planting until the end of the rectification period.
- Frequency of maintenance visits: Fortnightly during growing season and in accordance with an agreed maintenance schedule. A Record of Maintenance sheet is to be completed following each visit giving a summary of work executed. These are to be presented to the MC within 10 days of each visit.

### 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 hand pulling or other approved method. Herbicides may not be used post building occupation, unless with written consent of the MC/client. .
- 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: Fortnightly during growing season and in accordance with an agreed maintenance schedule.
- Watering: As required for healthy establishment, depending on weather conditions.

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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 details of any special procedures to be carried out.

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): 25 mm.
- Trees: Remulch.  
Depth (minimum): 25 mm.



## Q37 Green roofs

### To be read with Preliminaries/General conditions

#### GENERAL

- 110 INTENSIVE GREEN ROOF Roof Terraces and Balconies to Levels 1,2,3,4 & 6
- Roof type: As drawings and refer to architects & engineer's details.
    - Substrate: In situ concrete slab .
    - Slope: Flat generally with some areas of slope formed by tapered insulation.
  - Waterproofing: As drawing and refer to architects & engineer's details.
  - Thermal insulation: As drawing and refer to architects & engineer's details.
  - Protection: Combined layers by Bauder.
  - Moisture control layers: Drainage layers by Bauder as shown on drawings.
  - Growing medium: Topsoil as section Q28.
    - Depth: As drawing and varies.
  - Vegetation: Planting as section Q31.
  - Accessories: Edge retaining profile, drainage layers, filter membranes, irrigation system and tree guying.
- 140A PAVING AND DECKING SYSTEMS Refer to Architects Specification
- Type: Porcelain paving.
  - Paving support: Pedestals.

#### PERFORMANCE

- 210 GENERAL DESIGN
- Green roof and associated features: Complete the detailed design.
  - Proposals: Submit drawings, technical information, calculations and manufacturers' literature.
  - Performance criteria: waterproof integrity, thermal movement and life expectancy to be maintained and equal to the main roof terraces, irrigation to establish and maintain successful growth and establishment of plant species .
- 255 MAXIMUM PERMITTED GREEN ROOF LOADS
- Dead loads:
    - Green roof layers: As loading schedule, refer to engineer's details.
  - Imposed loads:
    - Activity: As loading schedule.
    - Vegetation: As loading schedule.
    - Allowance for additional loads during construction: As loading schedule.
  - Service loads: As loading schedule.
  - Requirement: Restrict site activities to ensure that design loads are not exceeded, or submit proposals for temporary supports.

#### PRODUCTS

- 310A INVERTED ROOF INSULATION Refer to Architect's details and specification
- 320 ROOT BARRIER Roof Terraces
- Manufacturer: Refer to architects detail and submit proposals .
    - Product reference: Refer to architects detail and submit proposals .
  - Material: Refer to architects detail and submit proposals .
    - Thickness: Refer to architects detail and submit proposals .

Roof Terraces Specification

- 325 SLIP LAYER Roof Terraces
- Manufacturer: Refer to architects detail and submit proposals.
    - Product reference: Refer to architects detail and submit proposals.
  - Material: Two layers polyethylene sheet
    - Thickness of each layer: Refer to architects detail and submit proposals.
- 330 PROTECTION LAYER Roof Terraces
- Manufacturer: Refer to architects detail and submit proposals .
    - Product reference: Refer to architects detail and submit proposals .
  - Material: Refer to architects detail and submit proposals .
    - Thickness: Refer to architects detail and submit proposals .
- 335 SEPARATION LAYER Roof Terraces
- Manufacturer: Refer to architects detail and submit proposals .
    - Product reference: Refer to architects detail and submit proposals .
  - Material: Refer to architects detail and submit proposals .
    - Thickness: Refer to architects detail and submit proposals .
- 355 COMBINED LAYERS To all Roof terrace planters
- Manufacturer: Bauder .
    - Product reference: DSE40 & DSE20, refer to details.
  - Type: Drainage, protection and reservoir.
  - Material: Polyethylene.
    - Depth: 40mm & 20mm.
  - Other requirements: refer to manufacturer's recommendations.
- 360 FILTER MEMBRANE To all Roof terrace planters
- Manufacturer: Bauder .
    - Product reference: Polypropylene filter fleece .
  - Material: Woven polypropylene fabric .
    - Mass: 125/m2 .
- 420 EDGE RETAINING PROFILE Raised Planters to Roof Terraces
- Manufacturer: Kinley  
Web: [www.kinley.co.uk](http://www.kinley.co.uk)  
Email: [sales@kinley.co.uk](mailto:sales@kinley.co.uk)  
Tel: +44 (0)1580 830688  
Address: Northpoint, Compass Park, Staplecross, East Sussex, TN32 5BSBS .
    - Product reference: Perimeta Planterline Bespoke custom-sized steel planters .
  - Material: Galvanised steel 3mm and polyester powder coated finish, colour to match architectural metalwork. .
  - Height: As drawing, height varies .
- 440 VEGETATION BARRIER Where planting abuts building structures; wall, parapet etc., refer to drawings for location
- Material: 20-40 mm round washed pebbles .
  - Depth: 40mm or as shown on drawings .
  - Width: varies, refer to drawings .
- 450 ROOF DRAINAGE OUTLETS For roof terraces
- Manufacturer: refer to engineer's details.
    - Product reference: refer to engineer's details.
  - Material: refer to engineer's details.
  - Size: refer to engineer's details.
  - Fixing: refer to engineer's details.

Roof Terraces Specification

- 460 SUPPORT PEDESTALS For roof terrace paving, refer to Architects specification & detail.
- Manufacturer: to architects details.
    - Product reference: to architects details.
  - Type: to architects details.
  - Material: to architects details.
  - Dimensions: to architects details.
  - Additional pedestals: to architects details.
  - Accessories: to architects details.

**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.

740 ROOT BARRIER INSTALLATION

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

750 PROTECTION LAYER INSTALLATION

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

755 SEPARATION LAYER INSTALLATION

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

770A COMBINED LAYER (DRAINAGE, PROTECTION & RESERVOIR) INSTALLATION

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

780 FILTER MEMBRANE INSTALLATION

- Joints: Minimize.
  - Overlaps (minimum): 150 mm .
- Fitting: Manufacturer's recommendation .
- Upstands: Extend to top of growing medium.

Roof Terraces Specification

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 .

**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 .

## S14 Irrigation

To be read with Preliminaries/ General conditions.

### GENERAL

- 110 IRRIGATION SYSTEM For roof terrace planters
- Source: Mains water supply.
  - Water meters: Not required.
  - Backflow prevention device: Required.
  - Water storage tanks: Not required.
  - Pumps: Not required.
  - Pipelines: Polyethylene.
    - Insulation: Contractor's choice.
  - Draw-off taps/ valves: Draw off tap for above ground use.
  - Filters: Contractor's choice.
  - Outlets: Porous pipe system.
  - Electrical supply: N/A Battery powered control system.
  - Accessories:
    - Controllers ;
    - Electronic timer ; and
    - Equipment enclosure .

### PERFORMANCE

- 210A DESIGN AND DETAILING
- Requirement: Complete the design of the irrigation system.
  - Proposals: Submit drawings (showing equipment positions and pipeline routes), technical information, calculations and manufacturer's literature.
  - General: Design the irrigation systems to comply with the relevant parts of BS 7562, BS 8558, BS EN 805, BS EN 806-2, -3 and -5 and BS EN 12484-4, and in accordance with HSE publication 'The control of legionella bacteria in water systems. Approved code of practice and guidance', water supply regulations and the requirements of the water supply undertaker.  
Performance: Provide suitable irrigation system to establish and maintain healthy plant growth to roof terrace planting e.g. as supplied / recommended by Access Irrigation
- 220 PIPELINE DESIGN
- Sizes: Calculate to suit probable simultaneous demand for the entire system and to ensure:
    - Flow rates (minimum): Contractor's choice.
    - Suitable discharge rates at distribution points.

### PRODUCTS

- 310 DEZINCIFICATION
- Fittings, pipelines and equipment located below ground or in concealed or inaccessible locations: Gunmetal or other material resistant to dezincification.
- 325 BACKFLOW PREVENTION DEVICES To irrigation system
- Standard: To BS EN 13959, type EC or ED.
  - Type: Contractor's choice.
  - Manufacturer: Contractor's choice.
    - Product reference: Contractor's choice.
  - Fluid Category: 5.

Roof Terraces Specification

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.

422 POROUS PIPE SYSTEMS

- Manufacturer: Permadrip Pro or similar agreed.
  - Product reference: Contractor's choice.
- Pipe size: Contractor's choice.
- Depth: Surface.
- Operating pressure: Contractor's choice.
- Discharge: Contractor's choice.
- Accessories: Contractor's choice.

450 CONTROLLERS

- Type: Fully automatic with rain and moisture sensors.
- Manufacturer: Hunter.
  - Product reference: Node BT.
- Power: Battery operated.
- Features:
  - Automatic operation with manual override;
  - Lockable, weather resistant case; and
  - Moisture sensor .

460 EQUIPMENT ENCLOSURE FOR IRRIGATION SYSTEM CONTROLLERS

- Manufacturer: Carson or similar agreed.
  - Product reference: Small box series 1419 or similar agreed.
- Type: External.
- Material: Mixed.
- Colour: Submit proposals.
- Classification: IP44 (minimum).
- Features: Concealed within planter, 1 no. controller per terrace, location to be agreed with Landscape Architect.

## **EXECUTION**

### 610 INSTALLATION GENERALLY

- Standard: In accordance with the relevant parts of 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.

### 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.

## **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.

### 912 FLUSHING AND DISINFECTION

- Standard: To BS EN 805, section 12.

Roof Terraces Specification

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: as required.

940 OPERATING TOOLS

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