Q10 Kerbs/ edgings/ channels/ paving accessories

To be read with Preliminaries/General conditions.

TYPES OF KERBS/EDGINGS/CHANNELS

180 DRAINAGE CHANNEL SYSTEMS WITH GRATINGS
- Manufacturer: ACO.
  - Product reference: HexDrain Brickslot.
- Size: 1000 (L) x 125 (W) x 140 (D).
- Type of fall: Integral continuous fall.
- Finish: Standard.
- Colour: Black.
- Accessories:
  - Casting in anchors;
  - Endcaps - closing pieces; and
  - Endcaps - outlets.
- Bedding: Proprietary.
- Joints generally: Drain unions as required.
- Cover gratings: Galvanized steel, slotted.
  - Fixings: Friction clips.
  - Loading grade to BS EN 124: A15.
  - Finish/ Colour: Black.

180A DRAINAGE CHANNEL SYSTEMS WITH GRATINGS
- Manufacturer: ACO.
  - Product reference: RainDrain.
- Size: 1000 (L) x 118 (W) x 97 (D).
- Type of fall: Integral continuous fall.
- Finish: Standard.
- Colour: Natural.
- Accessories:
  - Casting in anchors;
  - Endcaps - closing pieces; and
  - Endcaps - outlets.
- Bedding: Proprietary.
- Joints generally: Drain unions as required.
- Cover gratings: Galvanized steel, slotted.
  - Fixings: Friction clips.
  - Loading grade to BS EN 124: A15.
  - Finish/ Colour: Black.

LAYING

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

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

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

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

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

Q31
External planting

Q31 External planting

To be read with Preliminaries/ General conditions.

GENERAL INFORMATION/ REQUIREMENTS

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.

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 working days.

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: As plant schedule.
  - 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.

216 PLANTS/ TREES - SPECIFICATION CRITERIA
- Name, forms, dimensions and other criteria: To the relevant part of BS 3936.

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.

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 HTA '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: Black polyethylene bags.
- 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.

292 PREFABRICATED PLANT CONTAINERS
- Manufacturer: Contractor's choice.
  - Product reference: Contractor's choice.
- Material: Folded & Welded Aluminium Sheet Fabrication Drawings for comment.
- Dimensions/ shape: As Drawn.
- Lining: Bauder DSE60 – 60mm drainage / water storage panel. Installation as clause Q37/770I..
- Accessories: None.

PREPARATION OF PLANTING BEDS/ PLANTING MATERIALS

300 TREE TO PLANTER
Mature Amelanchier Lamarckii Tree

PLANTING TREES

505 TREE PITS
- Sizes: As drawing 1133-CT-GA-600.
- Sloping ground: Maintain horizontal bases and vertical sides with no less than minimum depth throughout.
- Pit bottoms: With slightly raised centre. Break up to a depth of Bauder DSE60 – 60mm drainage / water storage panel. Installation as clause 770I..
  - Treatment: As drawing1133-CT-GA-600.
- Pit sides: Scarify.
- Backfilling material: Tree backfilling material.
- Accessories: Root barrier.

PROTECTING/ MAINTAINING/ MAKING GOOD DEFECTS

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.

Q37
Green roofs

Q37 Green roofs

To be read with Preliminaries/General conditions

GENERAL

110A INTENSIVE GREEN ROOF Terrace

- Roof type: Cold.
- Substrate: Concrete

Slope: Level
Waterproofing System: BAUDER TOTAL GREEN ROOF SYSTEM – J41-130B
Slip Layer: Bauder PE Foil (loose laid) rolled out in two layers, with sheets staggered . Installation as clause 745.
Protection/drainage layer: Bauder FSM1100 - 8mm protection fleece. Installation as clause 750C.
Water storage/drainage layer: Bauder DSE60 – 60mm drainage / water storage panel. Installation as clause 770I.
Board fill: Bauder Mineral Drain granular fill. Installation as clause 775A.
Filter membrane:N/A
Growing medium:N/A
Landscaping depth: TBC
Planting: N/A
Surfacing:
2-5mm crushed and washed angular gravel bedding layer. Installation as clause 832A
Concrete paving slabs: Supplied by others to the landscape designers requirements as clause 465, installed on to the specified gravel bedding layer (refer 832A). Installation of the concrete paving as clause 841B.
Accessories: N/A
Additional requirements: 210, 710, 715A, 720, 910, 920, 930.

130A EXTENSIVE GREEN ROOF Conservatory

- Landscaping finish: Pre-cultivated Sedum vegetation blanket

Substrate: New Plywood Deck
Slope: 1°
Waterproofing system: BAUDER TOTAL GREEN ROOF SYSTEM – as per J41-130A
Drainage / protection layer: Bauder SDF Mat - 20mm drainage / protection layer. Installation as clause 770B.
Vegetation blanket: Bauder Xero Flor XF301 sedum blanket, applied in standard length rolls 2m x 1 m. Installation as clause 800B
Landscaping depth: ca. 48 mm (excluding vegetation).
Vegetation: Mainly Sedum with some moss and grasses.
Accessories: -
Bauder AL40 Sedum blanket edge trim, fitted around all perimeters and protrusions. Installation as clause 820A.
Bauder ALU 250 Inspection chambers, to be installed over all internal rainwater outlets within soft landscaping areas. The lid of the chamber must be level with, or higher than the surrounding landscaping. For landscaping exceeding 100mm, additional height adapter units (available in 50mm or 100mm depths) must be used to achieve the required chamber depth, with the chamber lid being at least level with the surrounding landscaping or higher. Installation as clause 830.

- Bauder Xero Flor organic fertiliser, apply as clause 850A.

Additional requirements: As clauses 210, 710, 715A, 720, 910, 915A, 916, 920, 930.

PERFORMANCE

210A GENERAL DESIGN
- Green roof and associated features: Complete the detailed design.
  Proposals: Submit drawings, technical information, calculations and manufacturers literature.

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.

715A GREEN ROOF RELATED REQUIREMENTS

The following are vital to the accurate pricing, correct installation, and ultimately the long-term life of a green roof, and must, therefore, be included within the specification and tender documents: -

Loadings: It is assumed that the architect or his advisors have satisfied themselves that the roof structure and deck are suitable to receive the dead load of the proposed green roof system and landscape both during construction and on completion of the works.

Additional protection: A planned or contractual delay between the installation of the waterproofing and landscape will almost certainly necessitate additional/increased protection to the waterproofing. This protection may be temporary or permanent. The responsibility and cost of this possible extra protection should be clearly included within the tender documents.

Detailed drawings: Correct detailing design and construction is essential to the long-term life of the green roof. It is essential, therefore, that detail drawings illustrating for the construction are included with the tender documents, in order to enable the contractor to tender accurately.

Minimum upstand height requirements: The waterproofing should be taken up all abutment upstands, pipes, detailing protrusions etc. a minimum of 150mm above finished landscape surface level to comply with British Standards and current code of practice BS8217:2005.

Provision for living products in hot weather conditions: During hot weather conditions, living products such as plants, turf, sedum blankets etc. must be laid on the day of delivery to site. With regard to sedum blankets or turf, any rolls not installed should be laid out and kept watered prior to final installation.

Watering / Irrigation: Adequate provision for watering the installed any form of planting must be in place on site before the product is installed. Irrigation systems if fitted should be operational. Initial watering should be by surface sprinklers to water in the fertiliser, where this is specified. All watering should be carried out in strict accordance with the Bauder watering requirements and guidance document.

Final Inspection: No landscaping work should be installed until Bauder have carried out a final inspection to the waterproofing and have passed this as suitable for guarantee. It is the responsibility of the roofing contractor to advise and organise this inspection with Bauder. We cannot guarantee any waterproofing that has been landscaped without this inspection having been carried out and passed as acceptable.

Damage risk form other trades: No landscaping should be installed while the roof area is subject to other site traffic. Bauder will carry out an inspection of the completed roof 4-6 weeks following installation and any site related damage by others will be reported to the client. Bauder accept no responsibility whatsoever for damage to the product or the installation caused by site work carried out by others after the landscaping has been installed.

First year maintenance: The contractor must price into his tender the cost of post installation maintenance for a minimum period of 1 year to ensure the handover of a flourishing green roof.

720 ADVERSE WEATHER

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

745 SLIP LAYER INSTALLATION
Installation: to be rolled out loose over the root resistant layer as specified (one layer for Extensive landscaping and two layers for Intensive landscaping).
This product is only required for roofs with a fall between 0-3º (A slip layer is not necessary or advisable for slopes above 3º).
Joints: Minimize.
Overlaps (minimum): All laps to be 150mm with care being taken to ensure that roll sides join between layers.
Upstands: Extend to top of growing medium. Sufficient foil must be allowed for to enable it to be taken up all upstand and edge details prior to installation of the protection layer.

745C PROTECTION LAYER INSTALLATION
Installation: Protection fleece rolled out and laid loose. Laps to be sealed by lightly heating overlap area with a propane gas torch to melt the polypropylene fibres and then press seal the two fleece sheets together.
Joints: Minimize.
Overlaps (minimum): Laps to be 150mm
Upstands: Sufficient protection fleece must be allowed for so that it may be installed to all abutment upstands and edge details, in accordance with the manufacturer's instructions. Extend to full height of the upstand and secure in place by using a lead or fabricated metal counter-flashing.
Openings in landscape restraint kerbs: Where these kerbs are present (roof slopes above 5º), the protection layer should be cut away from the openings/ gaps to avoid impeding drainage.

770B DRAINAGE LAYER INSTALLATION
- Extent: Continuous over designated roof area

Fitting: Loose laid over the waterproofing and butt jointed with 100mm fleece overlap
Upstands: Carefully cut to fit closely around penetrations and outlets.

770C DRAINAGE / WATER STORAGE LAYER INSTALLATION
Extent: Continuous over entire designated roof area.
Fitting: Loose laid over the protection layer. Boards are to be tightly overlapped at the edges and staggered.
Upstands: Fit closely around penetrations and outlets.
Construction of planter walls: The drainage/water storage board provides a suitable base surface for building concrete or brick kerbs/walls. The specified infill haunching should be installed over the board to required depth of cover, poured directly into the cells of board. These should be constructed to provide an adequate support for the raised masonry planters
For the specification of the type of infill and all kerb/wall construction elements – please refer to the structural engineer's plans and the specification. An internal surface of the planter wall may be primed using bituminous primer and then lined with single layer of torch applied root resistant Bauder Plant-E. The bright green slate finish may be considered undesirable, but the slate is necessary for long-term UV protection of the bitumen. To disguise and blacken the slate colour, paint exposed areas above anticipated soil level with a light coat of bituminous primer.

775A GRANULAR FILL
Extent: Continuous over designated roof area.
Installation: Applied directly to the water storage/ drainage board, filling the cellular troughs to a level flush with the upper crowns of the board and eliminating any hollows. Allowance should be made for any settlement that may occur.
In soft landscaped situations where a vegetation barrier is to be installed (inspection chambers at outlet positions, perimeters, roof penetrations etc.), the granular fill should be stopped 500mm short of the abutment and substituted with the 20/40mm round washed pebbles used to create the vegetation barrier (see standard detail drawings).
Depending on size and access of the project, the specified granular fill can be supplied by the manufacturer by various methods i.e. big bags, Tipper truck or via a silo lorry pumping directly onto the roof area.
Prior to costing this element of the installation the 'Approved Contractor' should contact Bauder Ltd so that they may help to advice on the best solution, specific to any contract.

800B VEGETATION BLANKET INSTALLATION
- Handling blankets:

Timing: Lay within 36 hours of lifting from growing position.
Method: laid manually – two-man operation
Excessive stacking: Not permitted.
Material loss (maximum): 3% of total surface area.
Growing medium condition: Thoroughly watered
Laying blankets:
Dry, damaged, frosty or waterlogged blankets: Do not lay.
Orientation: Diagonal or perpendicular to slope of roof.
Joints: Stagger. Butt together or slightly overlap to prevent gaps. Do not stretch blankets. All excess vegetation should be removed from the overlap and the opposite leading edge of the blanket to ensure that the joints butt together tightly (as per the Bauder installation guideline).
Edges: Finish with whole blankets.
Consolidation: N/A
Dressing: Bauder Xero Flor substrate.
Application: Brush in to fill joints.
Watering: Thorough, immediately after laying and dressing.
Roll size: 2m x 1m

820A EDGE RETAINING PROFILE INSTALLATION
- Cutting: Neat, accurate and without spalling.

Junctions: use pre-formed 90º corners where required and connector pieces
Position: True to line and level. Smooth continuous lines.
Fixing: The AL40 Sedum blanket edge trim is to be secured in place by separate pieces of torch applied Bauder Plant-E capping sheet cut into strips 1000mm x 200mm, these bituminous flashings should be torched through the holes in the trim to the waterproofing surface and set at intervals of 400mm between each one metre long flashing piece, bonding onto the main capping sheet by a minimum 100mm.
Precautionary note: when cutting metal, please ensure that appropriate tools and personal protection equipment are used.

830A INSPECTION CHAMBER INSTALLATION

- Location: Install centrally over rainwater outlets.
  Orientation: Align parallel with adjacent features.
  Surround: Using 20/40mm grade washed pebbles; the inspection chamber must be surrounded by a 500mm vegetation barrier surround to prevent unwanted growth obstructing the drainage system.
  Positioning: Never place directly on the waterproofing membrane – see options below-
  Intensive / extensive soft landscaping: Placed directly on to the drainage / water storage layer.
  Inverted roof with pebble ballast: Placed directly on the vapour permeable membrane or filter layer.
  Decorative aggregate finishes: Placed directly on the protection layer or vapour permeable membrane / filter layer
  Important Note: Ensure that a suitably sized hole has been cut out of the underlying drainage board / protection layer to allow water to flow freely into the outlet.
  Chamber Height: The contractor should also allow for the installation of additional Bauder height adapter units as required, in order to bring the inspection chamber up to at least the height of the surrounding landscaping. These are available in either 50mm or 100mm units.
  Box gutters and gullies: Where a box gutter is to be constructed, provision should be made to accommodate the 250mm diameter of the inspection chamber. The front support leg of the chamber will need to be removed (see installation guide) for the unit to fit inside a box gutter /gully. We recommend that all box gutters are constructed to a minimum finished width of 500mm to ensure that the support feet of the inspection chamber sufficiently clears the angle fillets within the gutter sole and leaves space to dress the pebble vegetation barrier around the main body of the chamber.
  Precautionary note: When cutting metal, please ensure that appropriate tools and personal protection equipment are used.

832A BEDDING LAYER

Extent: To designated areas beneath permeable paving – See landscape designer's plan.
Installation: Apply evenly over to provide a level finish. Depth to be a minimum of 30mm, but not exceeding 50mm. Provision should be made for containing the bedding layer at all abutments to ensure that loose gravel particles do not drop into the area beneath the drainage layer, where they may wash into the outlets i.e. use perforated aluminium retention angles or abutment kerbs.
Perimeter edge and abutment restraint: It is important that provision is made to support and retain the mineral drain fill and aggregate bedding layer within the construction at abutments, by adopting one or both of the following methods (dependent upon the nature of the construction)&
1. Concrete kerb bedded in concrete off of the drainage board layer, or perforated stainless steel or aluminium angle bolted together and inserted below the drainage layer.
2. Angles made from aluminium should be 1.5 –2.5mm or stainless steel 1 - 1.5mm thickness should be used. The opposite side of the angle should be supported by a 20/40mm pebble vegetation barrier of approximately the same depth as the landscape construction.

841B LAYING BRICK PAVING
Extent: To designated areas – See landscape designers plan.
Paving installation: Slabs to be laid on to the specified bedding layer, installed as specified by the architect / landscape designer and strictly in accordance with their specific recommendations regarding the layout in keeping with the landscape design.
Setting out: Minimize cutting.
Joints: Left open for drainage. The size of the joints to be in accordance with the clients requirements. These open joints may be controlled by using either proprietary spacers or using suitable strips of cut tile of the correct thickness or similar, to control the gap size.
- Width: 8mm.
- Perimeter upstands: 8mm.

Completion: Bricks must be level and stable.

COMPLETION

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

915A ESTABLI ISHMENT WATERING REQUIREMENTS – XF301 SEDUM BLANKETS ONLY
It is the responsibility of the roofing contractor to liaise with the main contractor/ building owner to provide water to ensure that the vegetation mat does not dry out within the first month.
An adequate mains supply of sufficient pressure must be available and operational prior to the sedum blanket being delivered and installed. Irrigation systems (where fitted on roof slopes above 10 degrees) must be operational, but initial watering in of the fertiliser must be by surface mounted sprinklers.
See the Bauder Watering Guide document for detailed information on watering requirements.
Bauder Ltd accepts no responsibilities whatsoever for the condition of installed sedum blankets that are not properly watered in accordance with our recommendations.

916 POST INSTALLATION MAINTENANCE
The installing contractor should price into the tender, the cost of carrying out post-installation maintenance for a contract period to be agreed with the client's representative.
Following completion of the landscaping installation and handover, the responsibility for future on-going maintenance of the green roof planting becomes the responsibility of the building owner or the Main Contractor, where this element forms part of the contract.
Maintenance services: Bauder Ltd offers a professional maintenance service using experienced green roof technicians and would be pleased to provide an estimate for carrying out on-going maintenance. Please contact our green roof maintenance team on Tel: 01473 257671. Alternatively, the work can be contracted to experienced landscape contractors of your choice.
Scope of maintenance procedure: as per manufacturer's recommendations.

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: as required by client. .