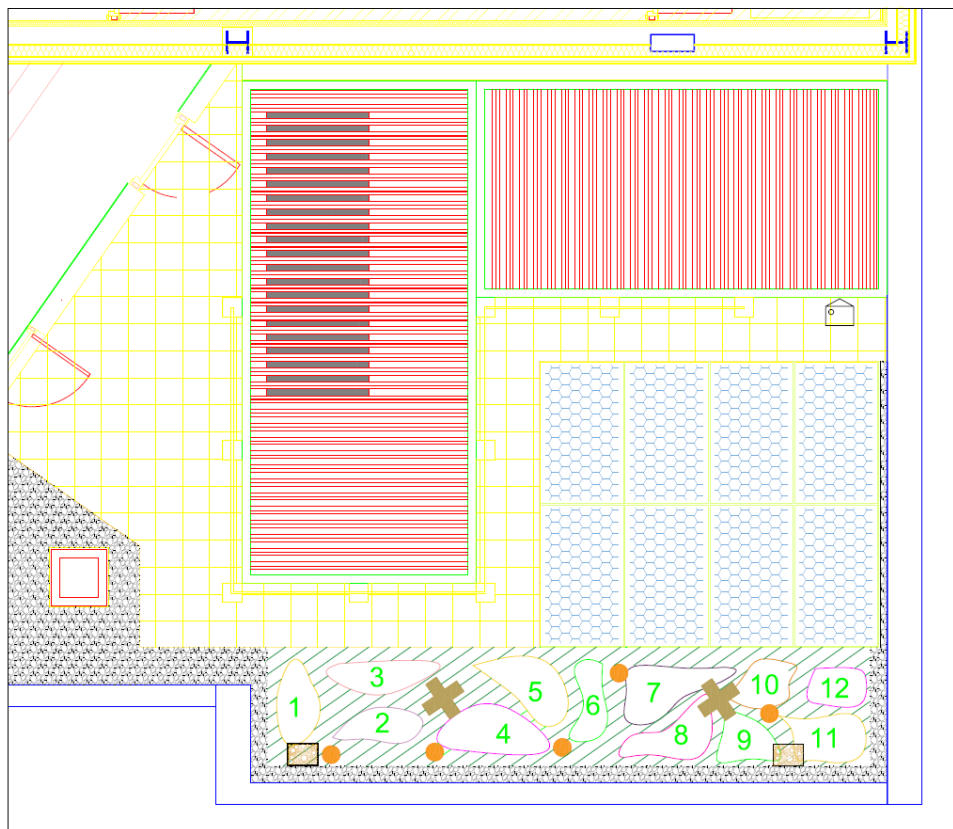


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Q37 Biodiverse Brown Roof

To be read with Preliminaries/General conditions

GENERAL HYDROBROWN BIODIVERSE BROWN ROOF SYSTEM



	20-40mm Stone ballast	1	Yarrow	7	Wild Marjoram
	0.5sqm areas plug-planted Wild flower, 150mm substrate, Vegetation (2)	2	Ground Yvy	8	Red Campion
	Sedum Species on a 80mm substrate also beneath PV panels, Vegetation (1)	3	Cat's Ear	9	Lady's Bedstraw
	Clean Brick pile, Vegetation (3)	4	Daisy	10	Thrift
	Invertebrate Box, Vegetation (3)	5	Cowslip	11	Birds Foot Trefoil
	Log Pile, Seasoned native hardwood timber, Vegetation (3)	6	Oxeye Daisy	12	Wild Thyme
	Birds nest box, mounted on surface of wall overlooking Biodiverse Roof Height 3m from FFL, Vegetation (3)				

Axter – Brown Roofs (Biodiverse)

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130 BIO-DIVERSE BROWN ROOF COVERING

To be read with Section J31 WILOTEKT-PLUS inverted roof specifications for Brown Roofs.

- Roof type and thermal insulation as J31 as required.
- Moisture control layers: HYDRODRAIN 20
- Filter layer: As per HYDRODRAIN 20
- Growing medium: Axter HYDROBROWN Substrate. Substrate depths to vary between 80–150mm above the HYDRODRAIN 20 or as per architect’s drawings.
 - Depth: 80mm (min.) -150mm (max)
- Vegetation (1): In accordance with ecologists report, Axter pre-grown Mixed Sedum Vegetation Blanket.
 - Product reference: Axter Mixed Sedum vegetation blanket.
- Planting mix: Three sedum varieties are included in the mixture to provide drought tolerance in dry periods.
Installation as clauses 400A & 801A.
- Vegetation (2): In accordance with ecologists report, a range of Axter supplied plug plants to meet the ecological values as required.
 - Product reference: Planting mix (Ecological values):
- Standard: Yarrow, Ground Yvy, Cat’s Ear, Daisy, Cowslip, Oxeye Daisy, Wild Marjoram, Red Campion, Lady’s Bedstraw, Thrift, Birds Foot Trefoil, Wild Thyme
- At a planting rate of 15-20 plugs per square metre
Installation as clauses 400B & 801B.
- Vegetation (3): To be left to self-colonise. Additional plant species can be introduced by applying native Wildflower seed directly to the substrate - see Axter Wildflower hydroseed mix.
Installation as clauses 400C & 801C.
- Bird Nesting: House Sparrows in accordance with Which? HQ Ecology for BREEAM report as per section Provision of Bird Nesting Opportunities (suggested location of bird nest box, mounted on surface of wall overlooking Biodiverse Roof area. Height 3mm from FFL).
Other finishes and additional habitat creation to be in accordance with ecologists report.
- Accessories: Axter RETAIN edge retaining profile.
20 to 40 rounded washed river gravel to all abutments, perimeters and protrusions (Maintain a minimum 500mm wide sterile margin).
Axter rainwater outlet inspection covers.
Maintenance and irrigation strategy designed in accordance with Axter Green Roof maintenance guide and implemented by Axter Ltd maintenance partners.
Watering points must be provided to all Green Roof areas.

Axter – Brown Roofs (Biodiverse)

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140 PAVING AND DECKING SYSTEMS

- Type: As drawing / architects specification.
- Paving support: Axter adjustable paving slab supports.

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PERFORMANCE

210 GENERAL DESIGN

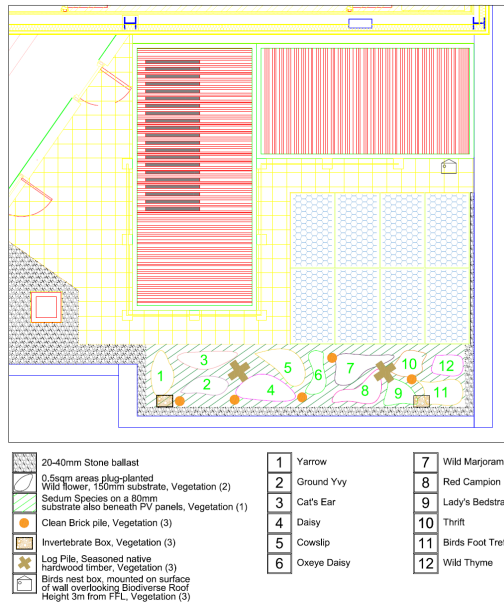
- Biodiverse brown roof and associated features: Complete the detailed design.
- Proposals: Submit drawings, technical information, calculations and manufacturers' literature.
- Performance criteria: as required.

255 MAXIMUM PERMITTED BIODIVERSE ROOF LOADS:

- Dead loads:
 - Biodiverse roof layers: Submit proposals
- Imposed loads:
 - Activity: Submit proposals
 - Vegetation: Submit proposals
 - Allowance for additional loads during construction: Submit proposals
- Service loads: Submit proposals
Requirement: Restrict site activities to ensure that design loads are not exceeded, or submit proposals for temporary supports.

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PRODUCTS

340A MOISTURE CONTROL LAYER To biodiverse roof areas.

- Manufacturer: Axter Ltd.
 - Product reference: HYDRODRAIN 20.
- Material: Recycled HDPE.
 - Capacity: 5.5 litres/m².

390 BIODIVERSE BROWN ROOF GROWING MEDIUM

- Manufacturer: Axter Ltd.
 - Product reference: Axter HYDROBROWN substrate.
- Material: Crushed virgin recycled brick, pumice and organic compost substrate to a depth of approximately 80–150mm graded.
- Ameliorant/ conditioner: As manufactured.
 - Coverage: as required.
- Declaration of analysis: Submit.
 - Parameters: pH value.

400A PRE-GROWN MIXED SEDUM VEGETATION BLANKET - (1)

- Manufacturer: Axter Ltd.
 - Product reference: Axter Mixed Sedum vegetation blanket.
- Planting mix: Three sedum varieties are also included in the mixture to provide drought tolerance in dry periods.

400B PLUG PLANTS - (2)

- Manufacturer: Axter Ltd.
 - Product reference: Axter Plug Plants.
- Planting mix (Ecological values):
 - Standard: Yarrow, Ground Yvy, Cat's Ear, Daisy, Cowslip, Oxeye Daisy, Wild Marjoram, Red Campion, Lady's Bedstraw, Thrift, Birds Foot Trefoil, Wild Thyme
- At a planting rate of 15-20 plugs per square metre

400C WILDFLOWER SEED MIX - (3)

- Manufacturer: Axter Ltd.
 - Product reference: Wildflower seed mix.
- Planting mix: Agrimony, Kidney Vetch, Common Knapweed, Wild basil, Viper's Bugloss, Lady's Bedstraw, Perforate St Johns Wort, Field Scabious, Rough Hawkbit, Oxeye daisy, Common Toadflax, Birdsfoot Trefoil, Musk Mallow, Wild Majoram, Hoary Majoram, Cowslip, Selfheal, Meadow Buttercup, Bulbous Buttercup, Wild Mignonette, Salad Burnet, Bladder Campion

Axter – Brown Roofs (Biodiverse)

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420 EDGE RETAINING PROFILE To exposed edges of greening.

- Manufacturer: Axter Ltd.
 - Product reference: Axter edge profile.
- Material: Aluminium.
- Height: To depth of planting.

430 INSPECTION CHAMBERS To all internal rainwater outlets.

- Manufacturer: Axter Ltd.
 - Product reference: Axter inspection chamber.
- Material: Polyester powder coated steel.
- Size: 300 x 300mm.
 - Depth: To suit planting.
- Access covers: integral into the unit.
- Features: perforated base.

460 SUPPORT PEDESTALS for paving slabs.

- Manufacturer: Axter Ltd.
 - Product reference: Axter adjustable paving slab supports.
- Type: Screw jack pedestal.
- Material: Recycled polypropylene.
- Dimensions: As required.
- Additional pedestals: Adjacent to perimeters.
- Accessories: Not required.

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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.

780 FILTER MEMBRANE INSTALLATION

- Joints: Minimise.
 - Overlaps (minimum): 150mm.
- Fitting: Loose laid.
- 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): 150mm or as determined by the landscaping consultant.
 - Sequence: Gently firm each layer before spreading the next.

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791 BIODIVERSITY DESIGN REQUIREMENTS

- Give notice of 7 days for approval of proposals in line with this clause
- Submit proposals for biodiversity roofs to be seeded with provenance wildflower seed mixes or planted
- Submit proposals for areas that will be left to naturally colonise with indigenous flora and fauna.
- Submit proposals if graded shingle is also be incorporated. These areas can be designed to provide raised mounds within the broad design and should be of varying height.
- They should constitute at least one fifth of any roof area.
- Submit proposals for wooden elements (e.g. dry logs 100mm x 500mm x 1000mm) to provide an important rotting wood ecological niche for rare invertebrates.
- Weight loadings for any surface landscaping items, such as rocks, logs, undulating areas of growing medium and fully established planting /vegetation, making up the biodiversity landscaping are subject to a structural engineer's approval.

801A MIXED SEDUM VEGETATION BLANKET – (1)

- Handling blankets:
 - Timing: Lay within 36 hours of lifting from growing position.
 - 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.
 - Edges: Finish with whole blankets.
 - Consolidation: Firm as laying proceeds to ensure full contact with the growing medium. Do not use rollers.
- Dressing: 2-5mm horticultural grit.
 - Application: Brush in to fill joints.
- Watering: Thorough, immediately after laying and dressing.

801B PLUG PLANT INSTALLATION - (2)

- Sowing rate: 15-20/m²
- Preparation: Growing medium must be free of weeds, have reasonable texture and structure and can retain moisture. A depth of 75-150mm or more is best for supporting the widest range of plant species.
- Sowing: Plugs are best planted in the autumn or spring but can be planted at other times of the year if there is sufficient warmth and moisture. On shallow growing medium, irrigation may be needed to maintain establishment through dry periods.
For further information please contact Axter Ltd.
- Watering: Thorough, immediately after laying and dressing.

Axter – Brown Roofs (Biodiverse)

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801C WILDFLOWER SEED INSTALLATION – (3)

- Sowing rate: 1g/m²
- Preparation
Growing medium must be free of weeds, have reasonable texture and structure and can retain moisture. A depth of 75-150mm or more is best for supporting the widest range of plant species.
- Sowing
Seed is best sown in the autumn or spring but can be sown at other times of the year if there is sufficient warmth and moisture. On shallow growing medium, irrigation may be needed to maintain establishment through dry periods. The seed must be surface sown: do not incorporate or cover the seed. Bulk up the seed with an inert carrier such as sand to make distribution easier.

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: Overlapped by roof coating.

830 INSPECTION CHAMBER INSTALLATION

- Location: Install centrally over drain outlet.
 - Orientation: Align parallel with adjacent features.
- Bedding: Proprietary support base.
- Backfill: Ballast.
- Surround: Growing medium.

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): 3mm.

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COMPLETION

910 INSPECTION

- Timing: Before handover.
 - Give notice (minimum): 3 days.
 - Interim and final roof inspections by Axter Quality Management.
 - Inspections to be completed in accordance with Axter QA Sequence documentation.
 - Inspections should be completed with the Roofing Contractor (Ai) and Main Contractor/Developer/Client representative in attendance.
 - Submit completed reports to Axtershield Installer (Ai) and all relevant parties as agreed at project pre-start.

920 COMPLETION

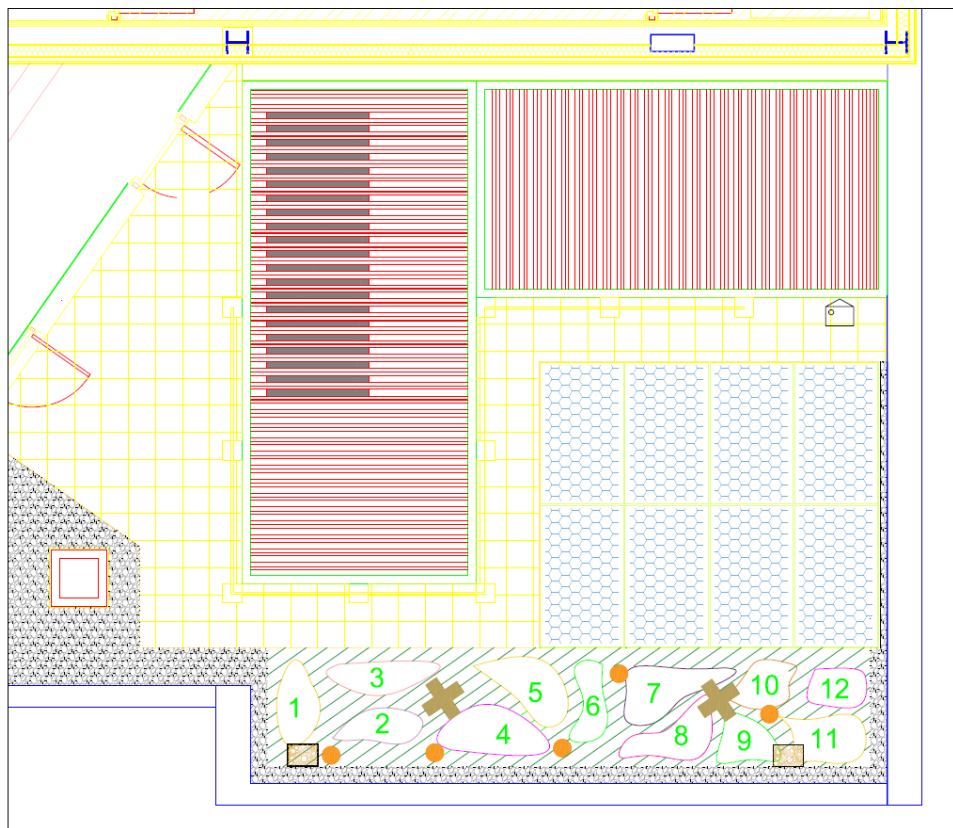
- General: Leave the works in a clean, tidy condition.
- Surfaces: Clean immediately before handover.
- Outlets: Clean and clear of obstructions.
- Completed green roof: Protect from adjacent or high level working.

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.

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	20-40mm Stone ballast		Yarrow		Wild Marjoram
	0.5sqm areas plug-planted Wild flower, 150mm substrate, Vegetation (2)		Ground Yvy		Red Campion
	Sedum Species on a 80mm substrate also beneath PV panels, Vegetation (1)		Cat's Ear		Lady's Bedstraw
	Clean Brick pile, Vegetation (3)		Daisy		Thrift
	Invertebrate Box, Vegetation (3)		Cowslip		Birds Foot Trefoil
	Log Pile, Seasoned native hardwood timber, Vegetation (3)		Oxeye Daisy		Wild Thyme
	Birds nest box, mounted on surface of wall overlooking Biodiverse Roof Height 3m from FFL, Vegetation (3)				

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