

Axter specification reference:	7558-3/90/PW-M – 06th AUGUST 2012 – Q37
Project:	SIDMOUTH STREET, BLOOMSBURY – North and South Block Biodiverse Green Roof Area

Q37 Green roofs

To be read with Preliminaries/General conditions

GENERAL HYDROSOIL EXTENSIVE BIODIVERSE GREEN ROOF SYSTEM

130 EXTENSIVE BIODIVERSE GREEN ROOF To be read with Section J 31 WILOTEKT-PLUS for Green Roofs

- Roof type: Inverted.
 - Substrate: As Section J 31.
 - Slope: As Section J 31.
- Waterproofing: WILOTEKT-PLUS as Section J 31 Clause 130 A.
- Thermal insulation: HYDROSHIELD as Section J 31 Clause 130 A.
- Protection: None.
- Moisture control layers: HYDRODRAIN/12.
- Growing medium: Axter HYDROSOIL Extensive Substrate.
 - Depth: 80mm (Minimum settled depth).
- Vegetation: Biodiverse mixed vegetation mat containing herb, sedum and wildflower species
- Accessories: Axter Retain/120 edge retaining profile
20 to 40 rounded washed river gravel to all perimeters and major protrusions
Axter rainwater outlet inspection covers
Irrigation system (supplied and installed by others) in accordance with requirements.
Maintenance in accordance with Axter Green/Brown roof maintenance guide and completed by Axter Ltd maintenance partners.

140 PAVING AND DECKING SYSTEMS

- Type: As drawing ref. no. _____
- Paving support: Axter paving slab supports.

PERFORMANCE

210 GENERAL DESIGN

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

PRODUCTS

340A MOISTURE CONTROL LAYER To extensive green roof areas.

- Manufacturer: Axter Ltd.
 - Product reference: HYDRODRAIN/12.
- Material: Recycled HDPE.
 - Capacity: 2 litres/m².

Axter – Green Roofs (Hydrosoil Extensive)

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390 EXTENSIVE GROWING MEDIUM To green roof areas

- Manufacturer: Axter Ltd.
 - Product reference: Axter HYDROSIOL extensive substrate.
- Material: As manufactured.
- Ameliorant/ conditioner: As manufactured.
 - Coverage: not required.
- Declaration of analysis: Submit.
 - Parameters: pH value.

400A VEGETATION BLANKET To green roof areas

- Manufacturer: Axter Ltd.
 - Product reference: Biodiverse mixed vegetation mat containing herb, sedum and wildflower species
- Planting mix: As required.
 - Thickness: As manufactured.
- Vegetation coverage (minimum):80%.

420 EDGE RETAINING PROFILE To exposed edges of greening

- Manufacturer: Axter Ltd.
 - Product reference: Axter Retain/120 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 300 mm.
 - 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: Minimize.
 - Overlaps (minimum): 150 mm.
- 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): 150 mm.
 - Sequence: Gently firm each layer before spreading the next.

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800 VEGETATION BLANKET INSTALLATION

- 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: 2-5 mm horticultural grit.
 - Application: Brush in to fill joints.
- Watering: Thorough, immediately after laying and dressing.

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): 3 mm.

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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: as required.

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Axter specification reference:	7558-1/90/PW-M – 06 th AUGUST 2012 – J31
Project:	SIDMOUTH STREET, BLOOMSBURY, LONDON – North and South Block Main Roof & Terrace Area

Axter WILOTEKT-PLUS on concrete deck under green roof

J31 Liquid applied waterproof roof coatings To be read with Preliminaries/General conditions.

TYPES OF COATING

130A WATERPROOF COATING

- **Manufacturer:** Axter Ltd. West Road, Ransomes Europark, Ipswich, IP3 9SX
Tel: 01473 724056
 - Web: www.axter.co.uk
 - Email: info@axterltd.co.uk.
 - Product reference: WILOTEKT-PLUS Elastomeric Bitumen
- **WILOTEKT-PLUS**
WILOTEKT-PLUS consists of a surface primer, a polymer (SBS) modified bitumen liquid applied in a single layer with a high strength woven glass mesh reinforcing fabric, protected by a 4mm thick flexible polyester reinforced elastomeric bitumen membrane. It can be used on all types of podium decks - limited access roofs, green roofs and trafficked areas for pedestrians and/ or vehicles.

Designers must ensure that the roof structure, including the thermal insulation if installed, can support the imposed load of the surface finishes.
 - Authority European Technical Approval ETA-03/0049 enables the system to be CE Marked.
- **Substrate:** Concrete
 - Preferably wood floated without surface laitance. (This can be laid flat without resource to screeds).
 - Preparation: remove all sharp-edged irregularities, fill any major cavities with an appropriate mortar, sweep slab and remove any loose or separate components. Concrete must be dry, if in doubt a test area should be installed, allowed to cool and then checked for adherence. All gaps especially between the concrete slab and upstands, construction joints, around outlets, etc. should be covered with a band of Axter's self adhesive aluminium coated strip STICKBAND 100.
 - Primer: WILOTEKT surface conditioning primer.
 - Reinforcement: WILOTEKT glass-fibre reinforcement to all areas, embedded in coating.
 - Coating application: Single coat WILOTEKT Elastomeric Bitumen 3 mm thick.
 - Surface protection: WILOTEKT 4 mm thick flexible polymer modified bitumen membrane.
 - Minimum system thickness: 7 mm.
 - Upstand details: ALPAFLORE PY AR reinforced Alpa[®]-mix bitumen membrane with anti-root additive, applied a min 150 mm onto the foot of the WILOTEKT surface protection layer.
 - Or (dependent upon proximity of soft landscaping)
 - Upstand details: EXCEL HR S reinforced Alpa[®]-mix bitumen membrane colour charcoal with a min 150 mm foot onto the WILOTEKT surface protection layer.
 - Attachment: This layer must be fully bonded by torching and on all laps a 2 mm bitumen bead must be visible. .

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- **Insulation:** Axter HYDROSHIELD (200 grade) expanded polystyrene board. Thickness to be 150mm. Target U-Value is 0.20W/m²/°C and structure details are required prior to final confirmation of insulation thickness.
BS EN 6946:2007 describes the method of calculation to compensate for water cooling beneath the insulation. If an fx factor < 0.4 is claimed then this must be confirmed by independent third party testing.
 - Attachment: Loose laid as described in relevant clauses of BS EN 13164:2001 (as clause 340).
- **Breather membrane:** Axter HYDROSHIELD membrane loose laid on top of the HYDROSHIELD inverted insulation with 300mm laps all bonded with Axter HYDROSHIELD adhesive tape and penetrations sealed with Axter STICKBAND adhesive tape.
 - Insulation protection/securement: Paving slabs on Axter paving slab supports or min 50 mm washed rounded river gravel.
- **Roof greening:** Bio diverse roof system as Q 27. May be installed in combination with paving slabs, ballast and/or alternative hard and soft landscaped finishes.

PRODUCTS

315 TIMBER TRIMS

- Quality: Planed, free from wane, pitch pockets, decay and insect attack (except ambrosia beetle damage).
- Moisture content at time of covering (maximum): 22%.
- Preservative treatment: As recommended for purpose by waterproof coating manufacturer.

365 STONE BALLAST

- Type: Washed, round aggregate.
- Supplier: Contractor's choice.
- Size: Graded 40-60 mm, free from fines and sharps.
- Colour: As drawing ref. no. _____

370 PRECAST CONCRETE PAVING SLABS

- Standard: To BS EN 1339, hydraulically pressed.
- Manufacturer: Contractor's choice.
 - Product reference: Contractor's choice.
- Colour/ Finish: As required by architect.
- Recycled content: Submit proposals.
- Size: 600 x 600 x 50 mm.
- Support system: AXTER PAVING SLAB SUPPORTS.

Axter. 6.16

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EXECUTION GENERALLY

410 ADVERSE WEATHER

- Do not apply coatings:
 - In wet conditions or at temperatures below 5°C, unless otherwise permitted by coating manufacturer.
 - In high winds (speeds > 7 m/s), unless adequate temporary windbreaks are erected adjacent to working area.
- Unfinished areas of roof: Keep dry.

420 SUITABILITY OF SUBSTRATE

- Substrates generally:
 - Secure, clean, dry, smooth, free from frost, contaminants, loose material, voids, protrusions and organic growths.
 - Compatible with coating system.
- Preliminary work: Complete, including:
 - Formation of upstands, kerbs, box gutters, sumps, grooves, chases and expansion joints.
 - Fixing of battens, fillets and anchoring plugs/ strips.
- Moisture content and stability: Must not impair integrity of roof.

ROOF COATING SYSTEM

710 ADHESION TESTS

- Requirement: Carry out a trial coating to determine priming requirements and/ or system suitability.
- Nature of test: 1 x 1m application of coating system to 1 roof.
- Test results: Submit and arrange for inspection.

740 MOVEMENT JOINTS IN SUBSTRATE

- Reinforcement strip: Apply STICKBAND.
 - Bedding: Preliminary coating application.
 - Joints: Lap in length.
 - Bond: Continuous over whole surface, with no air pockets.
- Condition at completion: Smooth.

750 PRELIMINARY LOCAL REINFORCEMENT

- Reinforcement strip: Apply to junctions at upstands, penetrations and outlets, joints and fixings in discontinuous unit substrates.
 - Bedding: Preliminary coating application.
 - Joints: Lap in length.
 - Bond: Continuous over whole surface, with no air pockets.
- Condition at completion: Smooth.

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760 APPLICATION OF ROOF COATINGS

- Thickness: Monitor by taking wet/ dry film thickness readings.
- Continuity: Maintain full thickness of coatings around angles, junctions and features.
- Rainwater outlets: Form with watertight joints.
- Drainage systems: Do not allow liquid coatings to enter piped rainwater or foul systems.
- Edge trims: Apply coatings over horizontal leg of trim and into recess.

770 SKIRTINGS AND UPSTANDS

- Top edges of coatings: Where not protected by flashings, apply into chases cut to a minimum depth of 10 mm.
- Completion of chases: When coatings are fully cured, prepare chase and apply sealant as directed.
 - Sealant: To BS EN ISO 11600.
- Colour: As coating.

SURFACING**810 BLINDING**

- Applying dusting powder: To coating surfaces at end of curing period to neutralize tackiness.

840 LAYING STONE BALLAST

- Condition of substrate: Clean.
- Gravel guards: Fit to outlets.
- Laying: Spread evenly. Do not pile to excessive heights.
 - Depth (minimum): As drawing ref.no. _____

850 LAYING PRECAST CONCRETE PAVING SLABS

- Condition of substrate: Clean.
- Setting out: Minimize cutting.
- Joints: Open.
 - Width: 3 mm.
- Perimeter upstands: 150 mm wide, filled with ballast.
- Completion: Slabs must be level and stable.

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COMPLETION**910 INSPECTION**

- Coating surfaces: Check when cured for discontinuities.
 - Defective areas: Apply another coating.

940 COMPLETION

- Roof areas: Clean.
 - Outlets: Clear.
 - Flashings: Dressed into place.
- Work necessary to provide a weathertight finish: Complete.
- Storage of materials on finished surface: Not permitted.
- Completed coatings: Protect against damage.

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Buildup type:
Hydrodrain 40 (or equivalent)
Hydrosoil 120mm
Bio diverse mat

Care required from install:

- Irrigate (saturate) once per week for first 12 weeks (NB// dry periods twice per week)
- 12 week inspection - determine if this process has been carried out and certify acceptable to invoke 12 months maintenance & nurture package -

Maintenance & Nurture Cycle for two years:

Spring - maintenance & nurture

End of summer - (once flowers have seeded) maintenance & nurture & cut back for winter

Maintenance Cycle thereafter:

Year 3: Maintenance Cycle

Spring - Maintenance

End of summer - (once flowers have seeded) maintenance & cut back for winter

Maintenance & Nurture Schedule of Works:

- ☐ Removal of debris and dead vegetation from the roof surface, drainage outlets, guttering and washed pebbles, etc.
- ☐ Weeding and removal of tree saplings and any undesirably invasive plants
- ☐ Sowing of additional seeds to repair patches of poor growth
- ☐ Check for disease, defects, drainage
- ☐ Application of maximum 30gm2 of slow release, low nitrogen fertilizer – when required
- ☐ Review Inspection Chambers, gutters and water flow and ensure that water outlets are all free draining
- ☐ Strim/cutback and removal
- ☐ General tidy and clear

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NB// In dry periods it is recommended that the plants receive irrigation (

Access to the roof will be required in order to carry out routine maintenance. As with all roofing projects, Green roof installations must comply with relevant Health and Safety requirements. Under current legislation, a fall arrest system, safety harness attachments or man safe systems should be used to ensure safety during installation and to allow for routine maintenance. NOTE// Wildflower roofs require on-going irrigation to survive long dry periods. Minimum requirement – taps at roof level.