

GREEN ROOF SYSTEM [SPECIFICATION]

DATE : FEBRUARY 2013



SITE : 328c KILBURN HIGH ROAD, LONDON, NW6 2QS

Vegetated Green Roof

Due to the size, location and maintenance constraints of the roof it is considered that a Sedum green roof will be best suited (See example photos below).

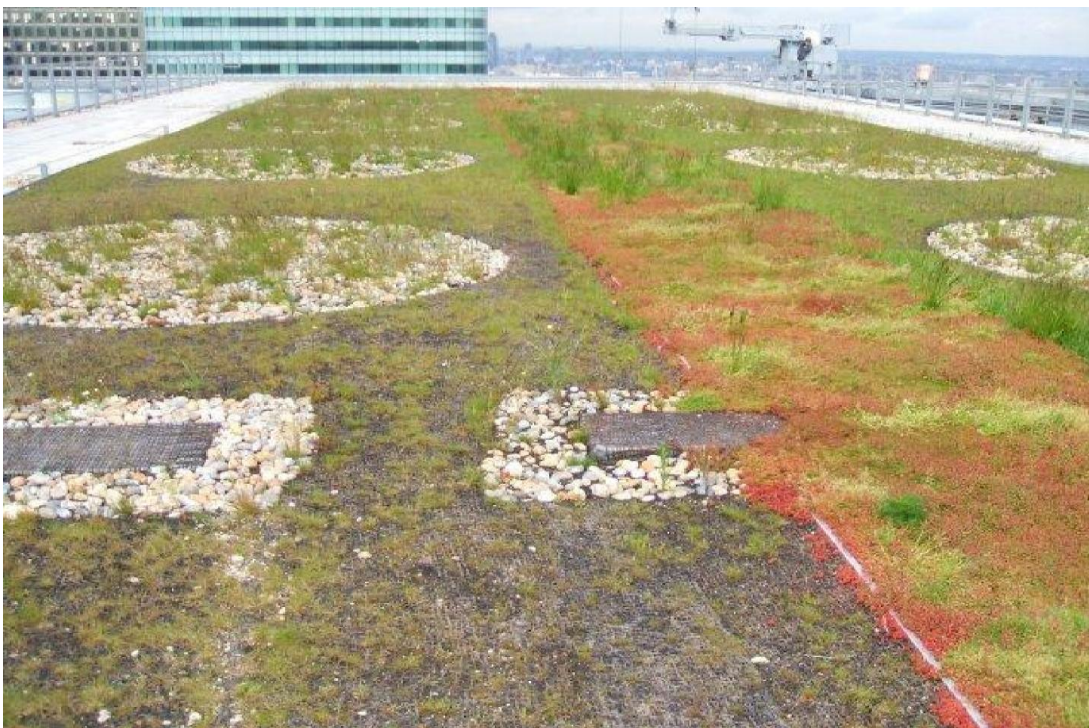
Extensive green (Sedum) roof systems are constructed using a low maintenance sedum planting (succulents) that provide excellent cover and increased protection to the waterproofing system. The plants are grown on a 'blanket' that is harvested like turf and installed by rolling out on top of the waterproofing and any other landscaping components required. The blankets are very lightweight, easy to maintain and provide instant greening to the roof

The sedum blanket is a very versatile, exceptionally lightweight green roof system and is suitable for both new build and refurbishment projects.

It should be noted that extensive green roof systems are not intended for general access or leisure purposes and are primarily used for their ecological benefits or aesthetic appearance.



Sedum Green Roofs



Sedum Green Roofs

LIVING ROOF SPECIFICATION:-

- 79.4m2 of roof would be utilized for living roof treatment
- 25mm drainage layer/filter sheet
- Varied substrate depth between 80mm -150mm extensive green roof substrate known to support the wildflowers plugs/seeds specified [see list below]
- 1 natural log 100mm diameter 1 m long per 20m2
- 16 - 20 plugs per m2
- 20% of any mix is to be of a special cornflower mix

VAPOUR BARRIER

3.5mm thick, aluminium lined, self-adhesive elastomeric bitumen vapour barrier, cold applied to the roof by removing the peel off release film.

The side laps are to be 100mm and must be laid red over blue, and sealed by torching and rolling with a Long Handled Lap Roller to extrude a 5-10mm bead. Head laps are to be 100mm and staggered and sealed by torching and rolling to extrude a 5-10mm bead of bitumen. Care should be taken to ensure adhesion when the temperature is below +5°C. At all abutments and details the bitumen bead must be extruded from the lap joints to ensure a seal.

Important Notes :-

1. The vapour barrier must be dressed up all upstands to a minimum distance of 150mm above the height of the insulation. This is to ensure that a 100mm lap is constructed above the urethane fillet. The contractor is to form all details in such a way that a fully bonded 100mm lap is obtained between the vapour barrier and the underlayer.
2. If the vapour barrier is left exposed for longer than two weeks as a temporary waterproof layer, the burn off release foil and surface of the torch-activated adhesion stripes will be effected by the exposure to ultra violet. This minor issue can be resolved by using more heat to activate the bitumen stripes, but the process will be slightly slower than when using newly laid material.

VAPOUR BARRIER INSPECTION

The Vapour Barrier must be inspected prior to laying insulation, in particular that it has been dressed up the upstands high enough to form a seal with the underlayer at a later stage. In the event that any upstands are seen to be below that which is necessary remedial work will have to be carried out prior to the contract proceeding.

INSULATION TO VERTICAL UPSTANDS

1. Insulation used for the upstands should be the same product type as specified for the flat areas.
2. To meet with the requirements of Part L of the current Building Regulations, the insulation to all vertical upstands must be the same thickness and /or meet the same thermal value as specified for the flat area. This applies to the kerbs of all roof lights, plant and access hatch kerbs and includes any changes of level. The only exception is for abutments to insulated cavity walls – see item 2 below.

3. Where the total insulation thickness specified exceeds standard available board thickness, provision should be made by the contractor to make up the total thickness required by using multiple board layers bonded together using polyurethane insulation adhesive. Where insulation is specified, this should be used in combination with flatboard as the adhesive will not cure between two foil surfaces. In this situation, the board should be applied to the outer surface.
4. **Insulated cavity wall abutments only:** Uprand detailing to incorporate 30 mm thick flat board. Insulated upstand support brackets must be used at all vertical abutment wall upstands (where the wall cavity is insulated) in conjunction with 30 mm insulation. These are to be fixed at 400mm centres using suitable fixings through the vapour barrier, so that the top edge is a minimum of 300mm above the surface of the deck. A 3mm gap should be left between adjacent sections.
5. To comply with Part L of the building regulations, the insulation to wall abutments should be 300 mm in height from the deck surface to the top of the upstand, with the vertical insulation being installed before the flat, so as to retain the insulation at the base.
6. All upstand details to be carried out in accordance with the associated detail drawing where indicated or provided.

INSULATION

Fire resistant, zero ODP, highly efficient rigid urethane insulation, 160mm thick (to achieve 0.15 W/m²K 'U' Value)* fully bonded to the vapour barrier by activating the surface of the vapour barrier with the gas torch. The boards are to be close butted and staggered. The insulation boards are to have their faces 'blackened out' using 95/25 hot bitumen to a width of 400mm at all upstands and details. This includes all perimeter edges, including rooflights, rainwater outlets, vent pipes, etc.

**'U' value based upon 18mm plywood deck with no further products beneath.*

UNDERLAYER

3mm thick, 200g/m² glass grille reinforced, self-adhesive elastomeric bitumen underlayer, fully bonded to the insulation by removing the peel off release film. **The side laps are to be 100mm and must be laid red over blue, and sealed by torching and rolling with Long Handled Lap Roller to extrude a 5-10mm bead.** Head laps to be 100mm and staggered, and sealed by torching and rolling to extrude a 5-10mm bead of bitumen. The underlayer must be taken up all upstands, edge details, in accordance with current British Codes of Practice, and fully sealed by torching with the vapour barrier by a minimum 100mm.

UNDERLAYER INSPECTION

The Approved Contractor must give reasonable notice to an Independent Surveyor of their intention to commence laying capping sheet. This will allow a discretionary inspection of the underlayer to take place, so that any remedial treatment necessary can be carried out prior to installing the capping sheet. This is particularly important when tapered insulation has been used to ensure that any areas of ponding water that may remain can be addressed.

ROOT RESISTANT LAYER

5mm thick, chemically treated, root resistant capping sheet to be fully bonded to the underlayer by torching. All head and side laps to be 100mm, with a minimum bitumen extrusion of 20mm (exposed areas will be subject to normal 5/10mm bead of bitumen extrusion). The bitumen must be dressed up all upstands, edge details, etc. This layer should be dressed up a minimum of 150mm above the finished landscape surface,

according to relevant Codes of Practice.

INSPECTION

No green roof build up is to be applied until the root resistant capping sheet has been thoroughly inspected by the Independent Surveyor to ensure that any remedial treatment that is necessary can be carried out prior to laying the sedum blanket.

UPSTANDS, EDGE DETAILS, FLASHINGS, ETC

Detail work to be carried out in charcoal grey flashing in accordance with current British Codes of Practice. Side laps to be 80mm, head laps to be 100mm.

TECHNICAL NOTES

- [1] 61mm x 61mm angle fillets must be used at all right-angled upstands. Under no circumstances must fillets of an alternative material be incorporated (i.e. cork, fibre, etc.).
- [2] In areas that the contractor considers to be a high fire risk, bitumen sheet should be installed; either by random nailing with large headed galvanised clout nails at 200mm minimum centres, or by fully bonding in hot bitumen of a suitable grade.
- [3] Against all insulation boards where the edge of the board is susceptible to mechanical damage, provision is to be made to supply and fix a timber protection batten of the same height. This to be suitably mechanically fixed to the roof deck.
- [4] Any peculiarities or details discovered which might affect the performance of the system, should be reported immediately to the specifier in order to rectify the problem.
- [5] The contractor is to ensure water tightness of the roof at all times. Proper day joints must be formed at the end of each working day to provide a temporary seal. No mopping or loose covers will be permitted. Materials used from the day joint, which are not part of the System must be cut away and removed prior to continuation of the works so that unnecessary build up of laps is avoided.
- [6] Where building works are to be carried out by other trades, following completion of the waterproofing, the contractor must make adequate provision for supplying protection to prevent damage to the new membranes. The independent surveyor will not carry out the final inspection until all associated trades are complete and the roof areas are clear from all debris and protection layers.
- [7] All mechanical and electrical work to plant and equipment, should be carried out by competent mechanical and electrical qualified tradesmen. All plant is to be reinstated and recommissioned on completion of the roofing works in accordance with the client's detailed specification.
- [8] If any items of plant/equipment are to be situated on the finished roof, a sacrificial layer of capping sheet is to be loose laid beneath. This is to extend a minimum 25mm past the point of contact all round. In the case of heavy items it may be necessary to introduce a load spreading slab.

ADDITIONAL ITEMS

- [1] Supply and install a new PVC coated lightning conductor in accordance with the client's detailed specification. The lightning conductor is to be fixed using type 4 conductor clips incorporating cap sheet pad fully bonded to the main capping sheet at 1m centre.

UPSTANDS TO DETAILS

The minimum recommended height for constructing waterproofing details is 150mm from the top of the installed landscaping. Special attention should be paid to all

structures, such as rooflights, counterflashings, window and door cills, etc. These may have to be raised to enable a 150mm high waterproofing detail to be formed.

FLASHING DETAILS

Separate flashings must always be formed. The capping sheet taken up a detail in one piece will not be permitted.

NEW GRP EDGE TRIM

Dress the underlayer up and over the perimeter detail to provide a 25mm overhang. Supply and fix a new 'Em-Trim' of a suitable depth to the perimeter edge. All trims are to be screw fixed in position, screws to be positioned at 300mm centres. A GRP bridging piece is to be installed at all joints. The new trim must cover any open joint, which may exist between the kerb and the top of the wall by a distance of minimum 20mm. The capping sheet is to be dressed tightly into the top lip of the trim, ensuring a bead of bitumen extrudes at the edge.

INTERNAL OUTLETS

- [1] All outlets must be carefully examined for damage and proper seating. Any faults must be rectified.
- [2] The contractor must ensure that the waterproofing is firmly sealed to the outlet and installed in a manner as to not impede water flow to the outlet, i.e. eliminate potential water checks.
- [3] The contractor must ensure that all outlets are unblocked during and at the completion of the contract.
- [4] All installed rainwater outlets must be fitted with their respective grille covers.

SOFT LANDSCAPING

IMPORTANT NOTE

In the event that other trades are required on the roof, the scheduling of work should be such that the installation of the soft landscaping element is the final operation to be carried out. This will ensure that the sedum blanket is not used as a working platform, and will therefore maximise its establishment.

EXTENSIVE INSPECTION CHAMBERS

Extensive Inspection Chambers to be installed on all outlet positions within the roof area. The contractor is also to allow for the installation of additional height adapter rings as required, in order to bring the inspection chamber up to at least the height of the planting build-up. The inspection chamber must have a vegetation barrier installed around it so as to prevent root growth entering the drainage system.

Note: Where a box gutter is to be constructed, provision should be made to accommodate the 350 mm diameter of the inspection chamber. It is recommended 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 body of the chamber.

FILTRATION AND DRAINAGE LAYER

25mm thick filtration and drainage layer to be laid over the waterproofing, close butted and staggered. The layer is to be taken beneath all vegetation barriers, stopping short of any edge trims if these are being used.

VEGETATION BLANKET – SHORT ROLLS

'Sedum' combination blanket with integral moisture retention fleece. Laps to be close butted and staggered. The flap of fleece along one edge of the blanket is to be folded out to enable the adjacent blanket to be lapped over. The

Sedum combination blanket is to be dressed tightly into the drainage trim at perimeters, abutment details etc. Where vegetation barrier is specified, this must extend on to the exposed edge of blanket by a minimum of 100 mm to provide protection against wind uplift and erosion. The sedum vegetation blanket has a nominal thickness of 28mm, excluding growth, and a saturated load of approximately 42-45kg/m². Blankets must be handled with care to avoid sedum/substrate loss. **Any excess pieces of vegetation blanket must be removed from the roof immediately on completion. Any areas of soil loss must be filled with substrate followed by sedum cuttings.**

The Sedum blanket achieves an Ext. F.A.A fire rating under BS 476: Part 3 1958.

Important note

During hot weather conditions, the vegetation blanket must be un-rolled on the day of delivery to site. Any rolls not installed should be kept watered prior to final installation. During colder weather they should be rolled out and used within 48 hours. Under no circumstances must they be allowed to remain rolled up for longer periods of time.

SLOW RELEASE FERTILISER

Xeroflor fertiliser for sedum must be applied at a rate of 80g/m² onto the newly laid sedum blanket. Care must be taken to distribute the fertiliser evenly, through use of an approved applicator. **The vegetation blanket should then be thoroughly saturated by the use of sprinklers so as to promote rapid establishment. 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.**

VEGETATION BARRIER/DRAINAGE BARRIER

All **perimeters, gutters, abutments, protrusions**, etc. must be protected by a vegetation barrier, approximately 300mm in width. If there are adjacent buildings within 6 metres and the barrier functions also as a fire-break, then the width of the vegetation barrier should be increased to 500mm - 20/40mm rounded sand washed stones recommended. **The vegetation barrier is to cover the edges of the sedum blanket by approximately 100 mm in order to protect against wind uplift and substrate erosion.**

POST INSTALLATION WATERING

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 roofs above 10° slope) must be operational, but initial watering-in of the fertiliser must be done by surface mounted sprinklers. The watering guidelines for Extensive Green Roofs can be downloaded from the Extensive Green Roof systems section of prospective contractor web site.

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 the final maintenance visit and application of slow release fertiliser at the end of the agreed contract period, the responsibility for the ongoing maintenance of the green roof planting becomes the responsibility of the building owner.

Period of maintenance contract: _____

(To be inserted as required i.e. one year, two years etc.)

Scope of maintenance procedure:

Maintenance guidelines for Extensive Green Roofs can be downloaded from the Extensive Green Roof systems section of prospective contractor web site.

WORKMANSHIP

- [1] The Sedum green roof system can *only* be laid by properly certified operatives, who have been trained or approved and hold the certificate of approval.
- [2] The green roof system must be laid with the use of roll bars or equal and approved.
- [3] Workmanship that is incorrect and not to Codes of Practice B.S. 8217:1994, will not be permitted, even if the system is watertight. The client will be told that all such faults must be remedied, before the Guarantee is issued.
- [4] Any building work that is the responsibility of the roofing contractor and, has a bearing on the life of the Green Roof System must be carried out by properly trained tradesmen.
- [5] Consideration must be given by the contractor at all times to the aesthetic appearance of the roof, i.e. alternate head laps to be in line and no unnecessary short pieces of capping sheet are to be used.

Important Note

It is imperative that the contractor conforms to the workmanship criteria as listed above as any deviation from this will nullify the guarantee.

GUARANTEE

A 20 year product and workmanship guarantee is to be provided upon completion following a Final Inspection.