



GENERAL MAINTENANCE

Green Roof Extensive System

Lightweight sedum system XF301.

BAUDER EXTENSIVE GREEN ROOF SYSTEMS

XF301 and SB & WB vegetation blankets and other substrate based planting schemes.

What to Expect From a Bauder Extensive Green Roof System

There is a common misconception that extensive green roofs, and sedum plants in particular, are always green and that from ground level they resemble grass. This is misleading, as they consist mainly of low growing, drought tolerant plants including sedums, saxifrage, wild flowers, grasses, moss and herbs.

The appearance of the vegetation within an extensive green roof will change year on year, dependent upon fluctuations in the seasonal weather throughout the period. It should also be expected that more grass and moss will be present during the wetter months, because the conditions will be ideal for these species to exist, they will tend to die off during the dry summer months, as free-draining extensive substrates will not hold sufficient moisture for them to survive.

The growth and flowering of the individual species within the vegetation mix through the late spring and summer will be dependent upon the weather prevailing at the time, which will also determine which species will be most prominent in any given year.

In the winter, sedum will become smaller and turn red/brown in colour as they prepare themselves to withstand the coming winter frosts. This gives the vegetation a red/brown hue in the late autumn and winter months, which is sometimes mistaken for the plants being distressed, when in fact they are in optimum condition for the time of year.

It is another misconception that extensive green roofs are maintenance free> Green roofs are 'low maintenance' rather than 'no maintenance'. Bauder recommend that all green roofs have a way of watering during prolonged periods without rain. All green roofs will benefit from water during droughts (See Bauder's Watering Guide).

All green roofs will require feeding from time to time e.g. Bauder's lightweight Xero Flor Sedum Blanket contains little in the way of natural nutrient, so fertiliser must be applied annually to ensure that the plants become resistant to extremes of weather and temperature.

The Bauder XF301 Sedum Blanket contains approximately 14-17 different plant species, some very similar in appearance to others but being more drought tolerant. Not every species incorporated will survive and the more dominant will be expected to prevail over time because they will adapt better to a particular location. Regardless of this, we would anticipate that at least 50% of the species will flourish.

Extensive green roofs that have a deeper substrate growing medium, where the vegetation is provided either by selected plug plant species or seeds, will generally support a broader species mix, which can include wild flowers, grasses and herbs. An increased amount of dead vegetation will arise from this type of species mix following flowering, which will need to be cut back and removed, both to reduce the bio-mass on the roof and to encourage seed drop from the dead flower heads.

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Watering and Irrigation: all green roofs will require water during prolonged periods of dry weather, generally sedums are much more drought tolerant than native wildflowers but both will benefit from a prolonged soaking (not little and often) to prevent them from fully drying out (Details are in the Bauder Watering Guide).

General Maintenance

General maintenance is normally carried out annually during springtime. However, certain tasks which will be dependent upon the location of the roof, such as the removal of weeds, seedlings and accumulated leaf litter from overhanging trees may also need to be done during the autumn.

The following procedures should be carried out as indicated below, in order to ensure that the roof is maintained in good condition and to protect the validity of the guarantee.

Preliminary Maintenance Procedures

- Ensure safe access can be gained to the roof and that relevant Health and Safety procedures are followed when working at roof level. It is advised that the contractor should always seek proof of current maintenance for any man-safe roof access systems prior to proceeding with the work on site.
- Remove all dead vegetation and debris from the roof surface, taking particular care to ensure that all chute outlets, gutters and downpipes are clear. Where the species mix incorporates wild flowers and grasses it is recommended that all dead vegetation is trimmed off and the waste lowered to the ground and carted away.
Please note: Roofs in the vicinity of taller trees will need more frequent maintenance. We recommend removing dead leaves during the spring and again in the autumn, to ensure that they do not damage the roof vegetation.
- Remove the lids of all inspection chambers, ensure that all rainwater outlets and downpipes are free from blockages and that water can flow freely away.
- Ensure that any protective metal flashings and termination bars remain securely fixed in place. Advise the client of the need to repair or renew as necessary.
- Examine all mastic sealant and mortar pointing for signs of degradation. Advise the client of the need to repair or renew as necessary.
- Check that all promenade tiles and paving slabs remain in position, secure and in good condition.
- Ensure that any new items of plant/equipment that may have been introduced to the roof are mounted on suitable isolated slabs and that any fixings used to secure the plant/equipment in place do not penetrate the waterproofing. If in doubt, please contact Bauder for further advice.
- The Building owner should keep a record of all inspections and maintenance carried out on the roof. Any signs of damage, contamination or degradation to the waterproofing should be reported to Bauder immediately, in order that arrangements can be made for remedial work to be carried out if necessary. Damage to the landscaping should be reported to the building owner. If this damage includes Bauder components, then Bauder may be contacted for remedial advice.

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- When carrying out maintenance to adjoining areas, care must be taken not to damage either the landscaping or the waterproofing system. If it is considered that either has been affected, the Bauder should be contacted for advice. Any waterproofing damage caused after completion of the original installation may invalidate the guarantee.
- Any unauthorised alterations to the waterproofing system will invalidate the guarantee. If such a situation should arise, then Bauder should be contacted so that we may advise on the alteration and how it should be incorporated without affecting the guarantee.

Vegetation Maintenance Tasks

The following tasks should be carried out annually: -

Application of Fertiliser to the vegetation: As a general rule all sedum based green roofs require feeding annually to promote strong growth in the sedum and make them more drought tolerant. Biodiverse and Wildflowers system often do not need annual fertiliser as this may allow weed species to out compete them.

1. Plant encroachment

Any vegetation which has encroached into drainage outlets, walkways and the vegetation barriers (pebbles) should be removed. The vegetation removed may be set aside and used to repair any bare patches if required (see below). If movement/settlement of the pebble vegetation barrier has occurred, additional washed stone pebbles similar to the existing are to be added.

2. Monitor the colour and rate of growth

The colour and rate of growth of the vegetation should be reviewed to establish the health of the plants. It should be noted that many factors can affect the growth and colour of the vegetation and that plants tend to be greener in wetter, mild conditions (springtime) and where the roof pitch is shallow.

Notes

- During May, June and July, sedum plants flower and you will see a mixture of colours – predominantly whites, pinks and yellows with some purple. The foliage of some species of sedum, such as Sedum Album “Coral Carpet”, is blush red naturally during the summer and autumn, and so the vegetation can take on a more ‘red/brown appearance. This becomes more noticeable once plants have flowered, leaving remnants of dry brown seed heads. The best visible indication of the health of a plant is if the leaves are fleshy and contain plenty of water.
- When exposed to extreme conditions, sedum plants have a tendency to turn a deep red colour. This is a natural phenomenon and is important to help the plant to acclimatize, ready to survive a cold winter or hot summer. This will usually occur during extreme cold weather as well as periods of prolonged drought, in very exposed locations or when the plants are in distress through lack of nutrient (fertiliser).
- If an irrigation system is fitted, it is best to run it only during prolonged dry weather and for limited periods – see ‘Irrigation’ information below.

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- If sedums are showing signs of distress, but have received regular rainfall, then the most likely problem is a lack of nutrient and a fertiliser should be applied.
- Only a relatively few species of sedum and other plants suitable for an extensive green roof installation will persist in partial and full shade, and they will generally be greener in colour and grow “leggier” in these locations. There will be a significant variance in the growth and colour between the plants growing in full or partial shade and those in full sun and this should be recognised as a feature of the living nature of each individual roof.
- If problems with the vegetation are suspected, Bauder may be contacted for advice and, if necessary, a suggested course of action.

3. Weeding

With the exception of saplings, which should always be removed, weeds in an extensive green roof should be considered as a problem only of aesthetics. If considered excessive, they can be removed either manually or by using a ‘spot weed wipe’, ensuring that care is taken to follow specific instructions regarding the use of any proprietary products. After the removal of weeds and saplings, treat the affected area as if it were a bare patch (see below). All extensive green roof installations will at times include some moss and grass.

4 Repairing Bare Patches.

Bare patches can be easily repaired and this is best done during the main growing seasons of March/April or from late August until the end of September. Take vegetation cuttings from surrounding areas of abundant growth and place on bare patches, pressing gently into the soil. A light sprinkling of sand mixed with compost should then be dressed over the affected area to improve the uptake of the cuttings. The best results will be achieved if this work is carried out during spring maintenance and the affected area is kept moist for a short period afterwards. Please contact Bauder for further project-specific advice.

Please note: In areas of extreme exposure or where localised wind-swirl is caused by adjacent structures, it is possible that both the vegetation and substrate will be disturbed by periods of high wind. Should this occur, consideration should be given to how best to secure the installation against similar conditions in the future prior to re-instatement. If a problem of this type is suspected, Bauder may be contacted for advice and, if necessary, a suggested course of action.

5 Fertiliser for Bauder XF301 sedum blankets

Bauder Sedum Blankets are grown in a shallow growing medium which contains very little nutrient, so the annual application of fertiliser is crucial to ensure that the plants remain healthy. Fertiliser should ideally be applied during March/April, as it helps the plants to prepare for extreme weather conditions and flowering whilst also allowing the different species to gain sufficient nutrients without competing against each other.

Organic fertiliser can be obtained direct from Bauder in 25kg bags, which is sufficient for an area of 312.5m² when applied at the recommended rate of 80gm/m². Areas of up to 30m² may be applied using either a hand held spreader or strewn by hand from a bucket. Larger roofs should always be done using a trolley applicator, which can be purchased direct from Bauder. Always apply the fertiliser at the given rate written on bag.

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It is recommended that the fertiliser is lightly 'watered in' immediately after application, to avoid "burning" of the foliage, which may occur if fertiliser pellets settle on the leaves. Dung-based organic fertilisers should be avoided.

6 Irrigation

Bauder SB sedum blanket and XF301 systems

When Bauder sedum systems are installed we recommend the provision of either a sprinkler or drip line irrigation system where the following conditions apply: -

- All south-facing roof without shade.
- All roof slopes exceeding a 2° pitch.
- Windy or exposed site locations, where the wind can dry out the blanket.
- Sites up to 50 miles inland of the east coast of the UK mainland.

Irrigation should only be activated during periods of dry weather, or if the sedum plants are showing signs of distress. The irrigation system is best activated for 2-3 hours, preferably at dawn or dusk to minimize unnecessary evaporation. Then once every 4-6 days for the duration of the hot weather conditions. This can be easily managed by using an inexpensive battery-powered, programmable timer.

Native Wildflower/Biodiverse Roofs

Extensive substrate green roof systems vary greatly in the amount of water they require. Sedum is very drought tolerant, wildflowers much less so. The watering requirements will depend on the following factors:

- The Pitch of the roof
- The amount of rainfall it receives.
- The exposure of the roof.
- The vegetation growing on the roof.
- The depth of the substrate and drainage board.

Bauder always advise that there should be a way to water the roof during times of dry weather. This might be a water supply point adjacent to the green roof, or a fully automatic irrigation system.

Some Biodiverse roofs are designed not to be watered. Whilst this will remove the water demands from the roof, it will reduce the flowering period of the plants and over time reduce the number of species as plants struggle with the harsh environment.

In these cases Bauder would strongly recommend that increasing the depth of substrate in some areas (15-2000mm+) to help prevent the substrate drying out completely (See Bauder Water Guidelines).

Please note - continuous daily watering is neither recommended nor necessary and will only promote weeds and other unwanted plant species.

Advice and Supply of Irrigation Equipment

Access Irrigation Ltd is one of the country's longest established irrigation specialists and has considerable experience in green roofs. They are happy to provide irrigation advice on any Bauder project and can supply a wide range of irrigation products.

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www.access-irrigation.co.uk

Support

Extensive roofs should require only minimal maintenance. Bauder is happy to offer advice on any issues concerning your green roof and any such query should be forwarded to the Bauder Green Roof Technical Department at the address below in the first instance. We believe our products and systems are of the highest standard and we are always prepared to discuss any queries or concerns that may arise. It is always of great help if you can provide photographs of the affected area(s) to accompany any such queries.

Please note: In the event of any query arising which it is thought may affect the condition of the system, then Bauder should be contacted at the address below. We cannot accept responsibility for any problem or failure due to use outside those parameters for which the system was designed or 'acts of god' beyond our control e.g. extreme weather conditions or damage through pests.

BAUDER GREEN ROOF MAINTENANCE SERVICE

With over 30 years' experience in the design and supply of green roofs throughout the UK and Ireland Bauder can offer unparalleled experience and expertise in green roof maintenance including sedum, plug planted and wildflower.

Having established the largest UK facility cultivating green roof vegetation blanket we have unique knowledge and horticultural expertise for roofscape vegetation. With national coverage by over 50 field personnel, you can be assured of a prompt reliable service to fully meet your requirements.

Our Service

Bauder's experienced team will provide you with a tailor-made maintenance programme for your green roof. A typical Bauder maintenance programme Includes:

- Full inspection and evaluation of your green roof
- Application of organic slow release granular fertiliser
- Removal of leaves and debris
- Removal of unwanted vegetation
- Inspection and clearance of outlets
- Examination and testing of irrigation

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This work is undertaken by Bauder's experienced maintenance technicians who will carry out the necessary risk assessments and comply with all current health and safety legislation throughout the duration of the work. Finally, you will be provided with a bespoke report with photographic verification outlining the condition of the planting and any areas requiring on going treatment.

To discuss your specific requirements, please call our Green Roof Maintenance Team for a no obligation quote.

T: 0845 271 8801 E: greenmaintenance@bauder.co.uk

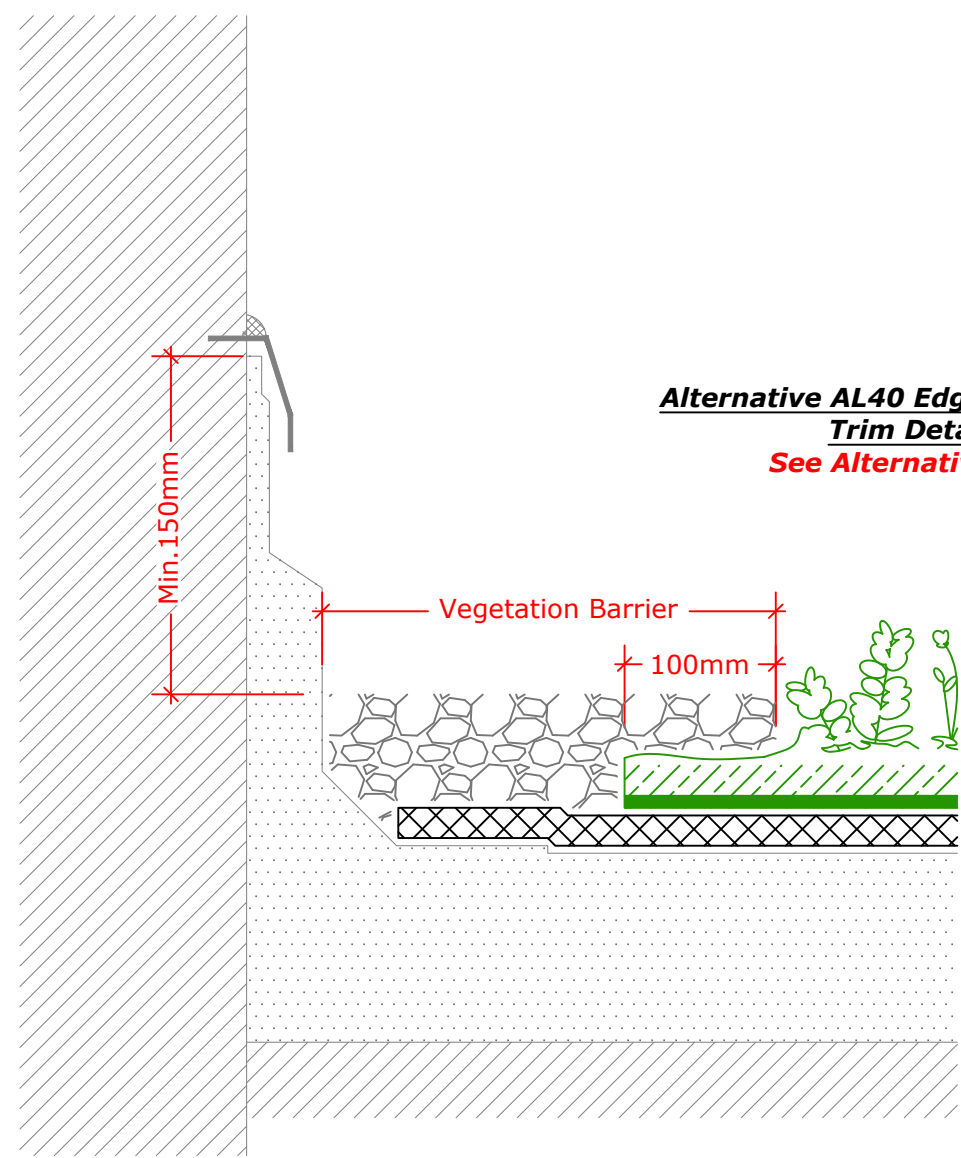
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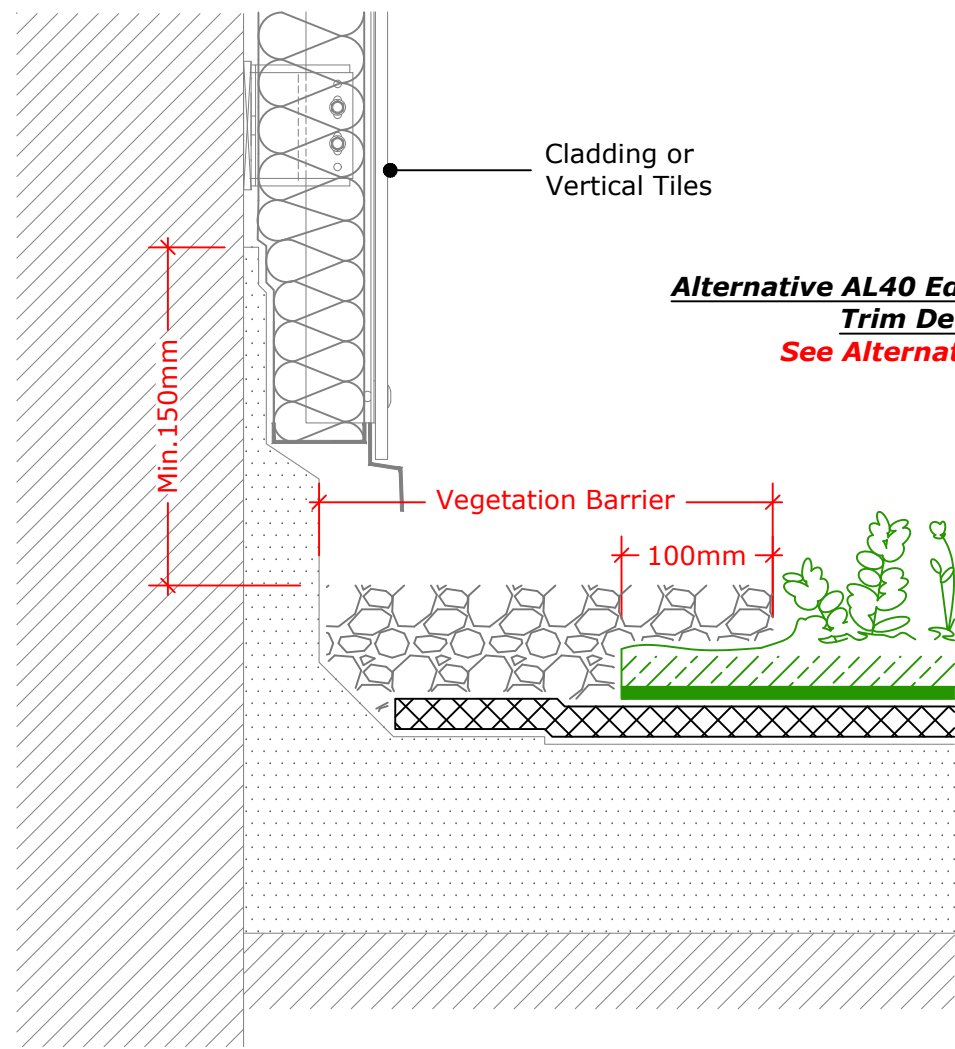
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Alternative AL40 Edge Retention / Drainage Trim Detail Available
See Alternative Detail Shown

Upstand

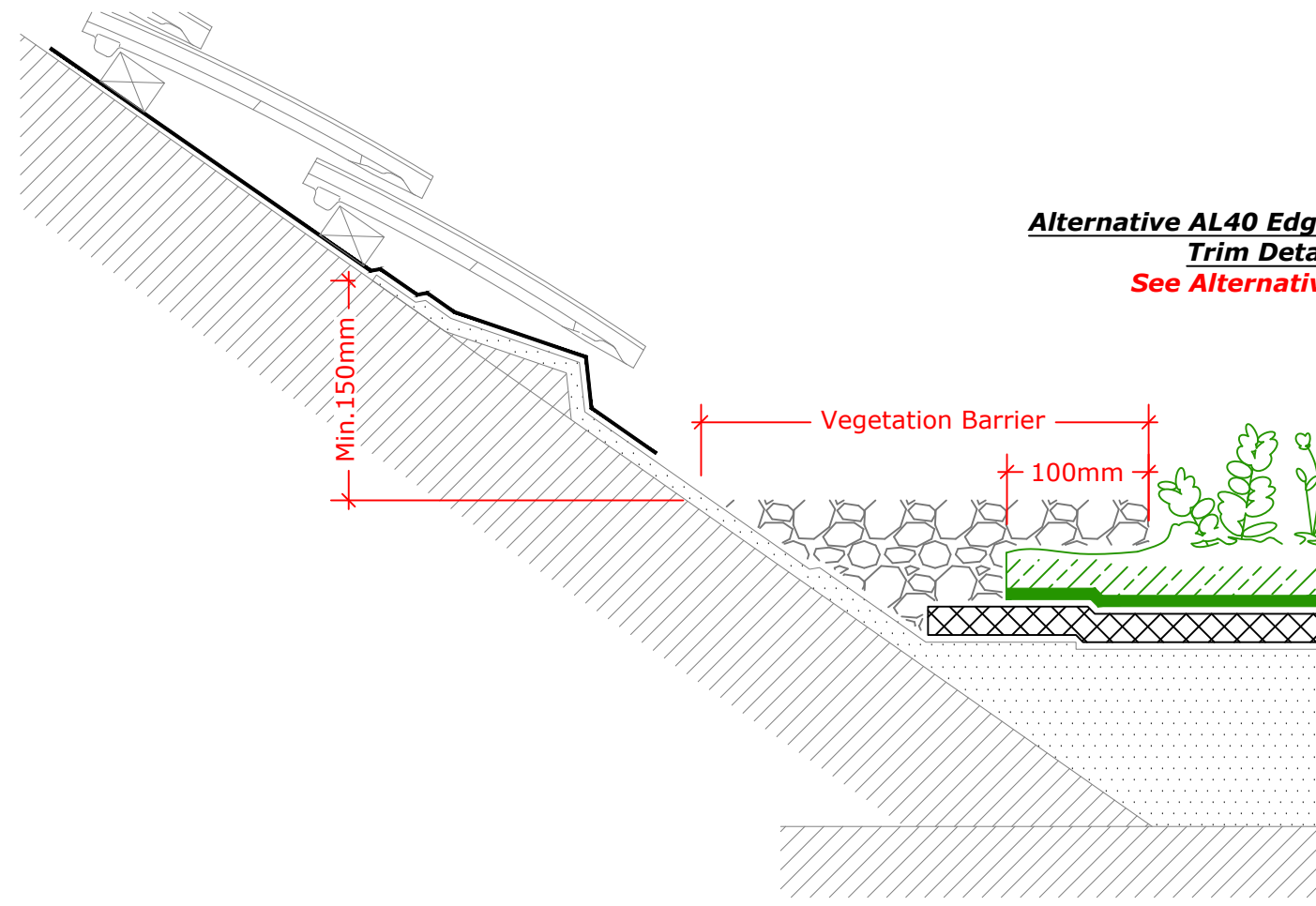
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Alternative AL40 Edge Retention / Drainage Trim Detail Available
See Alternative Detail Shown

Upstand to Vertical Cladding or Slates/Tiles

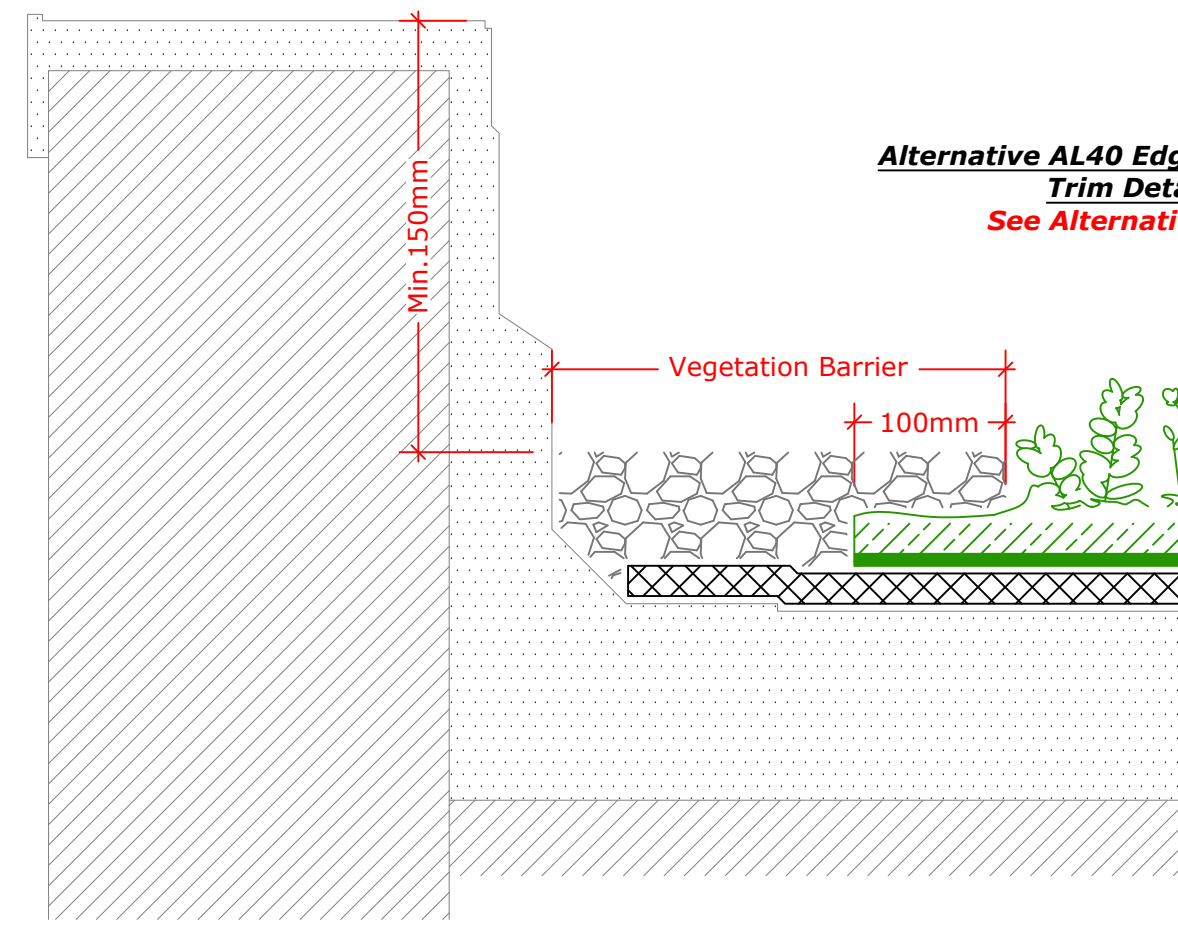
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Alternative AL40 Edge Retention / Drainage Trim Detail Available
See Alternative Detail Shown

Upstand to Pitched Roof

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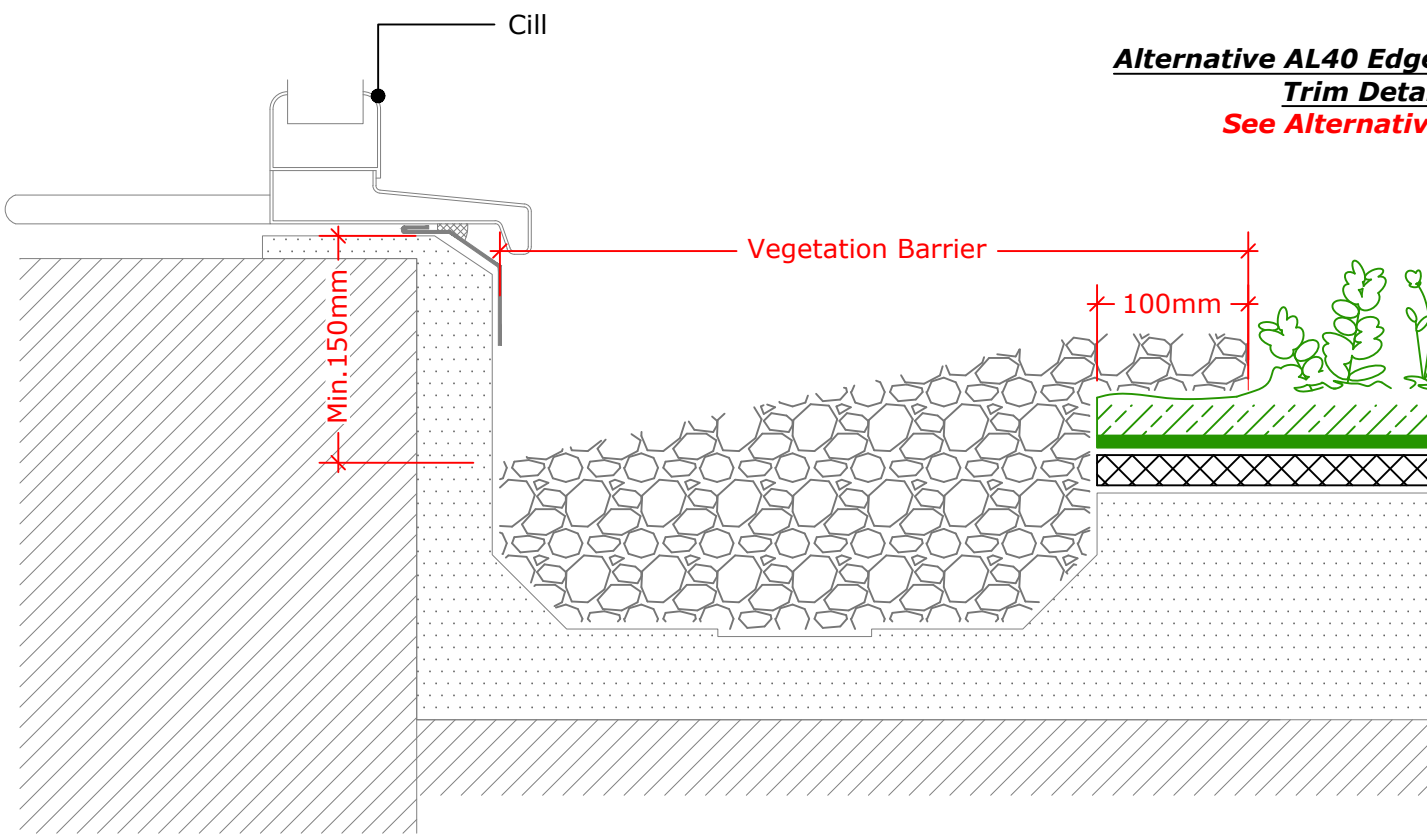
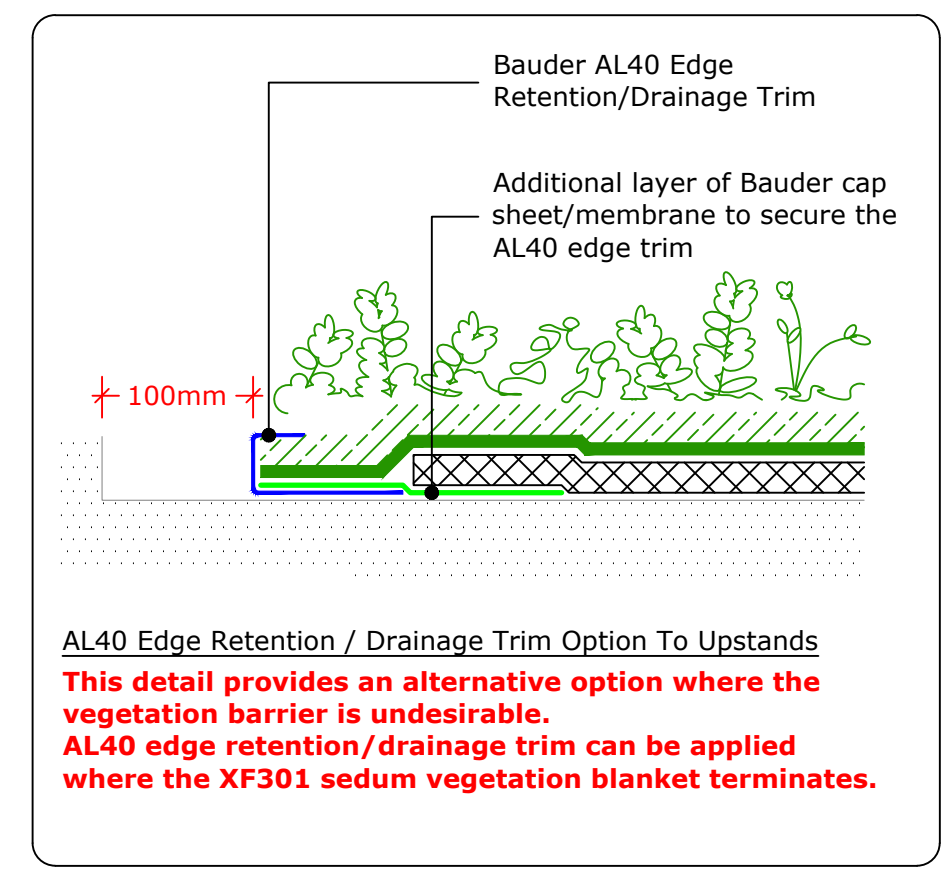


Alternative AL40 Edge Retention / Drainage Trim Detail Available
See Alternative Detail Shown

Parapet Upstand

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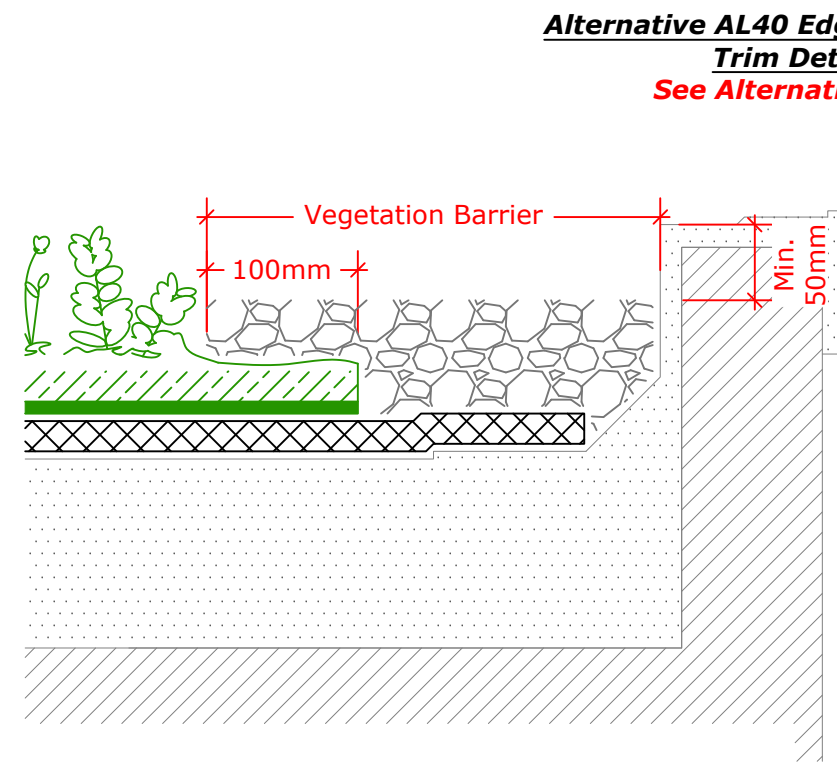
Alternative Details



Alternative AL40 Edge Retention / Drainage Trim Detail Available
See Alternative Detail Shown

Internal Gutter to Clerestory Window

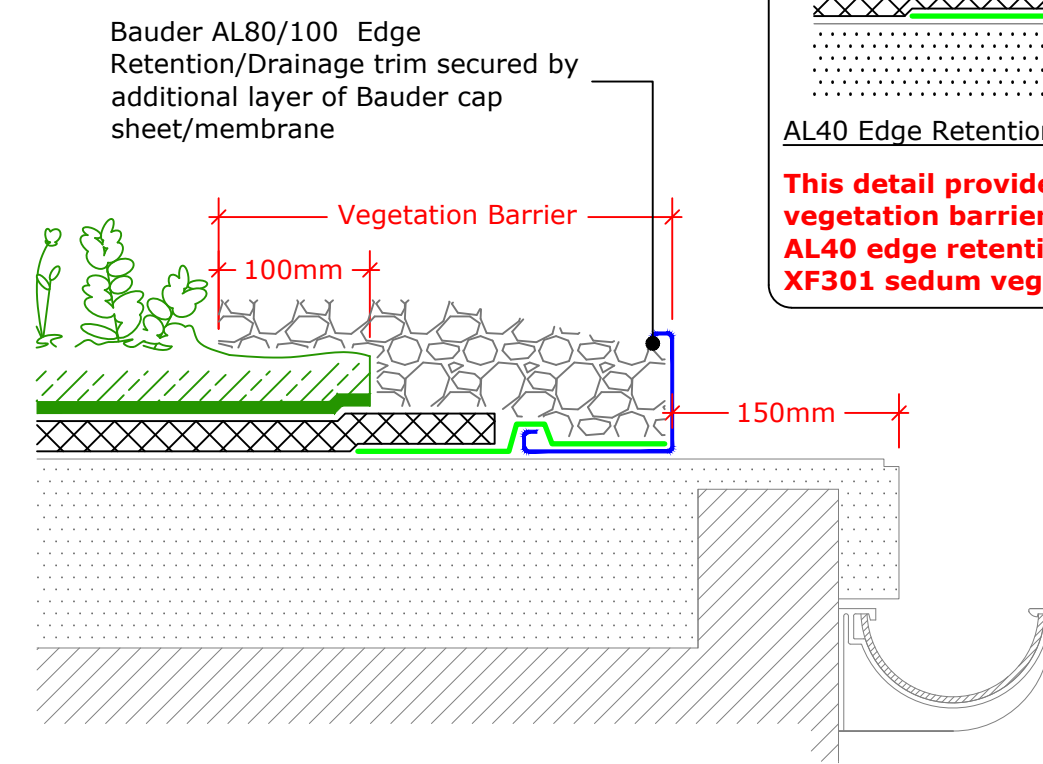
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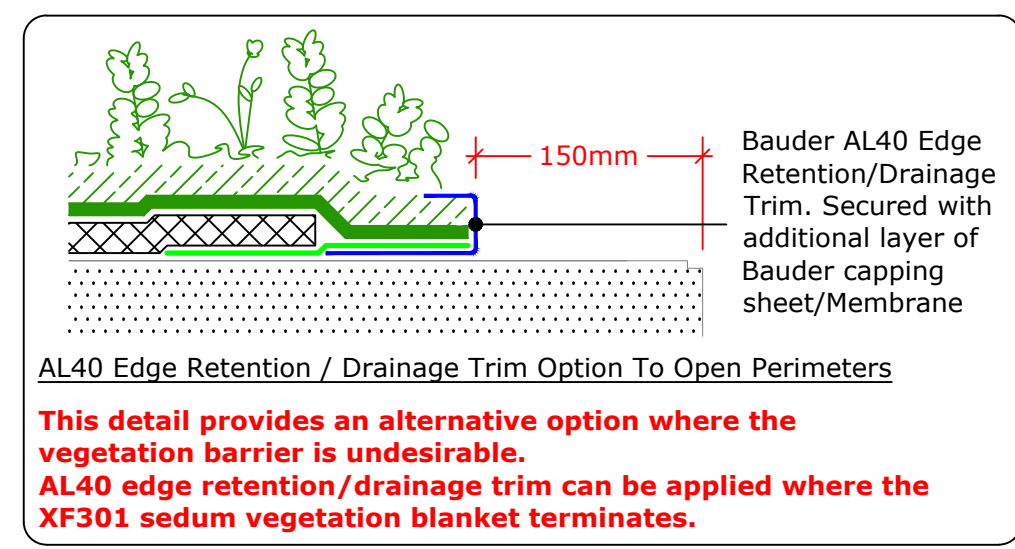
Alternative AL40 Edge Retention / Drainage Trim Detail Available
See Alternative Detail Shown

Perimeter Kerb

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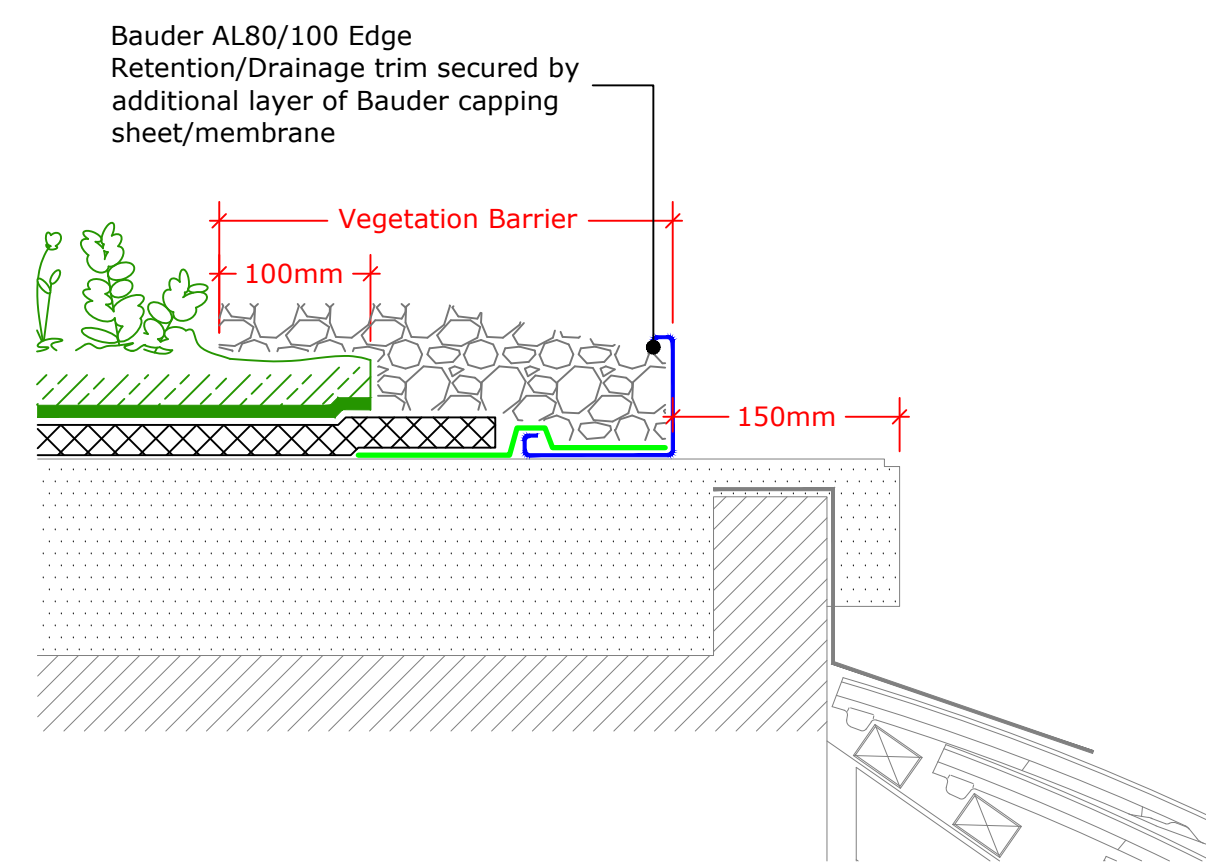


Alternative Details



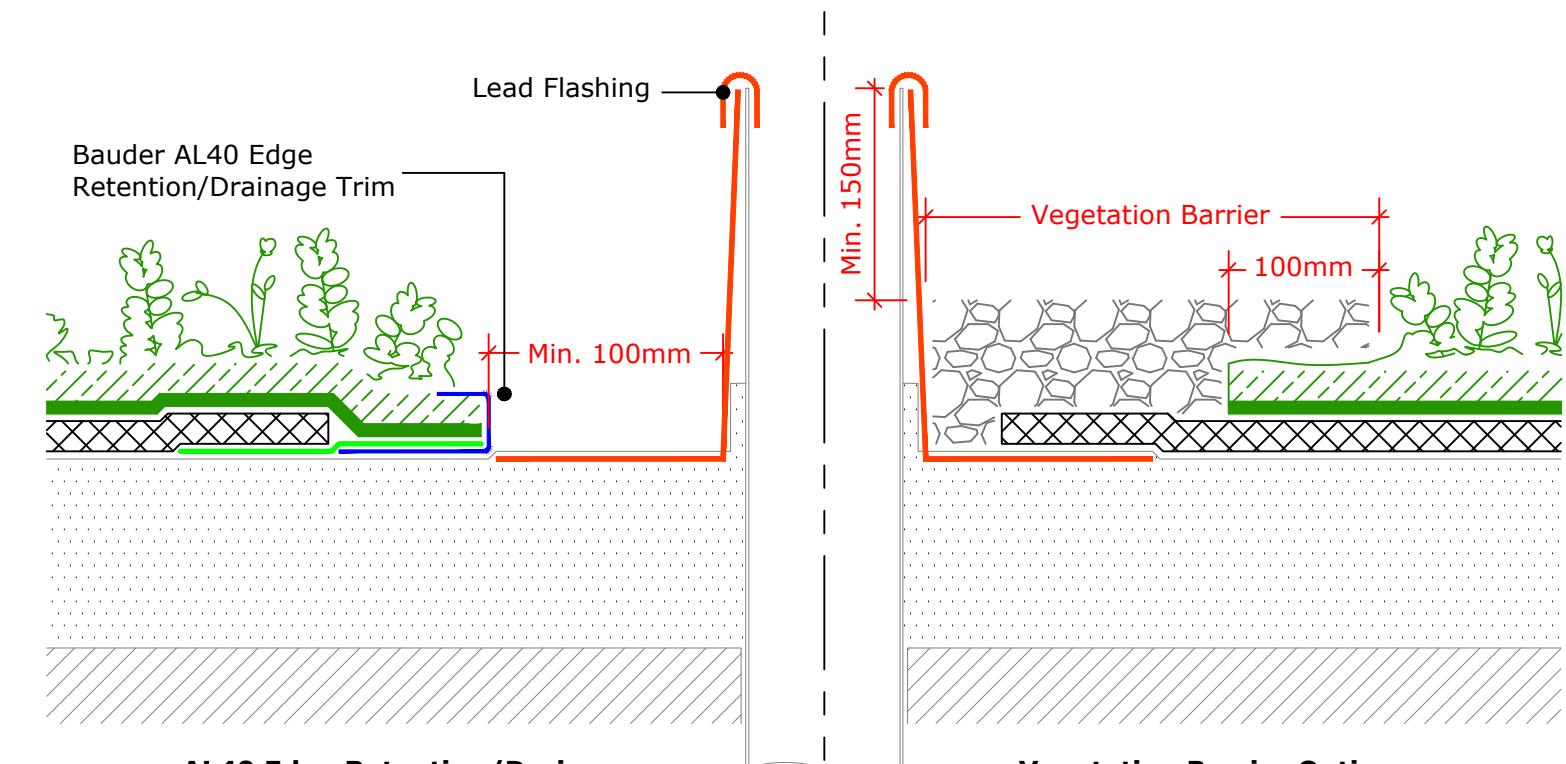
External Gutter

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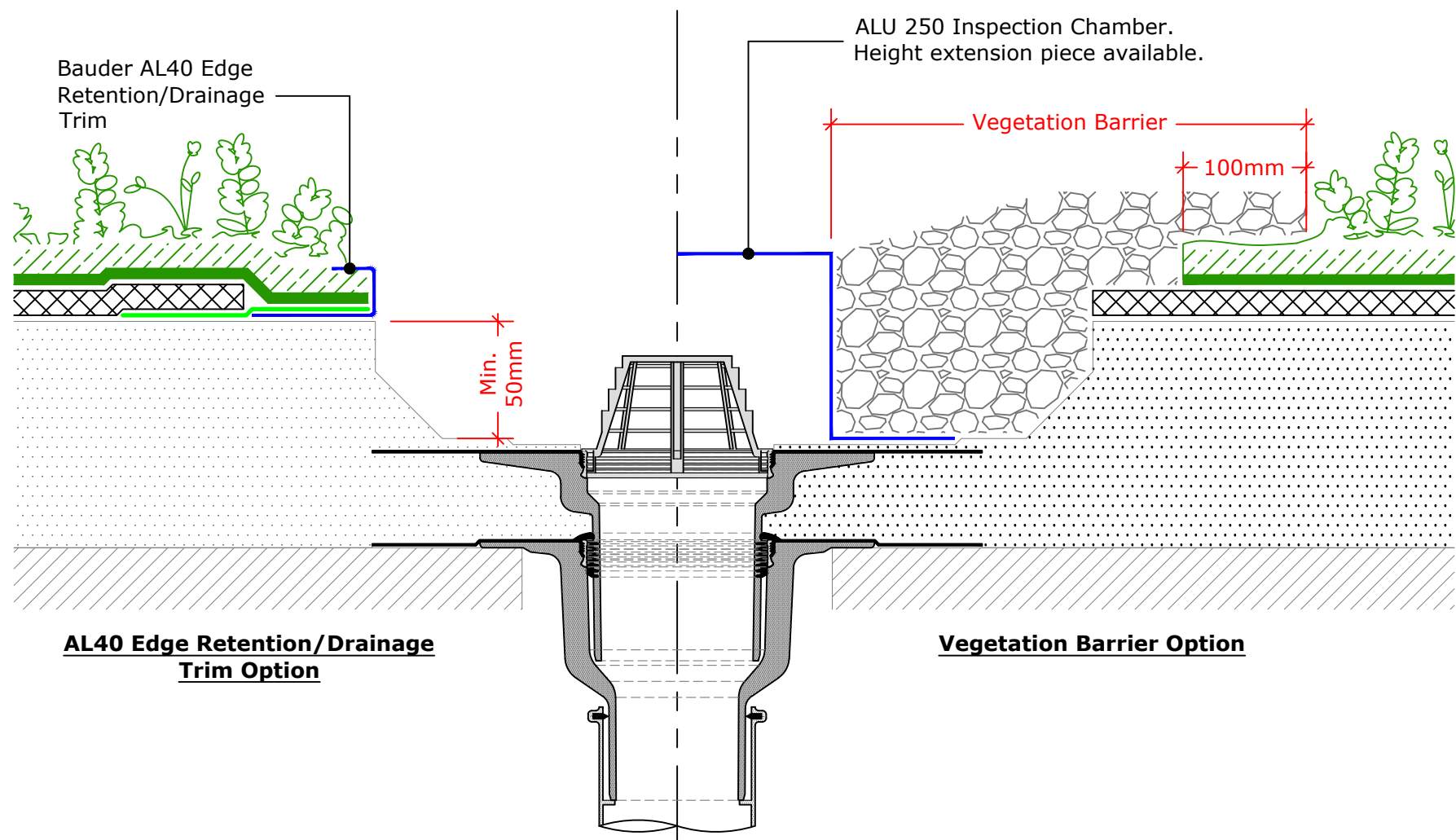
Detail to Mansard Roof

(Drg.No: D0901-00W_1-2Deg_006-Ext-XF301-SM_006)



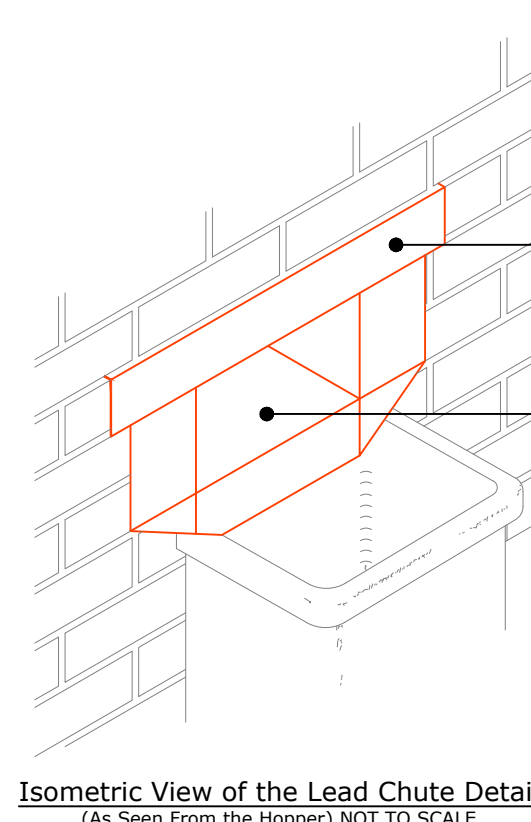
Upstand - Soil Vent Pipe

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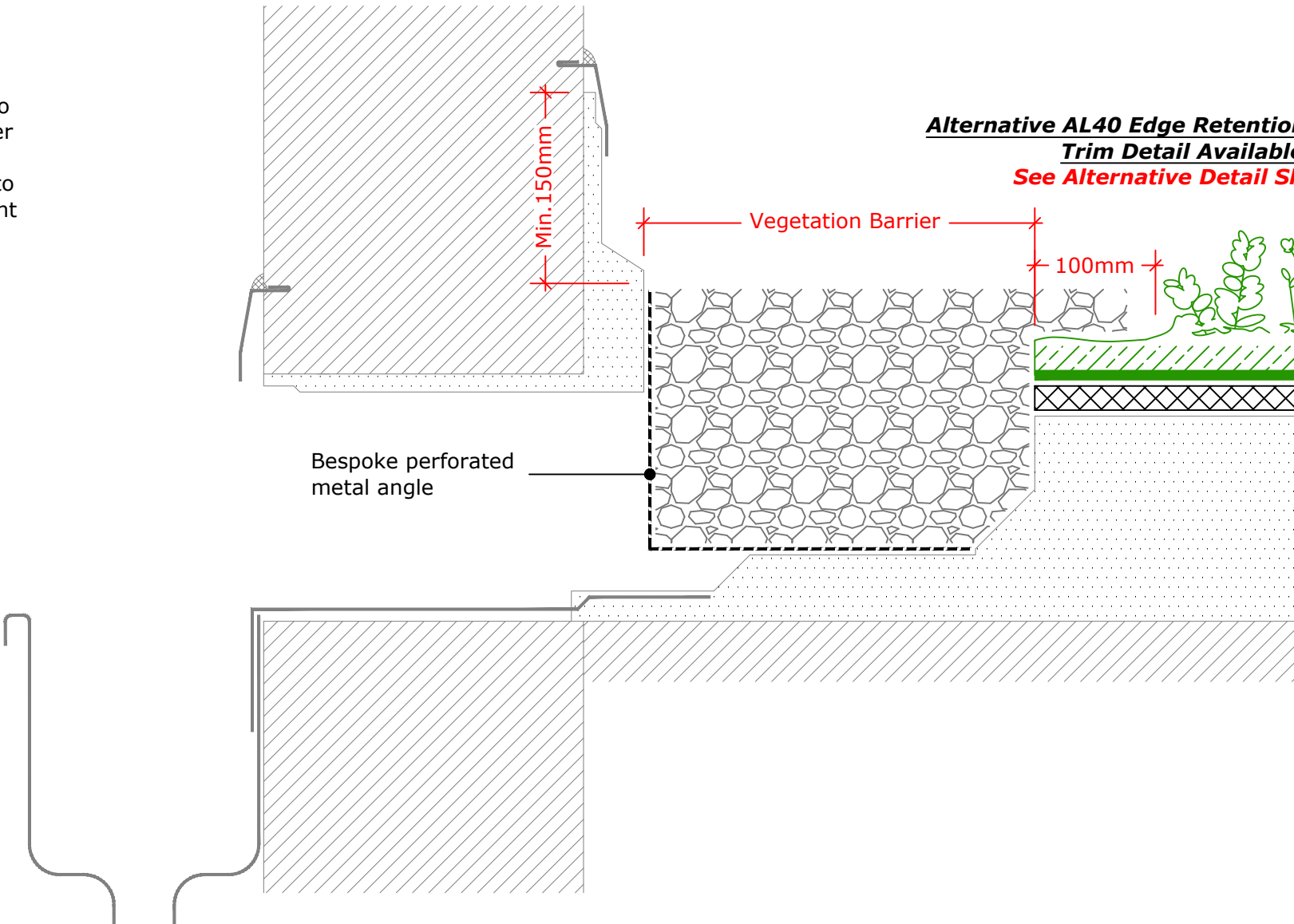


Bauder Outlet - Compact

(Drg.No: D0901-00W_1-2Deg_006-Ext-XF301-SM_001)



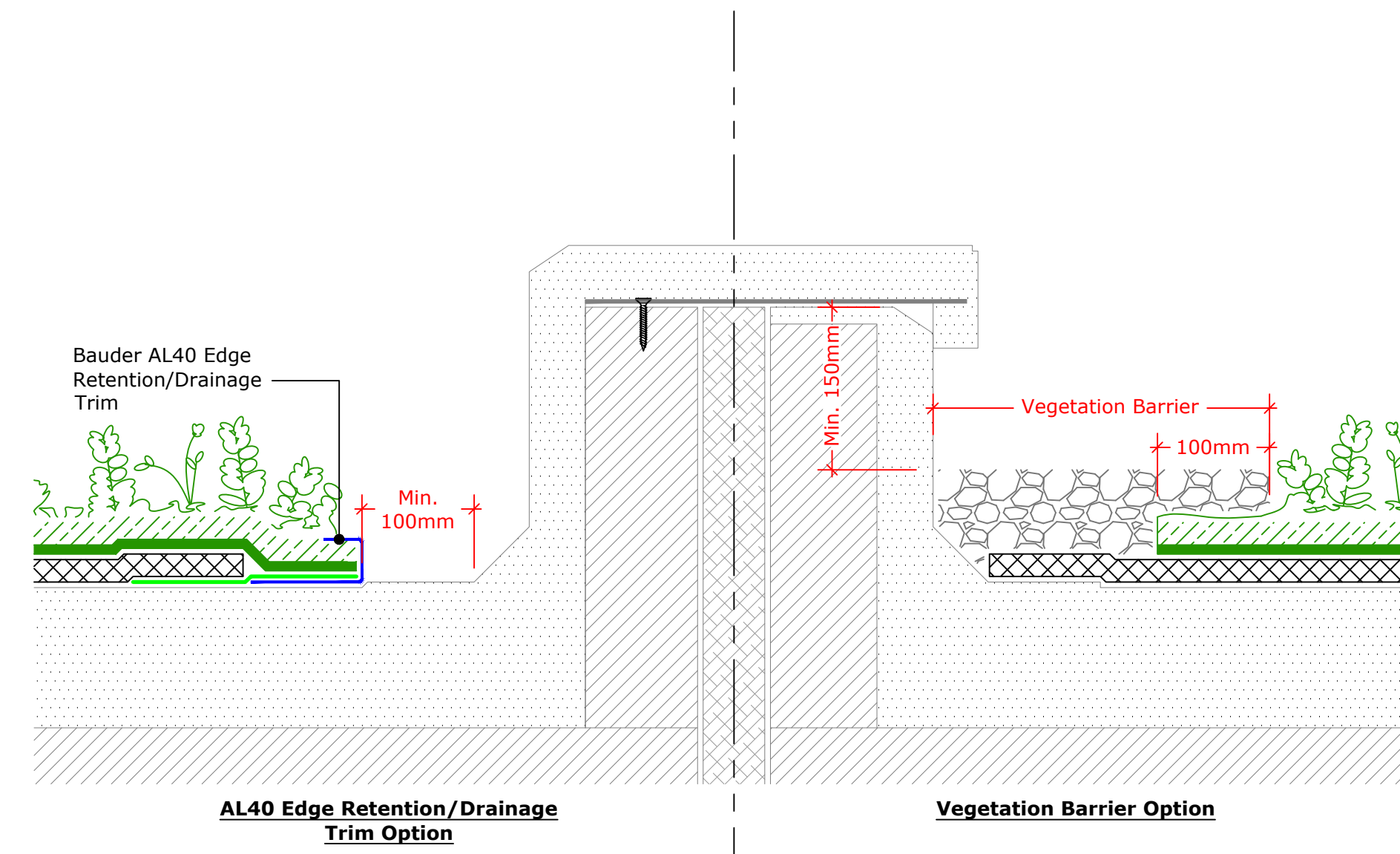
Isometric View of the Lead Chute Detail
(As Seen From the Top) NOT TO SCALE



Alternative AL40 Edge Retention / Drainage Trim Detail Available
See Alternative Detail Shown

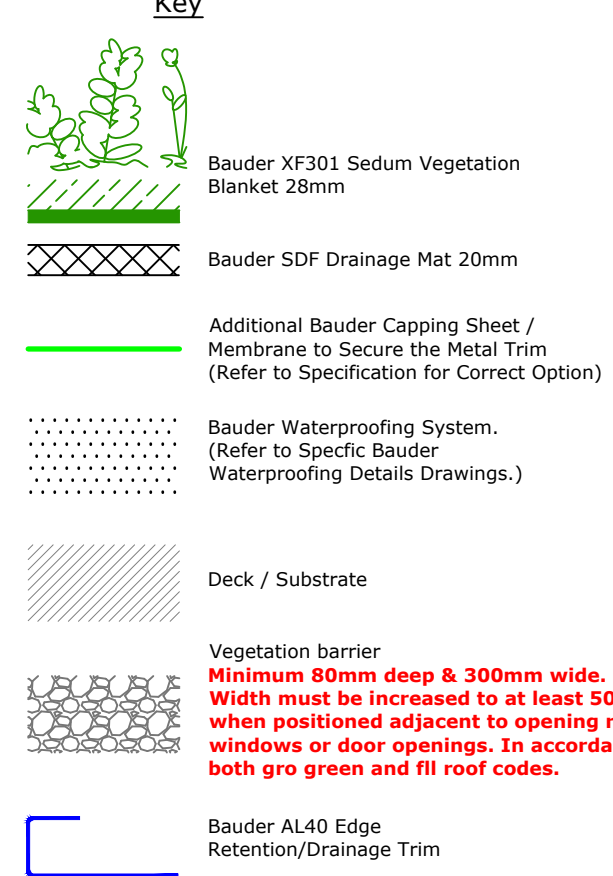
Upstand - Lead Chute

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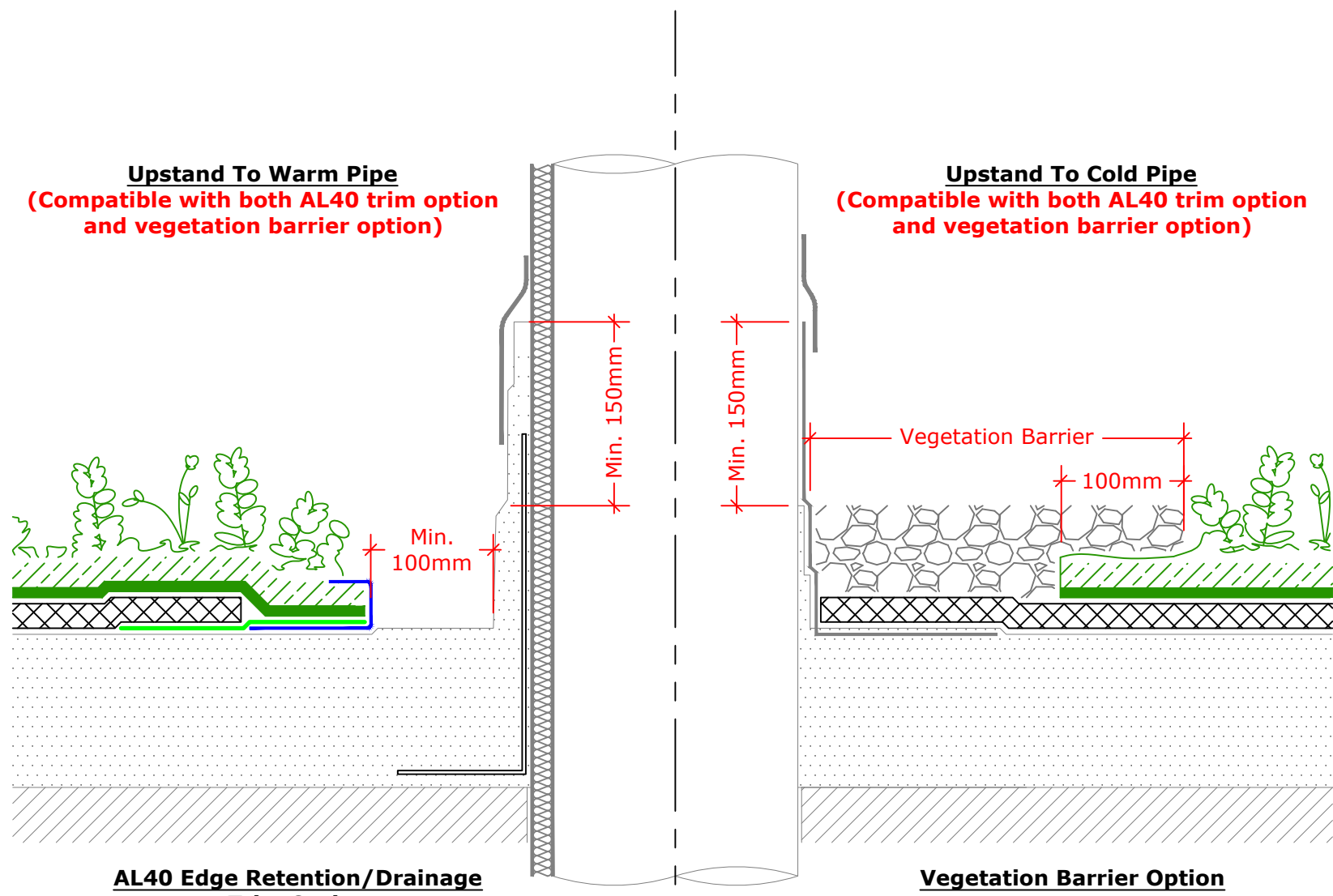


Twin Kerb Expansion Joint

(Drg.No: D0901-00W_1-2Deg_204-Ext-XF301-SM_001)

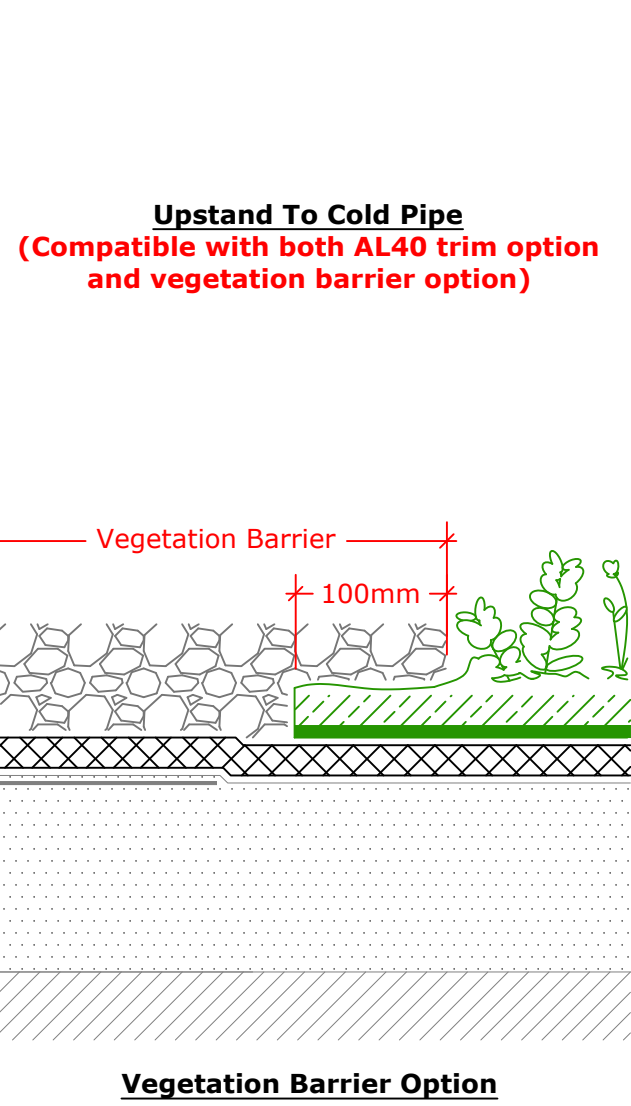


Important note:
This drawing shows alternative details. For the correct solution to be used, refer to the project specific specification.



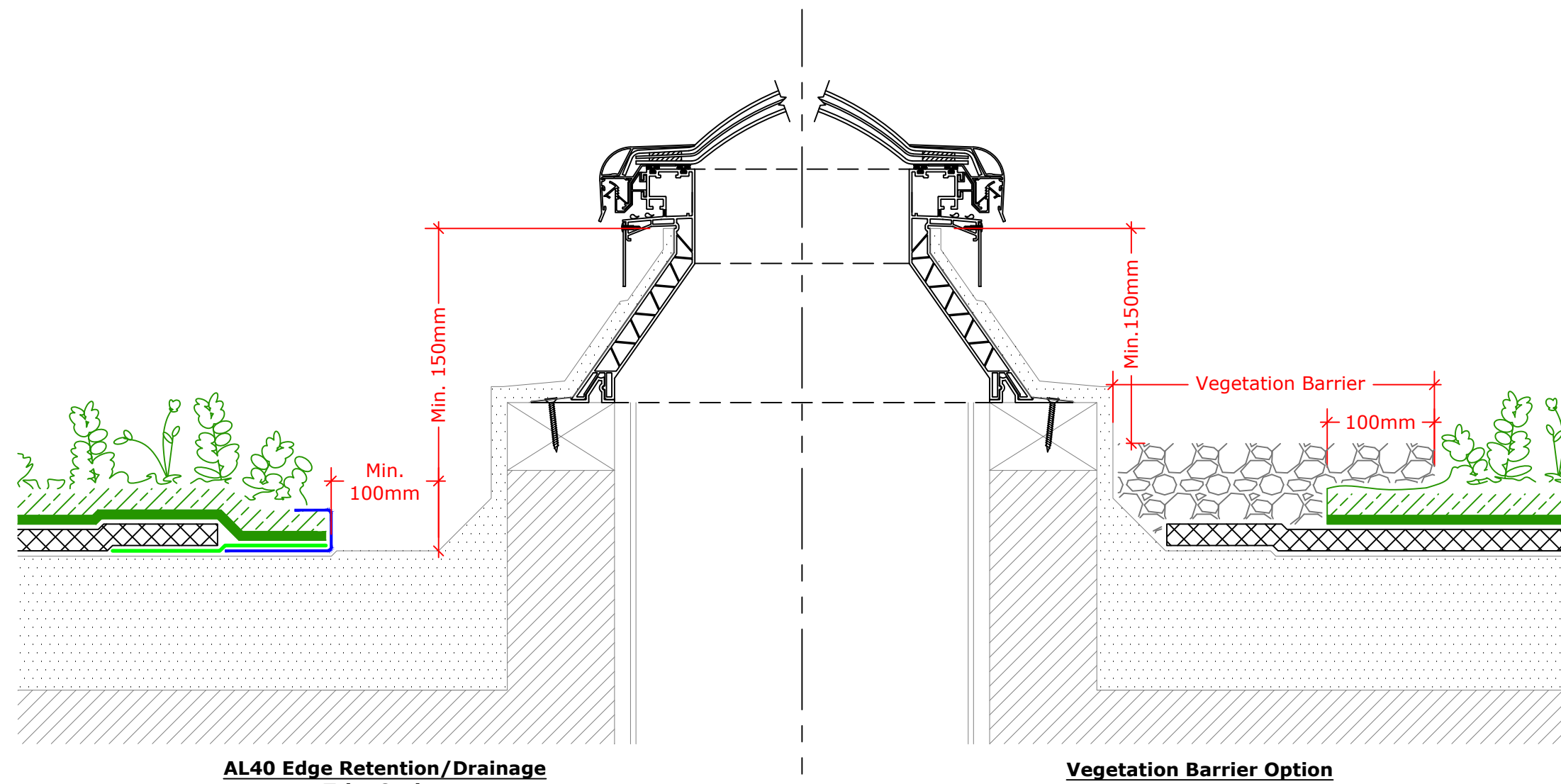
Upstand To Warm Pipe
(Compatible with both AL40 trim option and vegetation barrier option)

AL40 Edge Retention/Drainage Trim Option



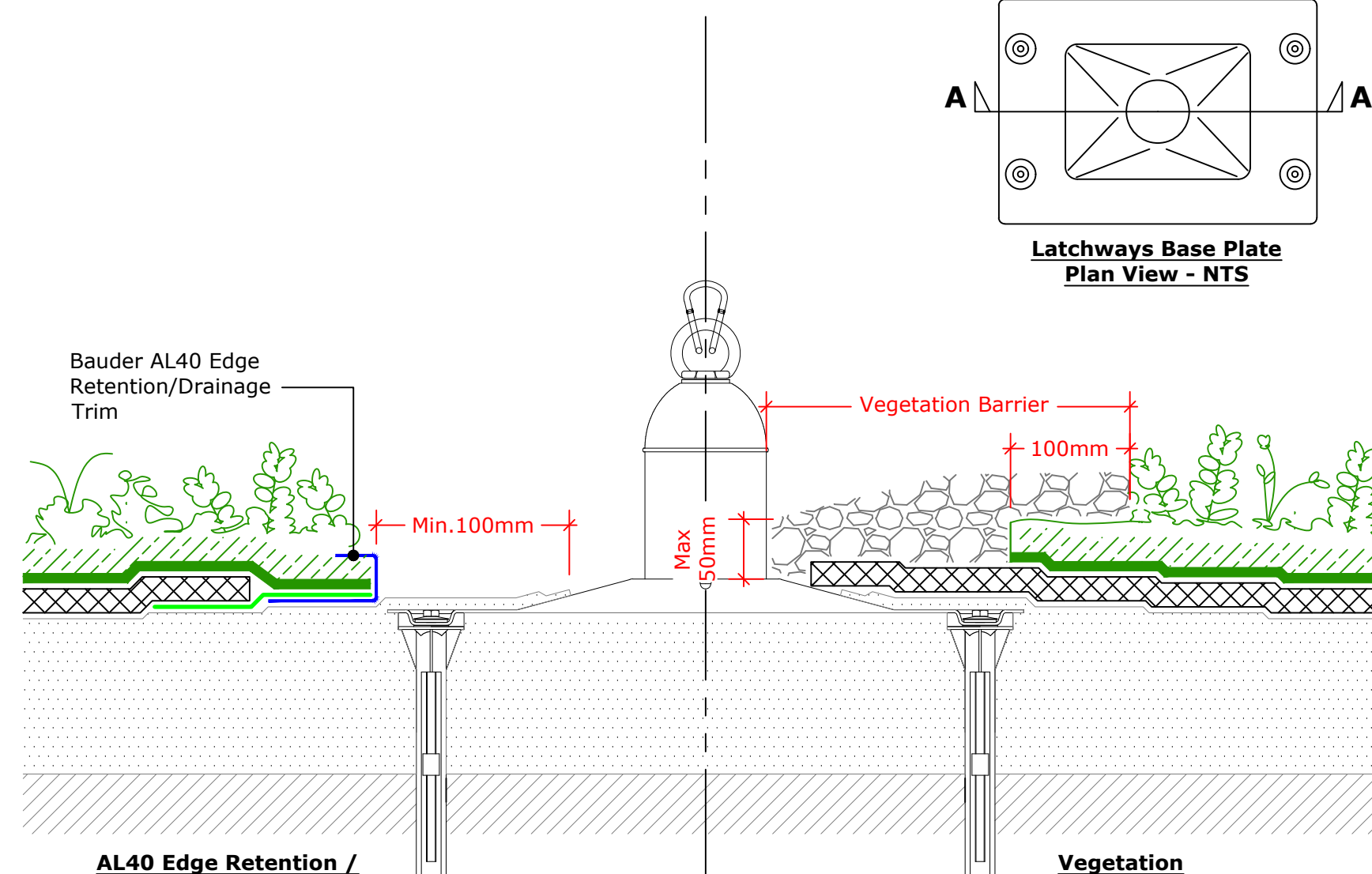
Upstand To Cold Pipe
(Compatible with both AL40 trim option and vegetation barrier option)

Vegetation Barrier Option



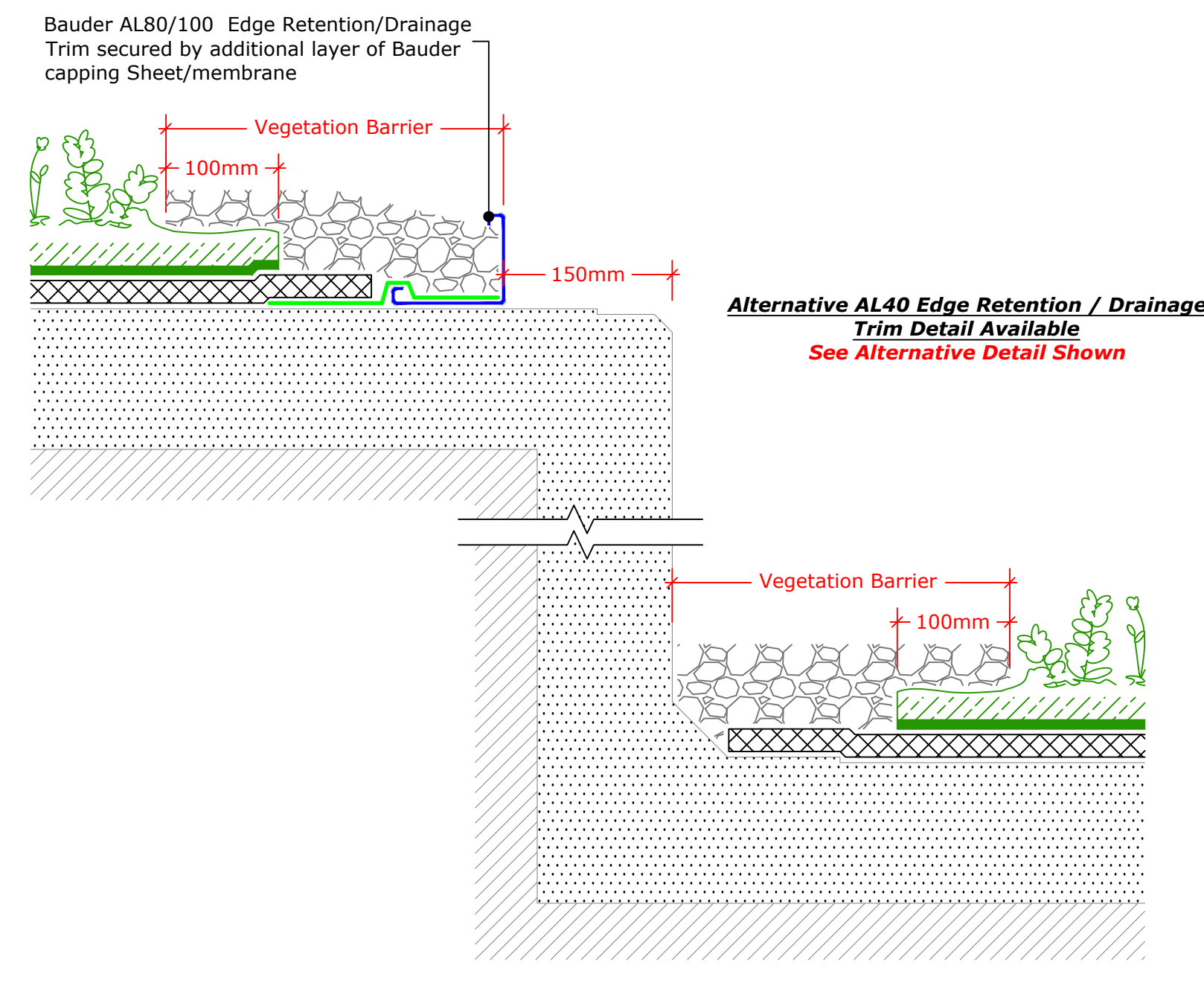
AL40 Edge Retention/Drainage Trim Option

Vegetation Barrier Option



AL40 Edge Retention / Drainage Trim Option

Vegetation Barrier Option



Change In Level

(Drg.No: D0901-00W_1-2Deg_210-Ext-XF301-SM_001)

- IMPORTANT NOTES:**
- These details are suitable for use on the following Bauder Systems:
Bauder Total Green Roof System
Bauderflex Green
Thermofol and Thermoplan
This drawing shows Alternative Options. For the correct solution to be used, refer to the Project Specific Specification.
 - Do not scale to ascertain dimensions.
 - All dimensions to be checked and verified on site prior to commencement of work.
 - This drawing is to be read in conjunction with the specification and associated drawings.
 - This detail is a guideline only, representing typical detailing conditions and illustrate the correct application of the above Bauder System. It may be necessary to modify this detail to suit specific project design constraints and application. For clarity the method of attachment has not been shown.
 - Provision should be made by the installer for maintaining the top leading edge of all upstand details in excess of 250mm in height using appropriate fasteners.

Rev	Date	Description	Drawn By



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Date	Drawn By	Checked By	Rev
1:5 16 Aug	D0901-00W_1-2Deg_200-Ext-XF301-SM_001		
Rev			

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Sedum species in current blankets

Sedum acre

Sedum album 'Bella d' Inverno'

Sedum album 'Coral Carpet'

Sedum ewersii

Sedum kamtschaticum subsp. *Ellacombianum*

Sedum kamtschaticum var. *floriferum* 'Weihenstephaner Gold'

Sedum montanum subsp. *orientale*

Sedum pulchellum

Sedum rupestre (*reflexum*)

Sedum sexangulare

Sedum spurium *mesemlanthemum* = *Delosferma*

Sedum spurium *mesemlanthemum* = *hallii*

Sedum verticillatum

Ray Stephenson is one of the worlds leading authorities on sedum plants and is the chairman of the Sedum society. He was commissioned by Strodhoff & Behrens last year to produce a study report on sedum species particularly suited to the UK climate, including coastal and exposed sites. This is the basis of the plants currently used within our blankets (although many of these were already being used).

There are currently 13 varieties used (dependent upon seed availability – see above). The mix will vary from blanket to blanket, but we expect at least eight species present in each blanket. The percentage mix of each species is also variable.

Most species are self-propagating, but there are also some that naturally seed and then die afterwards, but will return the following year.

To date, we are the only company with a blanket produced in the UK that is compliant with FLL regulations and that has a BRE certified FAA fire rating. Part of this test is reliant upon a blanket that does not contain too much organic content and sedum species that does not produce too much dead vegetation after flowering. It is the volume of dead vegetation that creates a fire risk in dry weather conditions.

Species develop according to the location. Inevitably, some species will dominate a site more than others and it is to be expected that accordingly some species may not survive long-term. The key to maintaining variety is annual maintenance and fertiliser at the correct time, to keep all species happy.

Notes from Ray Stephensons visit

1. Location – more rainfall in the west of the country than in the east. Irrigation to be considered for east located sites on slopes over 3 degrees.
2. Sedums are salt tolerant (coastal sites)
3. South facing aspects – irrigation for 30 degree slopes and above.

Watering Requirement Guidelines for Extensive and Bio-diverse Green Roof Installations

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1. INTRODUCTION

It is essential that all types of green roof, regardless of the planting specified, receives the correct level of care and attention immediately after completion, to ensure that the plants installed can rapidly and healthily establish within their new rooftop environment.

Essential to this process is the provision of an adequate water supply of sufficient pressure to roof level, to deliver either temporary watering during the proposed period of plant establishment or otherwise a permanent installed irrigation system that can provide watering on demand.

The type required is dependent upon the landscaping system specified and this is outlined in the sections below.



The following information is intended as a guide to assist in the planning of establishment watering and where installed, permanent irrigation, as being part of the long-term management and maintenance of all Bauder Extensive green roof systems.

It is recommended that this document is read alongside the appropriate Bauder installation and establishment maintenance guidelines together with general maintenance guidelines for the proposed vegetation type.

2. WATERING REQUIREMENTS PARTICULAR TO SPECIFIC BAUDER EXTENSIVE LANDSCAPING SYSTEMS

XERO FLOR XF301 LIGHTWEIGHT SEDUM BLANKET SYSTEM

This product does not require installation over a substrate growing medium, as the growing medium and moisture retention are self-contained, making this system the lightest of its type currently available. Bauder SDF Mat drainage layer is incorporated if the roof falls are less than 2°, otherwise the blanket is applied directly to the waterproofing.

A key advantage of XF301 is that it can be installed on slopes of up to 25°, without needing a heavily constructed and expensive landscape retention system, instead using a unique spiked retention component attached at set intervals to the waterproofing surface.

One consequence of being so lightweight and of shallow build-up, is the importance of annual maintenance, particularly fertilizing, as the system has little inherent nutrient.

The benefit of applying a shallow build-up on steeper slopes can also have a consequence in respect of water retention capacity and therefore provision for artificial irrigation should be allowed for under certain conditions. These are outlined below: -



Sedum blanket being applied to a steep sloped roof, fitted with both retention strips and drip line irrigation.

- **Roof falls up to 2°** - No artificial irrigation required
- **Roof Slopes in excess of 5 degrees, exposed locations or south facing** – Consider
- **Roof Slopes in excess of 10 degrees** – provision for irrigation considered essential
- **Slopes from 1-5 degrees coastal or exposed locations** – Consider
- **Slopes in excess of 5 degrees coastal, south facing and exposed locations** – provision for irrigation considered essential

For roofs less than 50 m² in area and single storey in height, irrigation can be achieved using a simple hose and sprinkler arrangement, but for larger areas it is more practical and cost effective to install a permanent drip line system.

Watering with an irrigation system is still periodic and only necessary during prolonged periods of drought or otherwise to maintain appearance. Over-watering will encourage grass and other weeds to establish and is not generally good for sedum plant health, as the plants need to go through the drought process to become hardy for surviving extreme weather conditions. Therefore watering once every 4-6 days during hot, dry periods, during dawn or dusk is recommended.

3. VEGETATION OVER A SUBSTRATE GROWING MEDIUM

This applies to the following Bauder vegetation finishes: -

- **Xero Flor XF118 wild flower blanket**
- **Xero Flor XF300 sedum blanket**
- **Bauder Traditional and UK Native Species plug plants**
- **Bauder KS Plus seed mix**

All of the above vegetation options are installed either over or within Bauder Extensive Substrate growing medium. These extensive green roof systems are generally intended to persist without any form of artificial irrigation once the vegetation is established.

However, aspect and location are factors that have a bearing and together with consideration towards our changing climate over the long-term means that provision for watering needs careful assessment. The broader range of vegetation now being used and the visual appearance sometimes demanded there will be projects that will require or benefit from the inclusion of a permanent irrigation system or water feed to roof level fitted during construction.

This does not necessarily mean a requirement for regular irrigation, but it does ensure that during times when additional watering above and beyond normal rainfall is required, this can be provided.

In particular, this applies to sloped roofs over 5° and the system types where permanently installed irrigation provision should be considered, are listed below: -

- **Bauder XF118** – Consider for enhanced visual appearance
- **Bauder UK Native Species Plug Plants** – Consider for enhanced visual appearance
- **Bauder KS Plus seed mix (both during and after planting has become established)** – Consider for enhanced visual appearance

Regardless of the green roof system specified, we would always recommend that sufficient watering points of adequate pressure are always provided at roof level to allow the entire roof area to be irrigated by hose and sprinkler during particularly prolonged periods of drought. It is cheaper periodically to add water than to replace planting.



4. WATERING DURING AND IMMEDIATELY FOLLOWING INSTALLATION

For all applications involving substrate growing medium, the substrate should be thoroughly watered to moisten it before the planting is installed and also to fill the underlying water storage board, so that some water retention is provided.

Once the planting has been installed, apply Bauder Xero Flor organic fertilizer at a rate of 80g/m², by using the recommended applicator trolley which ensures adequate and even pellet coverage.

Thoroughly water the vegetation immediately after installation or as soon as a sufficient area of planting is installed that can be watered using sprinklers.

Initial watering must be by surface mounted sprinklers to water in the fertilizer. Do not over-water the fertilizer if the substrate is already well moistened. Use just enough to wash the fertilizer pellets off any vegetation leaves to prevent burning.

Special note Regarding Bauder KS seed mix

This seed mix is provided in a formulation that allows it to be applied direct to a moist substrate and should **not** be watered in after installation, but left to germinate and establish at its own pace, requiring irrigation only in prolonged drought conditions once established.

5. ESTABLISHMENT WATERING

Establishment watering needs to be correctly managed to ensure that the landscaping is kept sufficiently moist to encourage strong root development whilst ensuring that the system never becomes too wet.

All newly installed sedum blanket vegetation will require watering for at least the first month after completion.

The wild flower, herb and rockery vegetation species used in all other extensive/bio diverse green roofs will need to receive irrigation for at least 10 weeks after completion, and will require close attention over the first 4 weeks to ensure that the system is kept moist without becoming over-saturated.

Frequency of watering is dependent upon the time of year and current weather conditions, but with sedum vegetation this is usually only required every 4-6 days during the summer months. With all other species it is possible that watering could be required on a more frequent basis in hot weather, which can only be determined by a visual inspection to review if the plants are wilting.

Water the vegetation for a period of approximately 1-2 hours to ensure that the growing medium is fully saturated. If the green roof has a leaky pipe or drip line irrigation system fitted then this can be employed to provide the required post-installation watering.

Please note that drip line irrigation is not suitable for initial watering in of the fertiliser, and therefore surface sprinklers should be used - see item 4 above.

6. METHODS OF WATERING AND THE EQUIPMENT REQUIRED

Temporary watering

There are a number of methods that can be used to facilitate temporary watering on site and these would be employed for establishment watering, for those landscapes not requiring any permanent irrigation, or otherwise when the permanent irrigation is not yet operational.

It is important to have a main's feed (or several mains feeds) to roof level of sufficient pressure to water the total vegetated area. A hub may be set up to then distribute water to the various areas via a set of secondary feeds.



Example opposite of a temporary watering system hub rigged up on site to provide adequate mains watering feeds to different roof areas.

These help the contractor managing installation and establishment watering to control irrigation from a central point, whilst retaining flexibility if the apparatus needs to remain mobile.

In situations where the mains water pressure is found to be insufficient, a Bowser can be used together with a pump, to provide water at the required pressure to roof level.

Mobile Bowlers are fine as a solution for temporary watering during installation where a mains feed is not yet available or for short term watering i.e. establishment watering of XF301 sedum blankets.

However, for longer term establishment watering as is required for XF118 wildflower blankets, where this can be required for up to 10 weeks, a permanent feed to roof level of the required minimum pressure is necessary.



Image supplied courtesy of Morclean Ltd

Requirements for mains water supply

A supply of mains water must be provided on site prior to the delivery and installation of the vegetation.

A minimum of 3 bar pressure at roof level is required to provide sufficient pressure to enable up to four sprinkler units to operate simultaneously. This is sufficient to cover an area of approximately 450 m² at any time, depending upon the water supply available.

Testing the water pressure

The water pressure and flow available from the mains feed must be checked with a suitable pressure gauge (see opposite) to confirm that the system is adequate in advance of the installation of the vegetation.



Multiple Hose connectors

Three-way multiple brass hose connectors provide a quick and efficient method of connecting up several hoses to the mains supply simultaneously.



Heavy duty hose pipe

Sufficient lengths of heavy duty hose to be provided to reach all roof areas



Pipe joiners

Hose pipe can be extended to the length required using these proprietary brass pipe joiners



Small Areas up to 20m²

An adjustable spray head is suited for very small areas and for watering in fertilizer



Areas under 100m²

Used with narrower head nozzles or alternatively use domestic oscillating sprinklers



Areas over 100 m²

Surface mounted sled riser units with changeable sprinkler heads give variable spray patterns



Watering roof areas over 100m²

Riser units can be 'daisy chained' together to irrigate the length of the roof. Sprinkler heads can be changed to enable different spray patterns to be employed to suit each roof area as required.

Several roof areas can be watered simultaneously using a multi-connector at the mains, so long as sufficient water pressure and flow is available for each separate feed.

When watering large roofs on public buildings such as schools, these will often have water meters fitted. The occupiers may wish a meter reading to be taken before watering commences, so that the cost of the water usage can be separated and later reimbursed.

Time control for evening irrigation

Battery operated timer control units are available to help control watering efficiency. These can be set to allow watering at dawn or dusk when wind and evaporation levels are at their lowest, thus preventing unnecessary water loss.

This facility is important for installations carried out during the dry summer months, as it enables the water to saturate the sedum blanket or substrate system which gives the plants the opportunity to take on and store water.

A separate timer will be required for each hose run in operation.

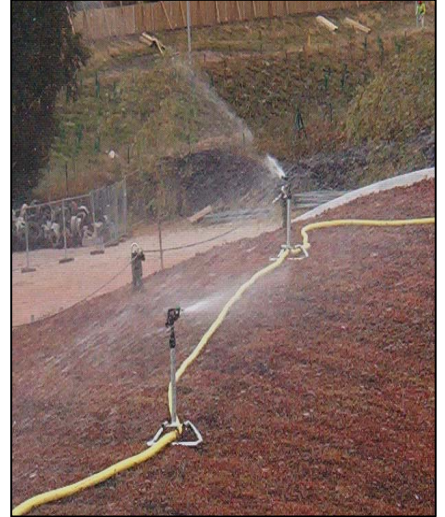
Permanent Drip line irrigation

This system can be installed for both occasional and regular watering. The system layout and components required for any individual green roof system will be dependent upon a number of factors, including vegetation type, substrate depth and roof slope. We would strongly recommend seeking project-specific advice from a specialist irrigation company to ensure that the proposed system will meet required criteria.

A minimum of 2 bar pressure at roof level is required for most systems to operate correctly. The system must be fully operational with all operational controls easily accessible for use. The irrigation system would normally require Category 5 back-flow prevention.

A permanent drip line system (where installed) is not suitable for the task of carrying out the initial surface watering after fertilizer has been applied. Fertilizer should be properly watered in using surface watering sprinklers to prevent burning the leaves and damaging the plants.

Watering is best carried out automatically at dawn or dusk using a timer control unit.





7. SPECIALIST ADVICE

Advice and Supply of Irrigation equipment

Access Irrigation Ltd is one of the country's longest established irrigation specialists and has considerable experience in many types of irrigation, including green roofs.

They are happy to provide irrigation advice on any Bauder project and can supply a wide range of irrigation products and technical advice.

Please contact: -

Access Irrigation Ltd
Crick
Northampton
NN6 7XS

T: 01788 823811

F: 01788 824256

E: sales@access-irrigation.co.uk

W: www.access-irrigation.co.uk



Technical Advice on Installation and maintenance of Extensive green roof systems

For project specific advice relating to establishment watering and irrigation issues that relate specifically to Bauder Green Roof systems, please contact our Technical Department using the details below.

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