Species Name	Latin Name	Height	Wildlife Benefit	Growth Conditions
Common Vetch	*Vicia sativa*	15-40cm	Mid flowering, attracts bees, wasps, butterflies and aphids – aphids are beneficial for house sparrows	Particularly attractive to aphids, an essential food source for house sparrow chicks. A member of the legume family therefore nitrogen fixing and will increase the nutrient value of the substrate over time
Corn Camomile	*Anthemis arvensis*	Up to 30cm	Attract a range of pollinating insects	Preference for light chalky or sandy soils
Cornflower	*Centaurea cyanus*	30-80cm	Attract many beneficial insects that come to nectar and feed on the pollen	A hardy plant which grows of many soil types and prefers full sun
Cowslip	*Primula veris*	Up to 25cm	Food plant of the Duke of Burgundy Fritillary butterfly, Plain Clary and Northern Rustic moths	A hardy plant preferring well drained soils and full sun
Cut Leaved Crane's-Bill	*Geranium dissectum*	10-40cm	Mid to late flowering, attracts beetles and butterflies.	Likes stony ground, wasteland, and thin soils. Low growing sprawling plant
Dove's-Foot Crane's-Bill	*Geranium molle*	Up to 20cm	Early flowering, attracts range of insects and beneficial for black redstarts	Low growing, sprawling habit. Drought tolerant and common on roadsides, wastelands and brownfield sites
Fox And Cubs	*Hieracium aurantiacum*	15-35cm	Mid flowering, attracts flies, good nectar source	Drought tolerant, hardy plant, low growing
Hares Foot Clover	*Trifolium arvense*	10-40cm	Late flowering, attracts flies, good nectar source	Drought and wind tolerant. A member of the legume family therefore nitrogen fixing and will increase the nutrient value of the substrate over time
Hoary Plantain	*Plantago media*	30-55cm	Mid flowering, large flowerhead, attracts bees and wasps	Drought tolerant, low growing
Kidney Vetch	*Anthyllis vulneraria*	Up to 60cm	Late flowering, attracts bees and wasps and butterflies. Beneficial for black redstarts.	Low growing, ground covering plant, found on wastelands, railway embankments etc. Drought tolerant. A member of the legume family therefore nitrogen fixing and will increase the nutrient value of the substrate over time

Species Name	Latin Name	Height	Wildlife Benefit	Growth Conditions
Knapweed	*Centaurea scabiosa*	Up to 50cm	Very attractive to butterflies and bees.	Tolerant of a wide range of soils. It's common throughout the British Isles.
Lemon-scented Thyme	*Thymus x citriodorus*	10cm	Very attractive to numerous species of butterflies and bees	Hardy low growing plant. Frost tolerant.
Musk Mallow	*Malva moschata*	Up to 80cm	Particularly attractive to several species of bees.	Prefers dry and fertile soils and full sun.
Ox Eye Daisy	*Leucanthemum vulgare*	Up to 60cm	Late flowering, attracts beetles and hoverflies.	Grows on disturbed soils and wastelands as well as wildflower meadows, tolerant of a wide range of environmental conditions including drought
Pale Toadflax	*Linaria repens*	Up to 80cm	Has pollen for bees and pollen beetles, *Brachtypterus spp.*, in the flowers.	Grows on dry banks and stony ground over much of England and Wales.
Perforate St Johns Wort	*Hypericum perforatum*	20-50cm	Mid flowering, attracts bees, wasps and beetles. Beneficial for black redstarts.	Found on wastelands, dry stony ground, drought tolerant, robust plant
Red Campion	*Silene dioica*	30-80cm	The nectar of the flowers is utilised by bumblebees and butterflies, and several species of moth feed on the foliage	Grows in a variety of conditions but prefers to grow on damp, non-acid soils.
Red Clover	*Trifolium pratense*	20-60cm	Late flowering, attracts bumble bees, common carder bee, butterflies and weevils.	Low growing drought tolerant, hardy plant, low nutrient growth. A member of the legume family therefore nitrogen fixing and will increase the nutrient value of the substrate over time
Reflexed Stonecrop	*Sedum reflexum*	10cm	An excellent source of nectar for bees and butterflies	Low growing plant which grows in small bushes, spreading on the ground
Ribwort Plantain	*Plantago lanceolata*	10-40cm	Beneficial for black redstarts	Drought tolerant and very common on wasteland, brownfield sites and roadsides
Rough Hawkbit	*Leontodon hispidus*	20-50cm	Yellow flower attracts butterflies and bees	A slow-growing, rosette-forming perennial of dry, neutral or calcareous soils. Dislikes nutrient-rich soils.

Species Name	Latin Name	Height	Wildlife Benefit	Growth Conditions
Scented Mayweed	*Matricaria recutita*	15-50cm	This plant is a very good source of nectar for bees and flies. One small weevil, *Omphalapion hookeri* lives on the seedheads. Scented mayweed is highly attractive to ladybirds that feed on aphids	It thrives best on lighter soils but can grow on loams and heavy clays. Prefers full sun.
Self Heal	*Prunella vulgaris*	30-60cm	Mid flowering, good for bees. Beneficial for black redstarts	Prefers sun or semi-shade and some moisture but drought tolerant, low growing creeping plant.
Tunic Flower	*Petroraghia saxifraga*	10-15cm	Flowers attracts numerous butterfly and bee species.	Grows in sunny location in poor to moderately fertile soil, low water. Tolerates drought and neglect.
Viper's Bugloss	*Echium vulgare*	30-60cm	An important food source for species of bumblebee and butterflies.	Grows in dry, sunny position in well-drained or sandy soils.
White Clover	*Trifolium repens*	20cm	Late flowering, attracts, honey bee, bumble bees, weevils	Low growing, relatively drought tolerant, will not grow well in shade, low nutrient growth. A member of the legume family therefore nitrogen fixing and will increase the nutrient value of the substrate over time.
White Stonecrop	*Sedum album*	20cm	It provides nectar and pollen for bees including the buff-tailed bumble bee. Used as food plants by the larvae of some Lepidoptera species.	Grows well in a city environment. Is drought tolerant and prefers sunny positions.
Wild Basil	*Clinopodium vulgare*	30-70cm	Pollinated by bees and attractive to butterflies.	Very hardy plant and drought resistant.
Wild Marjoram	*Origanum vulgare*	30-60cm	Late flowering, attracts butterflies and bees	Drought resistant, low growing
Wild Mignonette	*Reseda lutea*	30-50cm	The green-yellow flowers are very attractive to bees.	Grows in waste, scrubby, disturbed soils that are well drained and in full sunlight.
Wild Pansy	*Viola tricolor*	Up to 40cm	Attractive to, and pollinated by, a variety of species of bee.	Prefers sandy substrates and partial shade.
Wild Thyme	*Thymus serpyllum*	2-10cm	It is an important nectar source plant for honeybees as well as the large blue butterfly which feeds exclusively on wild thyme	A hardy plant that thrives in full sun and often grows in pavement cracks. A low growing, creeping plant
Yarrow	*Achillea millefolium*	Up to 80cm	Attracts beneficial Syrphid flies.	Drought tolerant plant that prefers full sun and shallow, disturbed and nutrient poor soils.
Zigzag Clover	*Trifolium medium*	20-60cm	Attracts bumblebees and butterfly species.	Low growing drought tolerant, hardy plant, low nutrient growth. A member of the legume family therefore nitrogen fixing and will increase the nutrient value of the substrate over time
Mosses				
Springy Turf Moss	*Rhytidiadelphus squarrosus*	Up to 15cm		It tolerates a wide range of soils and colonises on man-made habitats.
Wall Screw Moss	*Tortula muralis*	5-10cm		Commonly found on stone and concrete areas.
Grey Cushion Moss	*Grimmia pulvinata*	2cm		Grows on rocks and concreted areas.

1.13 The seed mix list in Table 1.1 has been specified due to the wildflower's local provenance to the Camden and London area. The species are also commonly found on industrial, wasteland and brownfield sites in this region. We recommend if possible that the seed supplier has collected the seed from the London area from the wild and grown these on in their nursery to ensure a successful, viable seed that is capable of germination – many commercial seed suppliers do this routinely. It is important that this method of sourcing is used to lessen the risk of virus, low health and poor germination in flowers that may occur if the seed had been taken directly from the wild and planted straight onto the roof. The seed is carefully nurtured at the nursery to ensure a stable seed mix that is able to grow successfully without disease. The wildflower species will carry the same characteristics as those found growing wild in London, as the seed will have been originally sourced in this area and carefully grown to provide a healthy flower mixture.

Grays Inn Road

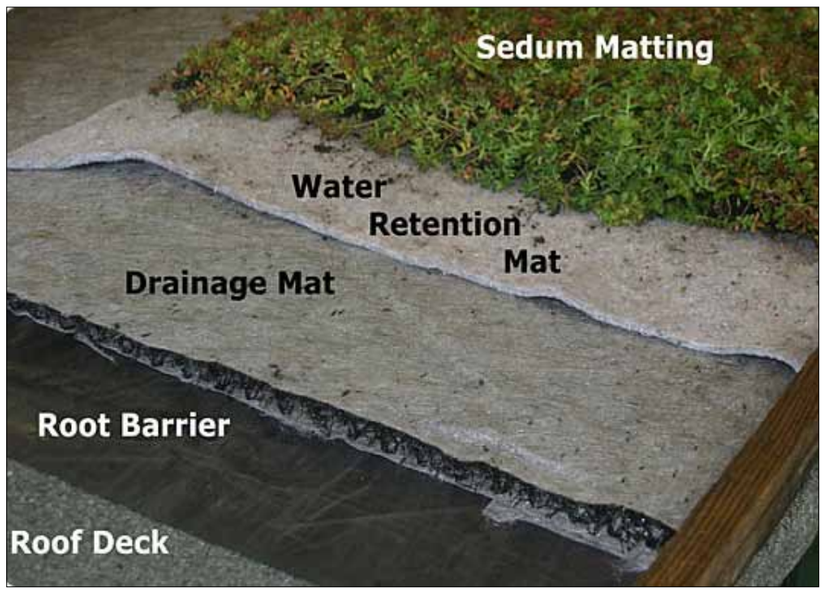
The extensive Sedum roofs are typically located on the upper roof levels (Fourth and Fifth Floors). These will be a pre-grown blanket laid over an appropriate lightweight substrate. The chosen system is the following:

Bauder XF301 Sedum blanket - containing a range of native and non-native Sedum species. The Bauder XF301 (Refer to Appendix C) with its patented carrier, which holds both the substrate and vegetation and acts as both water retention and drainage layer. All plants are selected to suit our climate and keep weight and maintenance to a minimum. The sedum blankets provide 90% ground coverage at installation. It is a very lightweight and cost-effective way of quickly delivering an established sedum vegetation finish onto a flat roof.

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/ aesthetic appearance.

Species to include: *Sedum acre**; *Sedum album* 'Bella d' Inverno; *Sedum album* 'Coral Carpet'; *Sedum ewersie*; *Sedum kamtschaticum* 'Ellacombianum'; *Sedum kamtschaticum* 'Weinstephaner Gold'; *Sedum montanum* ssp. Orientale; *Sedum pulchellum*; *Sedum rupestri* (reflexum)*; *Sedum sexangulare**; *Sedum spurium - mesemlanthemum* 'Delosferma'; *Sedum spurium - mesemlanthemum* 'Hallii'; *Sedum verticillatum*.

* - denotes a native species



Grays Inn Road

Sedum acre

Sedum album ‘Bella d’Inverno’

Sedum album ‘Coral Carpet’

Sedum ewersie

Sedum kamtschaticum ‘Ellacombianum’

Sedum rupestri

Sedum sexangulare

Sedum spurium - varieties

Sedum verticillatum

Appendix A - Drawings

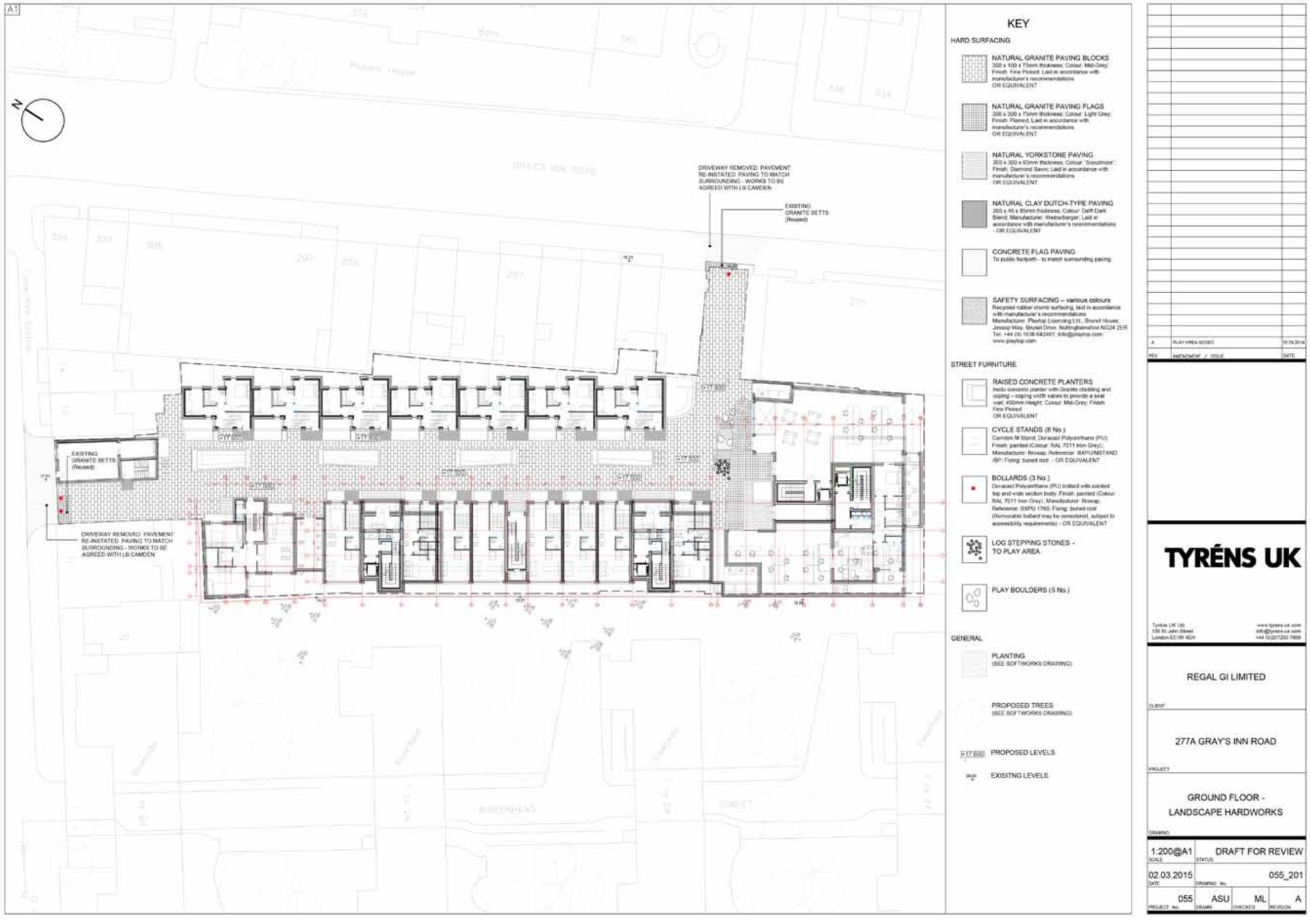
Landscape Hardworks - Ground Floor	055_201
Landscape Softworks - Ground Floor	055_301

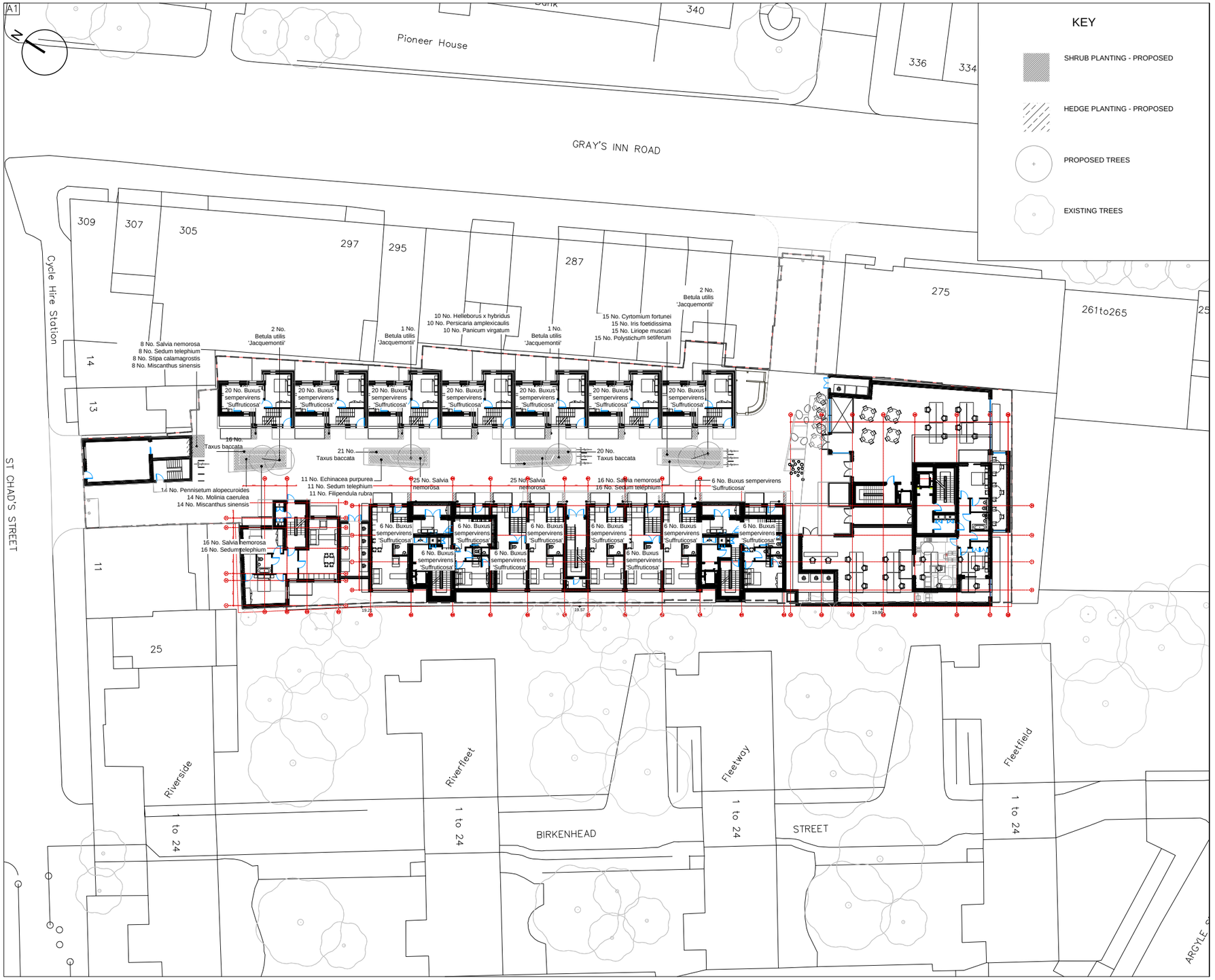
Typical Details:

Natural Granite Paving Blocks/Flags
Natural Yorkstone Paving
Natural Clay Dutch-Type Paving
Safety Surfacing
Pre-cast Concrete Paving/Extensive Sedum Roof - Interface
Pre-cast Concrete Paving/Biodiverse (Brown) Roof - Interface

Plant Schedule

Grays Inn Road





REV	AMENDMENT / ISSUE	DATE
A	PLAY AREA ADDED	15.08.2014

TYRÉNS UK

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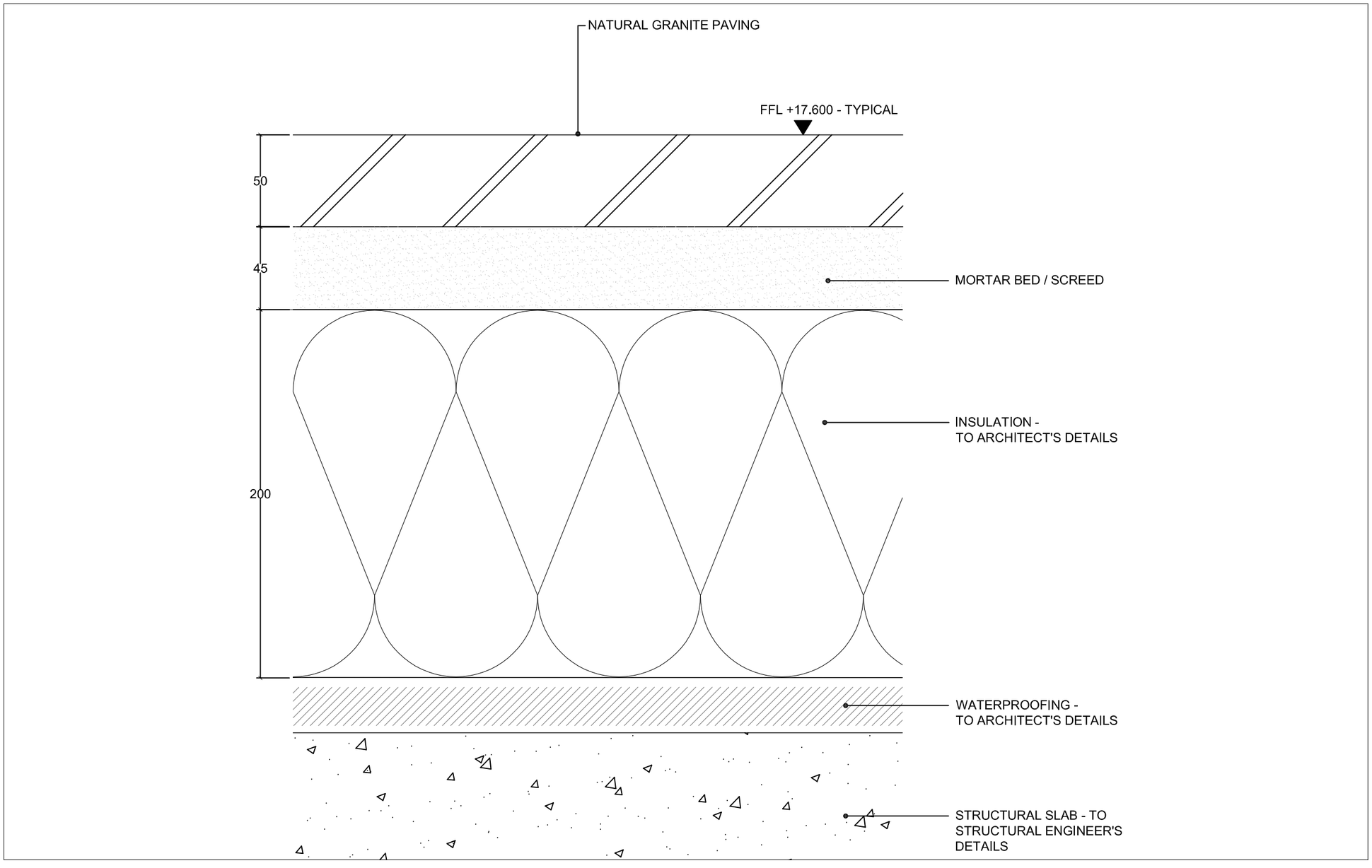
CLIENT: REGAL GI LIMITED

PROJECT: 277A GRAY'S INN ROAD

DRAWING: GROUND FLOOR - LANDSCAPE SOFTWORKS

SCALE: 1:200@A1	STATUS: DRAFT FOR REVIEW		
DATE: 02.03.2015	DRAWING No.: 055_301		
PROJECT No.: 055	DRAWN: ASU	CHECKED: ML	REVISION: A



Natural Granite Paving Blocks/Flags
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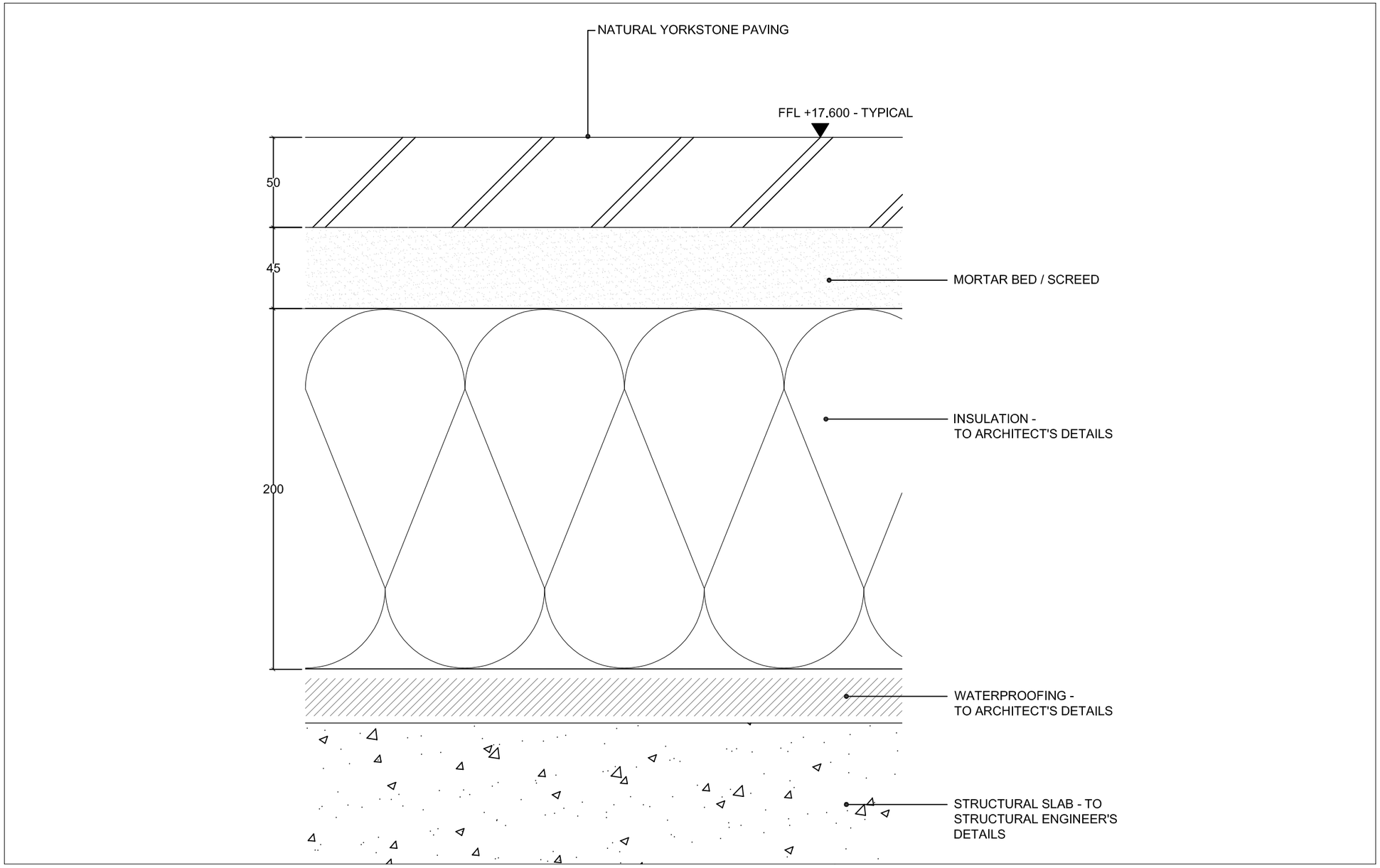

Natural Yorkstone Paving
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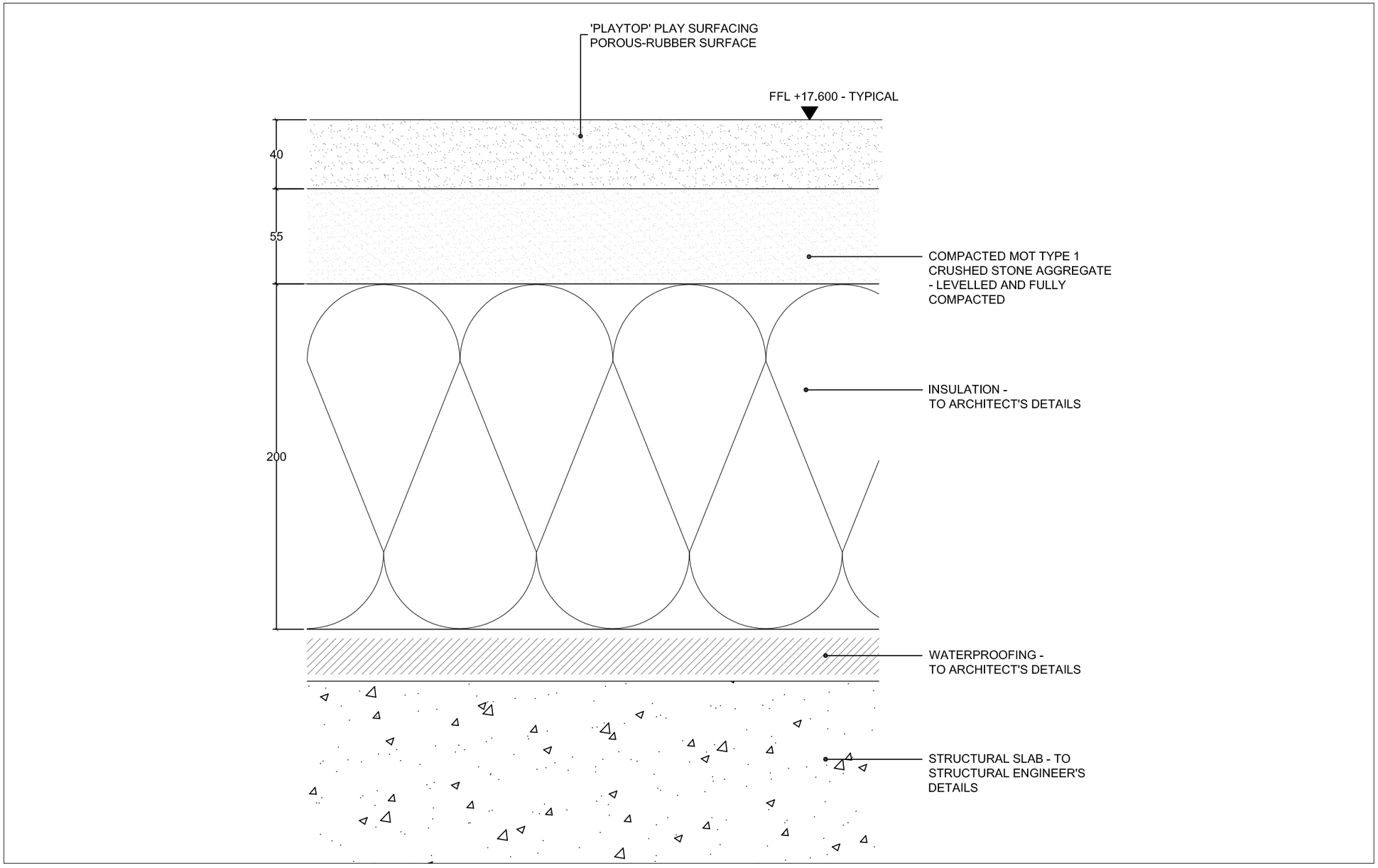

Natural Clay Dutch-Type Paving
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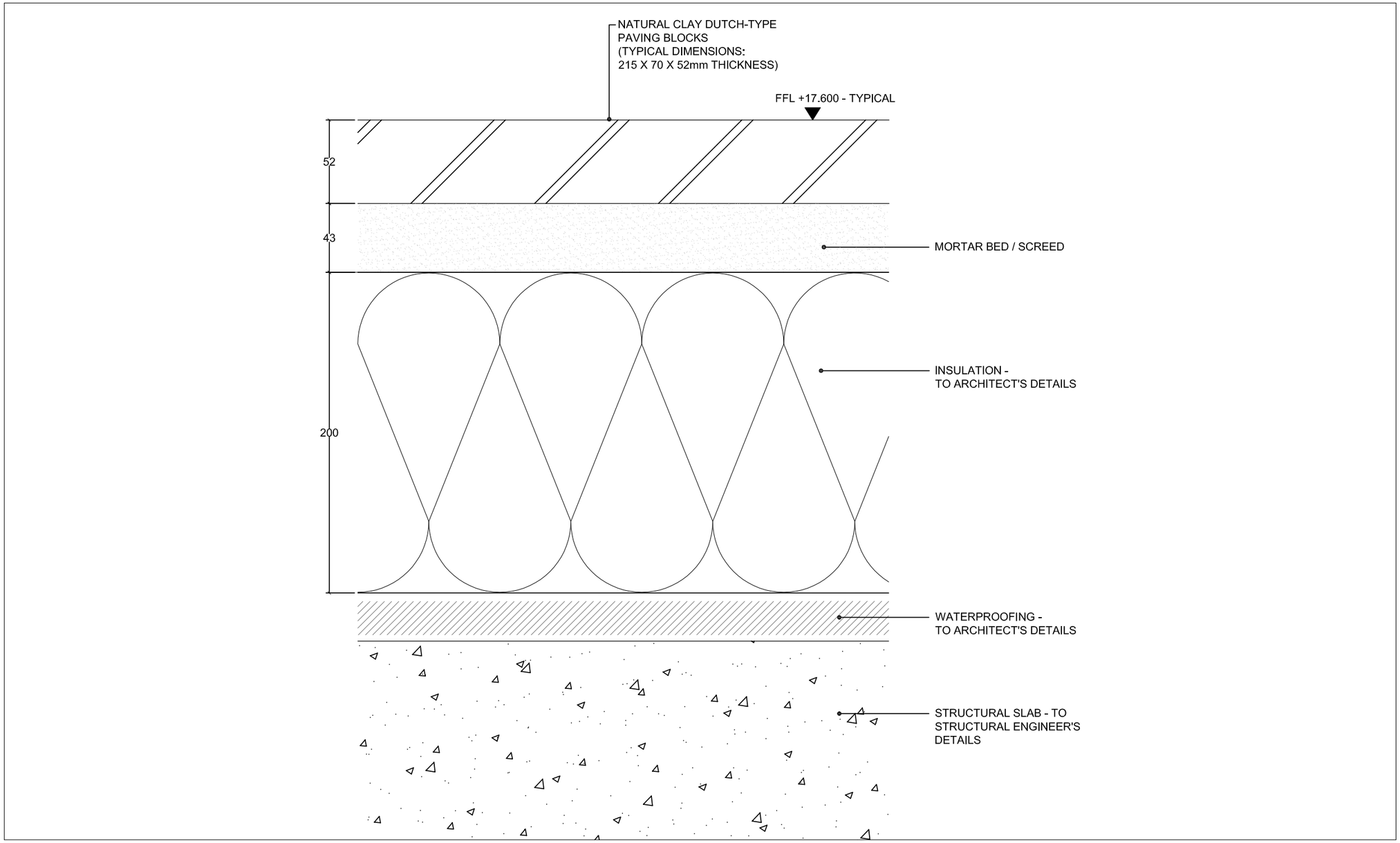

Safety Surfacing
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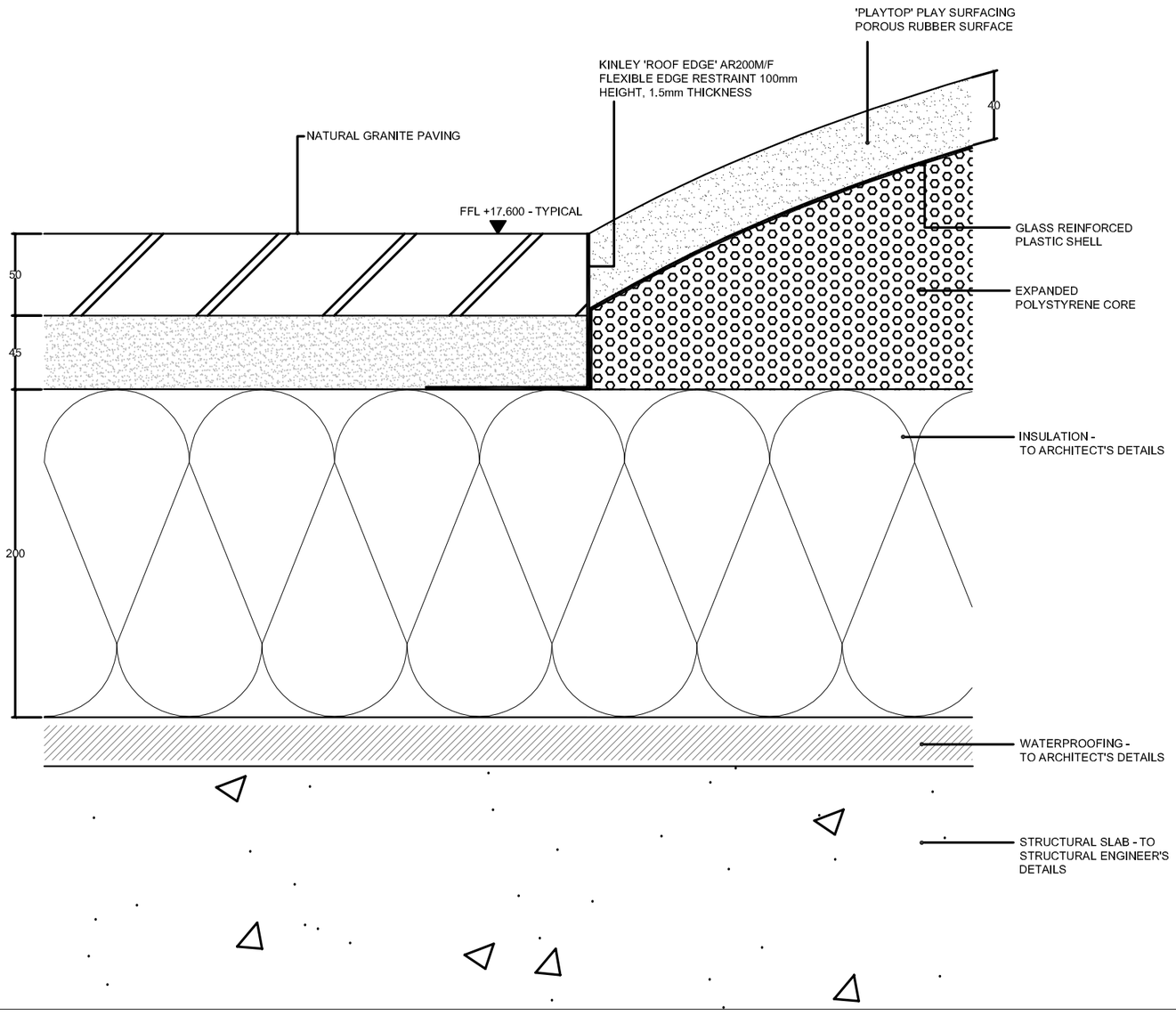

Paving/Play Mound - Interface

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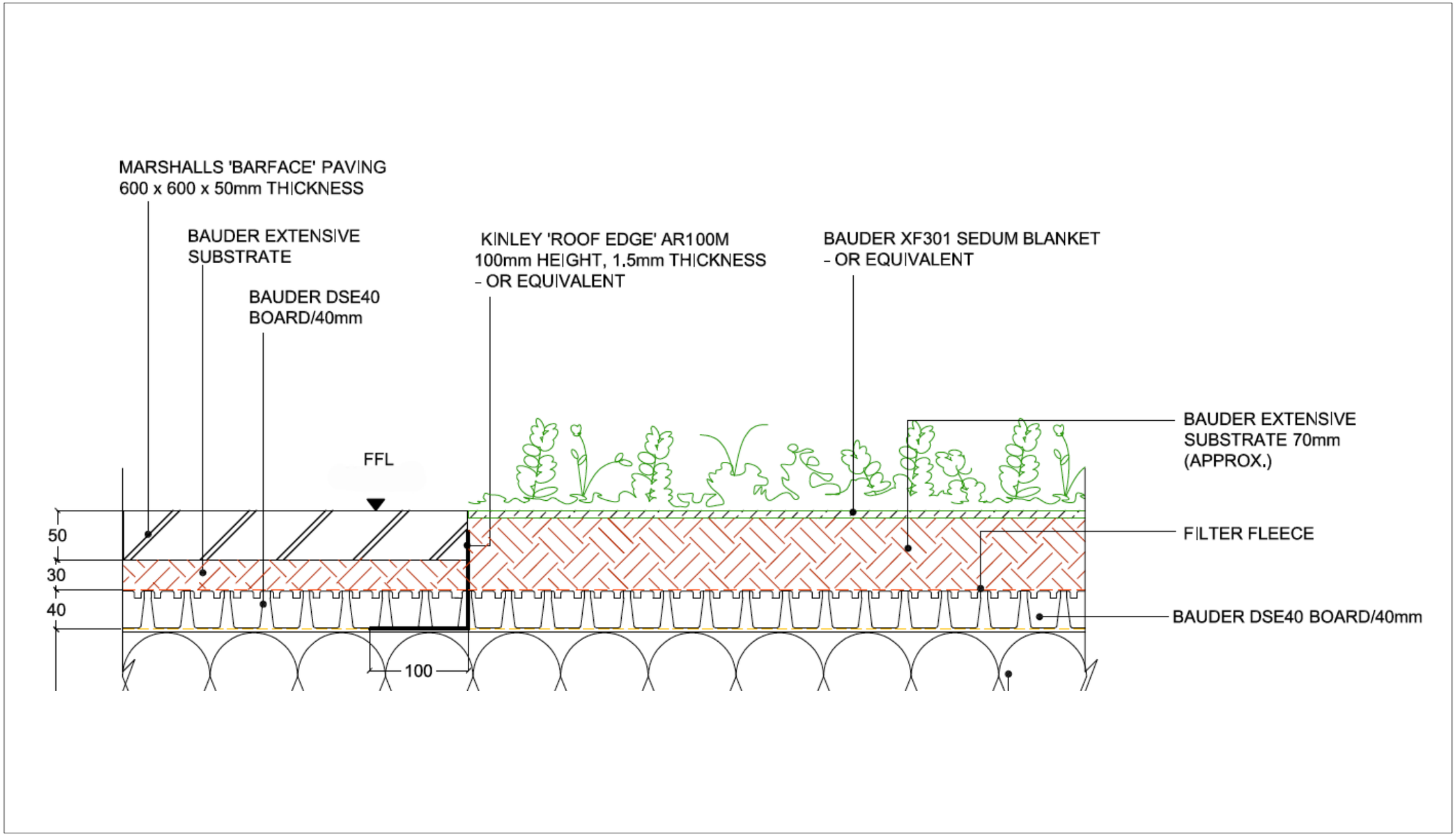

Pre-Cast Concrete Paving/Extensive Sedum Roof - Interface

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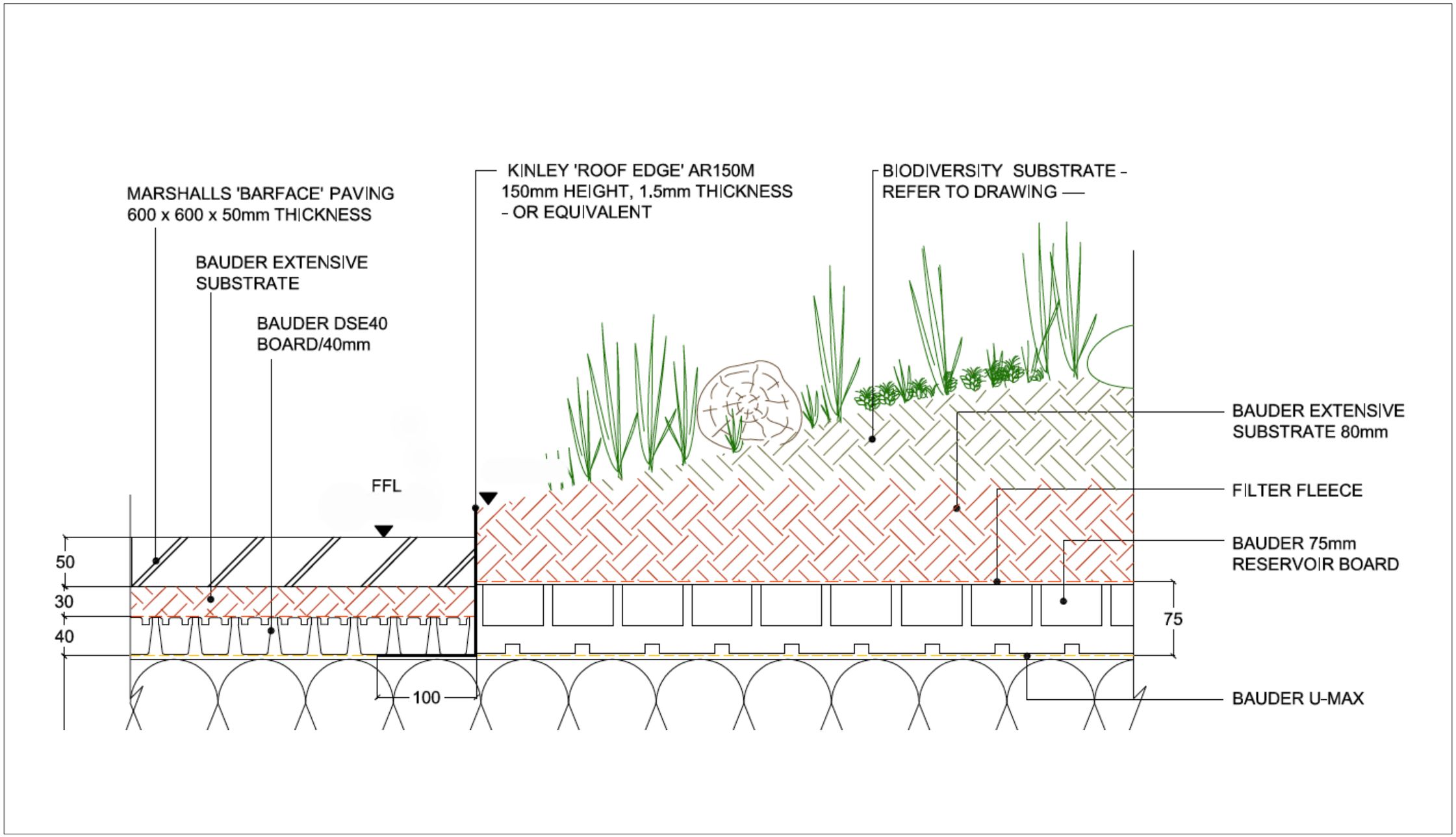


Pre-Cast Concrete Paving/Biodiverse (Brown) Roof - Interface

not to scale

TYRENS-UK

Grays Inn Road_Plant Schedule February 27, 2015

Raised Planters to Courtyard

Trees	Source	Age	Height	Girth	Root	Cntr	Form	ClrStem	Brks		Quantity
Betula utilis var. jacquemontii	(NPS)										6

Shrubs/Conifers	Source	Age	Height	Girth	Root	Cntr	Habit		Brks	Spacing	Quantity
Buxus sempervirens 'Suffruticosa'	(NPS)		40-60cm		C	10L	Bushy		6	8/m.sq	200
Taxus baccata	(NPS)	4x	100-125cm		RB		Leaders			3/m.sq	57

Perennial Plants	Source				Root	Cntr		Buds	Prop	Spacing	Quantity
Cyrtomium fortunei	(NPS)				C	3-4L				8/m.sq	15
Echinacea purpurea	(NPS)				C	3-4L			S	8/m.sq	11
Filipendula rubra	(NPS)				C	1.5-2L			V	8/m.sq	11
Helleborus x hybridus	(NPS)				C	3-4L			S	8/m.sq	10
Iris foetidissima	(NPS)				C	3-4L			S or V	8/m.sq	15
Liriope muscari	(NPS)				C	1.5-2L			V	8/m.sq	15
Miscanthus sinensis 'Gracillimus'	(NPS)				C	5-7.5L			V	8/m.sq	22
Molinia caerulea	(NPS)				C	1.5-2L			S or V	8/m.sq	14
Panicum amplexicaulis	(NPS)				C	3-4L			V	8/m.sq	10
Pennisetum alopercuroides 'Hameln'	(NPS)				C	3-4L			S or V	8/m.sq	14
Persicaria amplexicaulis 'Firetail'	(NPS)				C	5-7.5L			V	8/m.sq	10
Polystichum setiferum	(NPS)				C	1.5-2L			S or V	8/m.sq	15
Salvia nemerosa	(NPS)				C	1.5-2L			V	8/m.sq	90
Sedum telephium	(NPS)				C	3-4L			V	8/m.sq	51
Stipa calamagrostis	(NPS)				C	1.5-2L			V	6/m.sq	8

Appendix B - Notes on the Maintenance of Biodiverse Roofs & Monitoring Programme

MAINTENANCE

A maintenance scheme will likely be provided by the installation contractors; however this section gives a basic overview of maintenance required for biodiverse roofs.

Should the installation contractor not offer maintenance then a specialist contractor will be sought to do so. There will be a maintenance scheme that is adhered to for the living roof at the site despite extensive biodiverse roofs of the like being considered relatively 'low maintenance'. This maintenance scheme will be in addition to the monitoring actions detailed in section . The primary factors considered as part of maintenance of the living roof will be the following:

Undesirable Plants

Vegetation found across the roof and in drains that damages the biodiversity aims, planting regime and building fabric (e.g. Buddleja) will be removed whilst immature.

Fire Breaks

Vegetation breaks/barriers have an important safety function and prevent the spread of fire. All vegetation barriers at up-stands, roof penetrations and fire breaks will be maintained at their original width and cleared of any encroaching plants.

Drain Heads and Outlets

All drainage points will be checked every year and cleared out if necessary to ensure optimum performance. Excess water must be able to leave the roof, to avoid ponding and overloading.

Health and Safety During Maintenance

Where maintenance will be undertaken within 2m of the edge of a green roof, fall protection will be provided. The fall protection systems will themselves maintained once a year.

MANAGEMENT, MONITORING & FUNDING

This section provides an overview of the relevant management, monitoring and funding features of the ecological enhancements at the site. As an overview, an appropriate ecologist employed by the Client will monitor the ecological aspects of the enhancement features (e.g. checking species mixes are appropriate for the locality) with general maintenance and 'day to day' management being undertaken by an external company appointed by the owners/developers. Funding will be from an annual residents surcharge for grounds and property maintenance. The maintenance of the living roof will be undertaken by the installation contractors. However, should this maintenance not be offered then the services of a specialist living roof maintenance company will be sought.

This Ecological Management Plan will maintain and enhance the living roof habitats and species that are included in the London and Camden BAP. It will help achieve initiatives and targets set out within these BAP's providing habitat for priority species. In particular the living roof will contribute to targets for the London BAP Wasteland HAP, London and UK BAP Stag Beetle, Bat Species and Black Redstart SAPs, and Camden BAP the Built Environment.

The Ecological Management Plan will follow a clearly defined 5 year timetable in the first instance that will be used as a reference point for site maintenance, monitoring and any future planting and enhancement works that may be necessary for the biodiverse roof.

Living roof are dynamic, and the species composition is anticipated to change over time, due to plant selection resulting from the prevailing climatic conditions, natural colonisation, and succession. As a result, some of the actions within the first 5 years will be dependent upon rate of growth or success of initial planting/sowing and enhancements. In general, where measures have not been stated it is due to a non-intervention policy once the features have been established.

This Plan will also be iterative in the medium to long-term, adapting in a staged process to the changing roof composition and in response to the feedback from monitoring exercises. Suggestions can be made to alter the enhancement measures or supplement the planting regime as necessary. Primarily, the Ecological Management Plan will include actions to maintain the ecological objectives for the Living Roof, which are:

- Optimise biodiversity measured by the range of wildlife benefiting plant species, lichens, mosses and fungi, and invertebrate and bird species using the living roof;
- Encourage invertebrates through diverse range of floral species and suitable invertebrate niche habitats;
- Encourage species highlighted in the UK BAP, Red Data Book and English Nature's Species Recovery Programme such as the black redstart, the house sparrow, the brown-banded carder bee and ground nesting mining bees.

Greengage will undertake the monitoring programme that will measure the success of the living roof for their overall biodiversity value, observing any natural colonisation, the success of the seed mix and plug planting and use of the roof by birds and invertebrates as key biodiversity indicators. The monitoring for birds and invertebrates in particular will occur annually for the first 3 years and is recommended biennially thereafter. Monitoring will focus on the diversity and abundance of these species.

At or just after Practical Completion of the living roof, we will inspect the ecological enhancements implemented as a result of the recommendations in this Living Roof Specification. We propose to undertake three further site surveys over the following 3 years after practical completion to monitor the effectiveness for increasing biodiversity.

After the initial 3 years of establishment and annual surveys, we highly recommend that biennial site surveys over the following 10 years are undertaken to monitor the effectiveness of the ecological enhancement and amend the Ecological Management Plan accordingly.

Indicators of success will include the successful establishment of a wide variety of plant species, natural colonisation of floral species in the bare areas on the roof, evidence of invertebrates inhabiting the ecological features incorporated on the roof, evidence of bird activity on the roof such as birds using the nest boxes or signs that the black redstart is using the living roof.

The table below summarises management actions for the first 5 years. Following the initial 5 year period, the actions should be repeated, with any changes to the actions informed through the reactive process that should be used as a basis of this iterative management/monitoring plan.

In addition to checking the living roof, the Client's ecologist will check the status of the other ecological enhancement features during each visit, however specific maintenance and management of these features (if required) was included.

Table Showing Key Stages of the 5 Year Management Plan

Year and Season	Action	Comments
Year 1 – Spring	-	-
Year 1 – Summer	• Annual monitoring programme (survey to be undertaken between May and August) • Survey for signs of invertebrates and bird species using the roof areas • Check enhancement measures are intact	• An annual monitoring programme by the Ecologist will measure the success of the roof for their biodiversity value, including surveying for dominant plant species - this will inform the need for any improvements/alterations • Survey for signs that invertebrates are inhabiting enhancement features and other fauna are using the site for foraging, nesting or perching • During the monitoring programme it will be necessary to check the enhancement measures are intact, such as the wire netting not been blown away and the rope coils nailed down
Year 1 - Autumn	• Re – plant or supplement planting if necessary • Weed out competitive species if necessary	• Feedback from the monitoring programme will inform the need for any further planting or weeding if required
Year 1 – Winter	• Check if any litter needs removing and dispose where necessary	-
Year 2 – Spring	• Annual monitoring programme (survey to be undertaken between May and August) • Survey for signs of invertebrates and bird species using the roof areas • Check enhancement measures are intact	• An annual monitoring programme by the Ecologist will measure the success of the roof for their biodiversity value, including surveying for dominant plant species - this will inform the need for any improvements/alterations • Survey for signs that invertebrates are inhabiting enhancement features and other fauna are using the site for foraging, nesting or perching • During the monitoring programme it will be necessary to check the enhancement measures are intact, such as the wire netting not been blown away and the rope coils nailed down
Year 2 – Summer	-	-
Year 2 – Autumn	• Re – plant or supplement planting if necessary • Weed out competitive species if necessary	• Feedback from the monitoring programme will inform the need for any further planting or weeding if required
Year 2 – Winter	• Check if any litter needs removing and dispose where necessary	-
Year 3 – Spring	-	-
Year 3 – Summer	• Annual monitoring programme (survey to be undertaken between May and August) • Survey for signs of invertebrates and bird species using the roof areas • Check enhancement measures are intact	• An annual monitoring programme by the ecologist will measure the success of the roof for their biodiversity value, including surveying for dominant plant species - this will inform the need for any improvements/alterations • Survey for signs that invertebrates are inhabiting enhancement features and other fauna are using the site for foraging, nesting or perching • During the monitoring programme it will be necessary to check the enhancement measures are intact, such as the wire netting not been blown away and the rope coils nailed down
Year 3 – Autumn	• Re – plant or supplement planting if necessary • Weed out competitive species if necessary	• Feedback from the monitoring programme will inform the need for any further planting or weeding if required
Year 3 – Winter	• Check if any litter needs removing and dispose where necessary	-
Year 4 – Spring	-	-
Year 4 – Summer	-	-
Year 4 – Autumn	• Check enhancement measures are intact • Check if any litter needs removing and dispose where necessary	• Check the enhancement measures are intact, such as the wire netting not been blown away and the rope coils nailed down

Year and Season	Action	Comments
Year 4 – Winter	-	-
Year 5 – Spring	• Biennial monitoring programme of dominant plant species, invertebrates and birds diversity & abundance (survey to be undertaken between May and August)	• A biennial monitoring programme is recommended to continue to measure the success of the roof for their biodiversity value, including surveying for dominant plant species - this will inform the need for any improvements/alterations to the long term Ecological Management Plan (covering a period up to 25 years) • Survey for signs that invertebrates are inhabiting enhancement features and other fauna are using the site for foraging, nesting or perching • During the monitoring programme it will be necessary to check the enhancement measures are intact, such as the wire netting not been blown away and the rope coils nailed down
Year 5 - Summer	-	-
Year 5 – Autumn	• Re – plant or supplement planting if necessary • Weed out competitive species if necessary	• Feedback from the monitoring programme will inform the need for any further planting or weeding if required
Year 5 – Winter	• Check if any litter needs removing and dispose where necessary	-

The table outlines the necessary responsibilities and key objectives for the next 5 years. The actions should be repeated and edited as appropriate following the initial 5 years. This is the basis of the iterative plan, with edited/added actions decided upon by the ecologist as a function of any un-foreseen potential changes that may need to be addressed in the future). Should the Ecological Management Plan need to be extended beyond 10 years, it will be done so in appropriate stages, considered to be 5 – 10 years, 10 – 15 and up to 25 years.

Hence, the Ecological Management Plan is iterative and feedback from the monitoring exercises will inform and develop the Plan, which will be amended and updated accordingly to maintain the objectives.

Appendix C - Bauder XF301 - Information

BAUDER

TECHNICAL SYSTEM SUMMARY

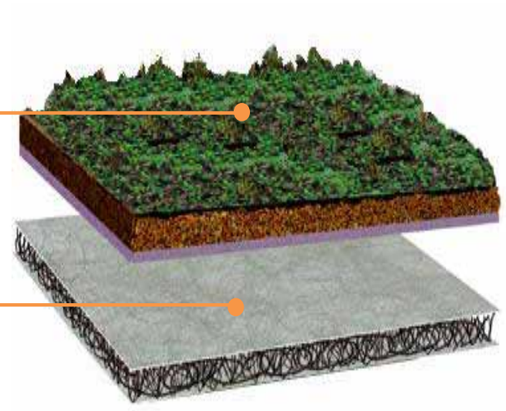
XF301 SEDUM BLANKET

EXTENSIVE GREEN ROOF SOLUTION

A pre-cultivated vegetation blanket on a patented nylon loop and geo-textile base carrier with substrate growing medium. The pre-attached moisture retention fleece provides water storage. The blankets are lightweight, easy to maintain and provide instant greening to the roof. The blanket features up to 11 species of sedum together with mosses and grasses, ensuring plant diversity.

Bauder XF301 Sedum Blanket
is a pre-cultivated vegetation blanket on a patented nylon loop and geo-textile base carrier with special substrate and a pre-attached integral 8mm moisture retention fleece.

Bauder SDF Mat
is a multifunctional drainage, filtration and protection layer manufactured from ultraviolet resistant nylon woven loops which are thermally bonded to geo-textile filter fleece facings.



When to Specify
The Xero Flor sedum blanket is a versatile, exceptionally lightweight green roof system that 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.

Waterproofing Options
There are different waterproofing systems available to suit the individual project criteria for the green roof, its landscaping options, weight loading limits, performance and durability requirements. Please contact us so that a technical advisor can take you through the system best suited to your project.

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BAUDER

TECHNICAL SYSTEM SUMMARY

XF301 SEDUM BLANKET

Weight Loading
Based on 1-2° pitch

Product	Thickness (mm)	Saturated Weight (Kg/m²)
Bauder XF301 Sedum Blanket	28.0	44.0
Bauder SDF Mat	20.0	0.2
Totals	**48.0**	**44.2**

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Date: 10-04-2010

TECHNICAL DATA SHEET

Bauder Xero Flor XF301 Sedum Blanket

DESCRIPTION
A pre-cultivated vegetation blanket on a patented nylon loop and geo-textile base carrier with substrate growing medium. The pre-attached moisture retention fleece provides some water storage.

TECHNICAL DATA:

Composition

Mineral component	recycled crushed brick and expanded clay shale
Organic component	composted pine bark

Technical Performance

pH value	6.5 – 7
Vegetation support layer	geo-textile carrier filter layer with bonded UV resistant nylon loops
Moisture retention fleece	recycled fibres (80%man-made, 20% organic)

Weights and sizes

Standard roll width	1 metre
Standard roll length	2 metres
Non-standard lengths	up to 10m (cut only in increments of 1m)
Thickness:	ca. 28mm (excluding vegetation)
Saturated weight:	44Kg/m²

Fire Rating

BS 476 Part 3:2004	Ext. F. AA

Supply Form
Rolls of blanket to specified lengths (as above)

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Appendix D - Management & Maintenance of Planters

1. The aim of this Management Plan is provide a framework for the maintenance, development and management of the landscape proposed for the Grays Inn Road project. This Appendix sets out maintenance actions to be carried out from the end of the defects liability period to ensure successful establishment as well as long term management actions for the various plant groupings in the public realm.

2. A key objective of the proposals for the site is to employ sustainable approaches wherever practicable to the landscape design and maintenance.

   There are a number of long-term management objectives for the site landscape which aim to protect the existing ecological assets and implement improvements to increase biodiversity:

- Provide a mature landscape setting for the buildings that fits within the existing landscape character of the area;

- Manage the proposed hedgerows to diversify habitat and allow development of understorey and margin vegetation;

- Manage areas of new planting to ensure successful establishment and longevity;

- Minimise disturbance to fauna using the planting areas/trees, by restricting certain operations to specific times of the year e.g. tree works;

- Review of the management actions every five years to ensure the objectives are being fulfilled.

3 Generally

3.1.1 Reinstatement

- Damage or disturbance to soil structure, planting, grass, fencing, hard landscaping, structures or buildings: Reinstate to original condition.

3.1.2 Watering

- Supply: Potable mains water.
- Quantity: Wet full depth of topsoil
- Application: Do not damage or loosen plants.
- Compacted soil: Loosen or scoop out, to direct water to rootzone.
- Frequency: As necessary for the continued thriving of all planting.

3.1.3 Water restrictions

- General: If water supply is, or is likely to be, restricted by emergency legislation, submit proposals for an alternative suitable source of water. Obtain instructions before proceeding.

3.1.4 Disposal of arisings

- General: Unless specified otherwise, dispose of arisings as follows: Remove from site.

3.1.5 Chipping or shredding on site

- General: Not permitted on site.

3.1.6 Mechanical equipment

- General: Minimize.
- Prohibited equipment: Chippers.
- Timing: Use of mechanical equipment allowed between the hours of 10.00am and 4.00pm only.
- Usage: Operated by qualified and experienced operatives only.

3.1.7 Litter

- Extraneous rubbish not arising from the contract work: Collect and remove from site.

3.1.8 Cleanliness

- Soil and arisings: Remove from hard surfaces.
- General: Leave the works in a clean, tidy condition at completion and after any maintenance operations.

3.1.9 Control of pernicious weeds (including Broadleaved Dock, Common Ragwort, Curled Dock, Creeping or Field Thistle, Spear Thistle, Giant Hogweed and Japanese Knotweed)

- Operations: Spot treat in June and September during suitable weather conditions and when plants are growing vigorously.
- Herbicide: Appropriate non-residual selective herbicide.
- Application: In accordance with manufacturer's recommendations and the Control of Pesticides Regulations.

3.2 Proposed Tree Planting

3.2.1 Establishment of new planting

- Duration: From the end of the defects liability until the fifth year after planting (initial plant establishment period).
- Weed control:
  - Method: Keep planting beds clear of weeds by maintaining full thickness of mulch.
  - Area: Maintain a weed free area around each tree and shrub, minimum diameter the larger of 1m or the surface of the original planting pit.
  - Weed tolerance: Weed to clear ground every two weeks.
  - Remove weeds entirely, including roots.
  - Disturbance: Remove the minimum quantity of soil, and disturb plants and mulched surfaces as little as possible.
- Mulch: Reinstate to original depth (75mm minimum).
  - Level of mulch at edges of beds: Reduce to 50mm below adjacent grass or hard surface.
- Soil condition: Fork over beds to keep soil loose, with gentle cambers and no hollows. Do not reduce depth or effect of mulch.
  - Depth of dig (minimum): 100mm.
  - Size of lumps: Reduce to crumb and level off.
  - Do not damage existing plants and roots.
- Timing: Twice annually.

3.2.2 Refirming of trees and shrubs

- Timing: After strong winds, frost heave and other disturbances.
- Refirming: Tread around the base until firmly bedded.
- Collars in soil at base of tree stems, created by tree movement: Break up by fork, avoiding damage to roots. Backfill with topsoil and refirm.

3.2.3 Pruning generally

- Pruning: In accordance with good horticultural and arboricultural practice.
  - Removing branches: Do not damage or tear the stem.
  - Wounds: Keep as small as possible and cut cleanly back to sound wood.
  - Cutting: Make cuts above and sloping away from an outward facing healthy bud, angled so that water will not collect on cut area.
  - Larger branches: Prune neither flush nor leaving a stub, but using the branch bark ridge or branch collar as a pruning guide.
- Appearance: Thin, trim and shape each specimen appropriately to species, location, season, and stage of growth, leaving a well balanced natural appearance.
- Tools: Use clean sharp secateurs, hand saws or other approved tools. Trim off ragged edges of bark or wood with a sharp knife.
- Disease or infection: Give notice if detected.
- Timing: Annually during September/October.

3.2.4 Formative pruning of young trees

- Standard: Type and timing of pruning operations to suit the plant species.
- Time of year: Do not prune during the late winter/early spring sap flow period.
- Young trees up to 4 m high:
  - Crown prune by removing dead branches and reducing selected side branches by one third to preserve a well balanced head and ensure the development of a single strong leader.
  - Remove duplicated branches and potentially weak or tight forks. In each case cut back to live wood.
- Operatives: Extensive pruning of young trees and any surgery to larger trees must be carried out by an approved member of the Arboricultural Association or other approved specialist.

3.2.5 Removal of dead plant material

- Operations: At the end of the growing season, check all shrubs and remove all dead foliage, dead wood, and broken or damaged branches and stems.

3.2.6 Dead and diseased plants

- Removal: As soon as possible.
- Replacement: Within two weeks.

3.3 Proposed Hedge Planting

3.3.1 Establishment of new planting

- Duration: From the end of the defects liability until the fifth year after planting (initial plant establishment period).
- Weed control:
  - Method: Keep planting beds clear of weeds by maintaining full thickness of mulch.
  - Area: Maintain a weed free area around each shrub, minimum the surface of the original planting pit.
  - Weed tolerance: Weed to clear ground every two weeks.
  - Remove weeds entirely, including roots.
  - Disturbance: Remove the minimum quantity of soil, and disturb plants, bulbs and mulched surfaces as little as possible.
- Mulch: Reinstate to original depth (75mm minimum).
  - Level of mulch at edges of beds: Reduce to 50 mm below adjacent hard surface.
- Soil condition: Fork over beds to keep soil loose, with gentle cambers and no hollows. Do not reduce depth or effect of mulch.
  - Depth of dig (minimum): 100mm.
  - Size of lumps: Reduce to crumb and level off.
  - Do not damage existing plants and roots.
- Timing: Twice annually.

3.3.2 Pruning generally

- Pruning: In accordance with good horticultural and arboricultural practice.
  - Removing branches: Do not damage or tear the stem.
  - Wounds: Keep as small as possible and cut cleanly back to sound wood.
  - Cutting: Make cuts above and sloping away from an outward facing healthy bud, angled so that water will not collect on cut area.
  - Larger branches: Prune neither flush nor leaving a stub, but using the branch bark ridge or branch collar as a pruning guide.
- Appearance: Thin, trim and shape each specimen appropriately to species, location, season, and stage of growth, leaving a well balanced natural appearance.
- Tools: Use clean sharp secateurs, hand saws or other approved tools. Trim off ragged edges of bark or wood with a sharp knife.
- Disease or infection: Give notice if detected.
- Timing: Twice annually during early spring and/or late autumn.

3.3.3 Trimming slowly establishing hedges (Evergreen hedge)

- Operations:
  - Timing: Cut back in June and September to encourage bushy growth.
  - Form: Prune to an ‘A’ shape to encourage a dense, wide base and allow to reach planned height (1.5m) by gradual degrees.

3.4 Proposed Ornamental planting

3.4.1 Planting beds

- Gaps in planting: Refill by replanting.
- Watering new plants: Before and after planting out.
- Operations:
  - Remove: Dead flower heads, fallen leaves, litter and debris.
  - Weeds: Thoroughly hand weed.
  - Cultivate: Lightly hoe.

- Mulch: Reinstate to original depth (75mm minimum).
  - Level of mulch at edges of beds: Reduce to 50 mm below adjacent planter edges.
- Timing: Twice annually.

3.4.2 Pruning ornamental shrubs/groundcover

- General: Prune to encourage healthy and bushy growth and desirable ornamental features, e.g. flowers, fruit, autumn colour, stem colour.
- Remove: Dead/damaged growth.
- Suckers: Remove by cutting back level with the source stem or root.

3.4.3 Reinstatement of shrub/groundcover areas

- Dead and damaged plants: Remove.
- Mulch:
  - Carefully move to one side and dig over the soil, leaving it fit for replanting.
  - Do not disturb roots of adjacent plants.
- Replacement plants:
  - Use pits and plants to original specification or to match the size of adjacent or nearby plants of the same species, whichever is the greater.
- Soil conditioner:
  - Type: As original specification.

3.5.4 Climbing plants

- Pruning: Remove excess growth, to ensure that signs, light fittings, doors and windows are kept clear at all times.
- Insecure growth: Attach to supporting wires.
- Supporting structures: Check and repair as necessary.
- Timing: Annually.

3.6 Proposed Perennial Planting

3.6.1 Planting beds

- Gaps in planting: Refill by replanting.
- Watering new plants: Before and after planting out.
- Operations at end of growing season:
  - Trim: Older flowering stems of herbaceous perennials.
  - Remove: Litter, debris and arisings.
  - Cultivate: Fork over the soil, taking care not to cause undue disturbance to plants.
  - Mulch: Apply as original specification
  - Weeds: Thoroughly hand weed.
- Timing: Twice annually.

3.6.2 Reinstatement of perennial areas

- Dead and damaged plants: Remove.
- Mulch:
  - Carefully move to one side and dig over the soil, leaving it fit for replanting.
  - Do not disturb roots of adjacent plants.
- Replacement plants:
  - Use pits and plants to original specification or to match the size of adjacent or nearby plants of the same species, whichever is the greater.
- Soil conditioner:
  - Type: As original specification.

3.7 Proposed Semi-mature trees

3.7.1 Initial establishment

- Duration: From the end of the defects liability until the fifth year after planting (initial plant establishment period).
- Weed control:
  - Area: Maintain a weed free area around each tree to extent of tree pit.
  - Weed tolerance: Weed to clear ground every two weeks.
  - Remove weeds entirely, including roots.
  - Disturbance: Remove the minimum quantity of soil, and disturb plants and mulched surfaces as little as possible.
- Mulch: Reinstate to original depth.
  - Level of mulch at edges of beds: Reduce to 50mm below adjacent hard surface.
  - Timing: Twice annually.

3.7.2 Tree guy wires

- Inspection/ maintenance times: Annually and immediately after strong winds.
- Operations:
  - Replace or resecure loose or missing guy wires.
  - Adjust to suit stem growth and to provide correct and uniform tension.
- Removal: Two years after planting.

3.7.3 Tree work

- Identification: Before starting work agree which trees are to be pruned.
- Remove:
  - Dead, dying, or diseased wood, broken branches and stubs.
  - Fungal growths and fruiting bodies.
  - Rubbish, wind blown or accumulated in branch forks.
- Protection: Avoid damage to neighbouring trees, plants and property.
- Standards: To BS 3998 and Health & Safety Executive (HSE) ‘Forestry and arboriculture safety leaflets’.
- Removing branches: Cut as shown in Arboricultural Association Leaflet No 8 ‘Mature tree maintenance’. Cut vertical branches similarly, with no more slope on the cut surface than is necessary to shed rainwater.
- Appearance: Leave trees with a well balanced natural appearance.
- Chain saw work: Operatives must hold a Certificate of Competence.
- Tree work: To be carried out by an approved member of the Arboricultural Association.
- Defective, diseased, unsafe or weak parts of trees additional to those scheduled for attention: Give notice if detected.
- Timing: To be carried out in late September/October to minimise disturbance on nesting birds and hibernating bats.

3.7.4 Cutting and pruning generally

- Tools: Appropriate, well maintained and sharp.
- Final pruning cuts:
    - Chainsaws: Do not use on branches of less than 50 mm diameter.
    - Hand saws: Cut in one continuous operation to form a smooth cut surface.
    - Anvil type secateurs: Do not use.
- Removing branches: Do not damage or tear the stem.
- Wounds: Keep as small as possible, cut cleanly back to sound wood leaving a smooth surface, and angled so that water will not collect on the cut area.
- Cutting: Cut at a fork or at the main stem to avoid stumps wherever possible.
- Large branches: Removed only if unavoidable.
- - Remove in small sections and lower to ground with ropes and slings.
- Dead branches and stubs: When removing, do not cut into live wood.
- Unsafe branches: Remove epicormic shoots and potentially weak forks that could fail in adverse weather conditions.
- Disease or fungus: Give notice if detected. Do not apply fungicide or sealant unless instructed.

3.7.5 Crown lifting

- Clearances: Remove branch systems to give clearance.
    - Height: maintain a 2.5m clear stem.
- Removing branches: Remove whole branches back to the stem, or cut lower portions of branches back to lateral or sublateral buds or branches. Do not leave stumps.

3.8 Hard Landscape

3.8.1 Hard surfaces and gravel areas

- Weeding: Spot treatment with non-residual systemic Glyphosate-based herbicide.
    - Timing: Annually.
- Hard surfaces: Remove litter, leaves and other debris.
- Surface gutters and channels: Remove mud, silt and debris.
- Drainage gullies: Empty traps and flush clean.
- Stain removal: In accordance with BS 7370-2, table 4.

Grays Inn Road