



SG70809
Q37 Specification for
New premier House R.Square
07/10/2014

This specification is based on current information available at the time of writing, if any aspects are revised prior to construction, or you require any additional details. Please contact our Technical Services Dept who would be pleased to amend or update the information provided.

The Q37 has been constructed using the following information.

Formal Take Off	Contractor Measure	Ecology Report	Drawings	BREEAM	Specification
●	●	X	●	X	●

SKY GARDEN LTD Unit 4 Beta Orchard Industrial Estate, Toddington, Cheltenham, Gloucestershire, GL54 5EB, t: 01242 620905 F: 01242 620739 e: enquiries@sky-garden.co.uk www.sky-garden.co.uk

DESCRIPTION (system)

1mm protection fleece - 20mm drainage and retention layer with filter system - 30mm sedum substrate (bulk bags) - 30mm sedum blanket (8-10 species, pre established UK provenance) - riverstone 20:40 grade 300mm border

The system uses locally produced UK plant material, plug, seed, shoot and blanket production is from Cheltenham production units with finishing areas in the North and East that can be utilised for bespoke production requirements. Substrate is blended and sedum, bio-diverse (crushed brick) top soil and green waste products are managed from the Cheltenham production unit. All substrates use screened certified materials, all brick is virgin and locally sourced and all bulk materials are moved using as minimal impact to energy and environmental cost as possible.

Lightweight	Intensive	Extensive	Bio-Diverse	Modular	Vertical
●	X	●	X	X	X

Q37 : 130 GENERAL

<i>Roof type:</i>	As J31 (liquid), H31 (standing seam), J41 (Bitumen), J42 (S. Ply), J21 (Mast)
<i>Substrate:</i>	As J31 (project specific) refer to project scope of works
<i>Waterproofing:</i>	As J31 project specific - root resistant - by others
<i>Thermal Insulation:</i>	As J31 project specific
<i>Protection:</i>	as Clause Q37 : 330
<i>Moisture Control:</i>	as Clause Q37 : 350
<i>Depth:</i>	as Clause Q37 : 390
<i>Vegetation:</i>	as Clause Q37 : 400

Accessories

<i>filter layer:</i>	as Clause Q37 : 360
<i>edge retention:</i>	as Clause Q37 : 420
<i>Intermediate restraints:</i>	as Clause Q37 : 820
<i>separation layer:</i>	as Clause Q37 : 430
<i>stone border:</i>	as Clause Q37 : 460
<i>roof contour:</i>	as Clause Q37 : 391
<i>habitat details:</i>	as Clause Q37 : 392
<i>wall habitats:</i>	as Q37 : 393
<i>aftercare:</i>	as Clause Q37 : 940
<i>irrigation:</i>	as Clause Q37 : 401

PERFORMANCE

Q37 : 210 GENERAL DESIGN

<i>Green roof and associated features:</i>	complete the detailed design in accordance with GRO green roof code and FLL guidelines					
<i>Proposals:</i>	submit drawings, technical information, calculations and manufacturers literature					
<i>Performance criteria:</i>	as per design requirements, see design specification.					
<i>Guarantee:</i>	guarantee of green roof performance offered in conjunction with a Sky Garden maintenance					
Suitability of use.						
Refurbishment	New Build	Inverted	Sustainable	Habitat Provision	Attenuation Aid	Aesthetics
●	●	X	●	●	●	●

Q37 : 250 CHARACTERISTIC ROOF LOADS

Roof Structure:	The structural engineers are satisfied themselves that the roof					
living roof	67.00	kg/sqm saturated	82	mm system	26	bulk lifts
service loads	NA					
long term wind loads	NA					
snow loads	NA					
other loads	NA					
Requirement	restriction of site activities that impact on the installed loading allowance.					
Activity	NA					
Roof structure, screed	NA					
/ w.proofing						
Component Allowance (mm)						
Settlement %	Fleeces	Drainage		Substrate	Vegetation	contour +/-
10	2	20		30	30	NA

PRODUCTS

Q37 : 320 ROOT BARRIER to extensive living roof

<i>Supplier</i>	SKY GARDEN LTD Unit 4 Beta Orchard Industrial Estate, Toddington, Cheltenham, Gloucestershire, GL54 5EB, t: 01242					
<i>Product ref</i>	RG	NA				
<i>Material</i>	Anti root plastic protection layer for all green roof systems.					
<i>Thickness MM</i>	NA					

Q37 : 330 PROTECTION LAYER to extensive green roof

<i>Supplier</i>	SKY GARDEN LTD Unit 4 Beta Orchard Industrial Estate, Toddington, Cheltenham, Gloucestershire, GL54 5EB, t: 01242					
<i>Product ref</i>	RG	PL01	1			
<i>Material</i>	tensile geo-synthetic protection fleece. (loose laid) Interface between membrane and drainage unit					
<i>Thickness mm</i>	1					

Q37 : 350 DRAINAGE LAYER to extensive green roof

<i>Supplier</i>	SKY GARDEN LTD Unit 4 Beta Orchard Industrial Estate, Toddington, Cheltenham, Gloucestershire, GL54 5EB, t: 01242					
<i>Product ref</i>	RG	DRRD01	20			
<i>Material</i>	recycled HDPE with geo synthetic protection and filtration layer, interface between protection layer and substrate layer					
<i>Thickness</i>	20					
<i>Area Weight</i>	1	kg/sqm				
<i>Colour</i>	black	Dimensions	0.97 x 50m			
<i>Standards</i>	BS EN 9863:1 / BS EN 150 11058 / EN 150 12958					
<i>water discharge</i>	DIN EN ISO 12958					
<i>1-10% inversion</i>	1,6 - 5,38 l/s*m					
<i>filled volume</i>	3	Litres				
<i>water storage</i>	3	Litres				
<i>application</i>	butt together, on pitched roofs overlap 1-2 corrugations.					
<i>performance</i>	regenerated HDPE with water storage and discharge delay channels.					
<i>Compressive strength</i>	85	Kpa	flow capacity (perforations)	18L/S/sqm		
	8.5	T/sqm				

Q37 : 360 FILTRATION LAYER to extensive green roof

<i>Supplier</i>	SKY GARDEN LTD Unit 4 Beta Orchard Industrial Estate, Toddington, Cheltenham, Gloucestershire, GL54 5EB, t: 01242					
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Product ref	RG	FF01	1				
Material	Non woven geo textile (mechanically fitted to drainage layer to improve system integrity and performance.						
Thickness mm	1						
Q37 : 390 SUBSTRATE LAYER to extensive green roof							
Supplier	SKY GARDEN LTD Unit 4 Beta Orchard Industrial Estate, Toddington, Cheltenham, Gloucestershire, GL54 5EB, t: 01242						
Product ref	RG	SBS01	30				
Material	blended crushed virgin brick substrate, 50mm-dust with 10% organic green waste content.						
Thickness	30						
Coverage	total						
analysis	submit						
parameters	pH value 6-7.5						
	consistent installation of product to filter layers provided						
Ameliorant / conditioner	base package included						
Crushed brick %	Green Waste %	0-12mm %	0-5mm %	5-15mm %	20-35mm %	35-50mm %	
90	10	20	10	60	5	5	
green waste	composted green waste, bark						
air filled porosity	+20% v/v						
Settlement %	10						
Q37 : 391 SURFACE CONTOUR to extensive green roof							
Supplier	SKY GARDEN LTD Unit 4 Beta Orchard Industrial Estate, Toddington, Cheltenham, Gloucestershire, GL54 5EB, t: 01242						
Product ref	RG	NA					
Material	substrate within substrate bed or sand laid flat no contour						
MM + - contour	NA						
Technique	light contour to increase bio-diversity and establishment zones for selected plant material.						
Average Depth of bed	30	settled					
Q37 : 392 HABITAT CREATION to extensive green roof							
Supplier	SKY GARDEN LTD Unit 4 Beta Orchard Industrial Estate, Toddington, Cheltenham, Gloucestershire, GL54 5EB, t: 01242						
Product ref	RG	NA	Excluded				
base habitat	1sqm mounded 20:40mm riverstone habitat on sand base 50mm into substrate bed						
base + stone HBS0101	1sqm mounded 20:40mm riverstone habitat on sand base 50mm into substrate bed with boulders						
stone and sand	for invertebrate, bird and insect development, (site sourced if available) 5-8 large stones per pile						
habitats	NA						
Base + stone and wood HBS/W0101	1sqm mounded 20:40mm riverstone habitat on sand base 50mm into substrate bed with boulders						
Density	for invertebrate, bird and insect development, (site sourced if available) 5-8 large stones per pile + 1/200-250 sqm						
Insect Hibernacula HBIH0101	seasoned wood and stone for specific bee and insect development, 1sqm habitat.						
Q37 : 393 WALL MOUNTED HABITATS to extensive green roof							
Supplier	SKY GARDEN LTD Unit 4 Beta Orchard Industrial Estate, Toddington, Cheltenham, Gloucestershire, GL54 5EB, t: 01242						
Product ref	RG	HWMBD01	Excluded				
Material	NA						
Thickness	NA						
Technique	NA						
Q37 : 400 VEGETATION to extensive green roof							
Supplier	SKY GARDEN LTD Unit 4 Beta Orchard Industrial Estate, Toddington, Cheltenham, Gloucestershire, GL54 5EB, t: 01242						
Product ref	RG	VGBDS0105	30				
Plant type	Bio-Diverse seeded						
plant species	Sedum Blanket:- Sedum acre, album, ellacombianum, floriferum, forsterianum, hybridum, kamtcschaticum, montanum Orientale, oreganum, rupestre, reflexum, sexangulare, spurium, selskianum						
Plug	seed/shoot	blanket	coverage %	plug density /sqm	seed rate / sqm	shoots gms/sqm	
	x	●	90				

<i>Species</i> 8-10	sun tolerant 70	shade tolerant 30	bio-diversity L	Sustainability M	nectar / pollen H	habitat creation H
<i>bio-diversity</i>	the system has a low to moderate bio-diversity rating as there is little exposed substrate, no habitat provision and a limited range of species.					
<i>sustainability</i>	the system is sustainable as plant material is pre established and hardened off so more tolerant of roof conditions.					
<i>nectar richness</i>	the system provides seasonal nectar but not a wide range of foraging capacity for the full season.					
<i>pollen richness</i>	the system provides seasonal pollen but not a wide range of foraging capacity for the full season.					
<i>irrigation need</i>	the system has a limited substrate bed so drying out is a risk in the Summer and water provision will be required.					
<i>aftercare need</i>	a standard remedial aftercare program is recommended to ensure species development is maintained.					
<i>Compliance</i>	specification, ecology report, BREEAM, GRO					
<i>Blanket straps</i>	for exposed and coastal roof systems, blanket straps will be used to prevent wind lift in combination with retention					

Q37 : 401 IRRIGATION to extensive green roof

Supplier	SKY GARDEN LTD Unit 4 Beta Orchard Industrial Estate, Toddington, Cheltenham, Gloucestershire, GL54 5EB, t: 01242		
Product ref	RG	TIS0175	excluded
Included / excluded	we recommend a temporary system be considered for periods of hot dry weather when the system will discolour		
Process	roof top connector providing 2.5-3bar pressure and a flow rate of 60L/min.		

Q37 : 940 AFTERCARE to extensive green roof

Supplier	SKY GARDEN LTD Unit 4 Beta Orchard Industrial Estate, Toddington, Cheltenham, Gloucestershire, GL54 5EB, t: 01242		
Product ref	RG	MRM02	excluded
description	we recommend a standard remedial aftercare package to maintain system performance.		
process	two assessment visits, Spring and Autumn + completion report		

Q37 : 420 EDGE RETENTION DETAIL to extensive green roof

Supplier	SKY GARDEN LTD Unit 4 Beta Orchard Industrial Estate, Toddington, Cheltenham, Gloucestershire, GL54 5EB, t: 01242		
Product ref	RG	RE0275/100	excluded
description	2mm galvanised aluminium up stand with a 100mm face plate and 75mm foot, perforated for water passage and		
Material	Metal		
Thickness	2mm (suitable ballasted to slopes of 5 degrees)		
Technique	spot bonded or system ballasted, positioned at the edge of the stone detail as an exposed		

Q37 : 430 SEPERATION DETAIL to extensive green roof

Supplier	SKY GARDEN LTD Unit 4 Beta Orchard Industrial Estate, Toddington, Cheltenham, Gloucestershire, GL54 5EB, t: 01242		
Product ref	RG	SE0175/100	excluded
Material	metal		
description	1.5mm galvanised aluminium up stand with a 100mm face plate and 75mm foot, perforated for water passage and		
Thickness	1.5mm (the detail is supported to the top from the system on one side and the stone edge on the other, traffic on		
Technique	spot bonded or system ballasted, positioned between the stone edge detail and the system as a		

Q37 : 460 BORDERS to extensive green roof

Supplier	SKY GARDEN LTD Unit 4 Beta Orchard Industrial Estate, Toddington, Cheltenham, Gloucestershire, GL54 5EB, t: 01242		
Product ref	RG	RSB300x80	included
Material	20:40mm washed river stone, 300mm border		
Included / excluded	included within estimate		
Technique	300mm border around system edge and interfacing with separation detail either metal or fleece.		

Q37 : 470 SUBSTRATE (retention net)

Supplier	SKY GARDEN LTD Unit 4 Beta Orchard Industrial Estate, Toddington, Cheltenham, Gloucestershire, GL54 5EB, t: 01242		
Product ref	RG	SRN01	excluded
Material	Geo synthetic surface net		
Description	fine grade retention net to prevent wind lift on exposed or coastal roofs. The product is permanent but primarily an		
Technique	netting for exposed or open substrate or blanket systems where wind or bird damage is possible,		

Q37 : 820 INTERMEDIATE RESTRAINTS

Supplier	SKY GARDEN LTD Unit 4 Beta Orchard Industrial Estate, Toddington, Cheltenham, Gloucestershire, GL54 5EB, t: 01242		
Product ref	RG	NA	excluded
Material	metal / wood weathered detail required on systems 10 degrees + (these details normally interface with the deck and		
Description	baton system required to support drainage and substrate layer of green roof system in combination with retention		
Technique	interim retainer fitted by contractor, interval density 2-10m centres depending on pitch.		

Intervals						
0-5 degrees	5-10 degrees	10-15 degrees	15-20 degrees	20-25 degrees	25 -30 degrees	30 degrees +
eaves only	eaves only	eaves and interim				
ballasted	mechanical fit					
not required	not required	3 m centre	2.5m centre	2m centre	1.5m centre	1m centre

EXECUTION

Q37 : 710 INSTALLATION GENERALLY

<i>preparation:</i>	clear all surfaces of debris
<i>timing:</i>	after certification of waterproof membrane integrity
<i>surface condition:</i>	visually inspect waterproof membrane, report any damage
<i>faults in membrane:</i>	report
<i>contamination:</i>	do not use materials detrimental to healthy plant growth
<i>storage:</i>	do not overload
<i>point loads:</i>	avoid
<i>outlets:</i>	do not block
<i>outlet grills:</i>	installed

Q37 : 720 ADVERSE WEATHER

<i>unfinished work:</i>	secure from damage and wind uplift
<i>conditions:</i>	do not install or work with frozen materials

Q37 : 740 ROOT BARRIER INSTALLATION

<i>joints</i>	minimize
<i>overlaps (min)</i>	100mm

Q37 : 750 PROTECTION LAYER INSTALLATION

<i>joints</i>	minimise
<i>overlaps (min)</i>	100mm
<i>up stands</i>	extend to top of growing medium

Q37 : 770 DRAINAGE LAYER INSTALLATION

<i>extent</i>	continuous over entire roof area
<i>fitting</i>	loose laid
<i>up stands</i>	fit closely around penetrations and outlets

Q37 : 780 FILTER MEMBRANE INSTALLATION

<i>joints</i>	minimise
<i>overlaps</i>	100mm
<i>fitting</i>	loose laid
<i>up stands</i>	extend to top of growing medium

Q37 : 790 GROWING MEDIUM INSTALLATION

<i>handling</i>	minimise
<i>conditions</i>	handle in the driest condition possible. Do not handle or install wet or frozen
<i>layers</i>	
<i>depth (max)</i>	as per clause Q37 : 390
<i>sequence</i>	gently firm each layer before spreading to next

Q37 : 800 VEGETATION INSTALLATION

<i>handling</i>	all material to off loaded and planted, laid out and watered immediately
<i>Excessive stacking</i>	plug, not permitted
<i>Excessive stacking</i>	blanket, not permitted
<i>Timing</i>	install blanket products within 12 hours of site arrival install plug products 3-5 days after delivery, water regularly
<i>condition</i>	water thoroughly post installation for blankets and pre installation for plugs
<i>removal of trays</i>	to prevent material loss or damage.
<i>spacing</i>	mark roof areas for plug planting with suitable tool in sqm sections
<i>scope</i>	planting in accordance with planting and site plans
<i>application</i>	plant plugs into growing medium at suitable depth, ensure plant material is not covered
<i>watering</i>	thoroughly pre and post planting, account for time of year ref irrigation system requirement
<i>birds</i>	supplementary control required for plug planted systems.

Q37 : 820 EGDE RETAINING PROFILE INSTALLATION

<i>cutting</i>	neat, accurate and without spalling
<i>junctions</i>	vertical, secured using proprietary connectors
<i>position</i>	true to line and level, smooth continuous lines
<i>fixing</i>	spot bonding with manufacturers approval or system ballasted
	Retention detail is used where there are system retention requirements and should be spot bonded in accordance with manufacturers approval or system ballasted.
	Separation detail if for physical divide between system and slab or stone detailing and is system ballasted

Q37 : 830 INTERMEDIATE RESTRAINTS INSTALLATION

<i>process</i>	Intermediate restraints should be fitted across the roof on pitches exceeding 10 degrees As a guide, retention battens on pitches from 10 – 20 degrees should be installed at 2000mm increments up the roof slope with a mechanically fixed one at eaves. From 21 – 45 degrees the spacing should be reduced to 1000mm. The height of the restraints should not exceed the combined height of the drainage and substrate layers.
<i>recommendation</i>	

Q37: 840 LAYING BORDER

<i>condition of substrate</i>	clean
<i>gravel guards</i>	fit to outlets
<i>laying</i>	300mm borders around perimeters and outlets - spread evenly, do not pile to excessive height.
<i>depth</i>	50-80mm
<i>previously laid materials</i>	protect during the spreading process

COMPLETION

Q37 : 910 INSPECTION

<i>timing</i>	before handover
<i>give notice</i>	3 days (min)

Q37 : 920 COMPLETION

<i>general</i>	leave works in a clean tidy condition
<i>surfaces</i>	clean immediately before handover
<i>outlets</i>	clean and clear of obstructions
<i>completed green roof</i>	protect from adjacent or high level working

Q37 : 930 DOCUMENTATION

<i>timing</i>	submit at handover
<i>contents</i>	growing medium declaration of analysis
-	manufacturers guarantees and warranties
-	procedures for maintenance of the green roof
-	record drawing showing the location of planting and associated features
-	aftercare agreement
-	aftercare guidelines
-	O&M manual
-	irrigation guidelines
<i>number of copies</i>	as required