h) Cap sheet: EshaFlex 370 Grey mineral, 4.5mm torch applied SBS modified bituminised polyester/fibreglass cap sheet.

i) Insulation:

i) Non-combustible rigid extruded polystyrene (XPS) insulation laid loose over roofing membrane, to suit the required roof levels and drainage requirements, including all associated insulation of upstands and penetrations.

ii) Indicative reference: ProTherm G XENERGY Ultra.

iii) The thickness and density of the insulation to achieve the U-value requirements of 0.18W/ m²K or better.

iv) Radmat ProTherm Xenergy MinK Water Flow Reducing Layer laid over the insulation with 300mm laps.

j) Finishing layer(s) as the Design Drawings, comprising:

i) Minimum 50mm stone ballast layer to the top of insulation layer: 20-40mm washed, round aggregate such as indicatively manufactured by Marshalls, laid to levels shown on the Design Drawings. Provide ballast stops inclusive of factory formed drainage apertures, whilst retaining the ballast.

k) Pressed metal components/ accessories to be coloured polyester powder finished aluminium and of profiles, both to be accepted by the Architect through sampling. Colour to be agreed with the Architect.

l) Insulated drainage outlet assemblies with compatible leaf/ gravel guards to be to the manufacturer's recommendations and acceptable to the Architect.

m) Vapour control layers, sub-layers, metal framing and pitch pockets as required, counter flashings, movement/ control joints, sealants (colour co-ordinated where visible), fixings and fastenings, fillets, protection boards, stops, termination bars, adhesives and other accessories recommended by the system manufacturer to complete the installation.

J31.105 **Type RFS-251 Liquid Applied Inverted Roof System with Green Roof System**

Monolithic, fully bonded, hot-applied membrane roof system with extensive green roof system.

a) Indicative manufacturer: Radmat Building Products Limited.

b) Indicative reference: PermaQuick PQ6100.

c) Substrate: Composite concrete deck. Refer to the Structural Engineer's documentation.

d) Preparation: Concrete substrate applications only, to be clean, dry and free of contaminants and loose particles, as recommended by the manufacturer.

e) Surface conditioner primer to suit the substrate.

f) Membrane:

i) One-part hot-applied rubberised bituminous membrane base layer.

ii) Non-woven polyester fabric reinforcement layer, laid and bonded between base and finishing layers, as recommended by the system manufacturer:

- Colour: Black.

iii) One-part hot-applied rubberised bituminous membrane finishing layer.

g) Protection sheet: Radmat Texsa Protection Sheet (torched at laps).

h) Cap sheet: EshaFlex 370 Grey mineral, 4.5mm torch applied SBS modified bituminised polyester/fibreglass cap sheet.

i) Insulation:

i) Non-combustible rigid extruded polystyrene (XPS) insulation laid loose over roofing membrane, to suit the required roof levels and drainage requirements, including all associated insulation of upstands and penetrations.

ii) Indicative reference: ProTherm G XENERGY Ultra.

iii) The thickness and density of the insulation to achieve the U-value requirements of 0.18W/ m²K or better.

iv) Radmat ProTherm Xenergy MinK Water Flow Reducing Layer laid over the insulation with 300mm laps.

j) Finishing layer(s) comprising extensive ‘green’ roof system, as the Design Drawings:

i) Indicative manufacturer: Radmat Building Products Ltd.

ii) Indicative reference: Radmat MedO Sedum Blanket.

iii) Extensive green roof landscaping build-up:

- Slip layer polyethylene foil rolled out loose in a single layer over the root resistant layer.

- Protection layer: Proprietary 6mm thick protection fleece rolled out and laid loose.

iv) Drainage boards:
- Indicative manufacturer: Radmat Building Products Ltd.
- Indicative reference: Radmat D80.
- Boards to be click-in connection system to ensure the panels automatically lock together for stability.
- Boards to be entirely filled with Radmat D80 aggregate infill.
- Boards to be loose laid over the protection layer, continuously over designated roof area.

v) Filter membrane: Proprietary filter fleece loose laid over drainage layer with minimum laps of 100mm and taken up around all upstands, protrusions, etc. to substrate surface level, to comply with the manufacturer's recommendations.

vi) Growing medium: Extensive substrate suitable for wildflower planting to be a minimum depth of 120mm after compaction, above the filter fleece.

vii) Landscaping depth: Minimal depth for planting specified below, as recommended by the manufacturer.

viii) Proprietary pre-cultivated UK native species wildflower bio-diverse vegetation mat such as Radmat GM30 (species selection to the Client's requirements), as follows:
- 100% wildflower turf vegetation layer laid over separation layer to provide filtration, drainage and protection of the waterproofing system.

k) Planting:

i) Native wildflower plugs to be planted into the blanket at a rate of 12 plugs per m² with at least 12 of the species.

ii) "Leontodon autumnalis" to be included and not a similar species. This plant is specific to a very rare UK beetle, Olibrus flavicornis.

iii) The substrate areas to be seeded with both seed mixes at a rate of 6g/m². Seeds to be applied via a hydro-seeding technique. Hydro-seeding is an acceptable alternative to hand seeding and to ensure even coverage and germination.

iv) Wildflower blanket and seeding to be planted in to comply with the manufacturer's recommendations.

l) Vapour control layers, sub-layers, metal framing and pitch pockets as required, counter flashings, movement/ control joints, sealants (colour co-ordinated where visible), fixings and fastenings, fillets, protection boards, stops, termination bars, adhesives and other accessories recommended by the system manufacturer to complete the installation.

J31.106 Type RFS-255 Liquid Applied Inverted Roof System with Brown Biodiverse Roof System

Monolithic, fully bonded, hot-applied membrane roof system with brown biodiverse roof system.

a) Indicative manufacturer: Radmat Building Products Limited.

b) Indicative reference: PermaQuick PQ6100.

c) Substrate: Composite concrete deck. Refer to the Structural Engineer's documentation.

d) Preparation: Concrete substrate applications only, to be clean, dry and free of contaminants and loose particles, as recommended by the manufacturer.

e) Surface conditioner primer to suit the substrate.

f) Membrane:

i) One-part hot-applied rubberised bituminous membrane base layer.

ii) Non-woven polyester fabric reinforcement layer, laid and bonded between base and finishing layers, as recommended by the system manufacturer:
- Colour: Black.

iii) One-part hot-applied rubberised bituminous membrane finishing layer.

g) Protection sheet: Radmat Texsa Protection Sheet (torched at laps).

h) Cap sheet: EshaFlex 370 Grey mineral, 4.5mm torch applied SBS modified bituminised polyester/fibreglass cap sheet.

i) Insulation:

i) Non-combustible rigid extruded polystyrene (XPS) insulation laid loose over roofing membrane, to suit the required roof levels and drainage requirements, including all associated insulation of upstands and penetrations.

ii) Indicative reference: ProTherm G XENERGY Ultra.

iii) The thickness and density of the insulation to achieve the U-value requirements of 0.18W/ m²K or better.

iv) Radmat ProTherm Xenergy MinK Water Flow Reducing Layer laid over the insulation with 300mm laps.

j) Finishing layer(s) comprising biodiverse 'brown' roof system, as the Design Drawings:

i) Indicative manufacturer: Radmat Building Products Ltd.

ii) Indicative reference: Radmat MedO Biodiverse Substrate.

iii) Brown biodiverse roof landscaping build-up:

- Slip layer polyethylene foil rolled out loose in a single layer over the root resistant layer.
- Protection layer: Proprietary 6mm thick protection fleece rolled out and laid loose.

iv) Drainage boards:

- Indicative manufacturer: Radmat Building Products Ltd.
- Indicative reference: Radmat D10.
- Boards to be click-in connection system to ensure the panels automatically lock together for stability.
- Boards to be loose laid over the protection layer, continuously over designated roof area.

v) Filter membrane: Proprietary filter fleece loose laid over drainage layer with minimum laps of 100mm and taken up around all upstands, protrusions, etc. to substrate surface level, to comply with the manufacturer's recommendations.

vi) Growing medium: Biodiverse substrate suitable for biodiverse brown planting (to be confirmed) above the filter fleece.

vii) Landscaping depth: Minimal depth to be agreed with the Architect and as recommended by the manufacturer.

viii) Proprietary pre-cultivated UK native species biodiverse vegetation mat to be agreed with the Architect.

k) Planting: To be agreed with the Architect.

l) Vapour control layers, sub-layers, metal framing and pitch pockets as required, counter flashings, movement/ control joints, sealants (colour co-ordinated where visible), fixings and fastenings, fillets, protection boards, stops, termination bars, adhesives and other accessories recommended by the system manufacturer to complete the installation.

J31.200 QUALITY AND WORKMANSHIP

QUALITY

Refer to A70 for detailed descriptions of Submittals and Quality Requirements.

J31.201 Samples

a) Waterproof membrane: 300mm x 300mm.

b) Insulation.

c) Visible accessories.

J31.202 Mock-ups, Prototypes, Benchmarks

a) Mock-ups:

i) Not required.

b) Prototypes:

i) Not required.

c) Benchmarks:

i) First structural bay of each type.

J31.203 Other Documentation

Not used.

J31.204 General Work Section Requirements

a) Comply with the following Building Fabric Reference Specifications:

i) Z11 - Metalwork.

ii) Z22 - Sealants.

iii) Z61 - Insulation.