STATEMENT IN SUPPORT OF CONDITION 16

The planning consent condition 16 requires either a 'green' or 'blue' roof to be incorporated in the scheme – *'Prior to commencement of development other than site clearance and preparation, a feasibility assessment for a hybrid blue-green roof should be submitted to the local planning authority and approved in writing.'*

This has now been considered as the scheme drawings have been developed.

FEASIBILITY ASSESSMENT FOR A HYBRID BLUE-GREEN ROOF

The condition asks for a blue-green roof to be assessed but I think it would be helpful to differentiate between a 'Blue' and 'Green' roof as they are two different forms of construction and serve a different purpose.

A **'Green' roof** in simple terms, is a roof covered with a growing medium to allow vegetation to flourish on top of a building. It has the following benefits;

- Creates a natural habitat for flora and fauna
- Aids biodiversity encouraging a wider spread of species in the area
- The soft landscaping helps to reduce the risk of flooding by retaining large proportions of annual rainfall and reducing rainwater run-off. Particularly useful within Sustainable Urban Drainage (SUDs) schemes
- Environmental masking that blends the building into its surroundings
- Vegetation assists in reducing both gaseous pollutants and dust particles, improving air quality
- Through absorption of heat and the natural evaporation of water from plants and soil, it reduces urban heat island effect
- Fewer rainwater outlets are required, decreased rainwater drainage system capacity and a reduced requirement for storm water attenuation within the SUDs scheme for the site
- Increased life expectancy of waterproofing membranes as the vegetation protects it from solar degradation
- Noise reduction for the building – green roofs have excellent acoustic qualities

A '**Blue' roof** is a term for the incorporation of an attenuation tank at roof level as a method of preventing the sewers being surcharged. It is usually incorporated below a growing medium and planting (green roof) but can be covered by paving or decking.

The idea was developed for use on buildings where attenuation is required and cannot be achieved elsewhere on the site. It should only be considered as a solution if attenuation cannot be achieved elsewhere on the land being developed. Placing a storage tank on the roof increases the load that the structure must carry, increasing column and roof slab sizes. This in turn means that more raw materials are used, increasing the carbon input.

The roof level attenuation requires more maintenance than a green roof and more than a ground situated attenuation system. There is a greater risk of water penetration/flooding from a blue roof (roof level attenuation) than a ground-based system if it is not maintained regularly and correctly.

Maintenance of a blue roof is critical to the viability of its ability to continue to function, as follows;

- Following any significant storm event, the outlets should be visually inspected to ensure no blockage has occurred.
- Following any significant traffic or remedial works that take place on or around the roof, each of the outlets should be visually inspected to ensure all drainage holes are clear and free draining.
- Quarterly each outlet, should be inspected and cleared of any build up or debris. All leaf litter must be removed from the roof surface. Debris must be removed from the roof and not simply flushed down rainwater pipes.
- Tree limbs that overhang the roof must be cut back to give at least a 1 metre clearance, this will significantly reduce any risk of any blockage to outlets.
- During maintenance visits all upstands must be visually inspected to ensure they are firmly adhered to the structure.

The rationale for rainwater attenuation, is to avoid a surcharge on the drains and sewers. Only one form of attenuation is required if the surcharge requirements can be met in that way.

It is more practical for attenuation to be achieved by installing a tank in the ground. On this development site there is sufficient space to incorporate a tank at ground level below the courtyard without any additional construction being required, therefore attenuation is being dealt in that way. The attenuation tank provides 6m^3 of storage and slow discharge by way of a Wavin Aquacell and a Hydrovalve restricting flow into the off-site surface water drainage system to 5l/s. Details of the proposed drainage are provided on SLC Consulting Engineers drawing 21024 – 2101 B

The majority of the main roof will be occupied by plant, back of house equipment & PV panels and therefore it is more practical to have a tank in the ground than a blue roof system.

It is therefore proposed to construct this building with a green roof and rainwater attenuation at ground level.

This will allow a lighter concrete frame, reduces need for inspections of outlets following severe storms and will allow the ongoing management of the outfall to the combined system via a hydrovalve at ground level.

Details for the location (floor plans and section) for the green roof, its specification and maintenance are appended to this assessment, and include

- The Sedum proposed would include between 8 and 12 species and would be planted at 16 plants per square meter
- The growing median for the Sedum roofing will be and average of 130mm thick (between 80 and 150mm in troughs)
- The maintenance of the Sedum plants will include initial watering, feeding, and annual clearing of unwanted weeds