

Green Space Factor

Castle Square

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Disclaimer

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Introduction

Overview

Eight Associates has been commissioned by Spider Project Management Ltd to complete a Green Space Factor (GSF) calculation and report for a proposed development at Castle Square, Swansea, SA1 3PP, hereinafter referred to as the site. The site is centred on National Grid Reference SS 65641 93049. The site area within Castle Square is approx. 0.43ha with the roadways and paving surrounding Castle Park totalling 0.40ha.

The site currently comprises predominantly hardstanding and amenity grassland with scattered trees and introduced shrub within the segments of Castle Square. The site is bounded by retail units to the north and west, Castle Bailey Street and Swansea Castle to the east and Care Street and retail units (restaurants) to the south. In the centre of the site is a large electronic advertisement board. Prior to any work being carried out on site, the site was deemed to have low ecological importance.

Building Proposals

The current proposals include the regeneration of a public realm space in Swansea city centre, including green and biodiverse roofed pavilions that will provide retail opportunities and covered outside seating areas for pedestrians.

Green Space Factor (GSF)

Swansea Council is committed to using the GSF tool, designed for the Swansea Central Area, as a measure for the quantity and functionality of green space in its developments within the central area of Swansea. This is also in line with Policy ER2 of the Swansea Local Development Plan¹ which relates to Strategic Green Infrastructure Network and states:

ER 2: Strategic Green Infrastructure Network

Green Infrastructure will be provided through the protection and enhancement of existing green spaces that afford valuable ecosystem services. Development that compromises the integrity of such green spaces, and therefore that of the overall Green Infrastructure network, will not be permitted.

Development will be required to take opportunities to maintain and enhance the extent, quality and connectivity of the County's multi-functional Green Infrastructure network, and where appropriate:

- i. Create new interconnected areas of Green Infrastructure between the proposed site and the existing strategic network;
- ii. Fill gaps in the existing network to improve connectivity; and
- iii. In instances where loss of Green Infrastructure is unavoidable, provide mitigation and compensation for the lost assets.

In line with this policy, Swansea have implemented the use of the Swansea GSF tool designed to increase the quantity and functionality of green infrastructure schemes across the central area. Development must not compromise the integrity of the green infrastructure system. This means that where a development proposal will result in loss in green infrastructure and consequently a loss in ecosystem service provision, mitigation and compensation measures will be required. The Local Development Plan (LDP) policy now requires that compensatory measures should maintain and enhance the green infrastructure network. The policy criteria set out the type of measures that could be incorporated into a development scheme to achieve this.

The Swansea Central Area – Regenerating Our City for Wellbeing and Wildlife states that: Castle Square is a key central area to deliver multi-functional green space within the Green Artery and. The redevelopment of this area will create an enhanced public realm. One of the key objectives is that it should adopt an overall principle of retaining and enhancing public access and contributing to a greener Central Area with no loss of useable greenspace. The enhancement of the Square will play an important role in connecting greenspace around the historic Castle, to St Mary's Church and contributing towards the extension of the green artery². The site is currently considered to be of low ecological importance. Therefore, any redevelopment of the area will provide opportunities for habitats and fauna that do not currently exist on the site.

¹ Swansea Council (2019) Swansea Local Development Plan

² Green Infrastructure Consultancy (2021) Swansea Central Area – Regenerating Our City for Wellbeing and Wildlife

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Methodology - Swansea Green Space Factor Tool

The GSF tool is aimed at new developments and refurbishments. A minimum target score of 0.3 for predominantly commercial development will be expected. The calculation is based on the Proposed Site Plan where areas in m² of each proposed surface cover type at the site were measured (see Appendix A).

A factor between 0 and 1 for each surface type were assigned using Appendix A3.3 in the Swansea Central Area - Regenerating Our City for Wellbeing and Wildlife (February 2021). Using this table, the lowest score of zero is given to impermeable surfaces such as asphalt and concrete and the highest score of 1 is given to natural vegetation on deep soils.

The factor for each surface cover is multiplied by the area of the site in square metres which is made up of this surface cover. The resulting figures for each surface are added together and then divided by the overall site area. This gives an overall GSF score for the site of between 0 and 1. Appendix B details the GSF tool score spreadsheet used to inform this assessment.

$$\text{GSF} = \frac{(\text{Score A} \times \text{Area}) + (\text{Score B} \times \text{Area}) + (\text{Score C} \times \text{Area}) + (\text{Score D} \times \text{Area}) \text{ etc}}{(\text{Total Site Area})}$$

Limitations

It should be noted that the GSF calculated in this report relies on the correct and up to date areas of each surface cover being provided by the design team. Should there be changes to the design of the site which may affect surface area cover ratios, the calculation should be updated. For the purpose of the calculation, all the planting areas and green roofs have been included within the calculation with the carriageway and retained cycle path and footways excluded.

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Results

The GSF calculations are detailed in Appendix B. The proposals were found to result in a GSF score of 0.46, therefore the target score of 0.3 for predominantly commercial development has been achieved. The following habitats will be created onsite post-development, providing benefits to biodiversity in the local area and all contribute to the GSF score.

Sealed Surface

The majority of the site comprises sealed surfaced used for a cycle path, existing tactiles, pavilion areas, pathways and the bandstand. The retained carriageway and paths outside of the Castle Square boundary have been excluded from the calculations.

Amenity Lawn

Amenity grassland will be included within Castle Square, adjacent to planting. The grassland will be species-poor and used for amenity purposes. Although species-poor, the grassland will act as a stepping stone to facilitate movement and dispersal of species.

Groundcover and Rain Garden Planting

Groundcover and rain garden planting will be undertaken across Castle Square, adjacent to amenity lawns. The planting will include a range of native and non-native species and has been designed to include a diverse range of heights, structures and ages of plants. The planting plans are detailed on the Outline Planting Schedule produced by Spacehub in 2022³. The flowers will provide pollen and nectar for insects such as bees and butterflies. This is important for fertilisation and thus seed and fruit production for many plants. A variety of different species will be used to maximise biodiversity.

Intensive Green Roof

An intensive green roof is proposed on the Pavilion A accessible roof which will be planted with amenity lawn and ornamental planting. This will have a minimum settle depth of 400mm. The roof should meet the requirements of Green Roof Organisation (GRO) code 2014. Green roofs can support biodiversity in cities such as Swansea by acting as a green corridor or stepping-stone to facilitate movement and dispersal of species, thus increasing connectivity across the city. They can also provide important refuges for wildlife in urban areas. Outside of biodiversity, green roofs can reduce the risk of flooding (and are often used for Sustainable Urban Drainage, SUDs, purposes), improve air quality and reduce the urban heat island effect.

Biodiverse Roof

A proposed biodiverse roof comprising a wildflower blanket with plug planting is proposed on the Pavilion A canopy roof and Pavilion B roof. The biodiverse roof will be seeded with a wildflower blanket with plug planting to achieve an instant effect. The substrate depth will be a minimum of 80mm and therefore meets the GRO code 2014.

Existing and Proposed Trees

Sixteen trees are being retained and ten trees are being proposed as part of the development. Twenty-two of the existing/proposed trees will be standard trees planted in natural soils with a minimum soil volume equivalent to at least two thirds of the projected canopy area of the mature tree. The remaining four trees will be planted in pits with a soil volume less than two thirds of the projected canopy area of the mature tree. For the GSF calculation, an average tree canopy of 8x8m² has been used and this is include above the site area, therefore the 'Sum Total' within the GSF calculation is higher than the site area of Castle Square. Tree planting includes native species and species with a known wildlife benefit which will provide a benefit to local invertebrate, bat and bird populations.

³ Spacehub (2022) Castle Square – Planting Plans. Outline Planting Schedule.

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Conclusion

The GSF for the proposed site is 0.46 (to two decimal places), which meets the target score of 0.3 for predominantly commercial developments in Swansea Central Area.

The green infrastructure potential at the site has been maximised by the creation of green roofs, amenity grassland, groundcover planting, rain gardens and the retention and planting of trees.

It is concluded that the proposed development at the site meets the GSF target score of 0.3 and the habitats being installed onsite will largely improve the biodiversity and greening on the site, in line with Swansea Central Area – Regenerating Our City for Wellbeing and Wildlife.

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Validation

Report produced by Sara Curtis:

| | |
|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ecologist's Qualifications: | BSc - Environmental Science MSc - Environmental Consultancy (Biodiversity and Conservation) |
| Evidence of practicing Ecologist | Eight Associates - Principal Ecologist and Sustainability Consultant specialising in Ecology (2022 to present date), Senior Ecologist (2018 - 2021), Ecologist (2013 - 2018) |
| Professional Membership and Professional Code of Conduct | Full member of the Chartered Institute of Ecology and Environmental Management |

Report verified by Gemma Golding:

| | |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ecologist's Qualifications: | WML-CL08 Natural England Class Survey Licence (CLS) for great crested newt MSc - Ecology and Evolutionary Biology BSc - Zoology |
| Evidence of practicing Ecologist | Eight Associates, Ecologist and Sustainability Consultant, conducting habitat and protected species surveys (2019 to present date); Atkins, Assistant Ecologist, habitat and protected species surveys (2018 - 2019); Jacobs, Seasonal Ecologist, protected species surveys (2018). |
| Professional Membership and Professional Code of Conduct | Working toward membership of the Chartered Institute of Ecology and Environmental Management |

Validation

I confirm the information provided in this document is truthful and accurate at the time of completion.

| | |
|------------------------------|----------------|
| Suitably Qualified Ecologist | Stacey Cougill |
| Signature of Ecologist | SC |
| Date | 04/05/2022 |

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Appendix A - Proposed Site Plan



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Appendix B - GSF Calculations

| Habitat | Classification according to Policy G5 of the Intend to Publish London Plan (Appendix B) | Factor weighting (F) | Area, m2 (A) | Score (Fx A= S) |
|--------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------|-----------------|
| Cycle Path Mesh Grille | Sealed surfaces (e.g. concrete, asphalt, waterproofing, stone) | 0 | 26 | 0 |
| Existing Tactiles | Sealed surfaces (e.g. concrete, asphalt, waterproofing, stone) | 0 | 43 | 0 |
| Re-used York Stone | Sealed surfaces (e.g. concrete, asphalt, waterproofing, stone) | 0 | 290 | 0 |
| Re-used York Stone to Pavilion 'A' Roof | Sealed surfaces (e.g. concrete, asphalt, waterproofing, stone) | 0 | 115 | 0 |
| New Granite Paving | Sealed surfaces (e.g. concrete, asphalt, waterproofing, stone) | 0 | 1160 | 0 |
| Amenity Lawn | Amenity grassland (species-poor, regularly mown areas) | 0.4 | 984 | 393.6 |
| Other Planting - ornamental, perennials | Groundcover planting - see RHS Groundcover Plants for overview. | 0.5 | 100 | 50 |
| Other Planting - ornamental, perennials | Rain gardens and other vegetated sustainable drainage elements. | 0.7 | 1069 | 748.3 |
| Intensive Green Roof - Amenity lawn/planting | Intensive green roof or vegetation over structure. Vegetated sections only. Substrate minimum settled depth of 150mm. | 0.8 | 105 | 84 |
| Biodiverse roof | Extensive green roof with substrate of minimum settled depth of 80mm (or 60mm beneath vegetation blanket) - meets the requirements of GRO code 2014. | 0.7 | 272 | 190.4 |
| Pathways through planters | Sealed surfaces (e.g. concrete, asphalt, waterproofing, stone) | 0 | 68 | 0 |
| Bandstand | Sealed surfaces (e.g. concrete, asphalt, waterproofing, stone) | 0 | 24 | 0 |
| 22 x Existing and Proposed Trees (each tree canopy approx. 8x8m ²) | Standard trees planted in natural soils or in connected tree pits with a minimum soil volume equivalent to at least two-thirds of the projected canopy area of the mature tree. | 0.8 | 1408 | 1126.4 |
| 4 x Proposed Trees (each tree canopy approx. 8x8m ²) | Standard trees planted in pits with soil volumes less than two thirds of the projected canopy area of the mature tree. | 0.6 | 256 | 153.6 |
| | | Sum Total | 5925 | 2746.3 |
| | | GSF Score | | 0.4635 |