

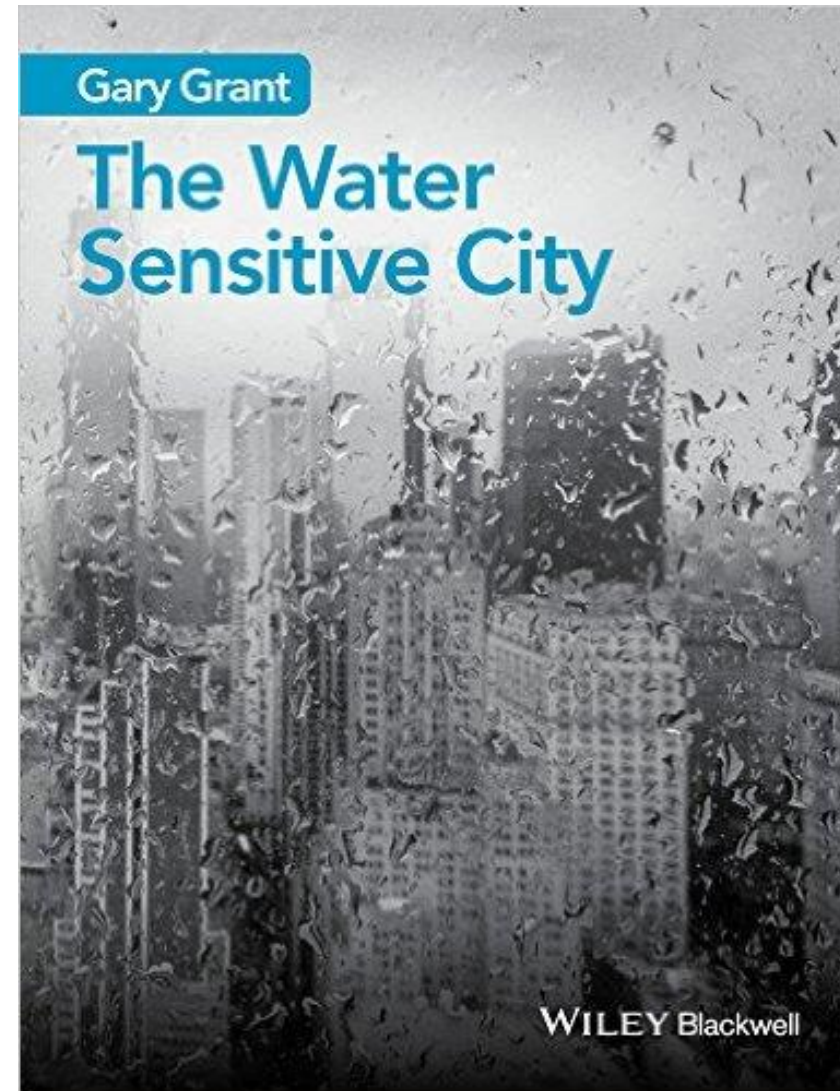
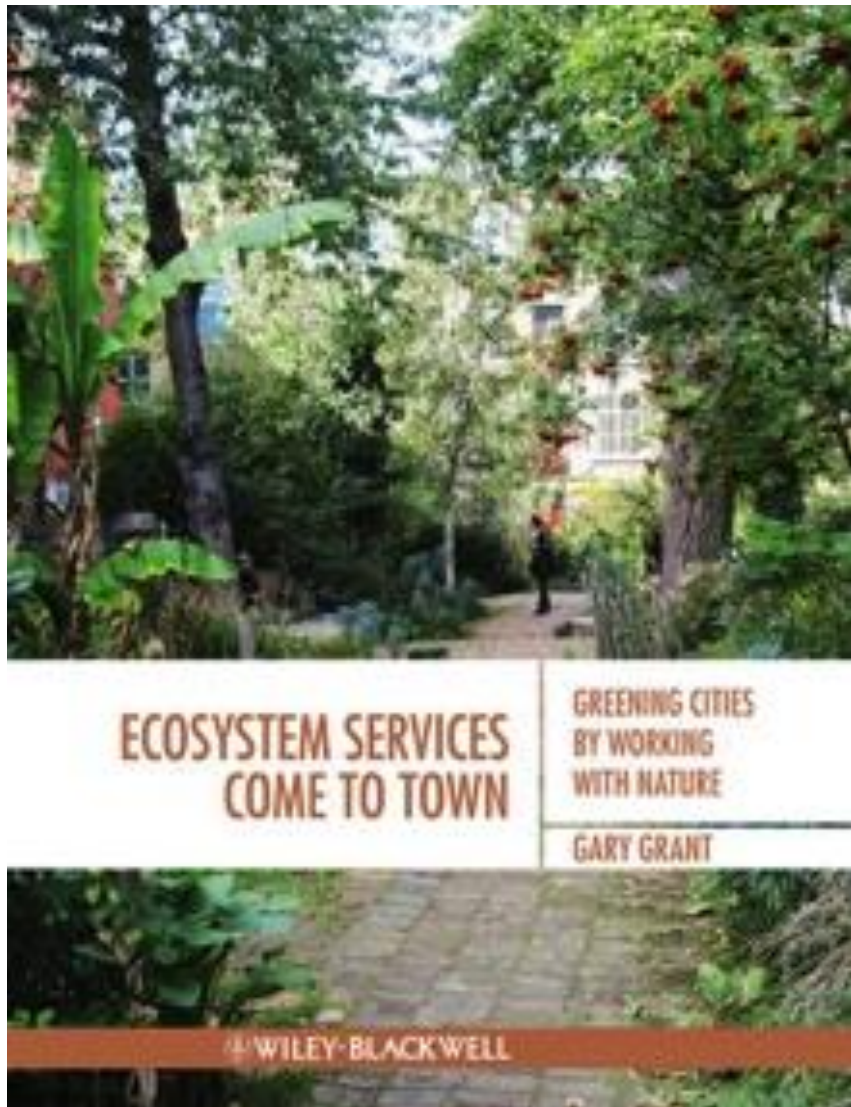
Adapting to Climate Change in the Built Environment using Blue & Green Infrastructure (Nature-based Solutions)



The Green
Infrastructure
Consultancy

Gary Grant

Twitter @ecoschemes



<http://eu.wiley.com> <http://greeninfrastructureconsultancy.com> Twitter @ecoschemes



CREATING GREEN ROOFS FOR INVERTEBRATES

A BEST PRACTICE GUIDE





Biophilic Living, Swansea

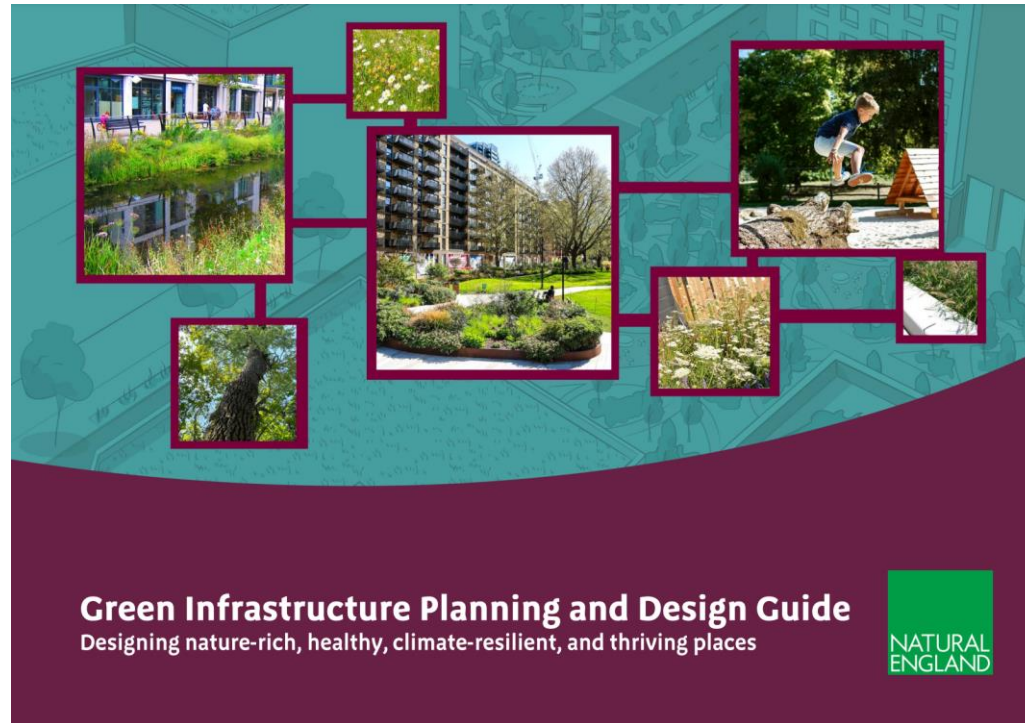


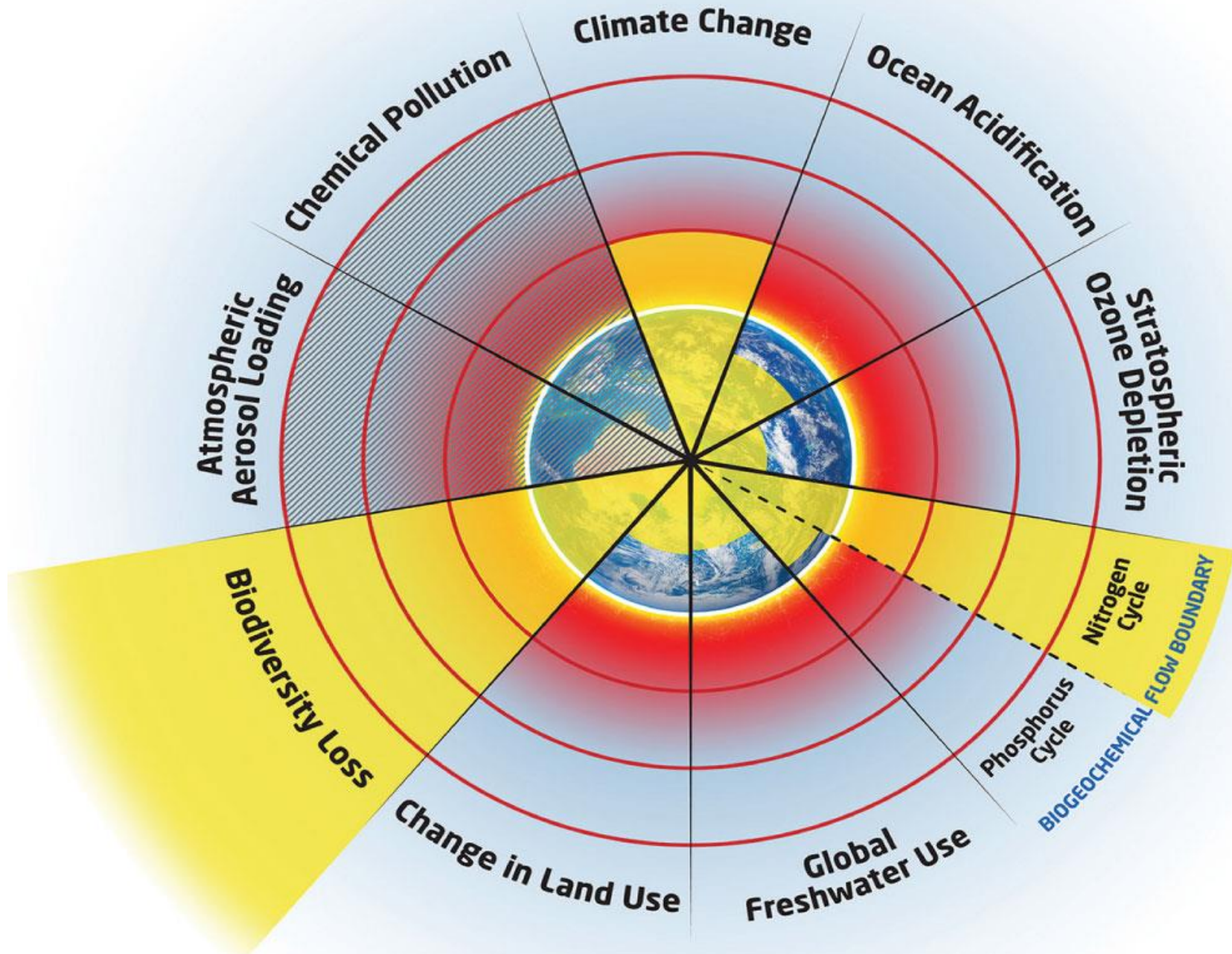
Littlehampton Rain Garden

Green Infrastructure Planning and Design Guide



- Designing nature-rich, healthy, climate-resilient and thriving places





Climate Change Mitigation

V

Climate Change Adaptation

Mitigation: Avoiding and reducing the emission of greenhouse gases

Adaptation: Altering our behaviour and environment to live with climate change

What is Green Infrastructure?

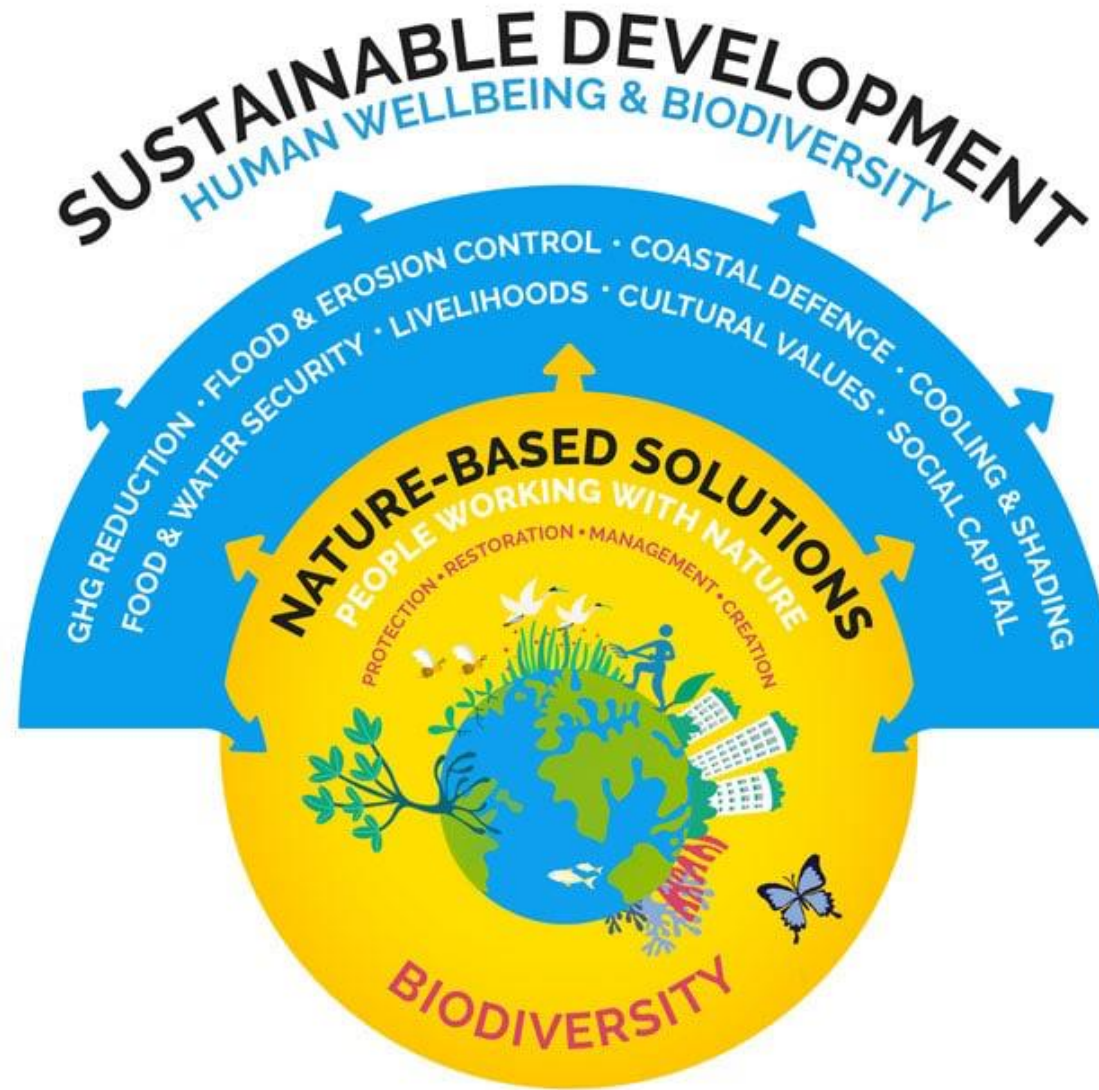


“GI is a strategically planned and delivered network of high quality green spaces and other environmental features.

*It should be designed and managed as a **multifunctional resource** capable of delivering a wide range of environmental and quality of life benefits for local communities”.*

Natural England

Nature-based Solutions (NbS)

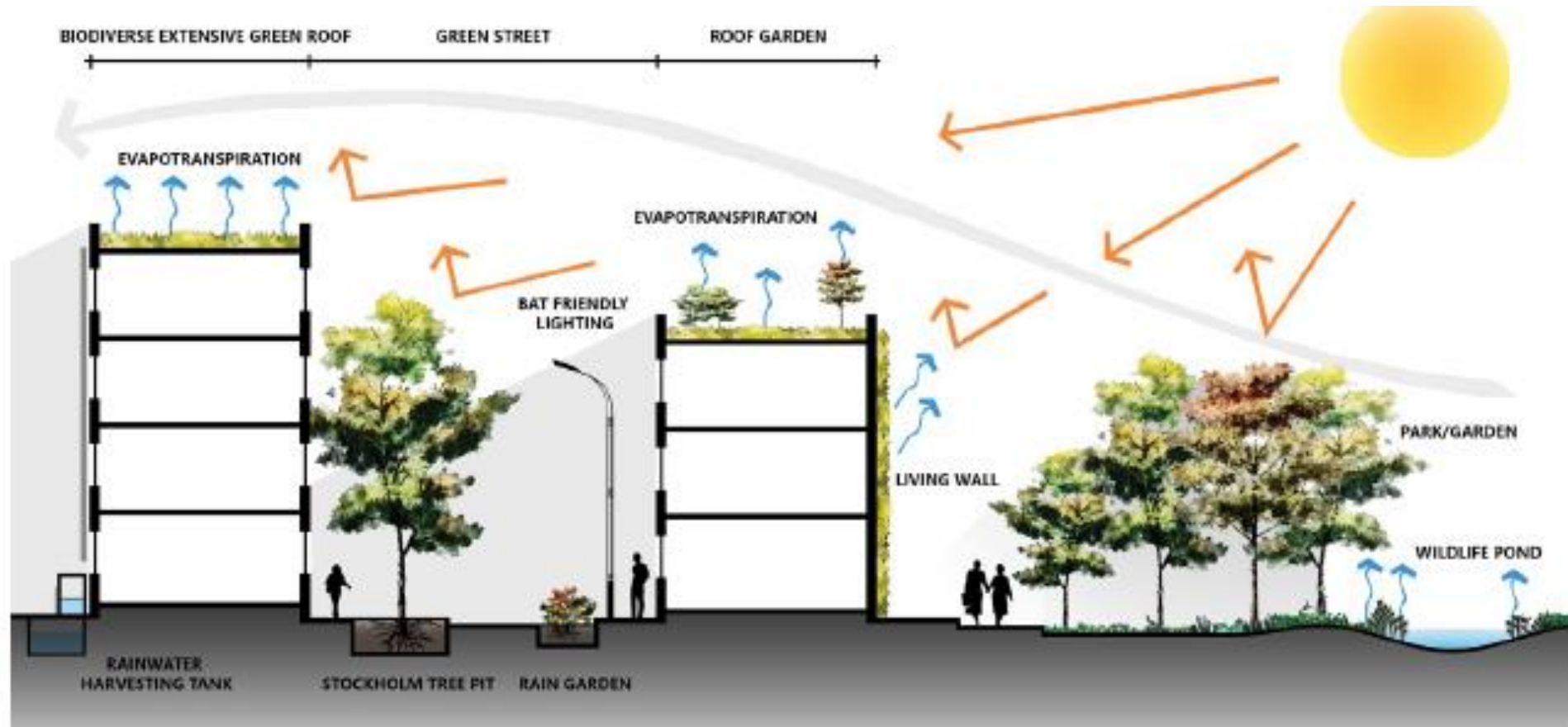


<https://www.naturebasedsolutionsinitiative.org/what-are-nature-based-solutions/>

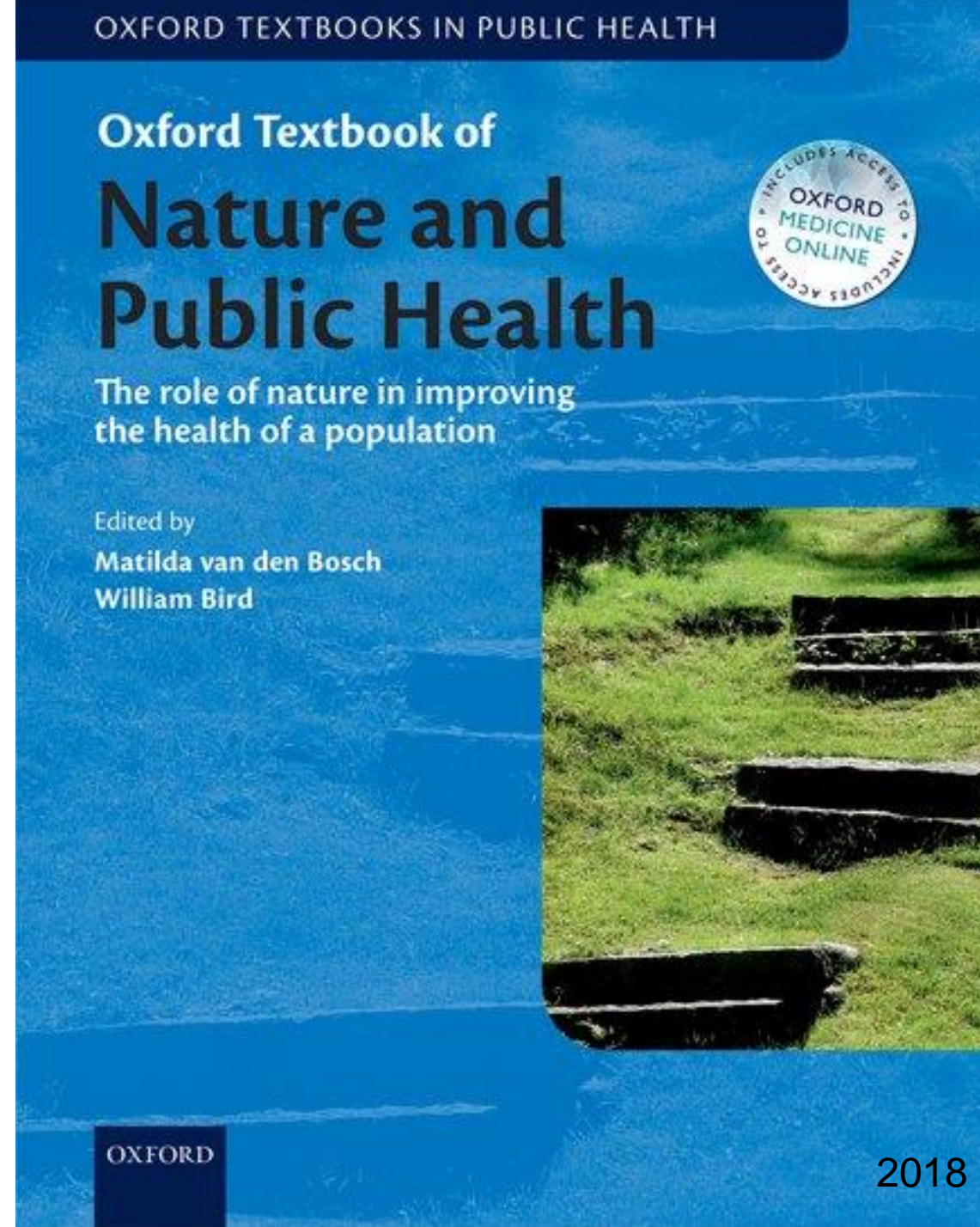
Benefits of Green Infrastructure:

- Stormwater management
- Water supply
- Microclimate
- Shade
- Cooling
- Windbreaks
- Reduces energy use
- Sequesters carbon
- Clean air
- Clean water
- Less noise
- Food
- Health and Wellbeing
- Community Cohesion
- Education
- Biodiversity
- Reduces requirement for grey infrastructure

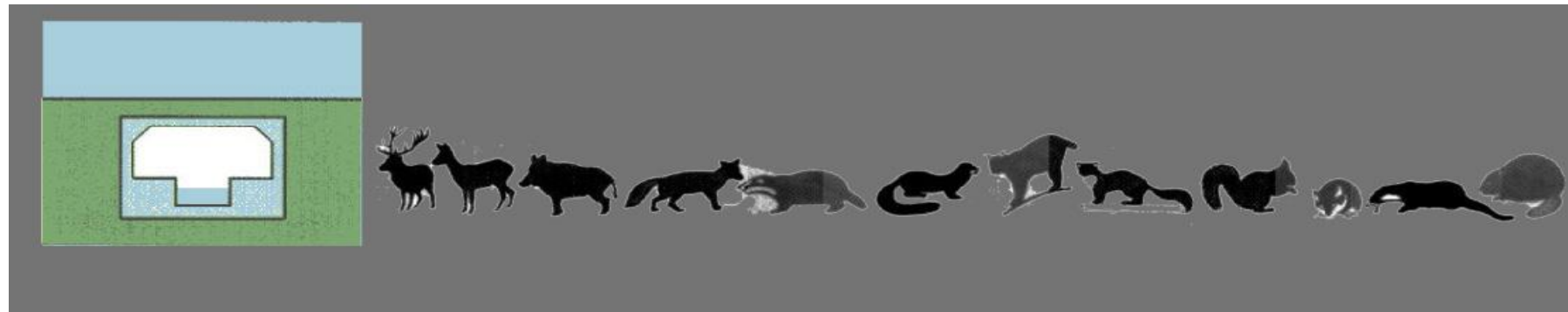
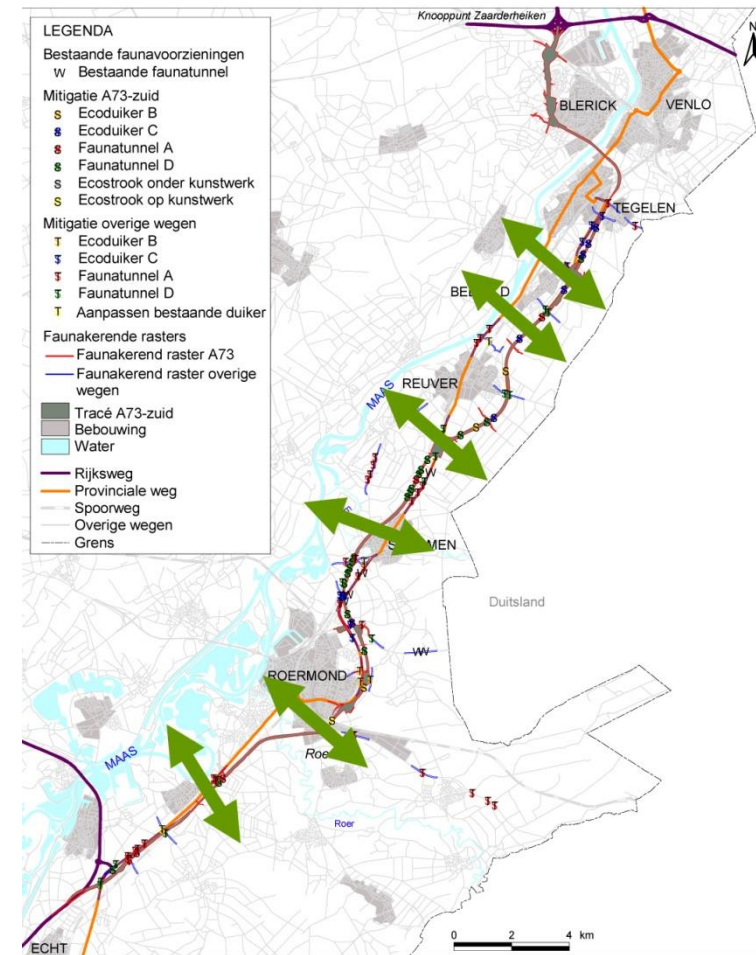
Multi-functionality



- Clean Air & Water
- Exercise
- Psychological
- Biophilia



Urban Landscape: Habitat Connection



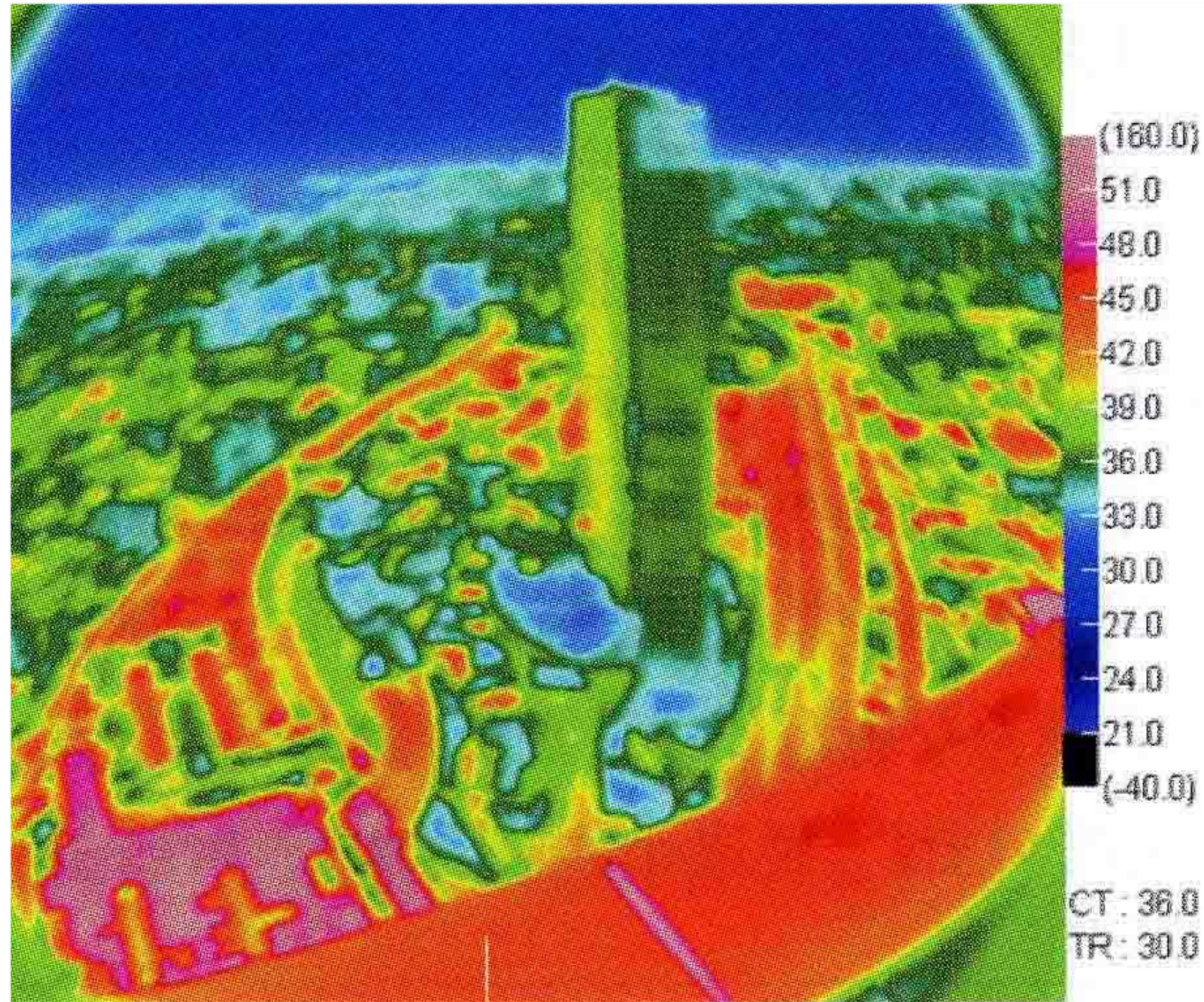
Making Cities Cooler



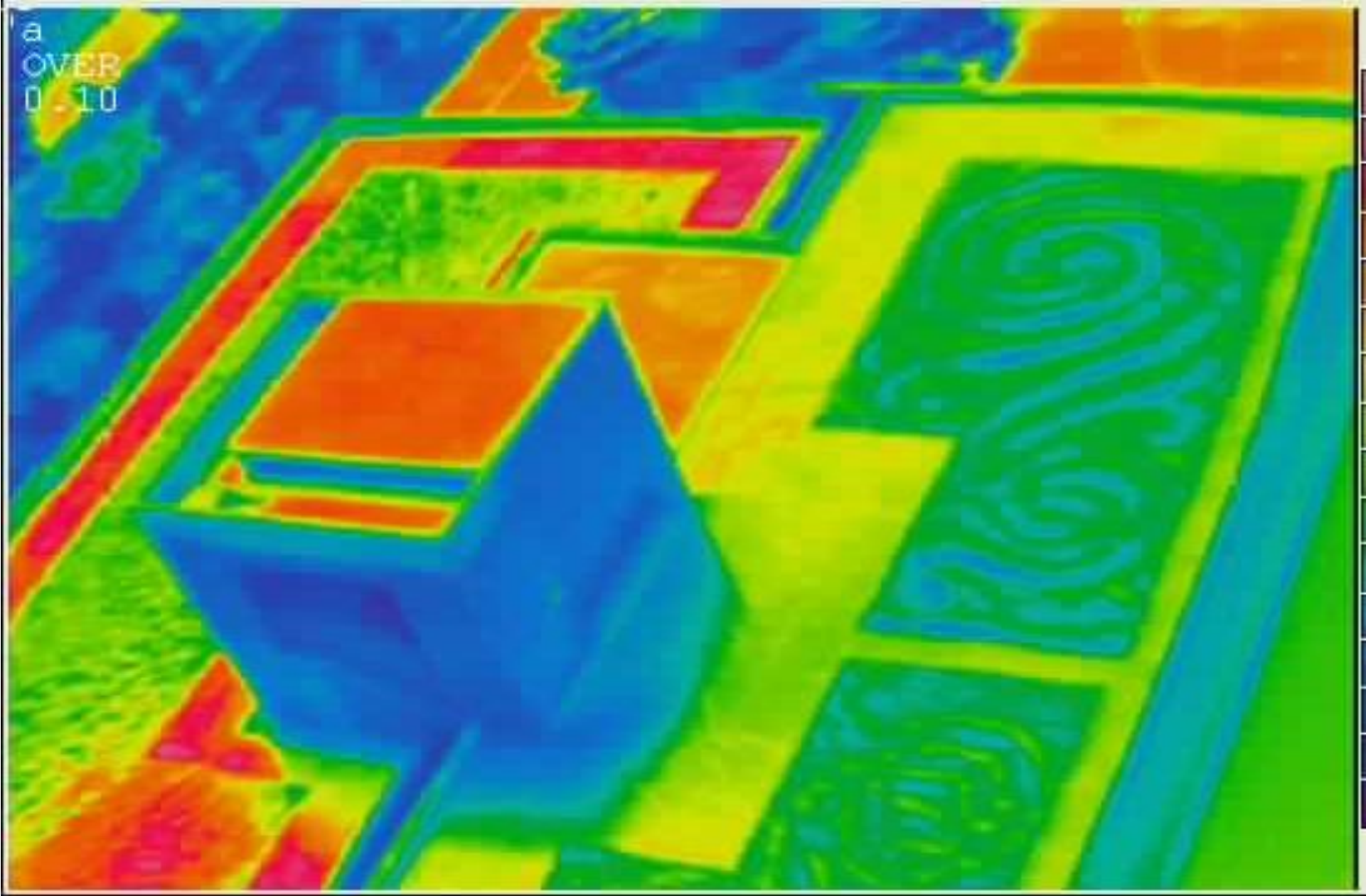
Temperature ($^{\circ}\text{C}$)





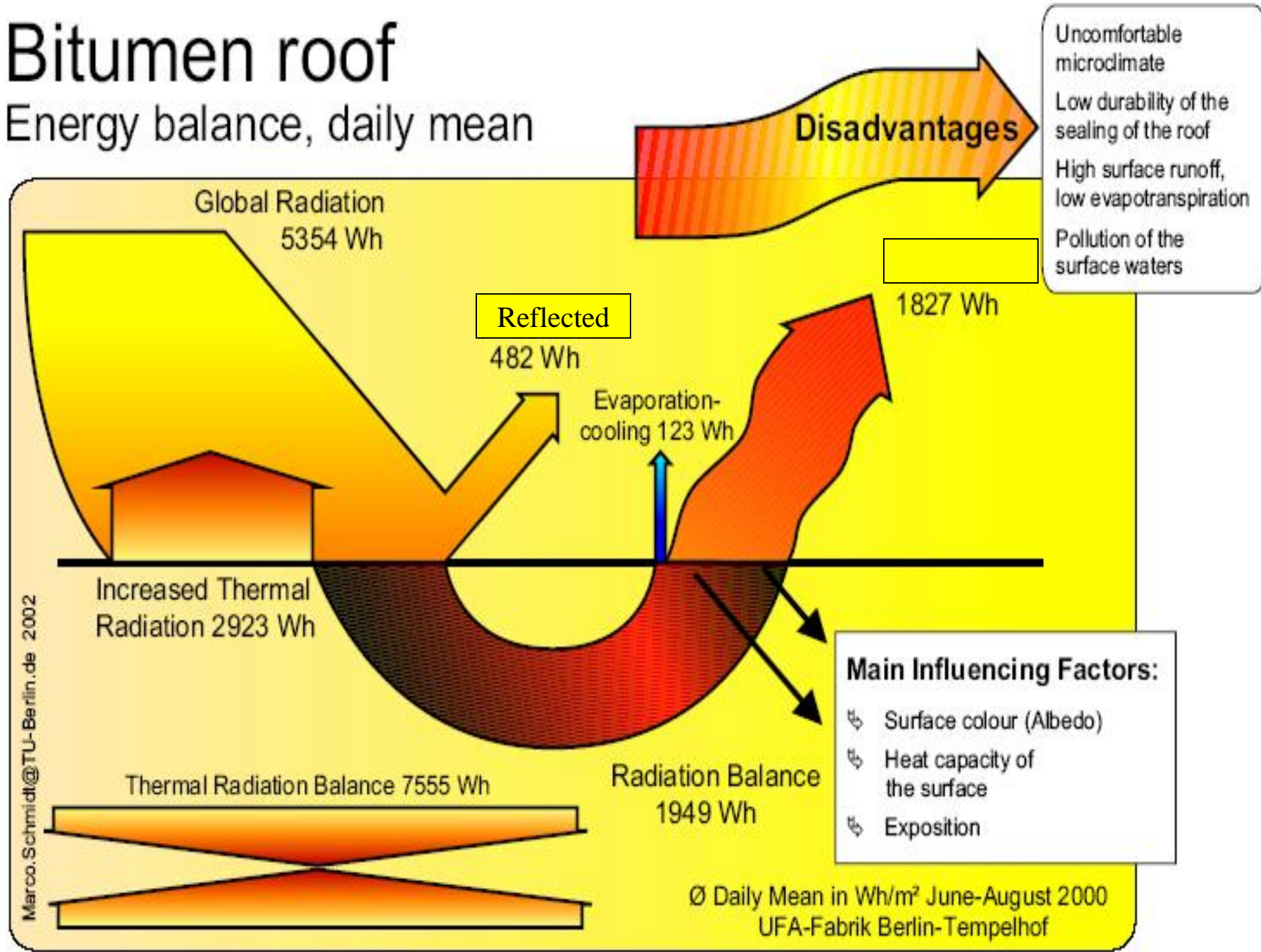






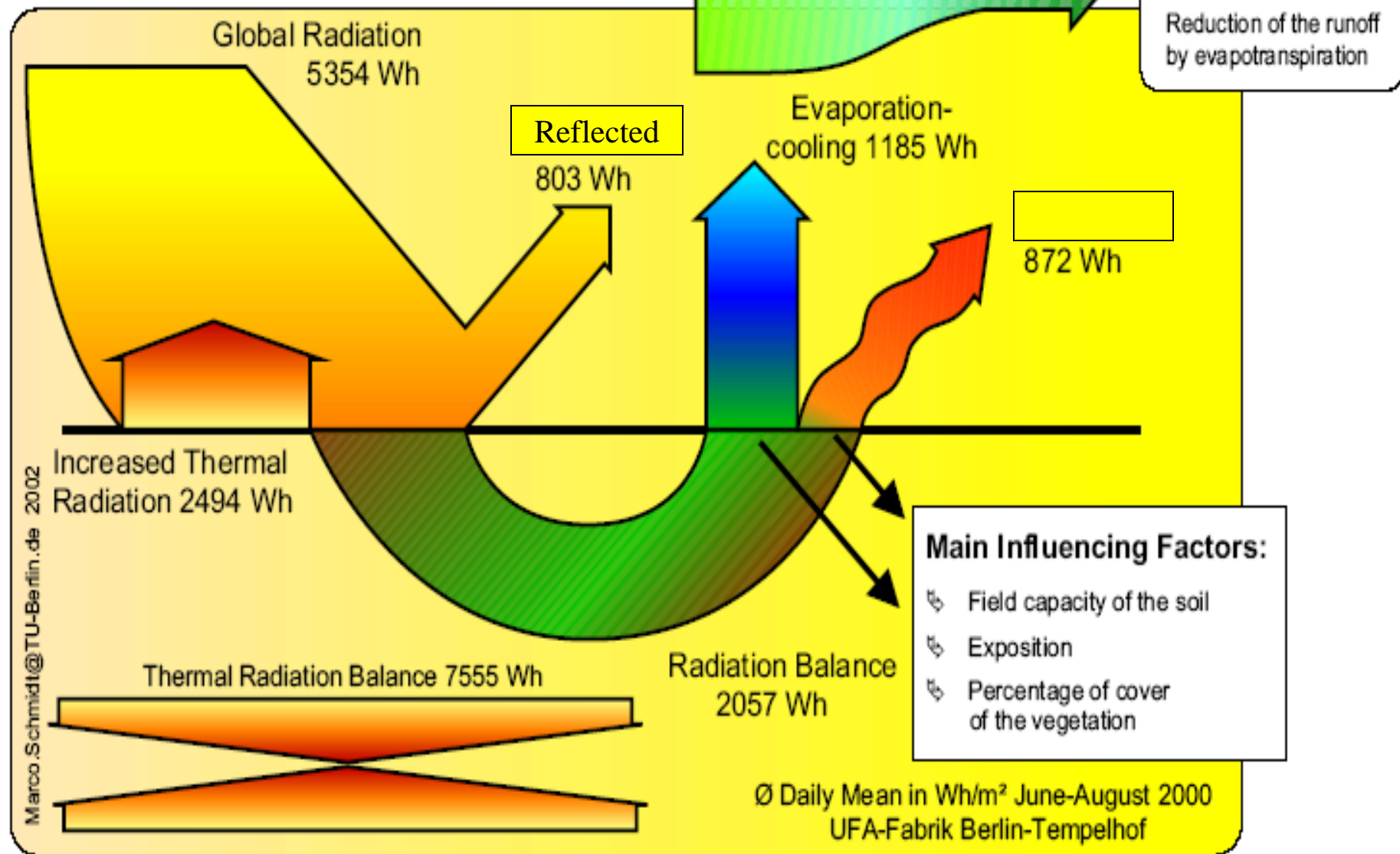
Bitumen roof

Energy balance, daily mean



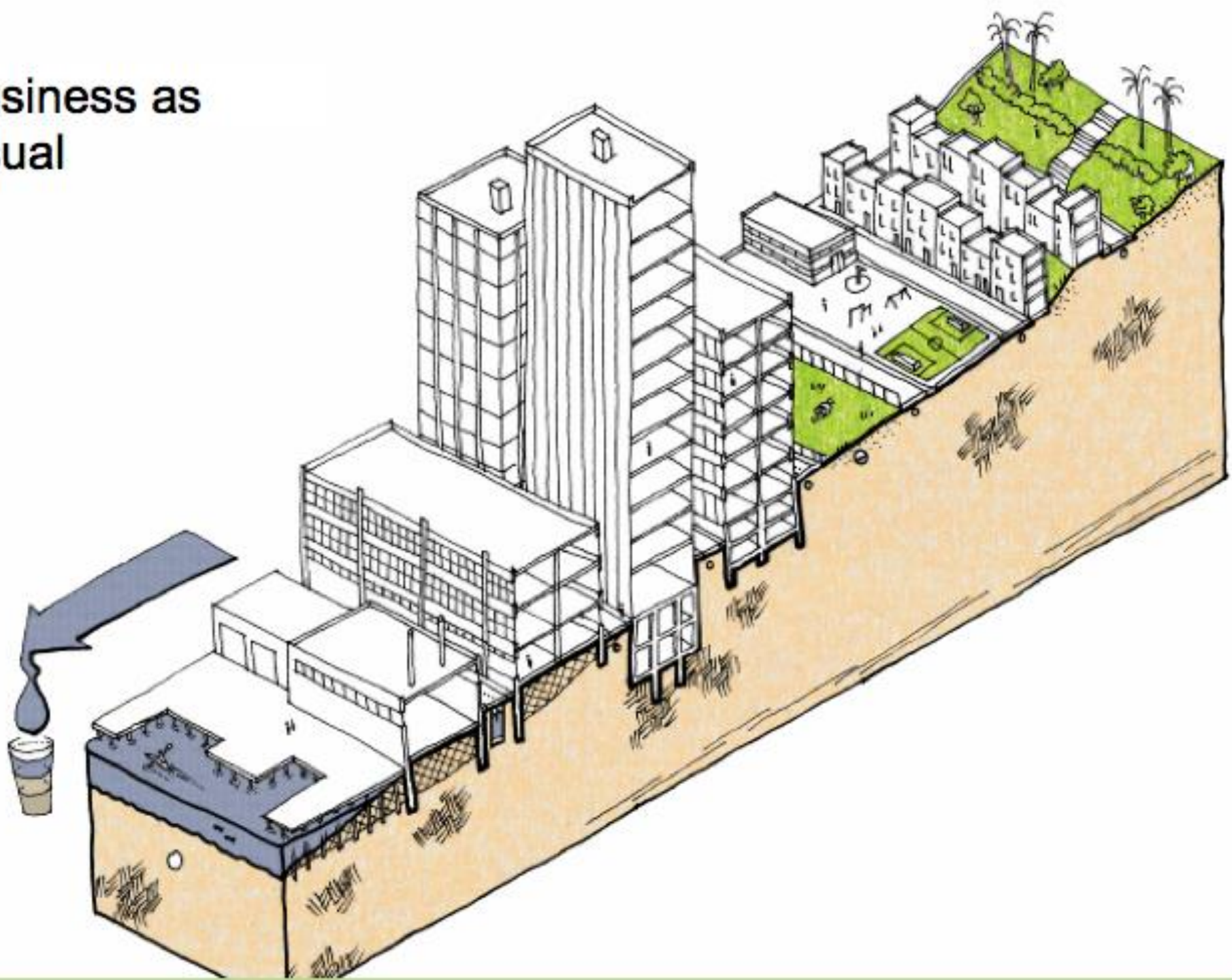
Extensive Greened Roof

Energy balance, daily mean

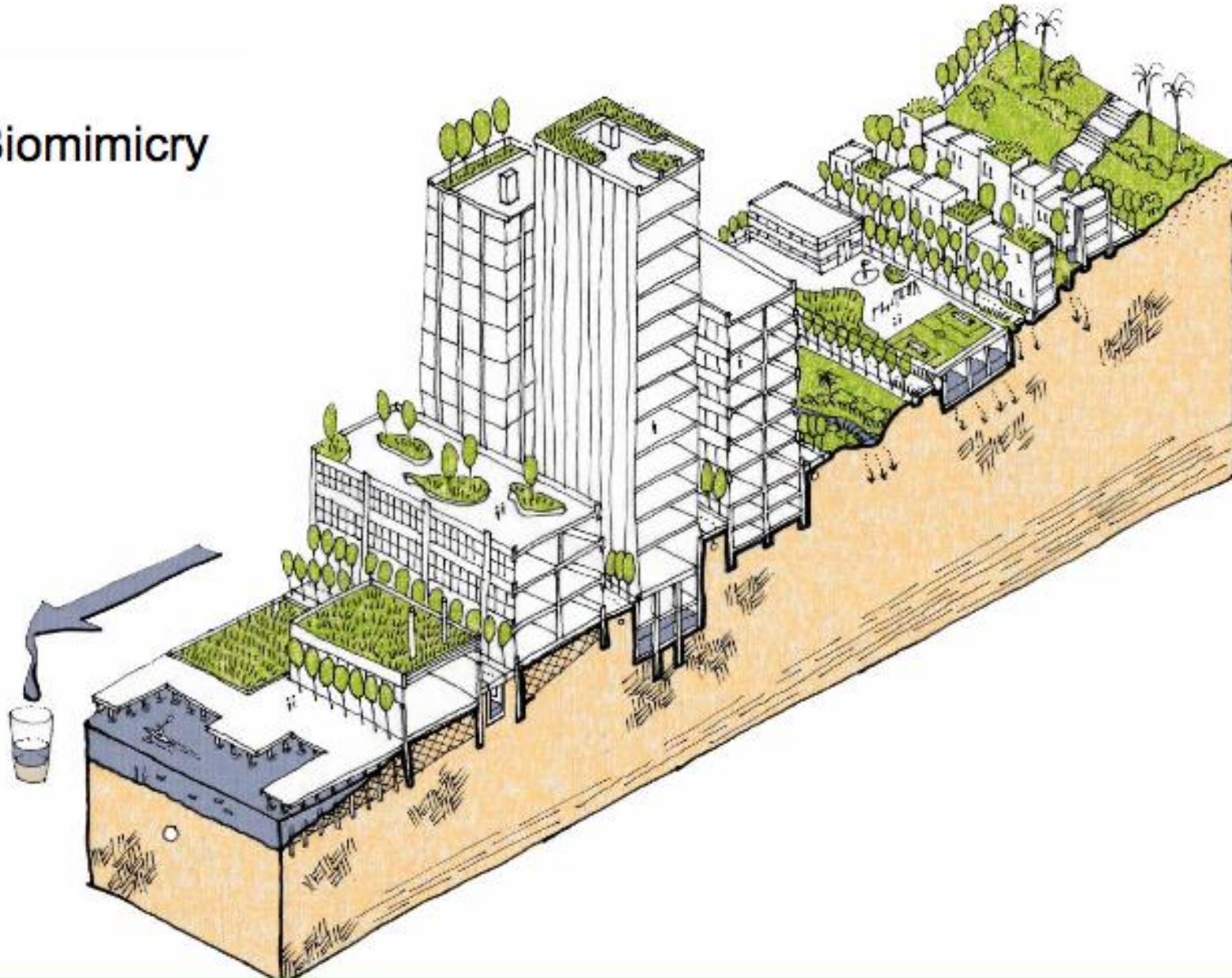


Water Sensitive Cities
Water Sensitive Urban
Design (WSUD)
#spongecities

Business as Usual



Biomimicry

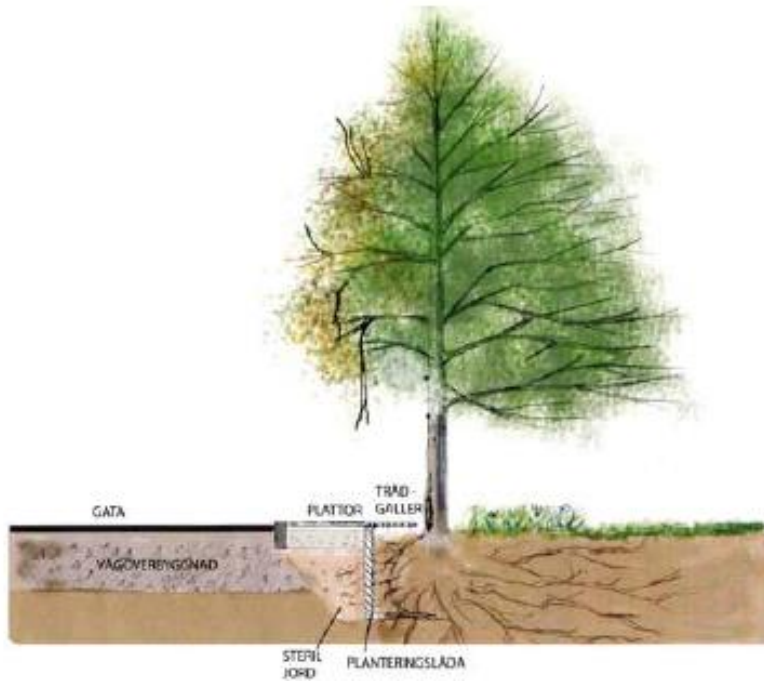




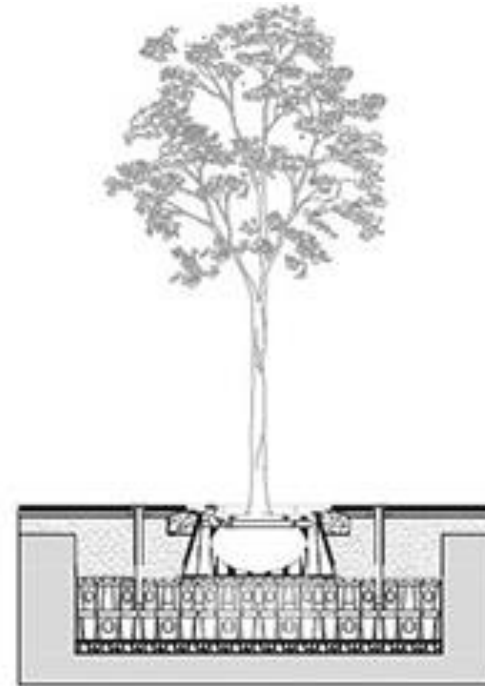




SuDS and Trees



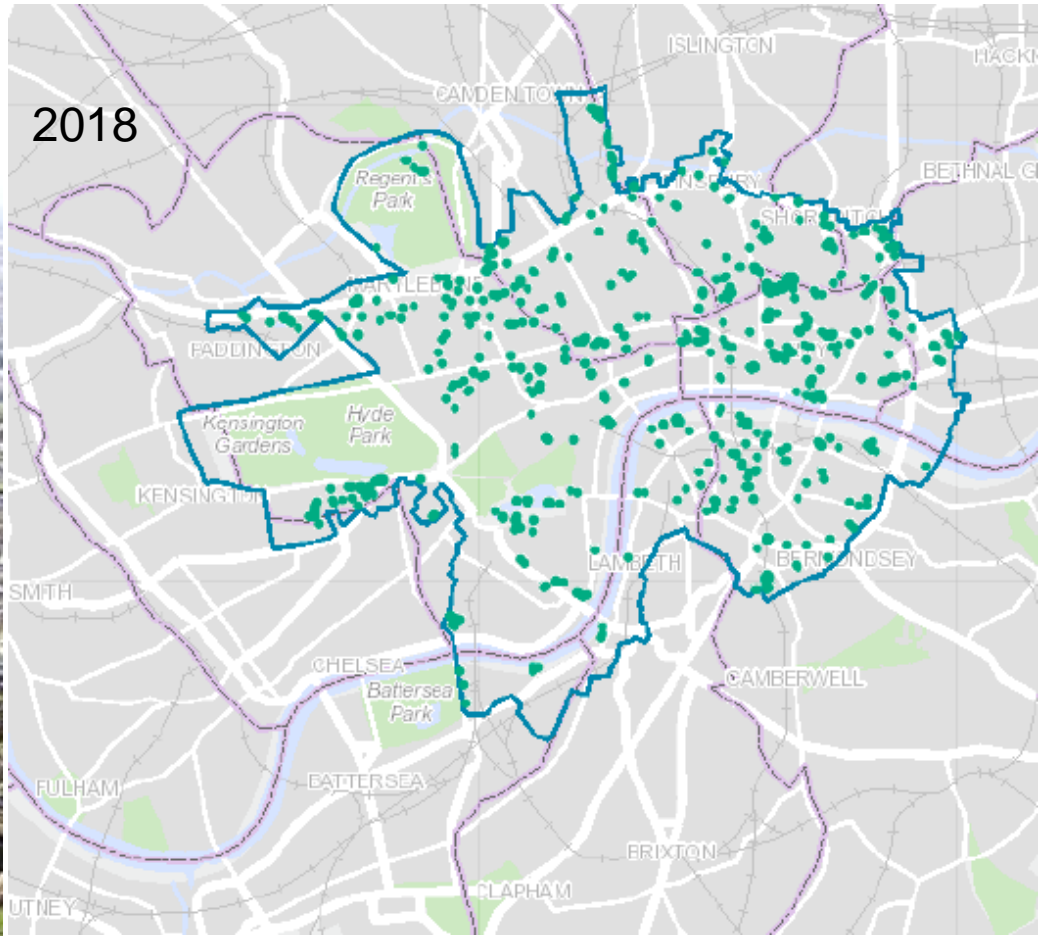
Typical Street Tree



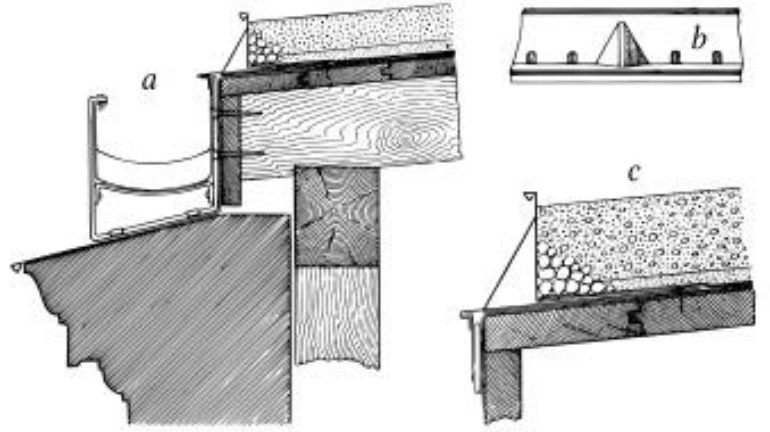
Street Tree with Soil Cells

Living Roofs and Walls

Technical Report: Supporting London Plan Policy 2008



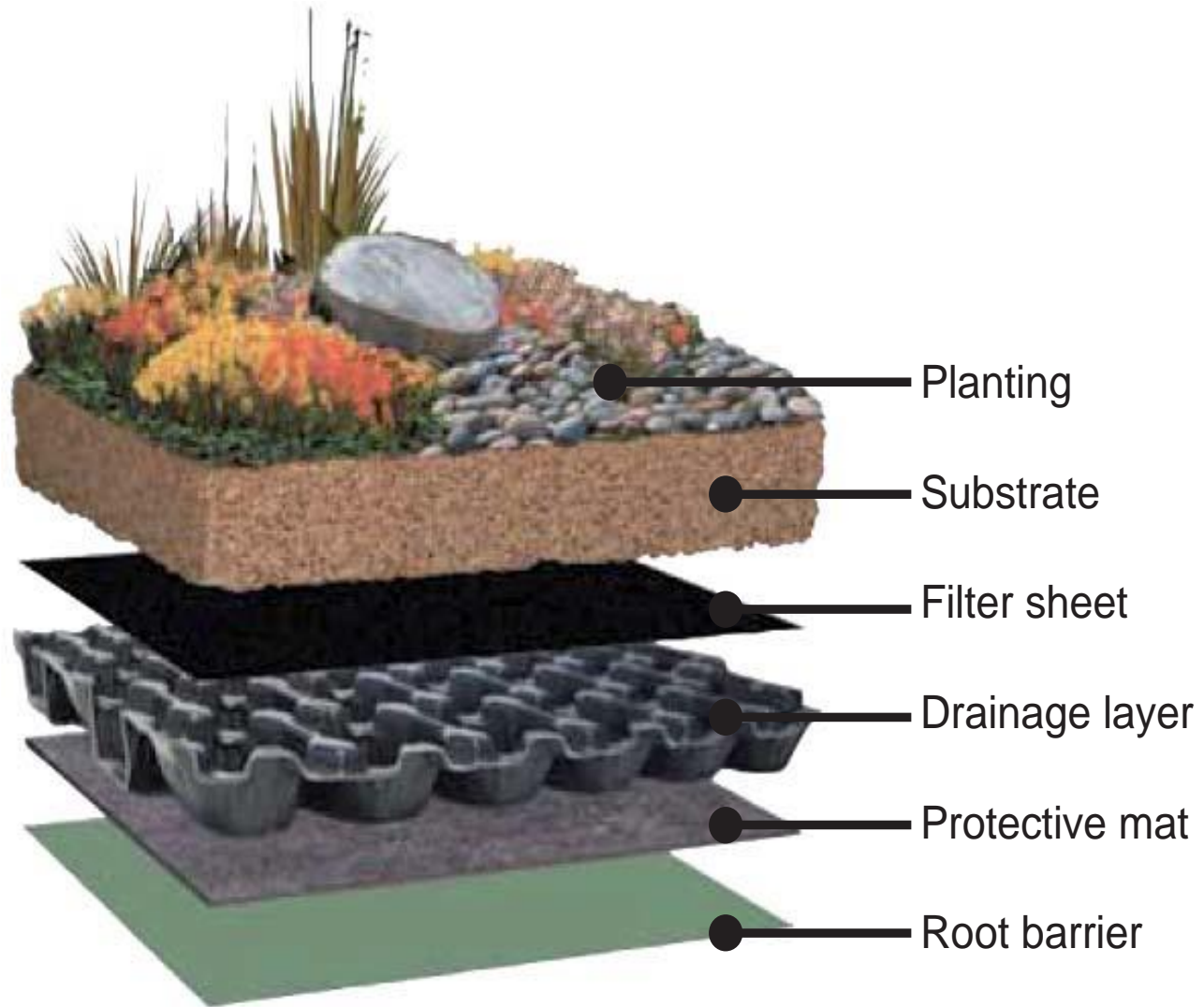
<https://www.london.gov.uk/what-we-do/environment/parks-green-spaces-and-biodiversity/green-roof-map>



Tar-paper gravel roofs (*Holzzementdach*) 19th century Germany. \









Typical Sedum Blanket

Does it meet GRO Code?

<https://livingroofs.org/code-practice-green-roof-organisation/>

David Attenborough
Building Biodiverse
Extensive Green Roof,
CCI, Cambridge

Nicholas Hare Architects





Crédit photo Aino Adriaens

Biosolar Roof or Solar Green Roof



Vertical Bifacial Biosolar Green Roof

Green Walls



Climbers (Traditional against wall or on trellis)



Modular/cellular/pockets with substrate and hydroponic

Rubens Hotel at the Palace,
Victoria, London 2013







