“Green Roofs” catalogue – compiled during field visits to Paris, Copenhagen, Oslo, New York, Boston and Philadelphia.

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Prepared by the University of Warsaw

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A **green roof** is a way of finishing the surface of a roof that allows planting and growth of vegetation. Green roofs contribute to increasing the biologically active area and are one of the tools used to adapt and reduce the effects of climate change in cities. By cooling and humidifying the air, they reduce urban heat islands, improve air quality, perform an insulating function by increasing the energy efficiency of buildings, and increase rainwater retention. Green roofs provide a habitat for birds and insects, and serve a variety of social activities, including gardening and recreation.

Extensive green roofs are characterized by small-scale vegetation with low biodiversity. These roofs have a simple structure and require little maintenance.

Intensive green roofs, composed of a larger number of technical layers, allow more diverse vegetation to grow. These roofs most often function as open spaces for local residents or publicly accessible spaces and require a lot of maintenance.

Photo 1 A green roof on an entrance shelter. Agnieszka Dudzińska-Jarmolińska

Address:	Oslo, Fornebu district
Description:	Green roof – extensive
Type of residence:	Single-family housing complex
Community:	Homogeneous/ better off
Cost of the solution:	Low-priced/self-implementable.
Description of the solution:	Small green roof/extensive – Scandinavian type using native turf.
Plant material used:	Turf from native vegetation
Other materials used:	-
Other	-

Photo: 2 "Green roof on a small addition" – Oslo - Author: Agnieszka Dudzińska-Jarmolińska

Address:	Oslo, Fornebu district
Description:	Green roof – extensive
Type of residence:	Single-family housing complex
Community:	Homogeneous/ better off
Cost of the solution:	Low-priced/self-implementable.
Description of the solution:	Small green roof/extensive – Scandinavian type using native turf.
Plant material used:	Turf from native vegetation
Other materials used:	-
Other	-

Photo: 3 "Green roof on an entrance shelter" – Oslo, author: Agnieszka Dudzińska-Jarmolińska

Address:	Oslo, Vestre Aker district
Description:	Green roof – extensive
Type of residence:	Single-family housing complex
Community:	Homogeneous/ better off
Cost of the solution:	Low-priced/self-implementable.
Description of the solution:	Small green roof/extensive – Scandinavian type using native turf.
Plant material used:	Turf from native vegetation
Other materials used:	-
Other	-

Photo 4 "Green roof on a residential building" – Oslo, author: Agnieszka Dudzińska-Jarmolińska

Address:	Oslo, Vestre Aker district
Description:	Green roof – extensive
Type of residence:	Single-family housing complex
Community:	Homogeneous/ better off
Cost of the solution:	Low-priced/self-implementable.
Description of the solution:	Green roof/extensive – Scandinavian type using native turf.
Plant material used:	Turf from native vegetation
Other materials used:	-
Other	-

Photo 5 "Green roof on residential and commercial building" – Oslo, author: Agnieszka Dudzińska-Jarmolińska

Address:	Oslo, Vestre Aker district
Description:	Green roof – extensive
Type of residence:	Single-family housing complex
Community:	Homogeneous/ better off
Cost of the solution:	Low-priced/self-implementable.
Description of the solution:	Small green roof/extensive – Scandinavian type using native turf.
Plant material used:	Turf from native vegetation
Other materials used:	-
Other	-

Photo: 6 "Green roof on a residential building" – Oslo, author: Agnieszka Dudzińska-Jarmolińska

Address:	Oslo, Gamle Oslo district
Description:	Green roof – extensive
Type of residence:	Multi-family complex
Community:	Homogeneous/ better off
Cost of the solution:	Expensive/self-implementation is not possible.
Description of the solution:	Large green roof/extensive.
Plant material used:	Sedum matting
Other materials used:	-
Other	The building is new, it was built on a post-industrial/post-port site as part of the area's revitalization process.

Photo 7 "Green roof on a residential building" – Oslo, author: Agnieszka Dudzińska-Jarmolińska

Address:	Oslo, Gamle Oslo district
Description:	Green roof – extensive
Type of residence:	Multi-family complex
Community:	Homogeneous/ better off
Cost of the solution:	Expensive/self-implementation is not possible.
Description of the solution:	Large green roof/extensive.
Plant material used:	Sedum matting
Other materials used:	-
Other	The building is new, it was built on a post-industrial/post-port site as part of the revitalization process.

Photo 8 "Green roof on a residential building" – Copenhagen, author: Agnieszka Dudzińska-Jarmolińska

Address:	Copenhagen, Holmen district
Description:	Green roof – extensive.
Type of residence:	Multi-family complex.
Community:	Homogeneous/ better off
Cost of the solution:	Expensive/self-implementation is not possible.
Description of the solution:	Large green roof/extensive.
Plant material used:	Sedum matting
Other materials used:	-
Other	The buildings were constructed in the Holmen port district, formerly occupied by the navy, as part of the area's revitalization process.

Photo: 9 "Green roof on a residential building" – Copenhagen, author: Agnieszka Dudzińska-Jarmolińska

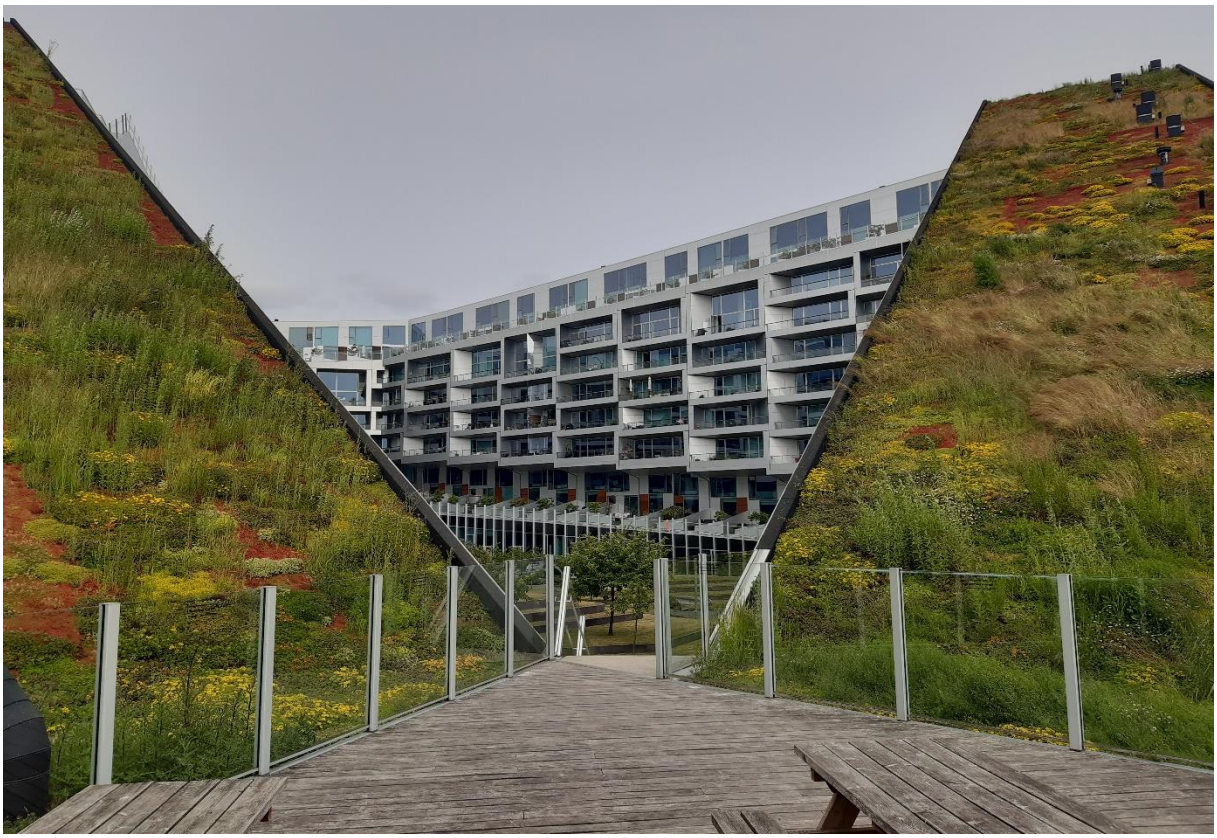

Photo: 10 "Green roof on a residential building" – Copenhagen, author: Agnieszka Dudzińska-Jarmolińska

Photo 11 "Green roof on a residential building" – Copenhagen, author: Agnieszka Dudzińska-Jarmolińska

Address:	Copenhagen, Ørestad district
Description:	Green roof – extensive
Type of residence:	Multi-family complex
Community:	Multi-ethnic/diverse, both better off and less well-off.
Cost of the solution:	Expensive/self-implementation is not possible.
Description of the solution:	Large green roof/extensive.
Plant material used:	Sedum matting
Other materials used:	-
Other	A residential building with a public terrace overlooking the Naturcenter Amager park.

Photo 12 "Green roof on a residential building" – Copenhagen, author: Agnieszka Dudzińska-Jarmolińska

Address:	Copenhagen, Ørestad district
Description:	Green roof – intensive.
Type of residence:	Multi-family building.
Community:	Homogeneous/ better off
Cost of the solution:	Expensive/self-implementation is not possible.
Description of the solution:	Cascading building structure with terraces developed into individual gardens.
Plant material used:	Diversified plant material.
Other materials used:	-
Other	Mountain Dwellings – an iconic building.

Photo 13 "Green roof on a residential building" – Oslo, author: Agnieszka Dudzińska-Jarmolińska

Address:	New York, Brooklyn Heights
Description:	Green roof – intensive.
Type of residence:	Multi-family building.
Community:	Homogeneous/better off.
Cost of the solution:	Expensive/self-implementation is not possible.
Description of the solution:	The garden is private and serves as a center of integration for the residents.
Plant material used:	Diverse perennial vegetation.
Other materials used:	-
Other	-

Photo: 14 "Green roof on the Økern portal building"– Oslo, author: Agnieszka Dudzińska-Jarmolińska

Photo: 15 "Green roof on the Økern portal building"– Oslo, author: Agnieszka Dudzińska-Jarmolińska

Photo: 16 "Green roof on the Økern portal building"– Oslo, author: Agnieszka Dudzińska-Jarmolińska

Address:	Oslo, Økern district
Description:	Green roof – intensive
Type of residence:	Office building
Community:	Ethnically diverse/ better off
Cost of the solution:	Expensive/self-implementation is not possible.
Description of the solution:	Large green roof/intensive.
Plant material used:	Herbaceous vegetation, annuals (vegetables and ornamental flowers), perennials, shrubs (fruit and ornamental), trees (fruit and ornamental).
Other materials used:	Organization of sports space, playgrounds, space for resting (seating).
Other	The roof is on a new office building with an extensive social program: playgrounds, a community garden, recreational areas, an urban apiary. Publicly accessible space, used by residents of nearby neighborhoods.

Photo: 17 "Green roof on an incinerator building" – Copenhagen, author: Agnieszka Dudzińska-Jarmolińska

Photo 18 "Green roof on an incinerator building" – Copenhagen, author: Agnieszka Dudzińska-Jarmolińska

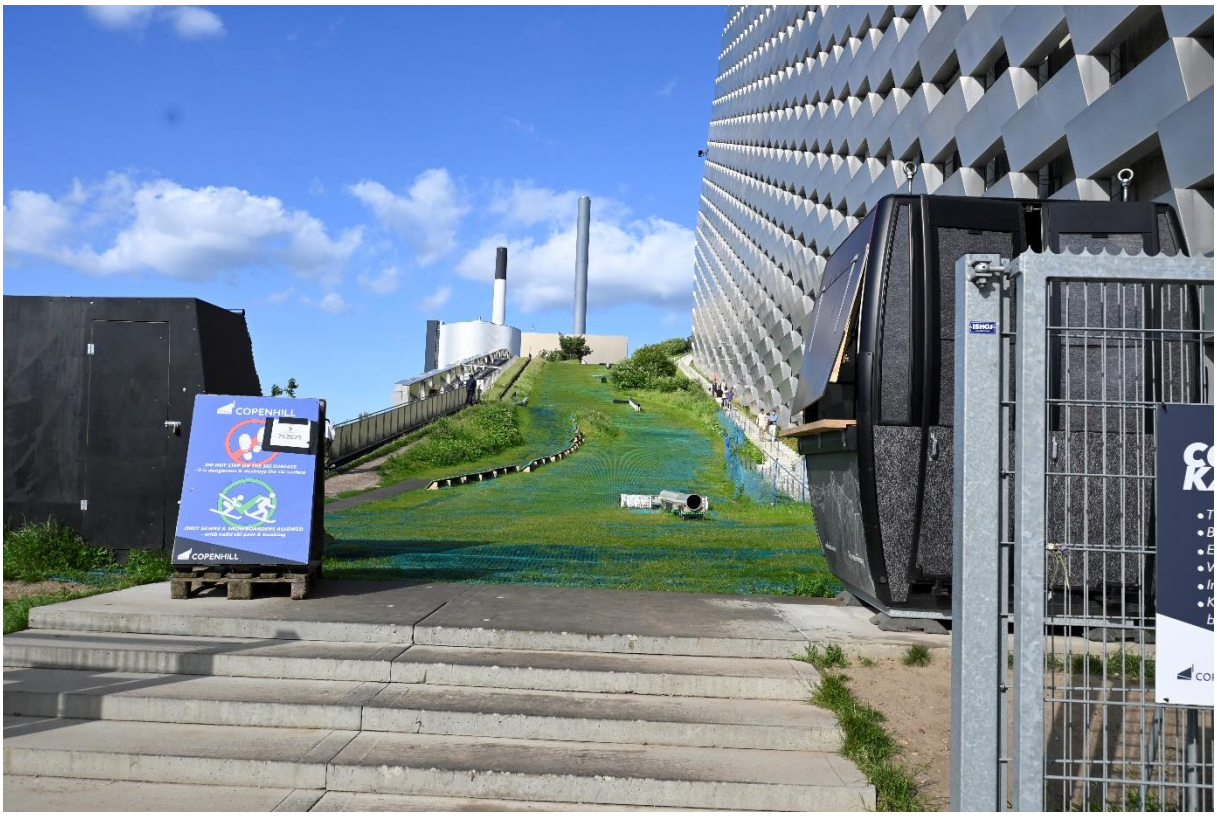

Photo 19 "Green roof on an incinerator building" – Copenhagen, author: Agnieszka Dudzińska-Jarmolińska

Address:	Copenhagen, Holmen district
Description:	Green roof – intensive.
Type of residence:	Industrial building located in close proximity to a multi-family residential area.
Community:	Facility open to the public.
Cost of the solution:	Expensive/self-implementation is not possible.
Description of the solution:	Green roof turned into a ski lift, part of the roof is intended for recreational space.
Plant material used:	Turf from native vegetation.
Other materials used:	Plastic matting, wooden observation decks.
Other	-

Photo: 20 "Green roof on Sister Cities building"– Philadelphia, author: Agnieszka Dudzińska-Jarmolińska

Address:	Philadelphia, Logan Square neighborhood
Description:	Green roof – intensive
Type of residence:	Central part of the city / business district
Community:	Ethnically diverse / economically diverse.
Cost of the solution:	Expensive/self-implementation is not possible.
Description of the solution:	A small green roof / intensive roof on a café building in Sister Cites Park. The roof is part of a water playground for children, a meeting place for the local community.
Plant material used:	Perennials and ornamental shrubs.
Other materials used:	A water playground – water slides.
Other	The roof is located on a small cafe building and is integrated into the park. It can be accessed through winding alleys. There is also a water slide.

Photo: "Green roof on the Irish Hunger Memorial"– New York City, author: Agnieszka Dudzińska-Jarmolińska

Address:	New York, Battery Park
Description:	Green roof – intensive
Type of residence:	Central part of the city / multi-storey townhouses with expensive apartments.
Community:	Public facility
Cost of the solution:	Expensive/self-implementation is not possible.
Description of the solution:	A small green roof/intensive. The facility is a memorial to the victims of the Great Famine in Ireland. It also serves as a space for recreation.
Plant material used:	Native vegetation from the west coast of Ireland.
Other materials used:	Stones sourced from the coast of western Ireland.
Other	-

Photo "Green roof – community garden "Jardin Suspendu" – Paris, author: Agnieszka Dudzińska-Jarmolińska

Address:	Paris, district XX, Charonne
Description:	Green roof – extensive
Type of residence:	Among multi-storey residential buildings.
Community:	Multi-ethnic/economically diverse.
Cost of the solution:	Low-priced/self-implementable.
Description of the solution:	A small green roof/extensive – transformed into a community garden.
Plant material used:	Vegetables (grown according to permaculture principles).
Other materials used:	Small playground, community garden equipment.
Other	A community garden with a rich social program.

Photo "Green roof on restaurant pavilions" – Copenhagen, author: Agnieszka Dudzińska-Jarmolińska

Address:	Copenhagen, Indre By district
Description:	Green roof – extensive
Type of residence:	-
Community:	Public facility
Cost of the solution:	Low-priced/self-implementation is not possible.
Description of the solution:	Small green roof/extensive.
Plant material used:	Sedum matting.
Other materials used:	-
Other	-

Photo: 24 "Green roof – Little Island construction" – New York, author: Agnieszka Dudzińska-Jarmolińska

Photo: "Green roof – Little Island construction" – New York, author: Agnieszka Dudzińska-Jarmolińska

Photo: 26 "Green roof – Little Island construction" – New York, author: Agnieszka Dudzińska-Jarmolińska

Photo: 27 "Green roof – Little Island construction" – New York, author: Agnieszka Dudzińska-Jarmolińska

Photo: 28 "Green roof – Little Island construction" – New York, author: Agnieszka Dudzińska-Jarmolińska

Address:	New York, near Greenwich Village
Description:	Green roof – intensive
Type of residence:	-
Community:	Public facility
Cost of the solution:	Expensive/self-implementation is not possible.
Description of the solution:	Small green roof/extensive – Scandinavian type using native turf.
Plant material used:	35 different species of trees, 65 species of shrubs, 290 varieties of grasses, perennials, bulbous plants and climbers.
Other materials used:	The "hanging" botanical garden was established in 132 pots placed at different heights above the water table.
Other	The city park located at Pier 55, inside the structure there are public toilets. There is also an auditorium with a stage and a small ciy square with tables and chairs and pavilions where food and drinks are sold.

Photo: 29 "Green roof on the former railroad line - High Line park" – New York, author: Agnieszka Dudzińska-Jarmolińska


Photo 30 "Green roof on the former railroad line - High Line park" – New York, author: Agnieszka Dudzińska-Jarmolińska

Photo 31 "Green roof on the former railroad line - High Line park" – New York, author: Agnieszka Dudzińska-Jarmolińska

Photo 32 "Green roof on the former railroad line - High Line park" – New York, author: Agnieszka Dudzińska-Jarmolińska

Photo 33 "Green roof on the former railroad line - High Line park" – New York, author: Agnieszka Dudzińska-Jarmolińska

Photo 34 "Green roof on the former railroad line - High Line park" – New York, author: Agnieszka Dudzińska-Jarmolińska

Photo: 35 "Green roof on the former railroad line - High Line park" – New York, author: Agnieszka Dudzińska-Jarmolińska

Address:	New York, Greenwich Village
Description:	Green roof – intensive
Type of residence:	Townhouses and new apartments.
Community:	Facility open to the public.
Cost of the solution:	Expensive/self-implementation is not possible.
Description of the solution:	Park on a railroad overpass.
Plant material used:	Ornamental trees, shrubs, perennials, herbaceous vegetation and vegetation that has appeared at the site as a result of secondary succession.
Other materials used:	Sculptures, seating areas, preserved elements from the former railroad, e.g. railroad tracks.
Other	A green roof in the form of a linear garden established on an old railroad structure in Greenwich Village. It was created as part of the revitalization of the post-industrial district. The investment has significantly influenced the development of the area, which is now undergoing hypergentrification.

Photo: 36 "Green roof on a former railroad line – Promenade Plantée park" – Paris, author: Agnieszka Dudzińska-Jarmolińska


Photo: 37 "Green roof on a former railroad line – Promenade Plantée park" – Paris, author: Agnieszka Dudzińska-Jarmolińska

Photo: 38 "Green roof on a former railroad line – Promenade Plantée park " – Paris, author: Agnieszka Dudzińska-Jarmolińska

Address:	Paris, the district from Bastille Square to Porte de Montreuil
Description:	Green roof – intensive
Type of residence:	Diversified downtown development.
Community:	Ethnically diverse/with a diverse economic status.
Cost of the solution:	Expensive/self-implementation is not possible.
Description of the solution:	Green roof on a former railroad line viaduct.
Plant material used:	Ornamental trees, shrubs, perennials, herbaceous vegetation and vegetation that has appeared at the site as a result of secondary succession.
Other materials used:	Park equipment.
Other	-

Photo: 39 "Green roof on a former railroad line – The Rail Park" – Philadelphia, author: Agnieszka Dudzińska-Jarmolińska

Photo: 40 "Green roof on a former railroad line – The Rail Park" – Philadelphia, author: Agnieszka Dudzińska-Jarmolińska

Photo: 41 "Green roof on a former railroad line – The Rail Park" – Philadelphia, author: Agnieszka Dudzińska-Jarmolińska

Address:	Philadelphia, Callowhill neighborhood
Description:	Green roof – intensive.
Type of residence:	Downtown development.
Community:	Ethnically diverse/lower economic status.
Cost of the solution:	Expensive/self-implementation is not possible.
Description of the solution:	Green roof on a former railroad line viaduct.
Plant material used:	Ornamental trees, shrubs, perennials, herbaceous vegetation and vegetation that has appeared at the site as a result of secondary succession.
Other materials used:	Park equipment.
Other	-

Photo 42 "Green roof on a bus stop – Grochów" – Warsaw, author: Agnieszka Dudzińska-Jarmolińska

Address:	Warsaw, Praga Południe district, Grochów
Description:	Green roof – intesive
Type of residence:	Multi-family housing complex.
Community:	Homogeneous/lower economic status.
Cost of the solution:	Low-priced/self-implementation is not possible.
Description of the solution:	Small green roof/extensive.
Plant material used:	Sedum matting.
Other materials used:	-
Other	-