

This work refers to the research thesis to obtain the degree of Master in Landscape Architecture and Garden Design, issued by the Master's program of Szent István University in Budapest, Hungary.

The studied subject is a review of the green roof technology applied to the Hungarian context, taking into consideration how the technology is developed concerning the local climate and plant application, using existing examples to support the research.

A green roof is not a typical roof garden. It is a vegetated landscape built up on a roof surface, consisting of different layers for its installation. Due to its many benefits such as stormwater management, reduction of energy costs, increase of biologically active surfaces, health and well-being, this technology has been widely applied in many countries around the world, always taking into consideration the particularities of each site.

In this context, this research systemized the information about green roof technology and made an analytical review of the applied methods used under the European standards, focusing in Hungary.

The literature used was the book "Guidelines For The Planning, Execution And Upkeep Of Green-Roof Sites" published by the FLL (Landscape Development Research Society). The thesis also considered two main study cases located in Budapest - the Green House Office Building and the K&H Headquarters - to make a comparative analysis resulting into guidelines for a green roof application.

At last, an illustrative design was proposed in order to explain how to use the guidelines when planning intensive and biodiverse green roof in Budapest, Hungary. The chosen site was the Somogyi Imre Kollegium rooftop, located near the Budai Campus of the Szent István University, on the slopes of the Gellért Hill.

The use of the building as a facility of an educational institution gave the leading concept for this illustrative project: "Education". The idea of having green roof in the building of a university that focus on Landscape and Horticultural sciences is a great opportunity to teach and learn about biodiversity, plant design and green roof technology.

To achieve all the goals, the work was structured in 4 steps: Data collection, Analysis, Results and Design.

The analysis phase had a design oriented vertent in which a throughout research highlighted the main characteristics of the site and its real needs, that can be seen in the SWOT summary below.

Later, combined with the guideline application the following masterplan was proposed: an intensive green roof for the dormitory building, a semi-intensive green roof for the entrance hall, and a biodiverse green roof for the library.

In conclusion, the work presented an overview of green roof's main characteristics and proposes an additional information concerning biodiverse green roofs, which is a yet missing from the studied FLL's book and it also understands that when design a green roof each site has its particularities and it is important to analyze accordingly.

GREEN ROOF DEFINITION

GERMAN
(Guidelines for the Planning, Execution and Upkeep of green roof sites, FLL, 2002)

EXTENSIVE
4cm – 20cm
Moss, sedum, herbaceous, grass plants

SIMPLE – INTENSIVE
12cm – 50cm
Grass, herbaceous, wild shrubs, coppices

INTENSIVE
15cm – 200cm
Lawn, shrubs, trees (bigger variety of plant)

Why choose the German definition?

- More specified
- Heavily used by producers
- It is the main guide concerning the technology
- Hungarian descriptions lacks information (growing media and plant application)

12cm – 50cm
Growing medium with more than 20% organic matter/volume

BIODIVERSE

ecological focus and provide habitat for a range of organisms

Imitates natural habitats conditions

Varying depth of substrate layer

Different microclimates

Open soil areas

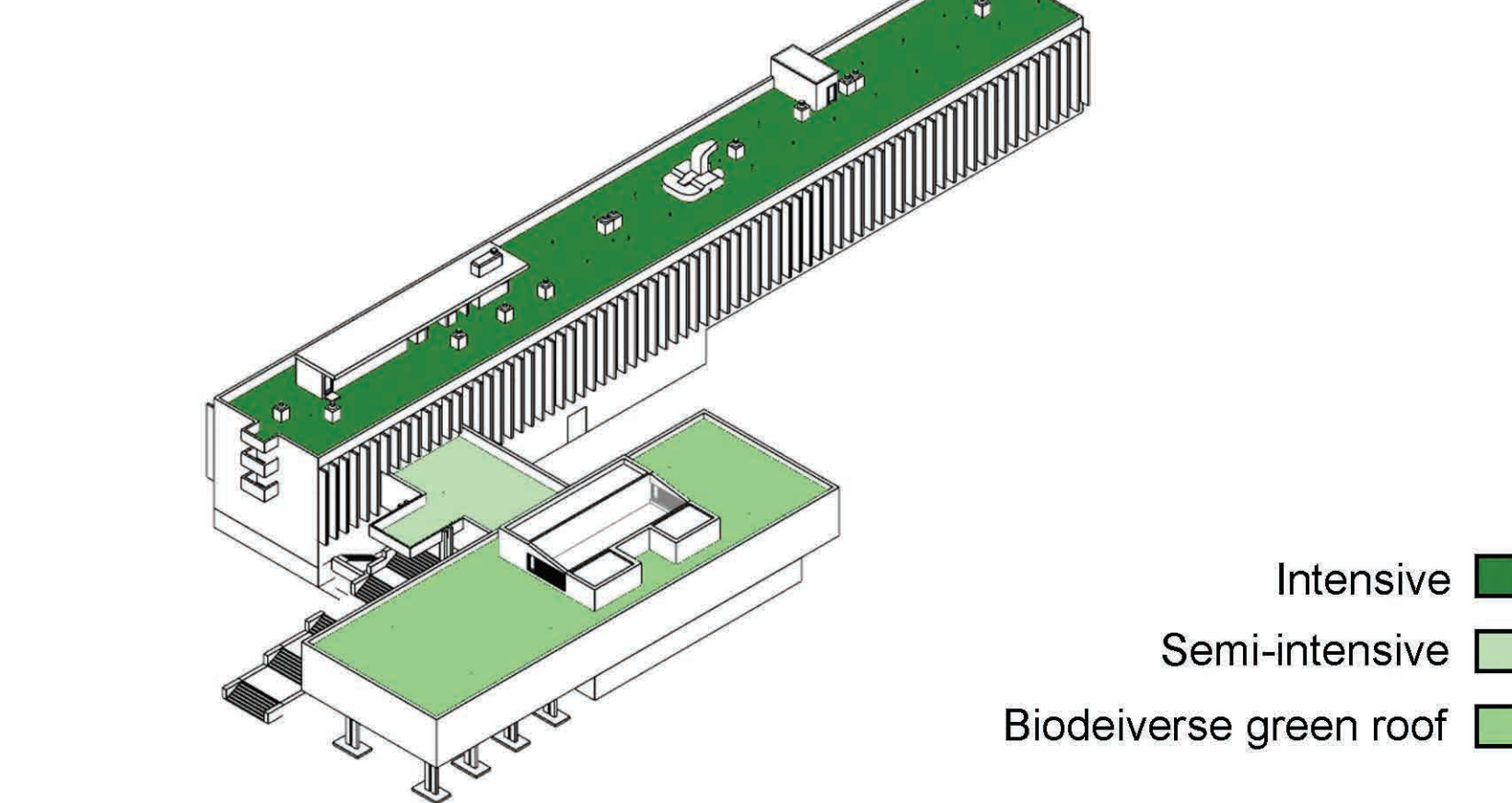
Water source

Green House Office building's biodiverse green roof (courtesy of Deep Forest Kft.)

SWOT ANALYSIS



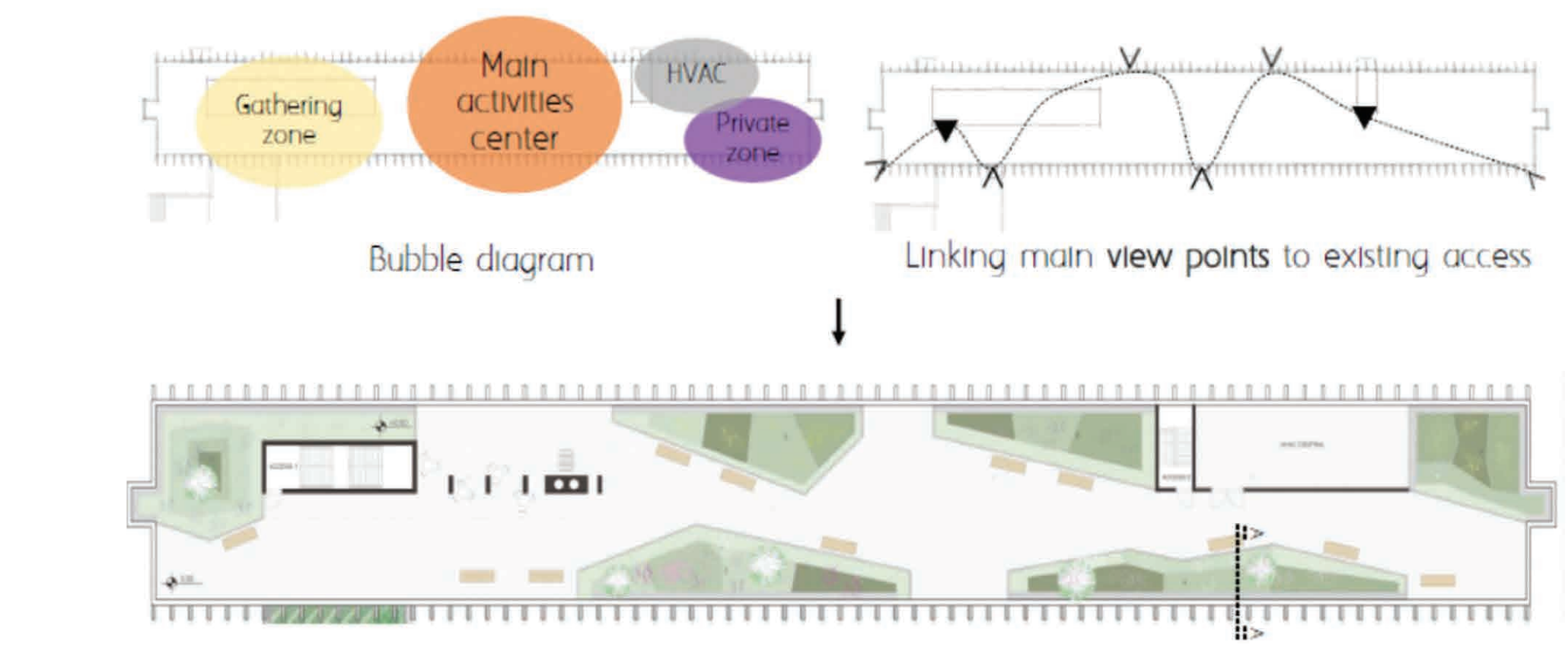
FUNCTIONS



GUIDELINES

PHASE	ACTION	DESCRIPTION
ANALYSIS	Local climate	Rainfall precipitation rate, temperature, wind direction
	Existing structure	Weight load capacity, size/dimensions, roof elements, drainage system
	Roof environment	Exposure zones, microclimates
	Access	Existing access, maintenance and construction possibilities
DESIGN	Project goal	Storm water, energy efficiency, increase biodiversity, amenity space, public space
	Green roof type	Extensive, simple-intensive, biodiverse, intensive
	Plant use	Methods of cultivation (seeding, cuttings or plugs), native species, animal attractors
CONSTRUCTION	Methods	Mats, modules or built in
	Layers	Specify sheets and media
	Irrigation	Type, mechanisms and frequency
MAINTENANCE	Upkeep	Pruning, watering and hardscape check up

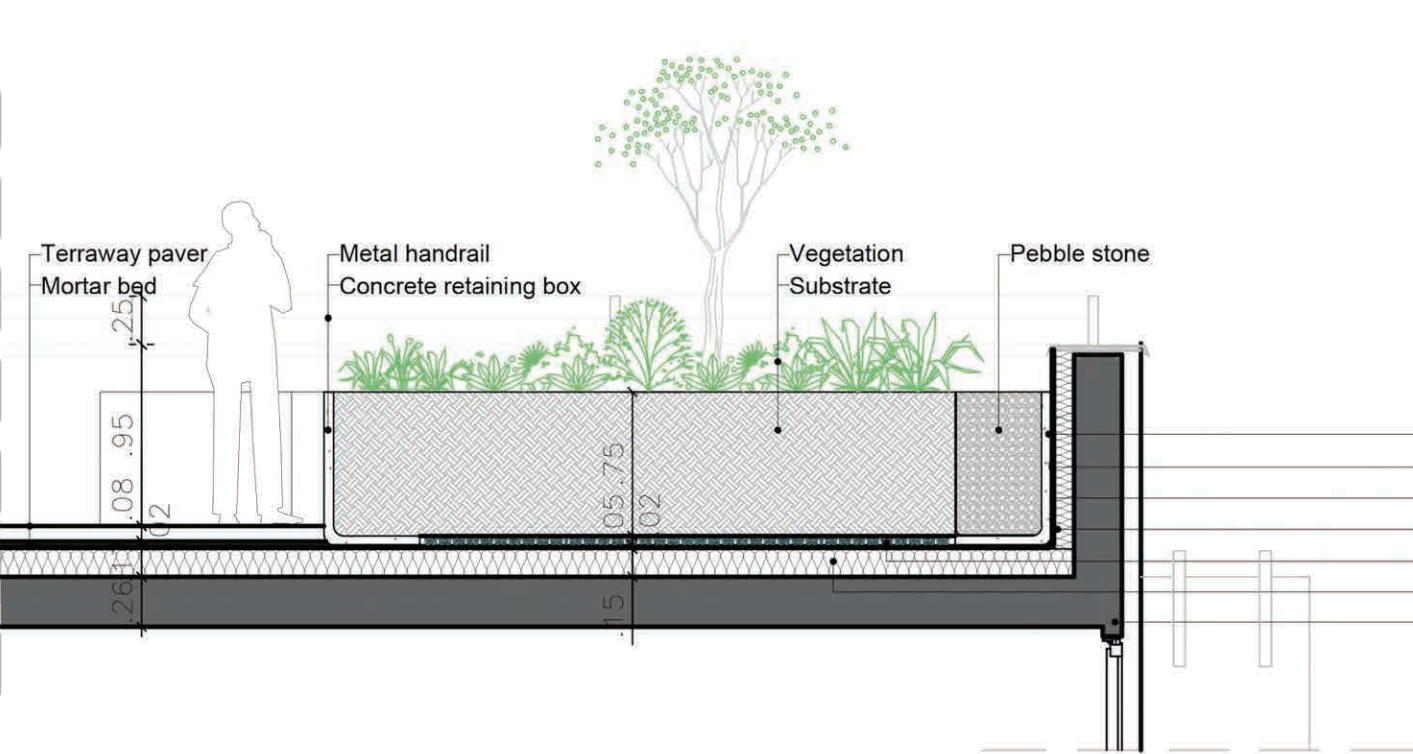
DORMITORY BUILDING DESIGN STRATEGY



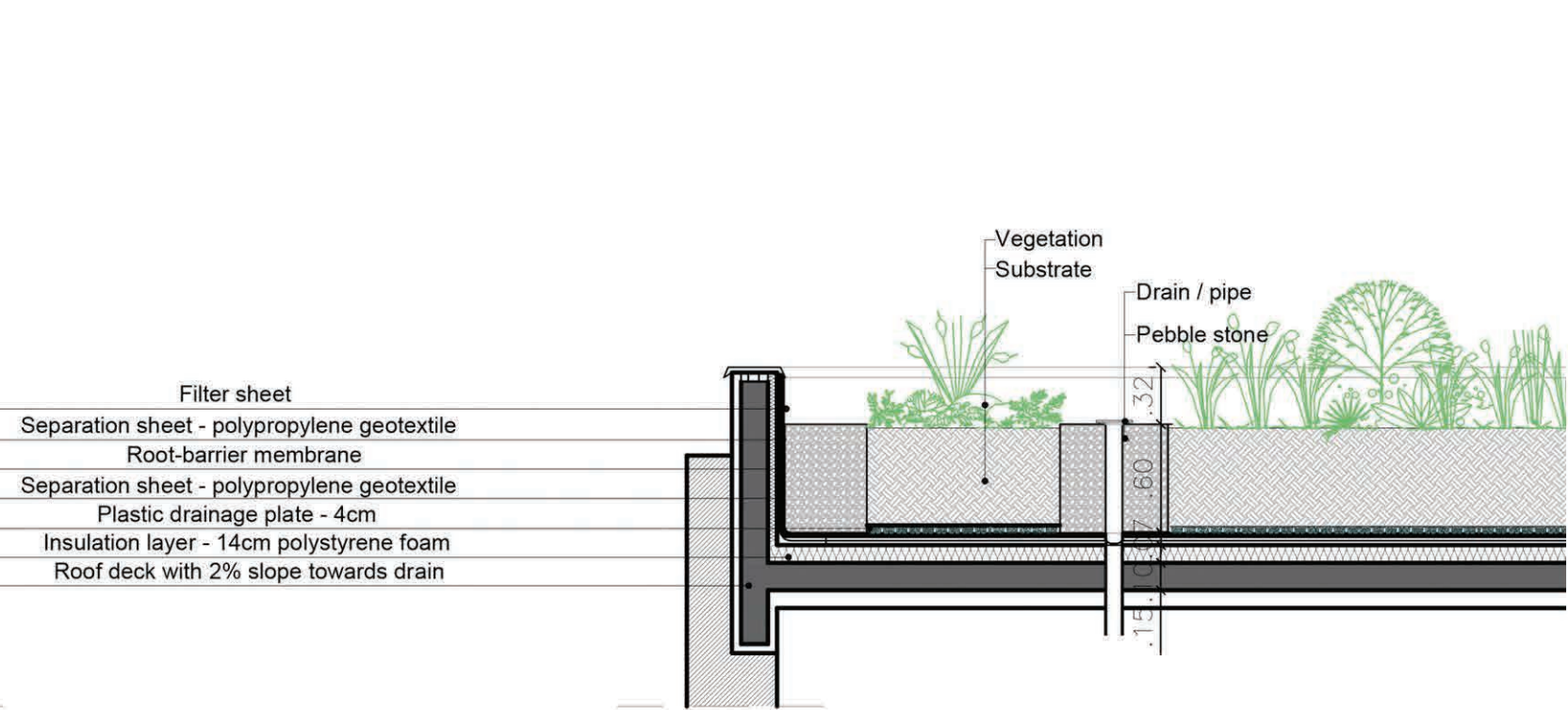
SOMOGYI IMRE KOLLEGIUM'S MASTERPLAN



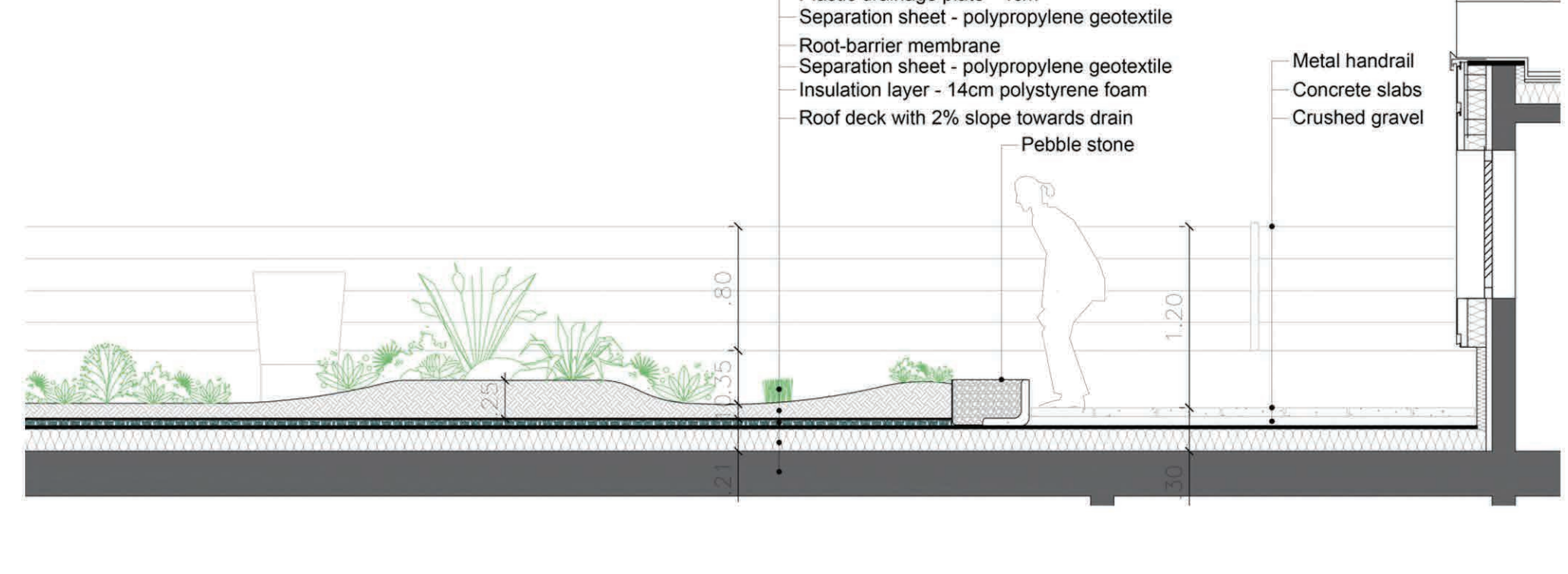
SECTION AA



SECTION BB



SECTION CC



ANO