

FAKULTÄT FÜR MASCHINENWESEN · EBERHARD-VON-KUENHEIM-BAU

Climate Strikes!

Design Proposals for a Climate Adapted Campus in Garching using the Biotope Area Factor (BAF) as a Planning Tool

Table of Contents

Climate Strikes!	2
Rafael Stutz, Gero Engeser	
Design Location 01: Leibniz-Rechenzentrum	4
Harmisha Kumbhani, Henri Busch	
Design Location 02: P+R South	14
Johanna Sturm, Severin Riedl	
Design Location 03: P+R North	24
Jessica Klug, Luca Büttemeyer, Maliheh Gholami	
Design Location 04: CIT	38
Kilian Maier	
Design Location 05: Eberhard-von-Kuenheim-Bau	44
Julie Högner, Merlin Pott, Sangeun Cho	
Impressions of the Poster Exhibition	58
Imprint	62

Climate Strikes!

Rafael Stutz
Gero Engeser

Cities are struggling with the heat island effect, which means enormous heating in particularly sealed areas with little greenery. Studies predict that the climate of Munich in 2050 will be comparable to the current conditions in Milan. The question of how we design open spaces is becoming increasingly relevant in the face of the worsening climate crisis. Fortunately, the problem is widely recognized, and there is a demand for change. Movements such as Fridays for Future or agreements such as the Paris Climate Agreement show the social consensus that more climate protection is being demanded. Unfortunately, these demands often remain demands. In planning processes in Landscape Architecture, efforts to make our environment more climate-friendly and sustainable are often lost during the negotiation process. Few specifications and binding target values for Green Infrastructure in public spaces are subject to many “grey” standards. Precisely defined figures specify what a road cross-section must measure or how the areas for the fire brigade must be dimensioned. But who is right, and what would happen if the top priority would be a specific number for Green Infrastructure?

During the summer term 2024 the Chair of Landscape Architecture and Public Space organised the short term design course “Climate Strikes! – Design Proposals for a Sustainable Campus in Garching” for Students of the bachelor programme Landscape Architecture and Landscape Planning and the master programme Landscape Architecture at the Technical University of Munich. The designs deal with the idea of an obligatory green factor as binding premise for the re-designed TUM Campus in Garching. The students were allocated one of five design locations at the campus for which they had to achieve a predefined Biotope Area Factor (BAF) in their designs. The BAF is already being used in urban planning in cities such as Berlin and Malmö. It specifies the proportion of areas with an impact on the natural environment in relation to the total planning area.

$$\text{Biotope Area Factor} = \frac{\text{ecologically-effective surface (m}^2\text{)}}{\text{total land area (m}^2\text{)}}$$

Different categories of surfaces are given a specific weighting factor depending on their ecological value. For example, a completely sealed area, such as an asphalt surface, is assigned a BAF value of 0.0. A vegetation area connected to the existing natural soil, where a forest could grow, is given a BAF value of 1.0. In between, there are seven other categories and a few other exceptional cases, such as water areas, roofs, or façade greening. A target BAF value of 0.6 had to be achieved within the replanning of the situations in Garching. It is based on Berlin’s specifications for converting and constructing public facilities. The results were presented as a poster exhibition on the TUM Sustainability Day in June 2024. The before and after photos illustrate how the image of our built environment changes when the framework conditions shift towards an increasingly ecological and sustainable focus.

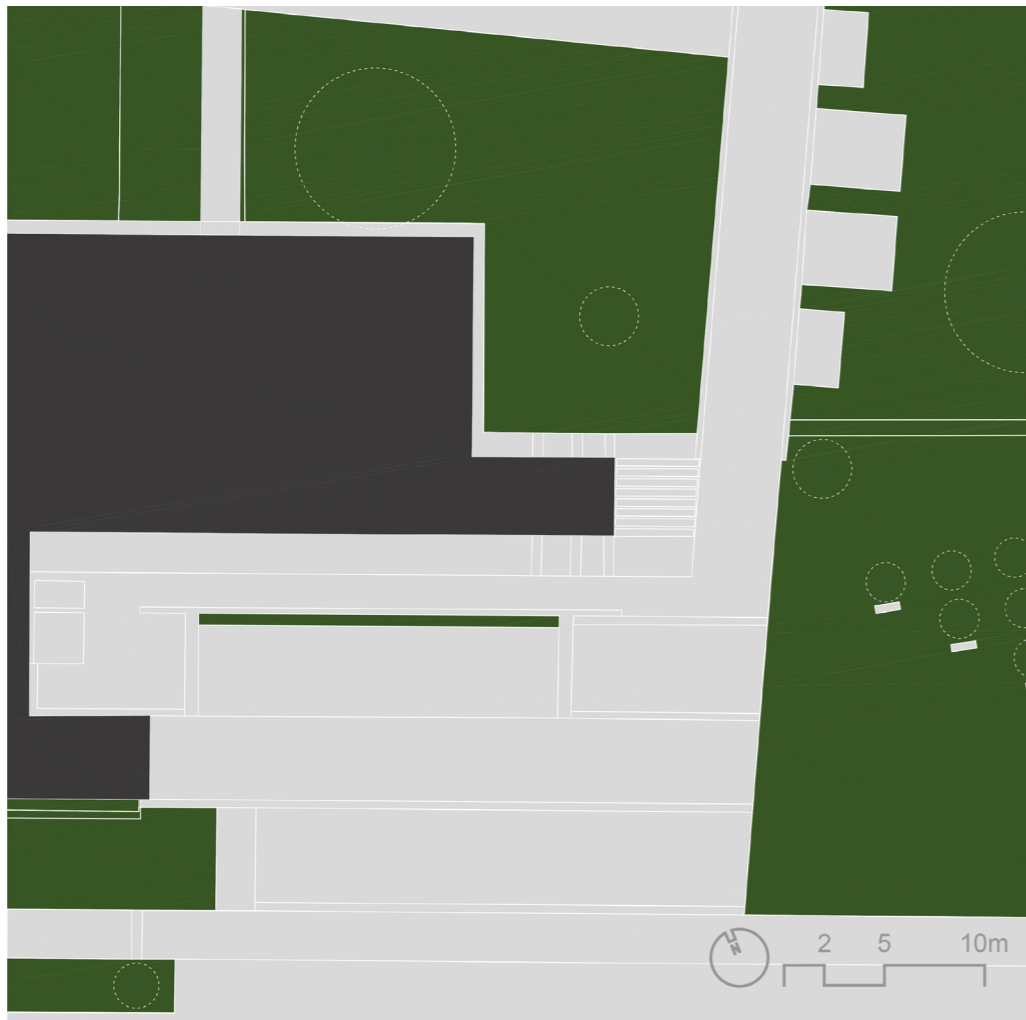


Poster exhibition "Climate Strikes" at the TUM Sustainability Day in Garching in June 2024
Photo: Gero Engeser

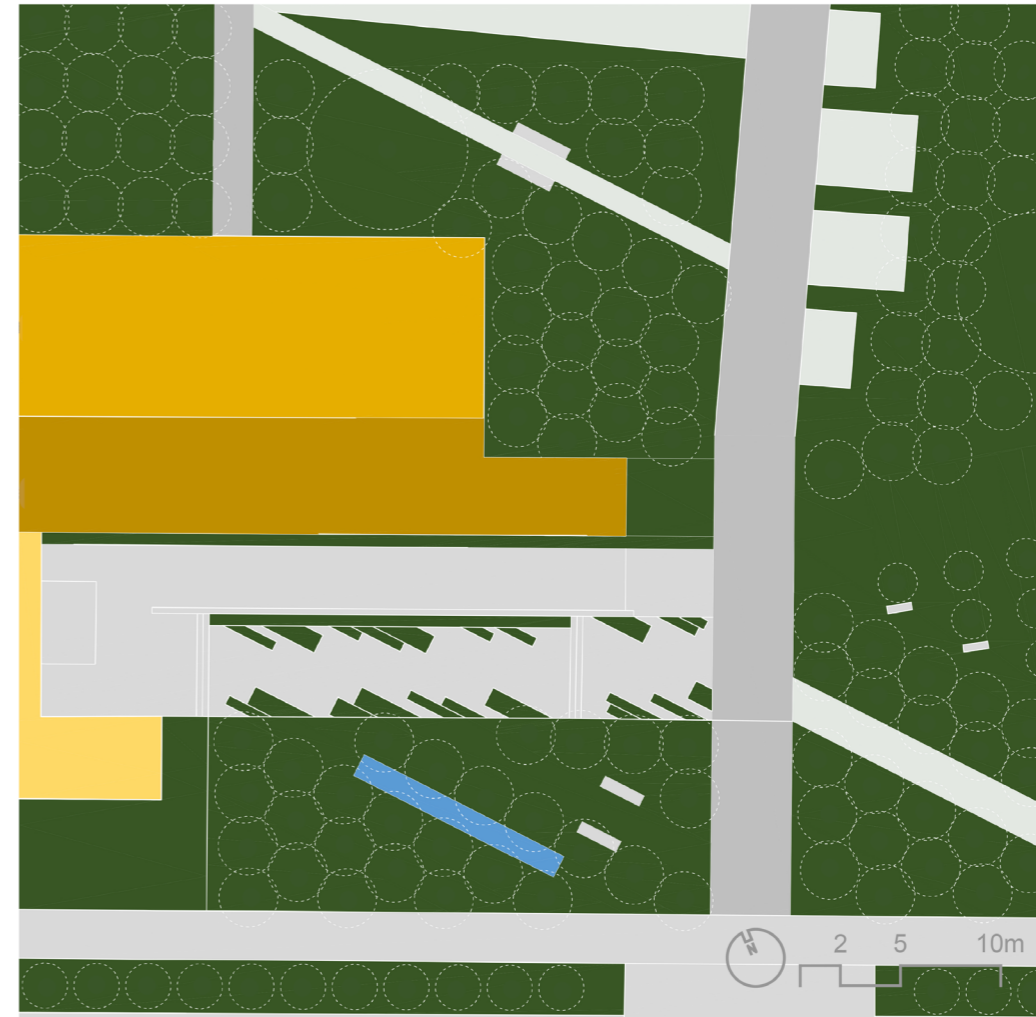
Design Location 01: Leibniz-Rechenzentrum



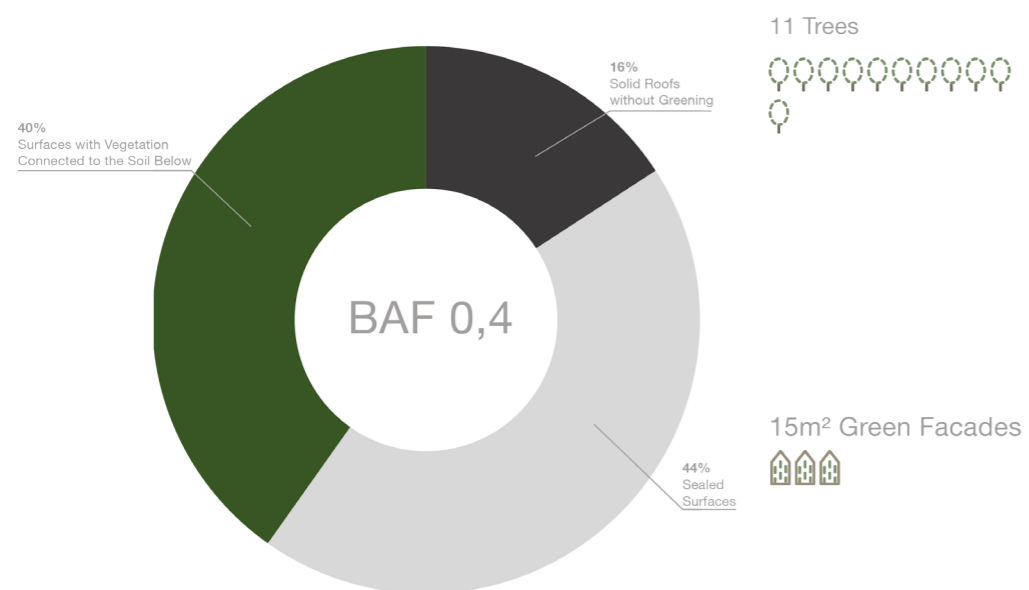
Existing Situation



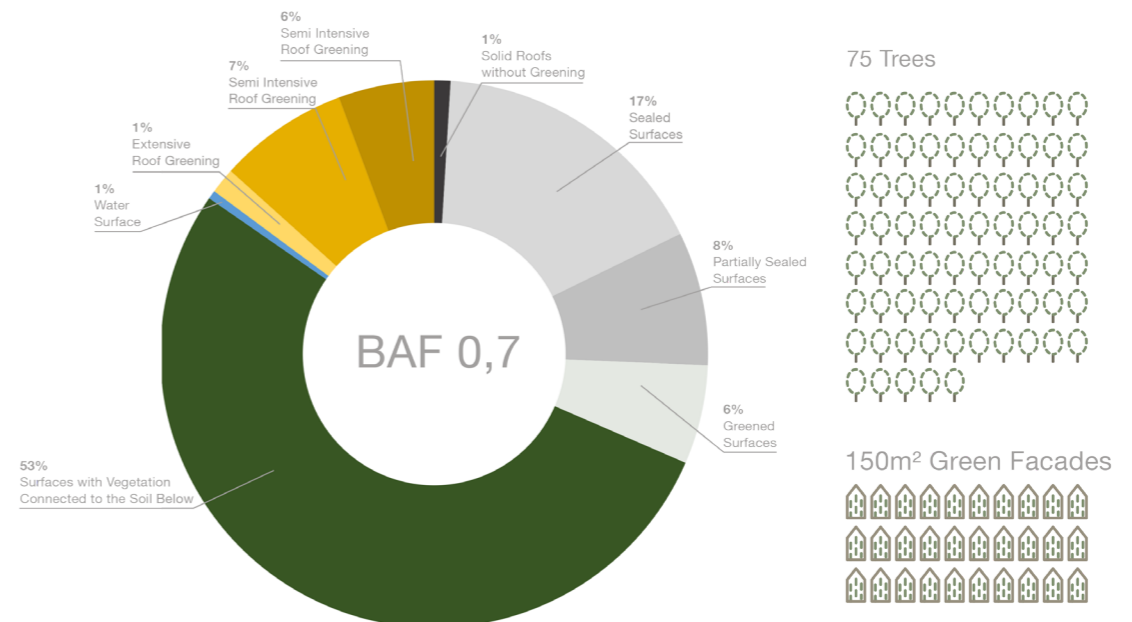
Proposed Design



Existing Quantification



Proposed Quantification



Location 01 – Harmisha Kumbhani

Existing Situation



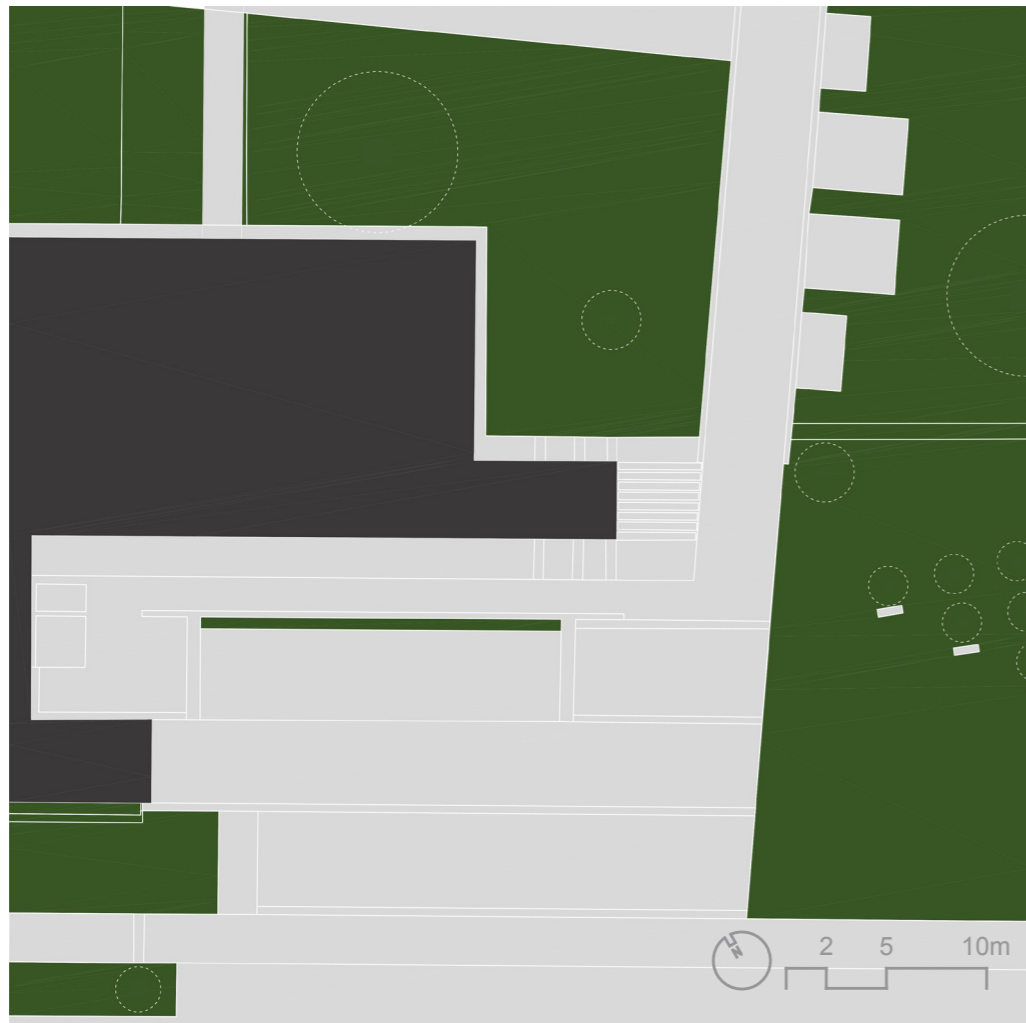
Photo: Felix Lüddecke

Proposed Design

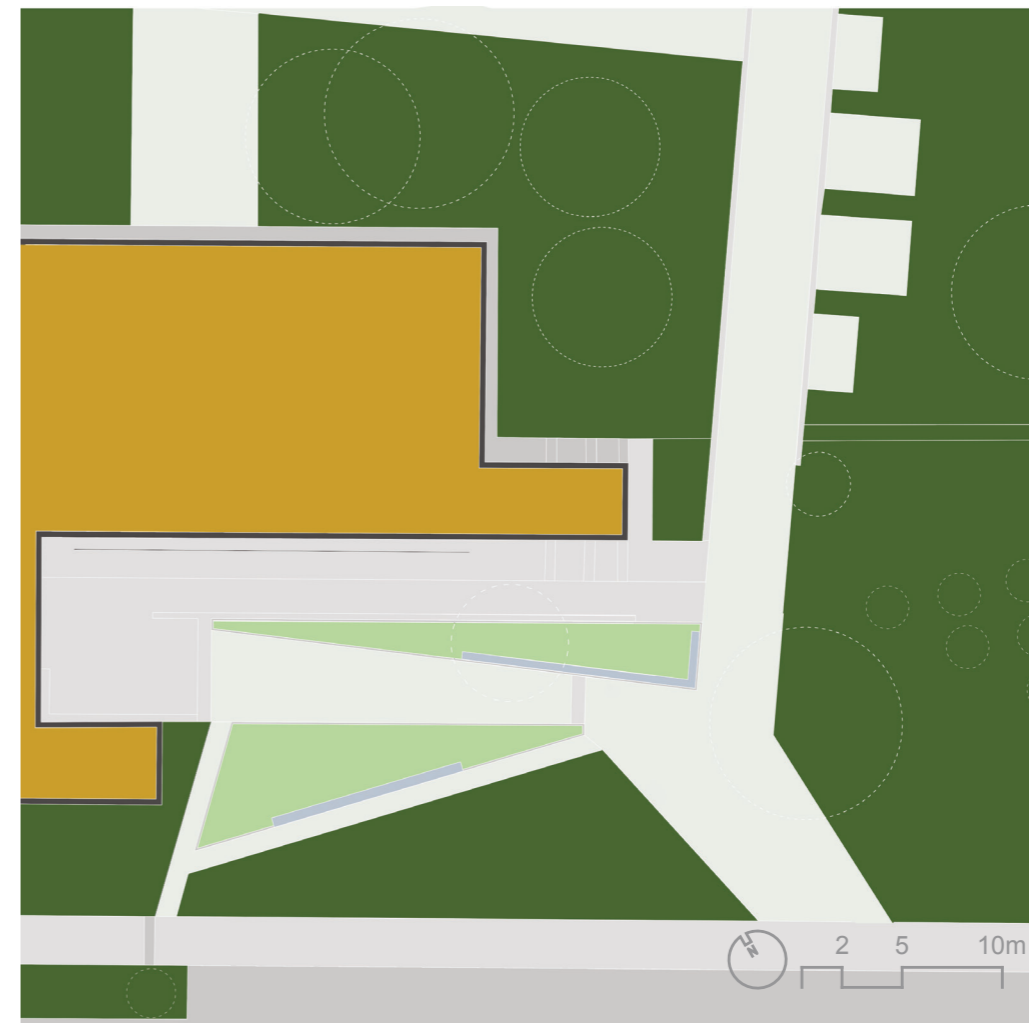


Collage: Harmisha Kumbhani

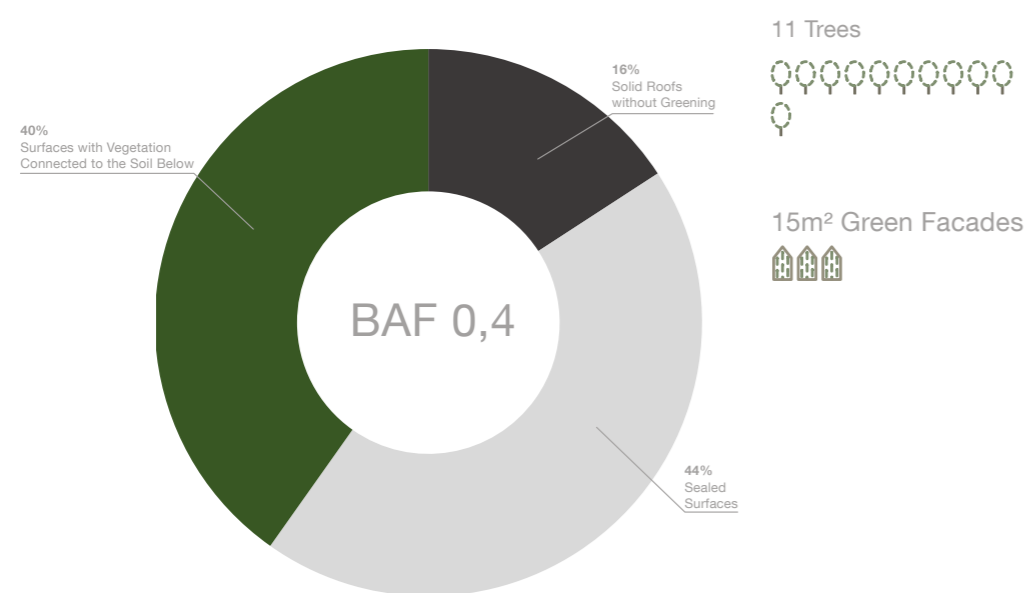
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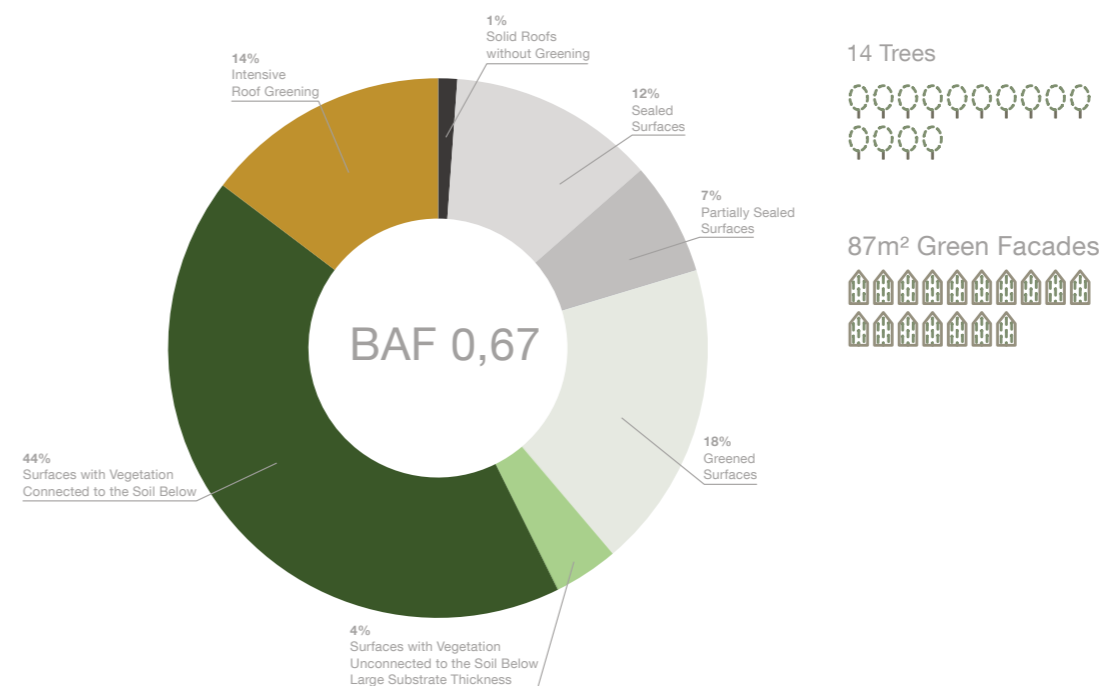
Proposed Design



Existing Quantification



Proposed Quantification



Location 01 – Henri Busch

Existing Situation



Photo: Felix Lüddecke



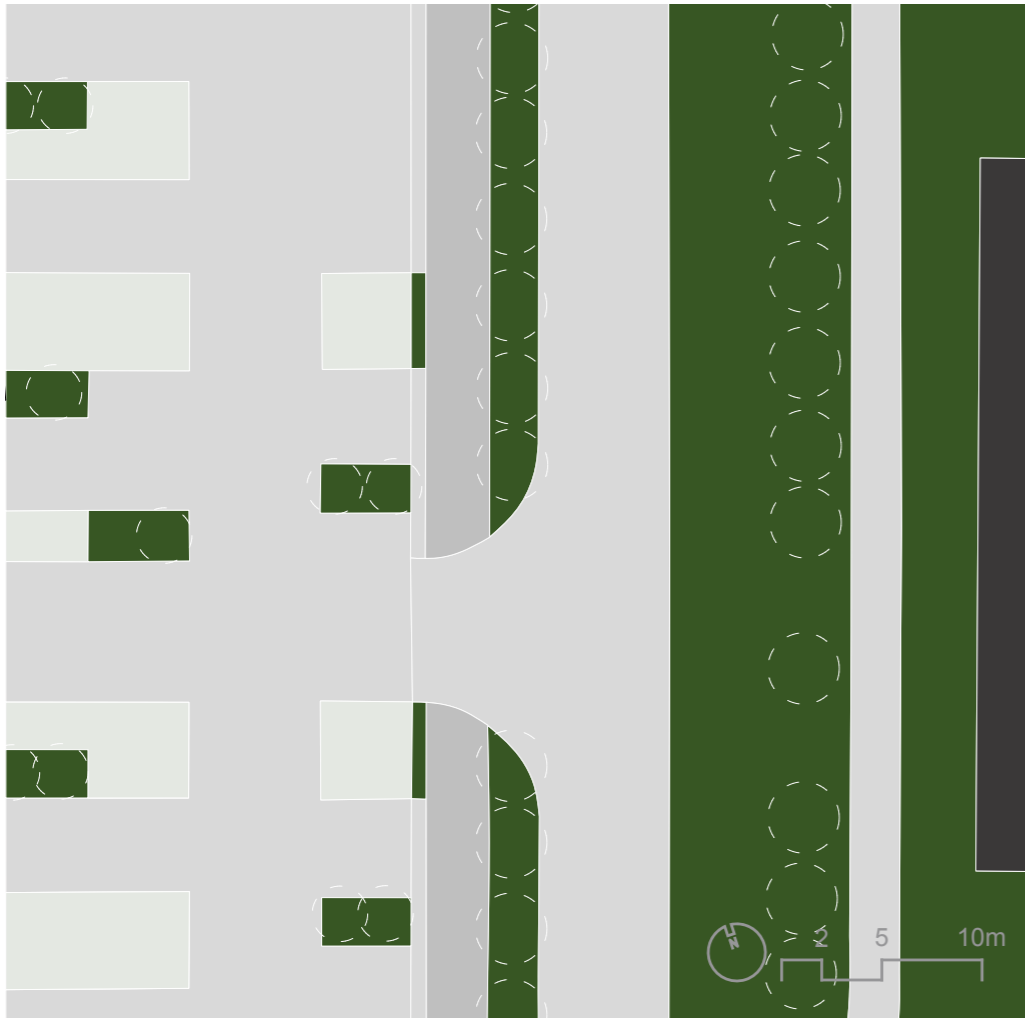
Collage: Henri Busch

Design Location 02: P+R South

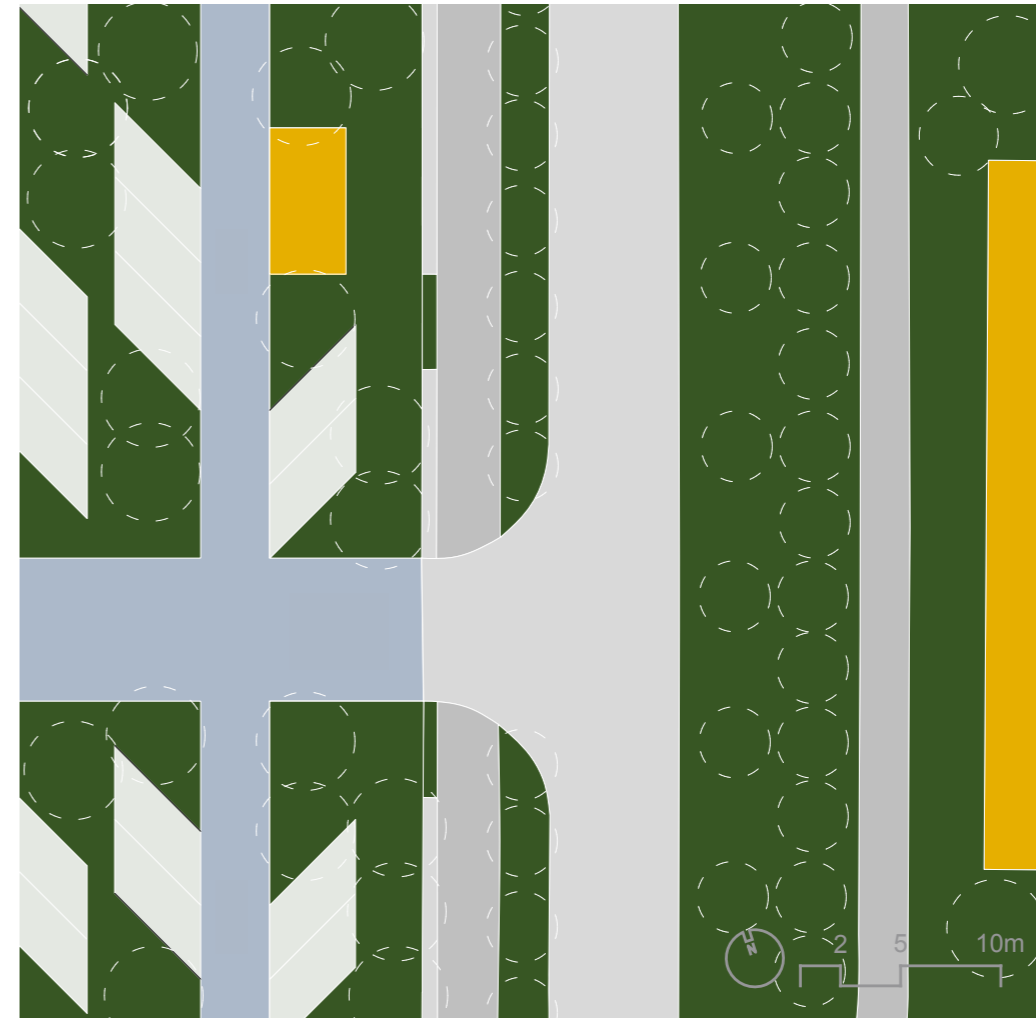


Photo: Rafael Stutz

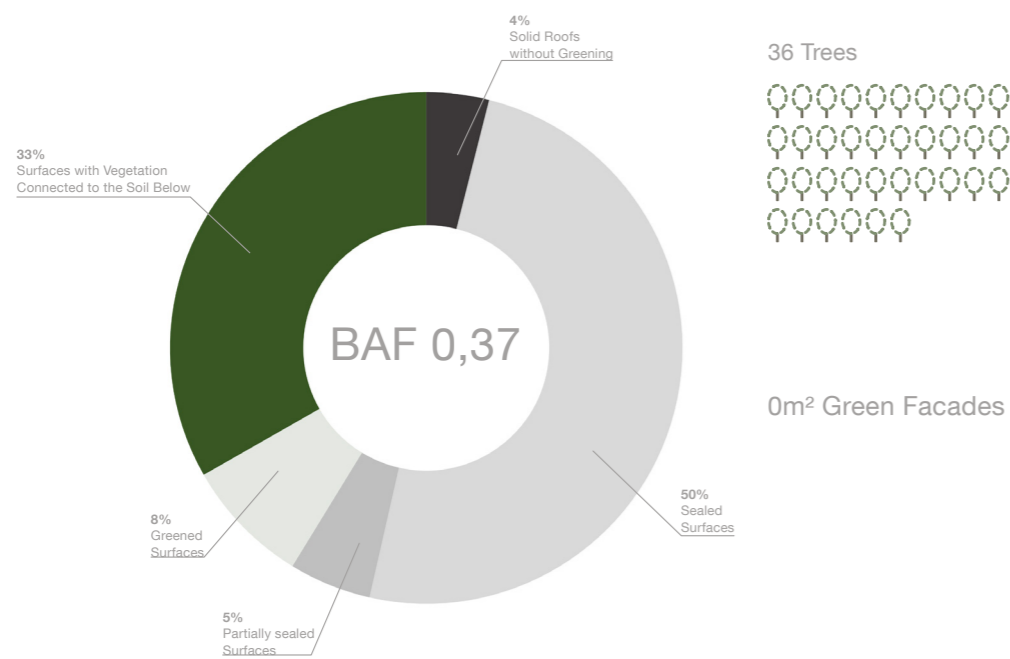
Existing Situation



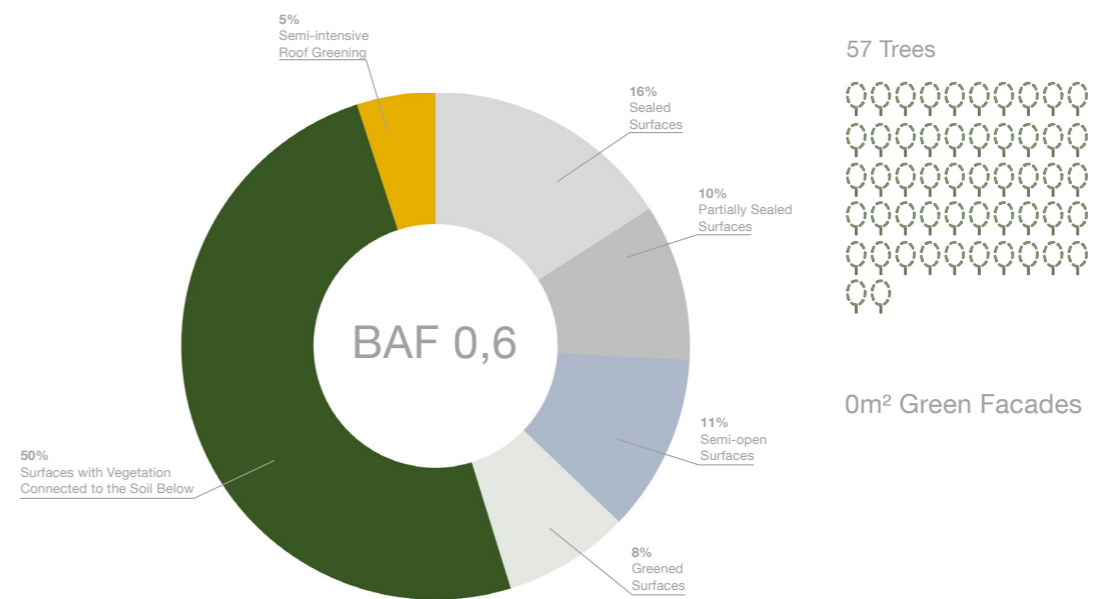
Proposed Design



Existing Quantification



Proposed Quantification



Location 02 – Johanna Sturm

Existing Situation



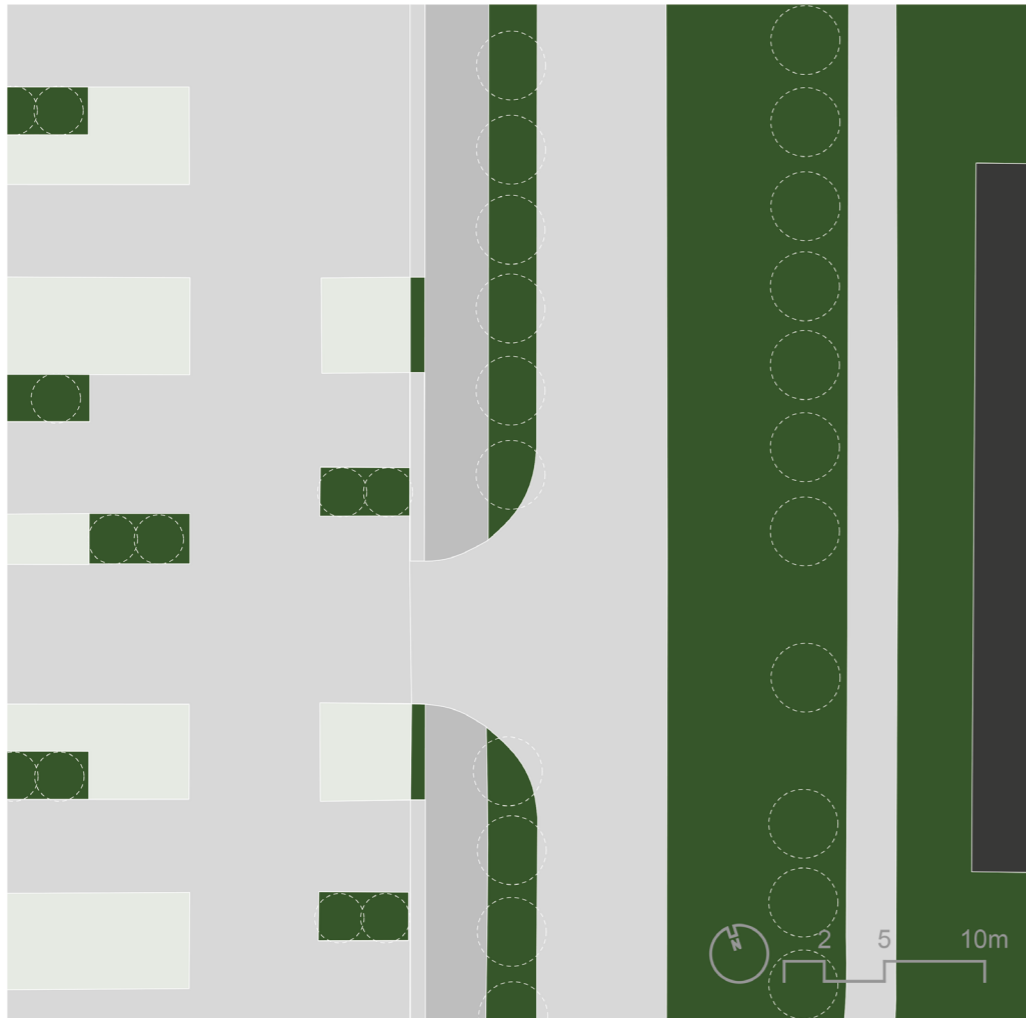
Photo: Rafael Stutz

Proposed Design

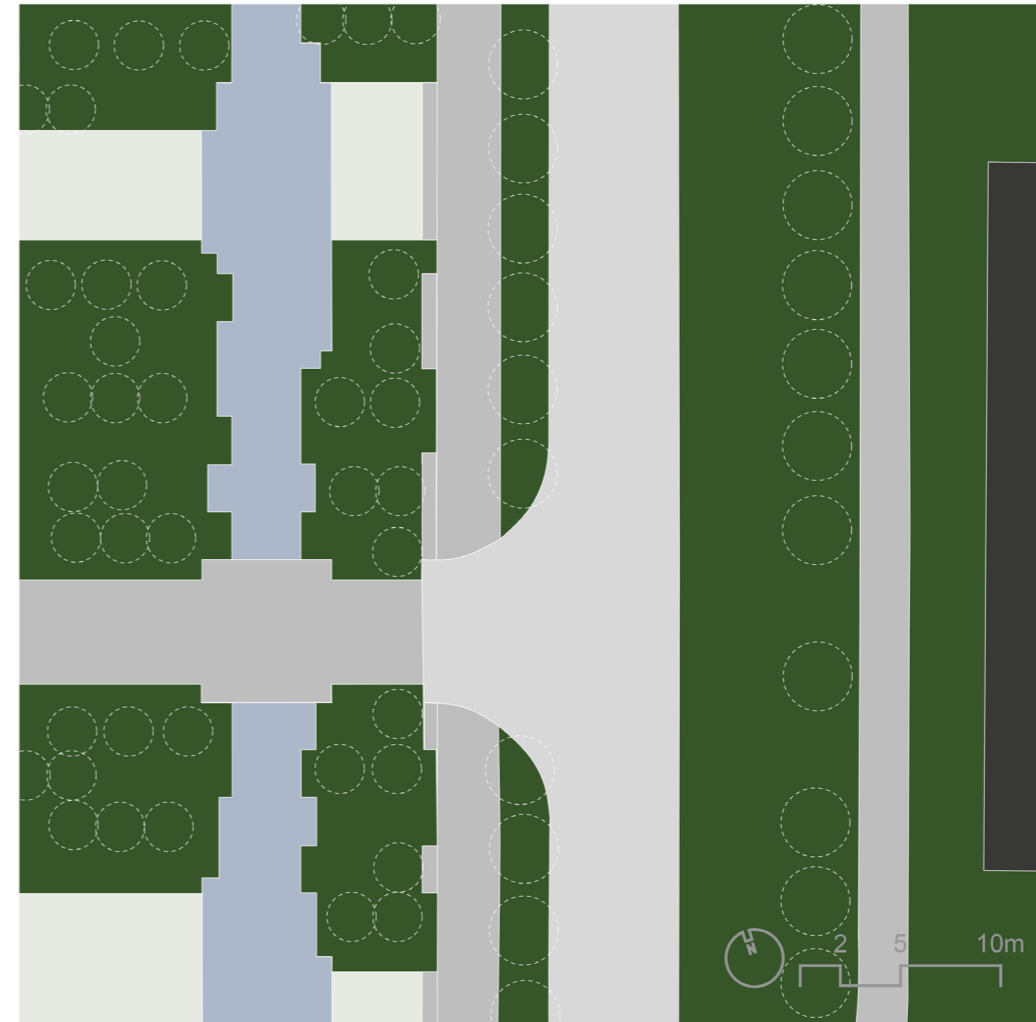


Collage: Johanna Sturm

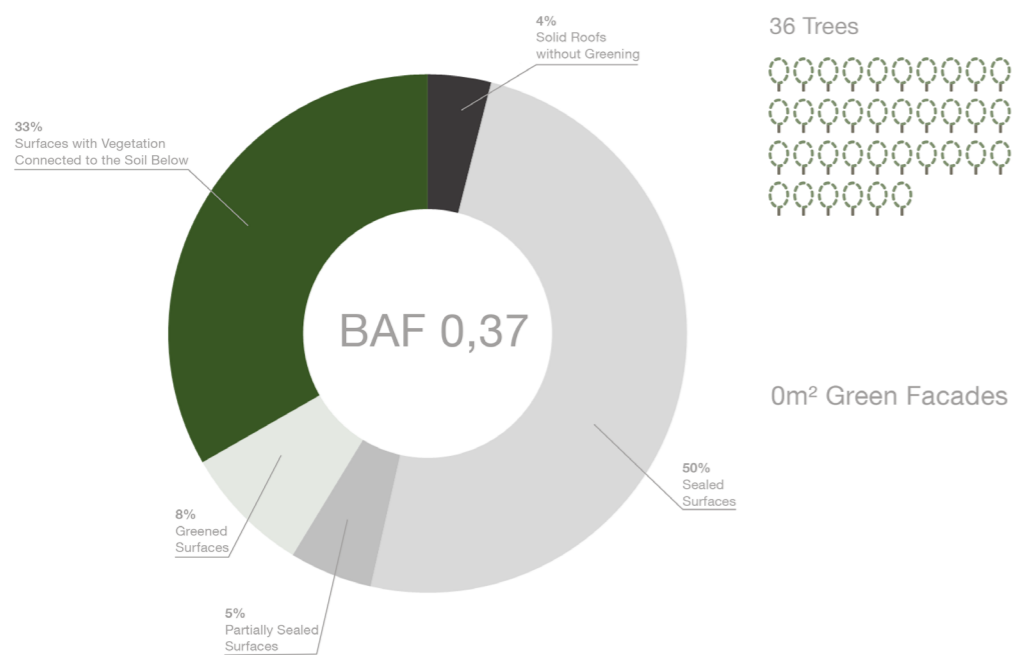
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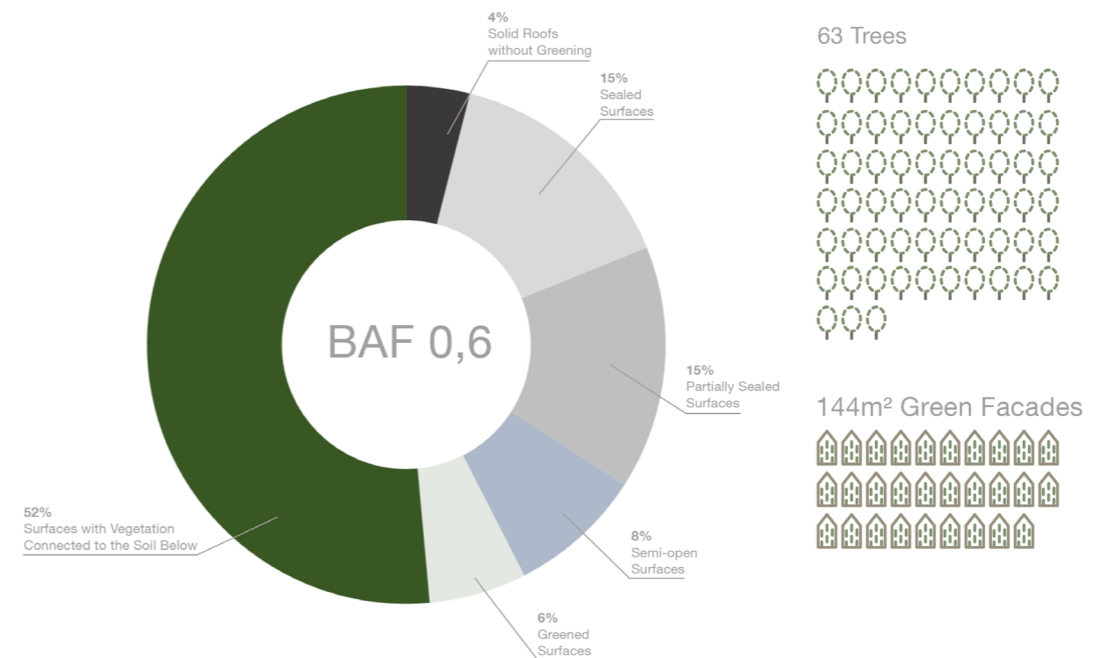
Proposed Design



Existing Quantification



Proposed Quantification



Location 02 – Severin Riedl

Existing Situation



Photo: Rafael Stutz

Proposed Design

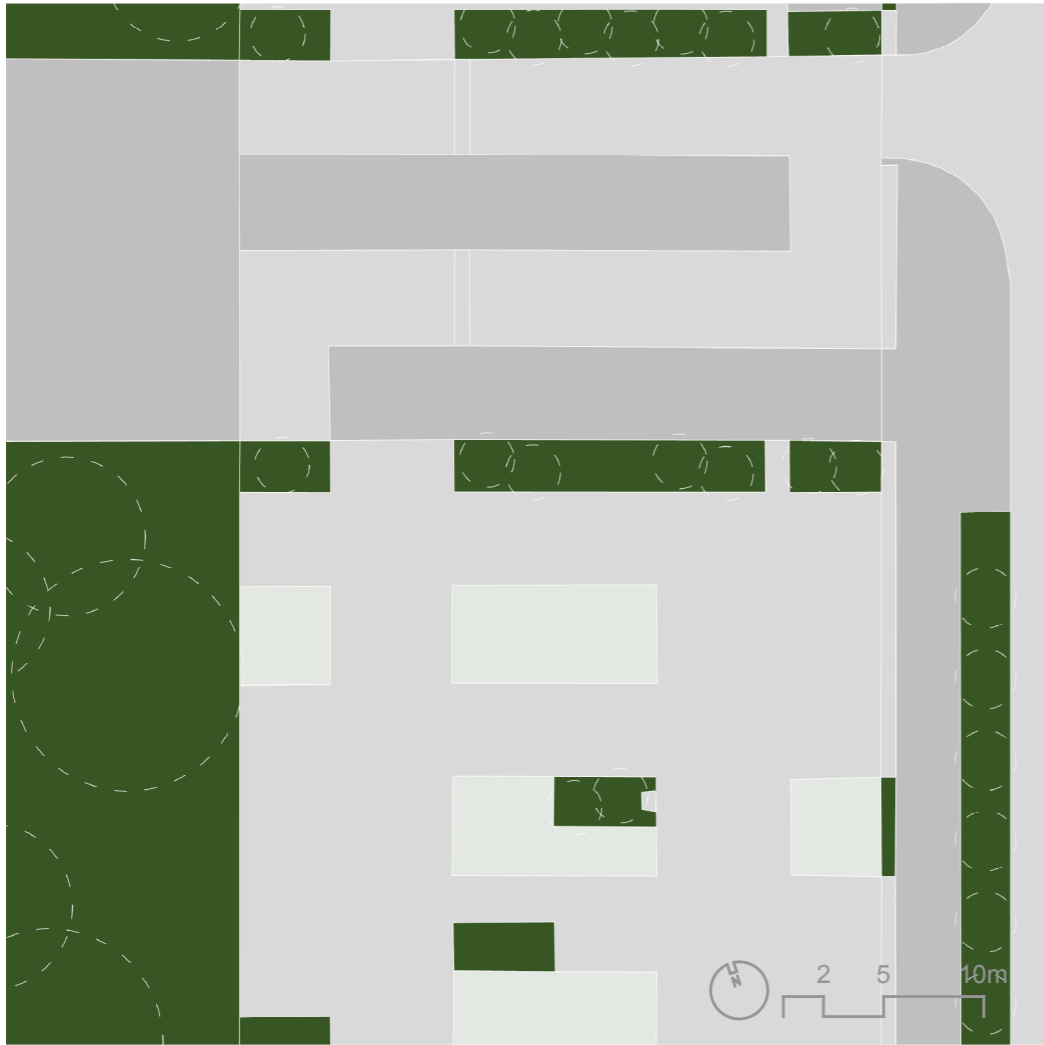


Collage: Severin Riedl

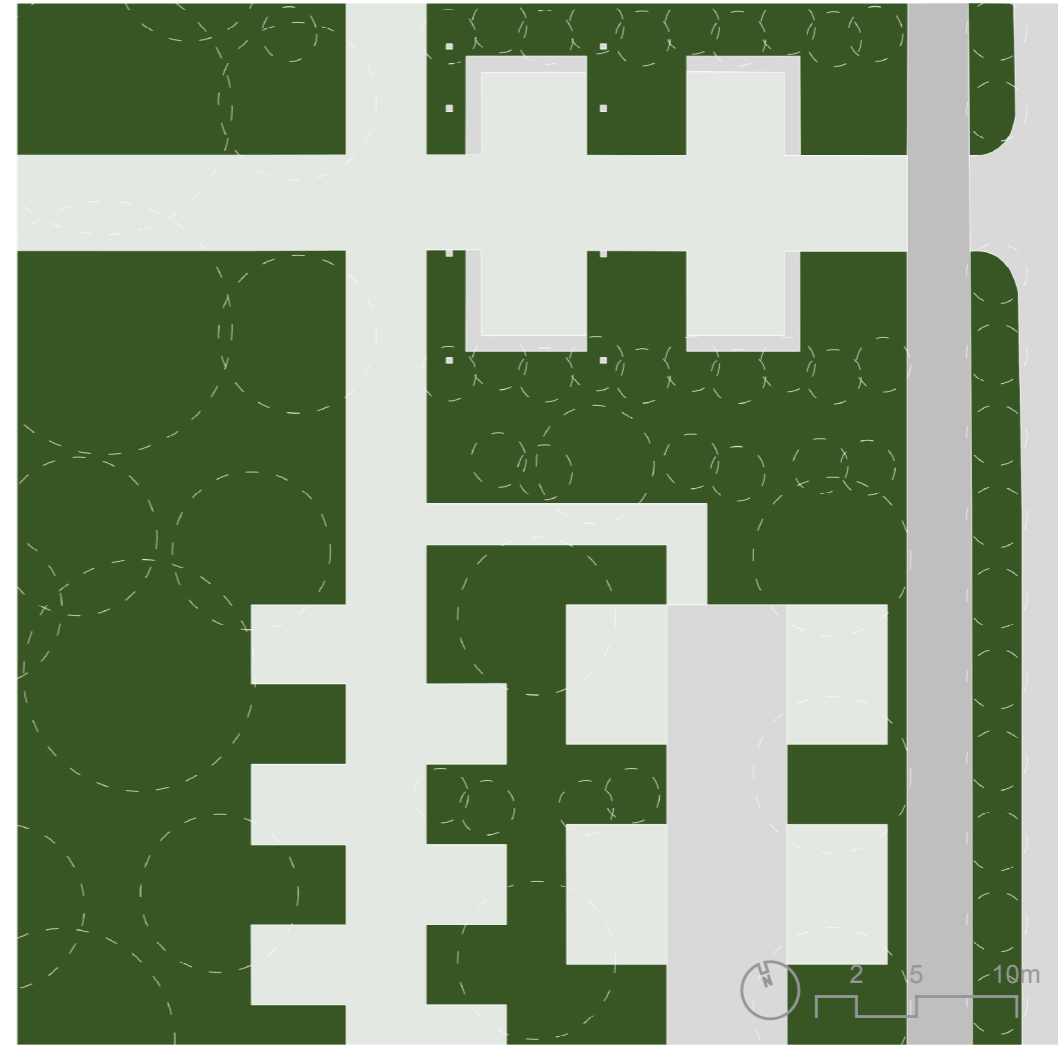
Design Location 03: P+R North



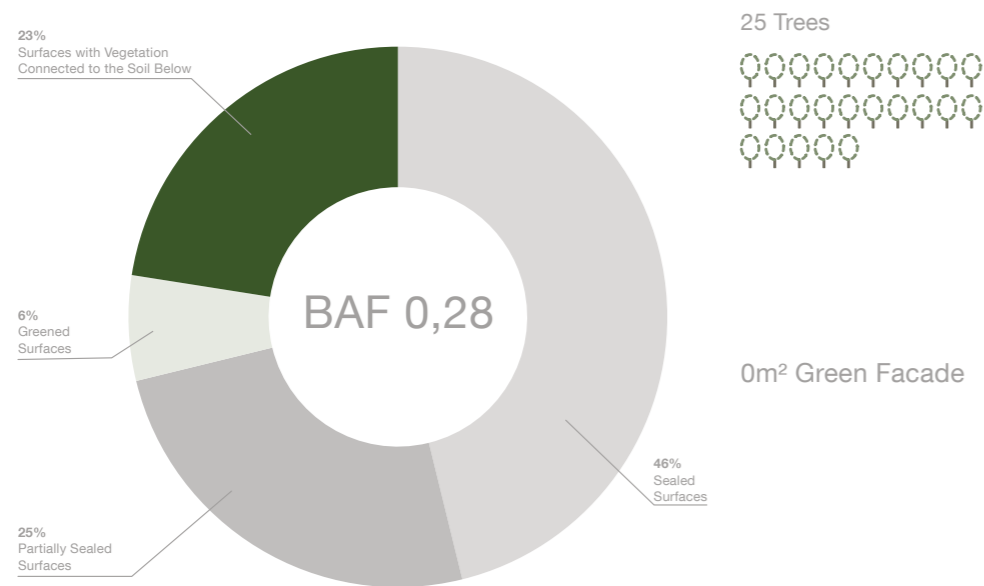
Existing Situation



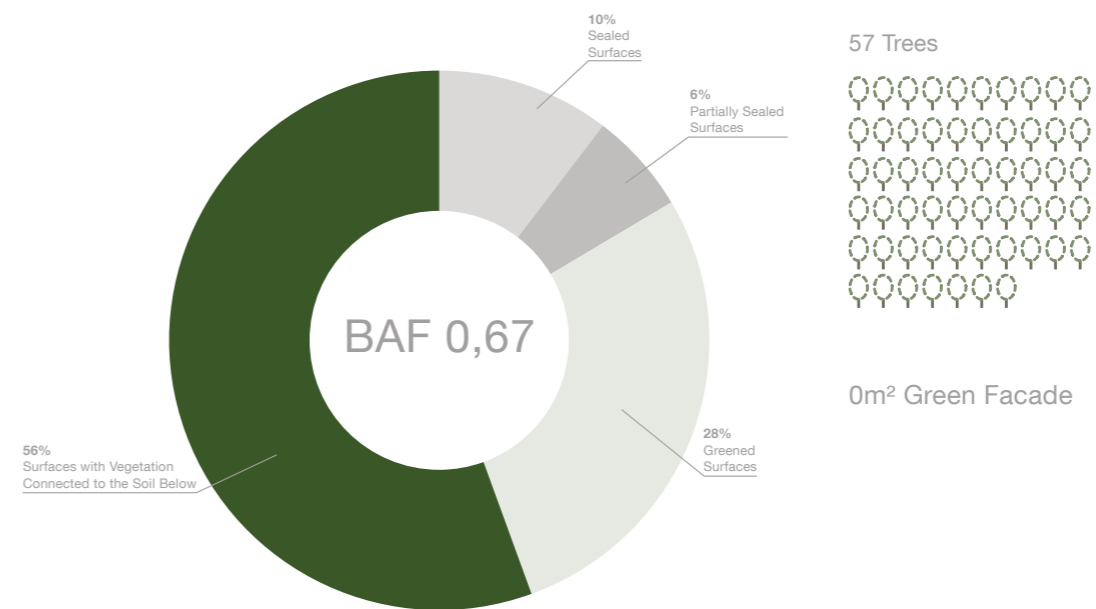
Proposed Design



Existing Quantification



Proposed Quantification



Location 03 – Jessica Klug

Existing Situation



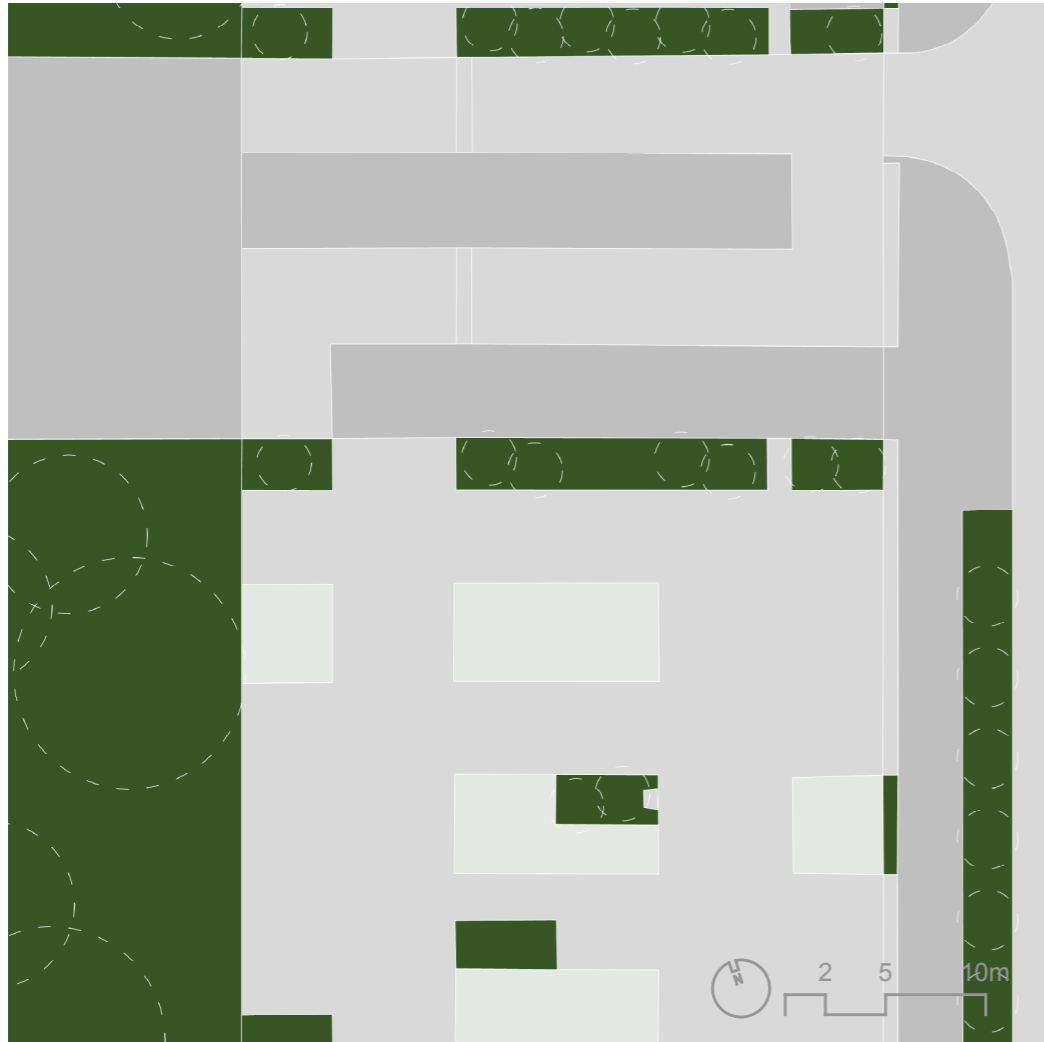
Photo: Felix Lüddecke

Proposed Design

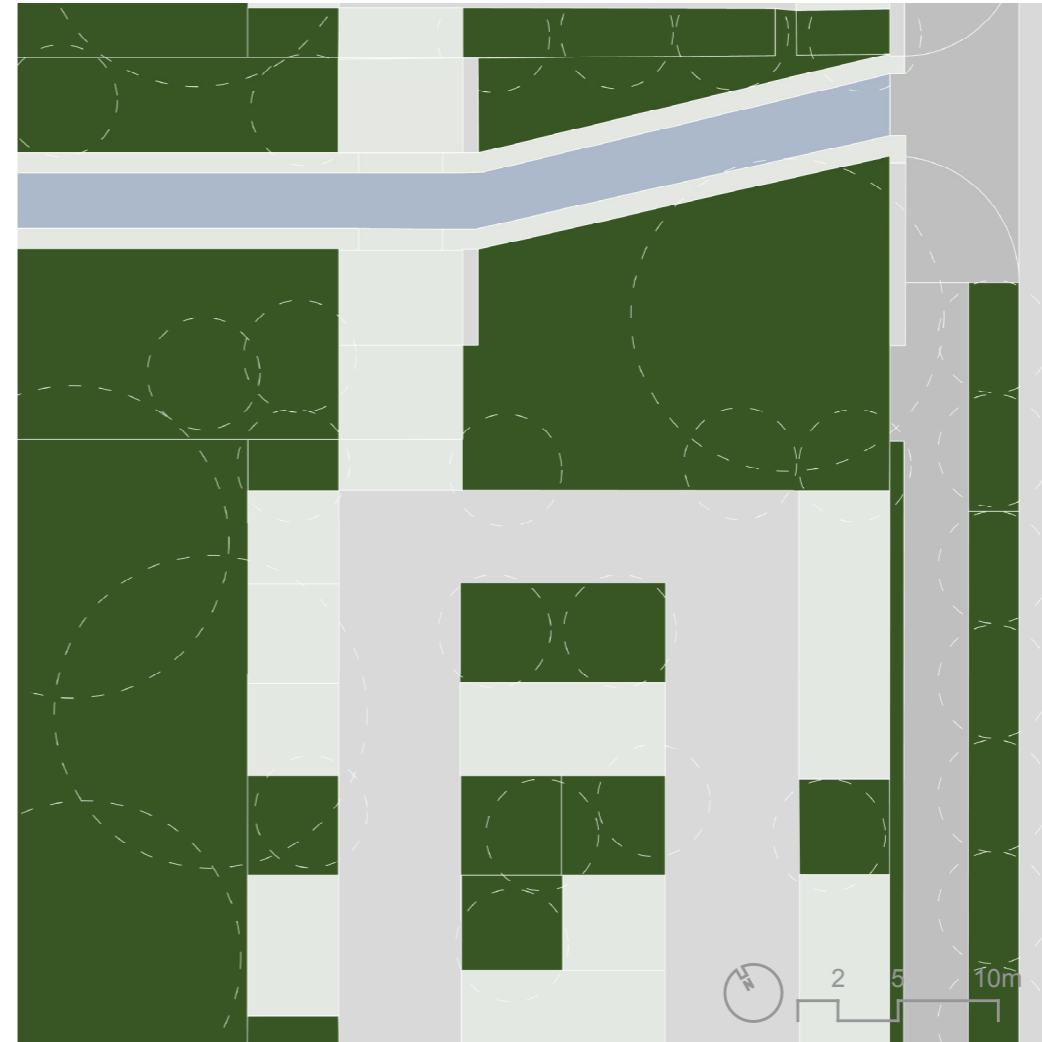


Collage: Jessica Klug

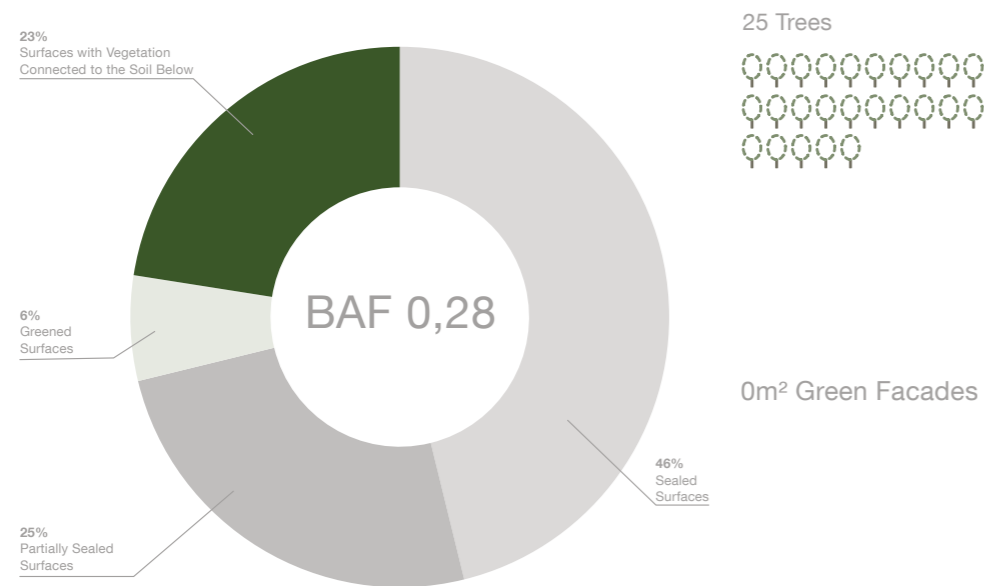
Existing Situation



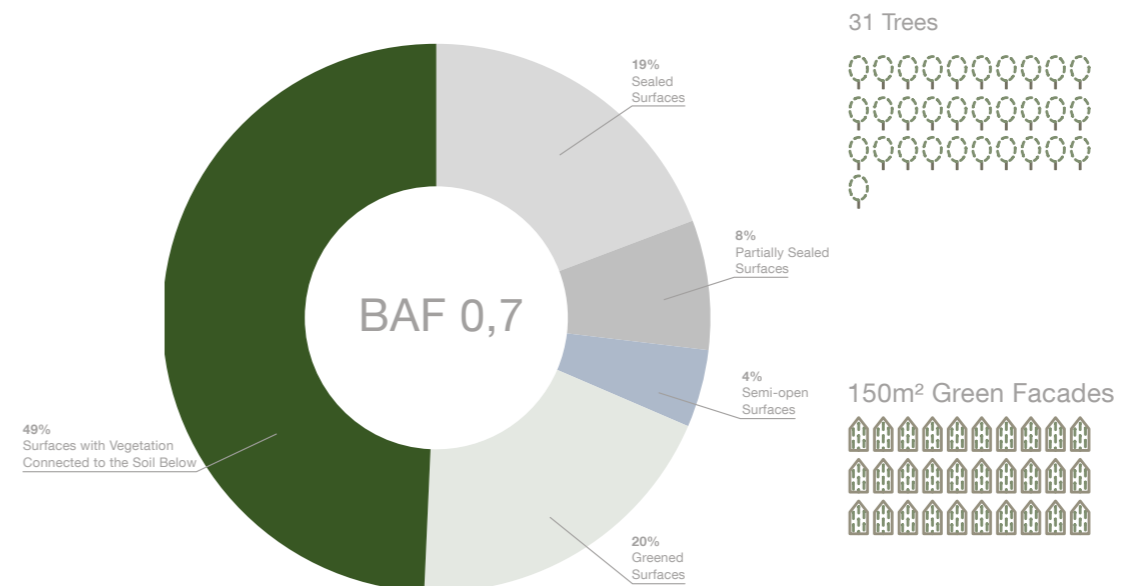
Proposed Design



Existing Quantification



Proposed Quantification



Location 03 – Luca Büttemeyer

Existing Situation



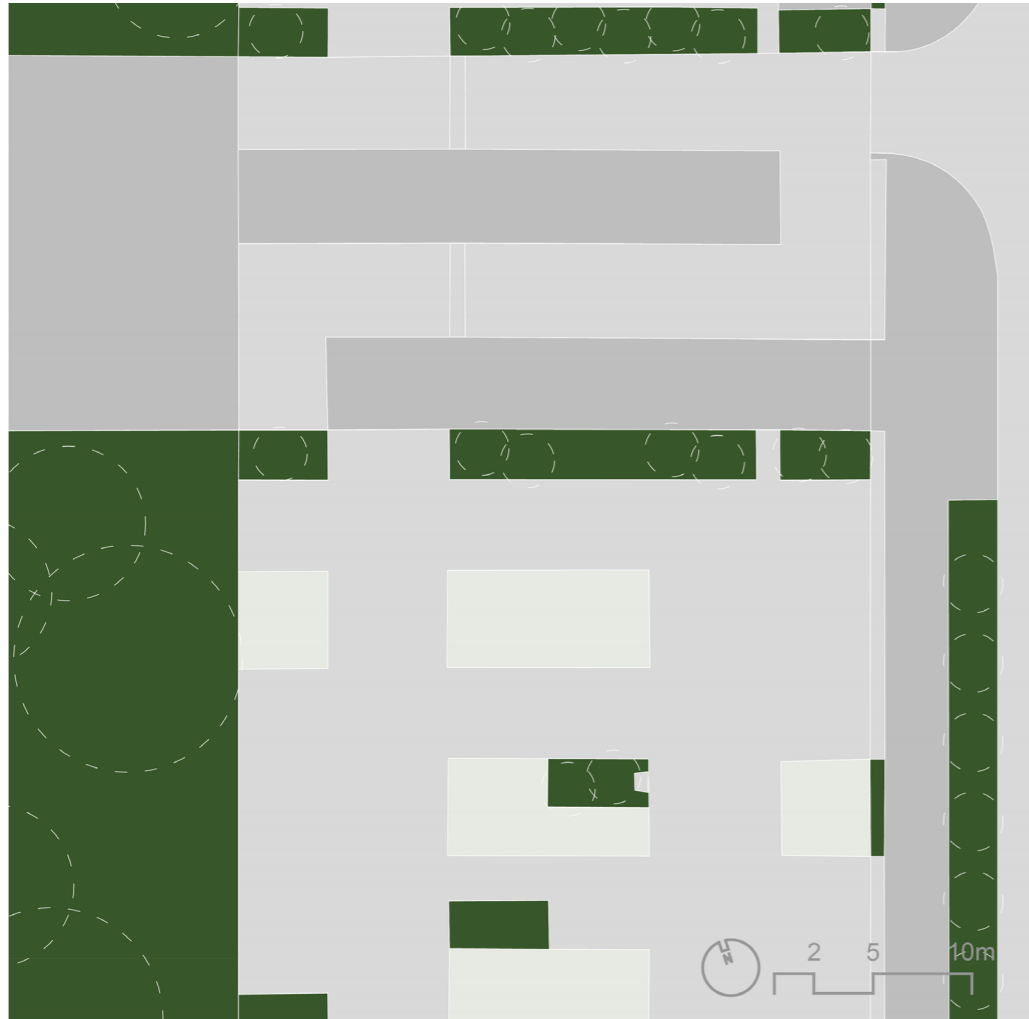
Photo: Felix Lüddecke

Proposed Design

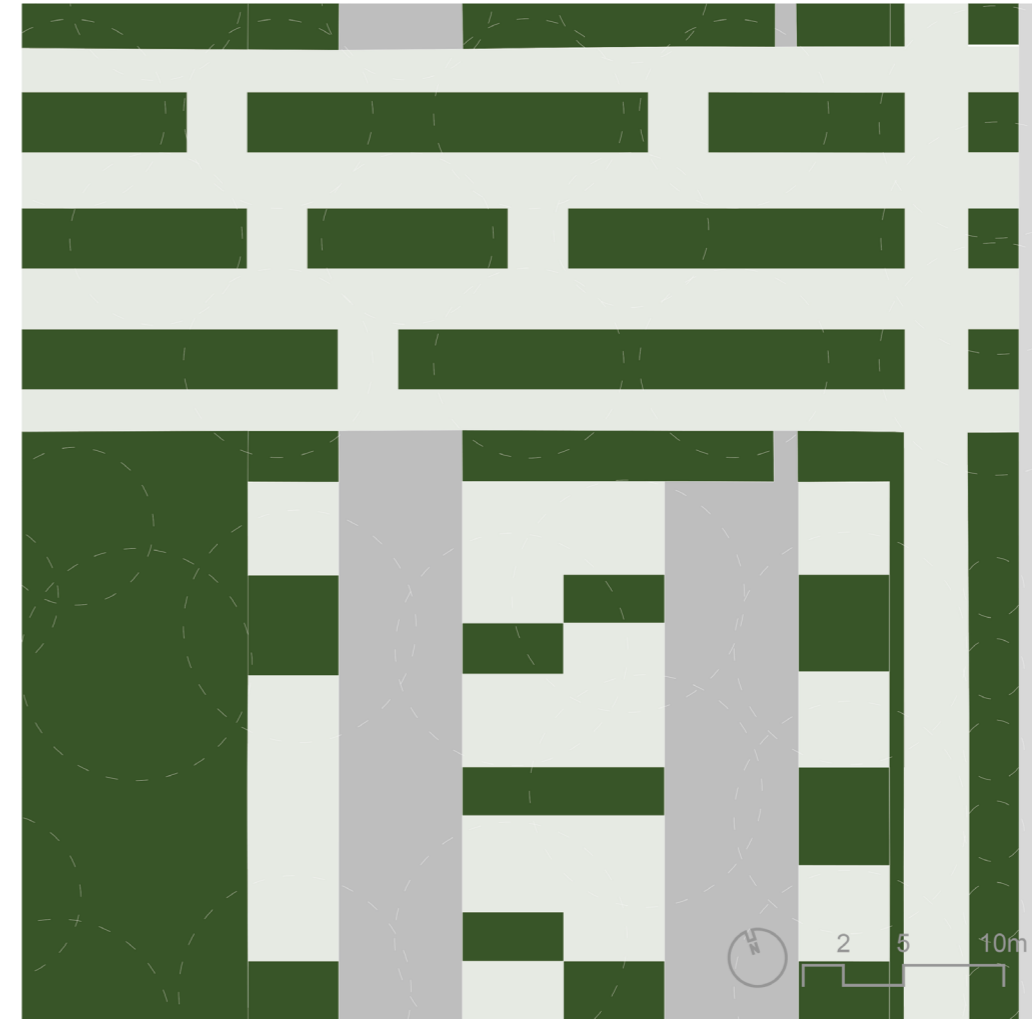


Collage: Luca Büttemeyer

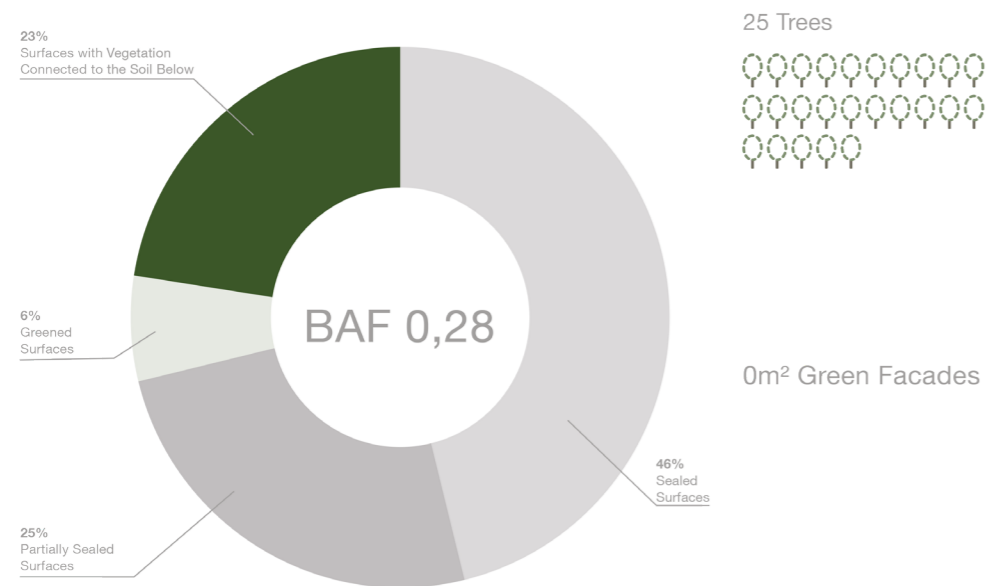
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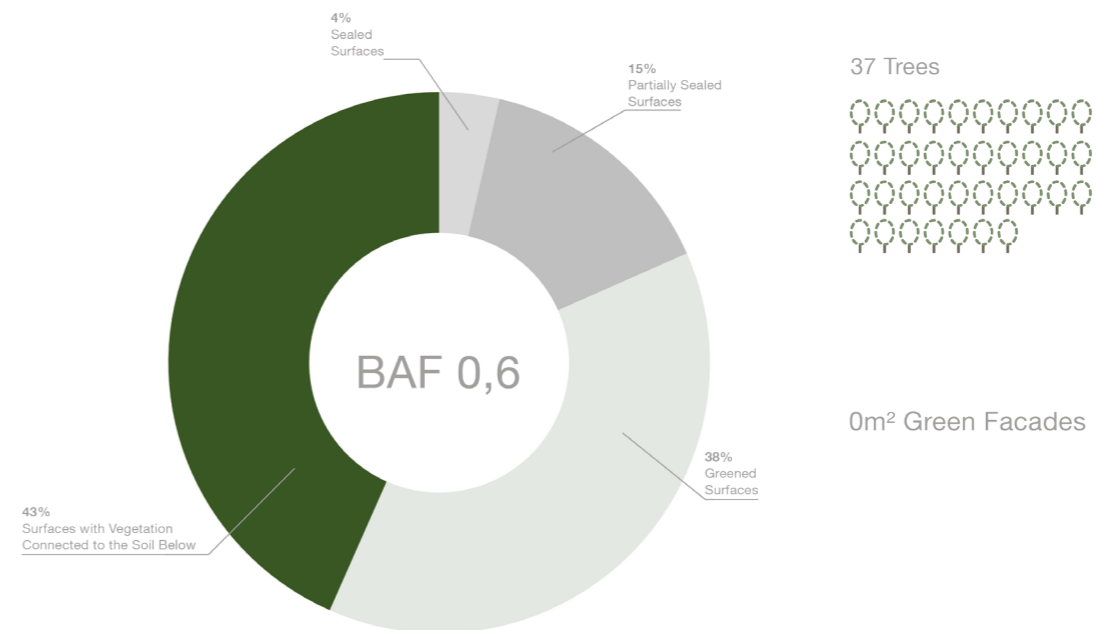
Proposed Design



Existing Quantification



Proposed Quantification



Location 03 – Maliheh Gholami

Existing Situation



Photo: Felix Lüddecke

Proposed Design



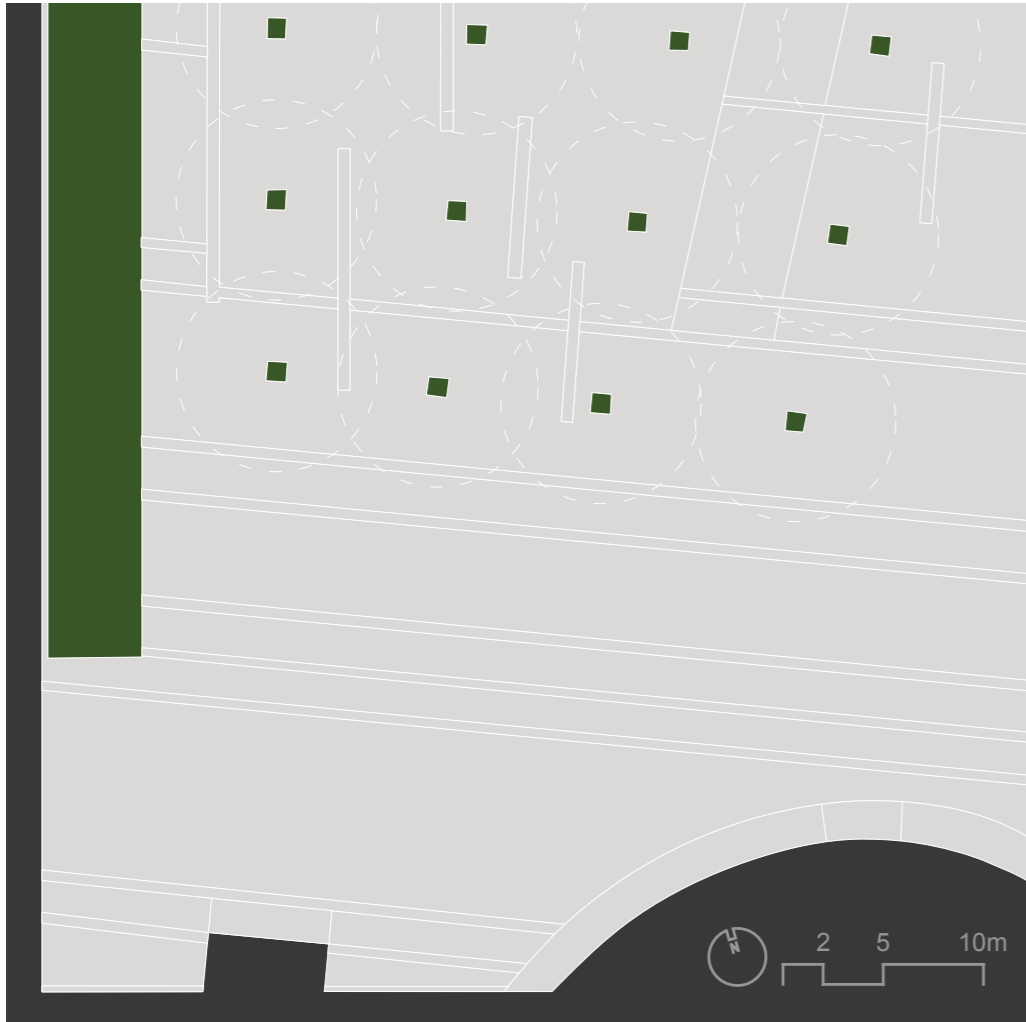
Collage: Maliheh Gholami

Design Location 04: CIT



Photo: Felix Lüdicke

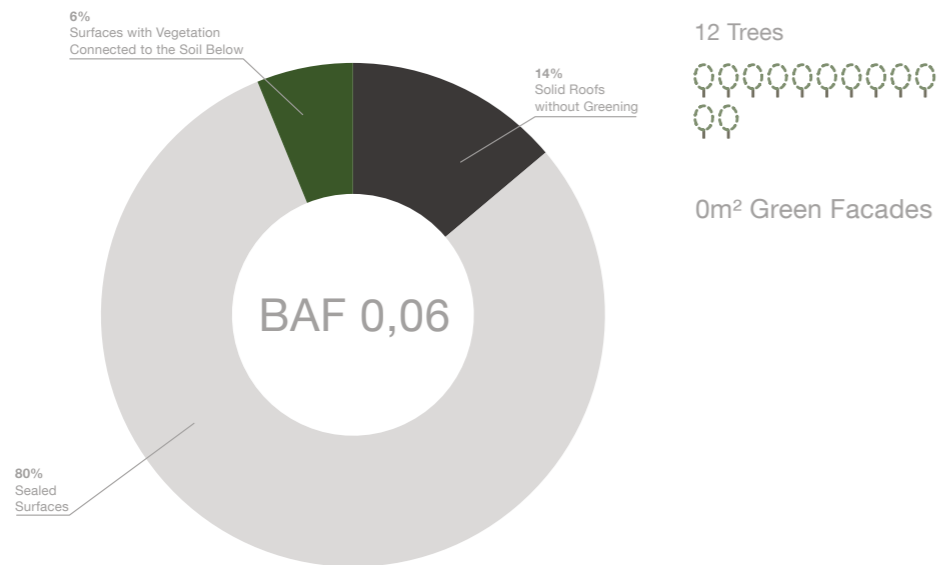
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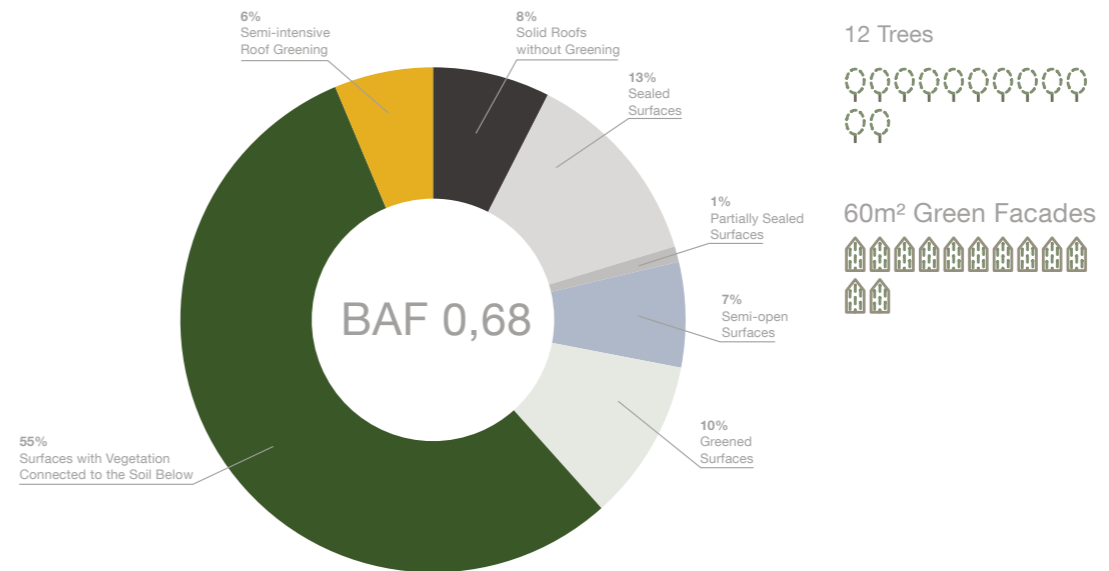
Proposed Design



Existing Quantification



Proposed Quantification



Location 04 – Kilian Maier

Existing Situation



Photo: Felix Lüddecke

Proposed Design

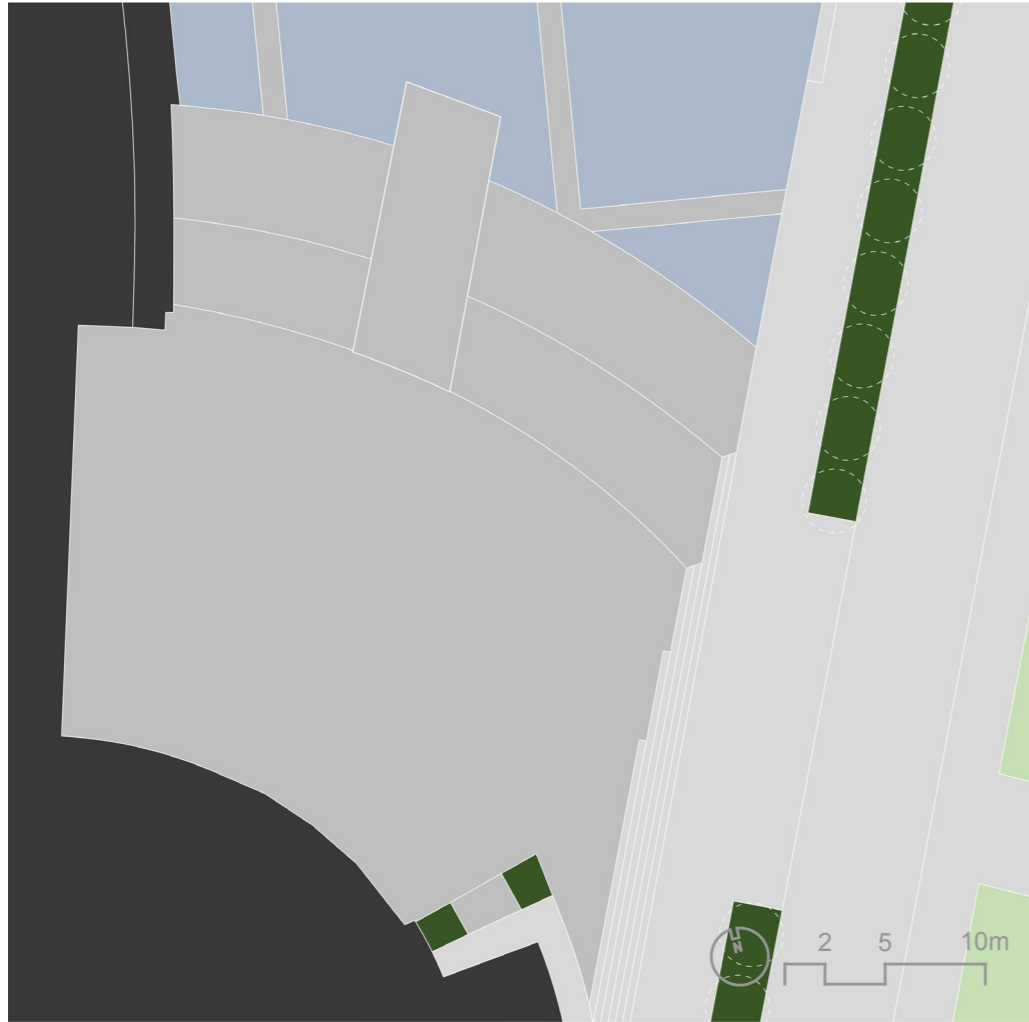


Collage: Kilian Maier

Design Location 05: Eberhard-von-Kuenheim-Bau



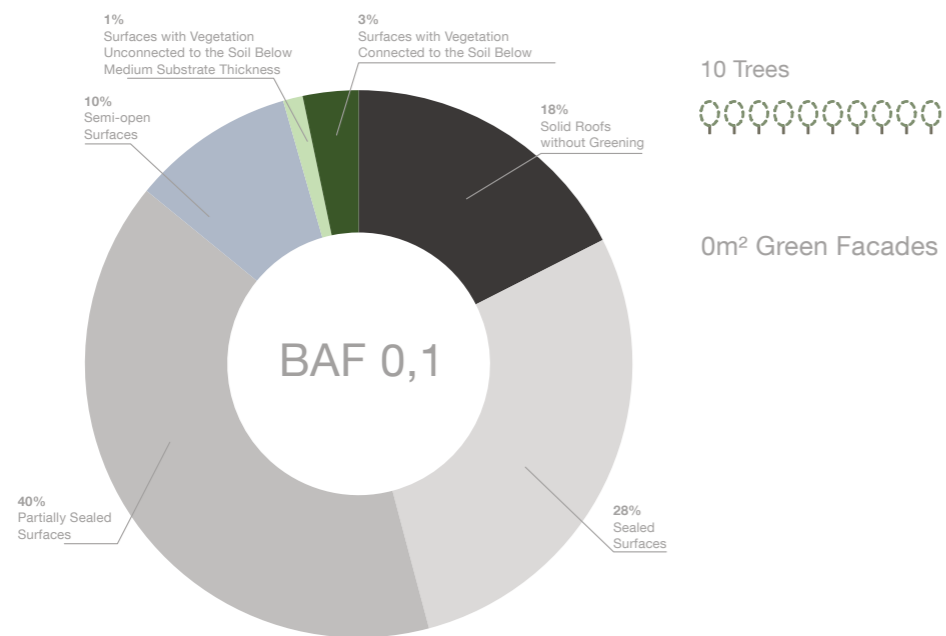
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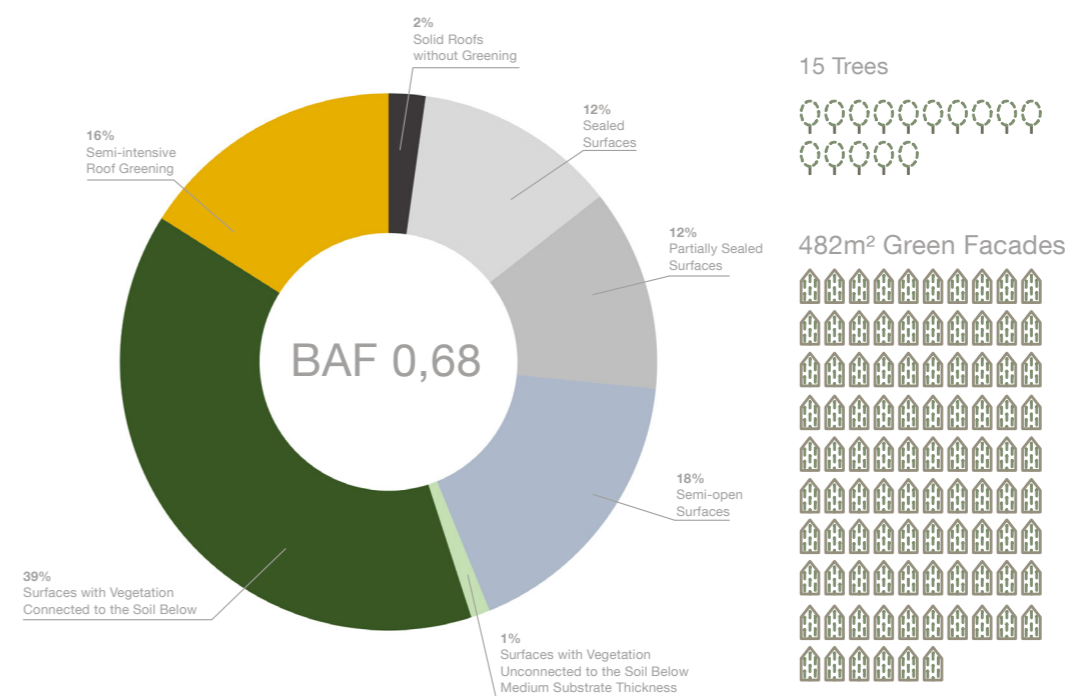
Proposed Design



Existing Quantification



Proposed Quantification



Location 05 – Julie Högner

Existing Situation



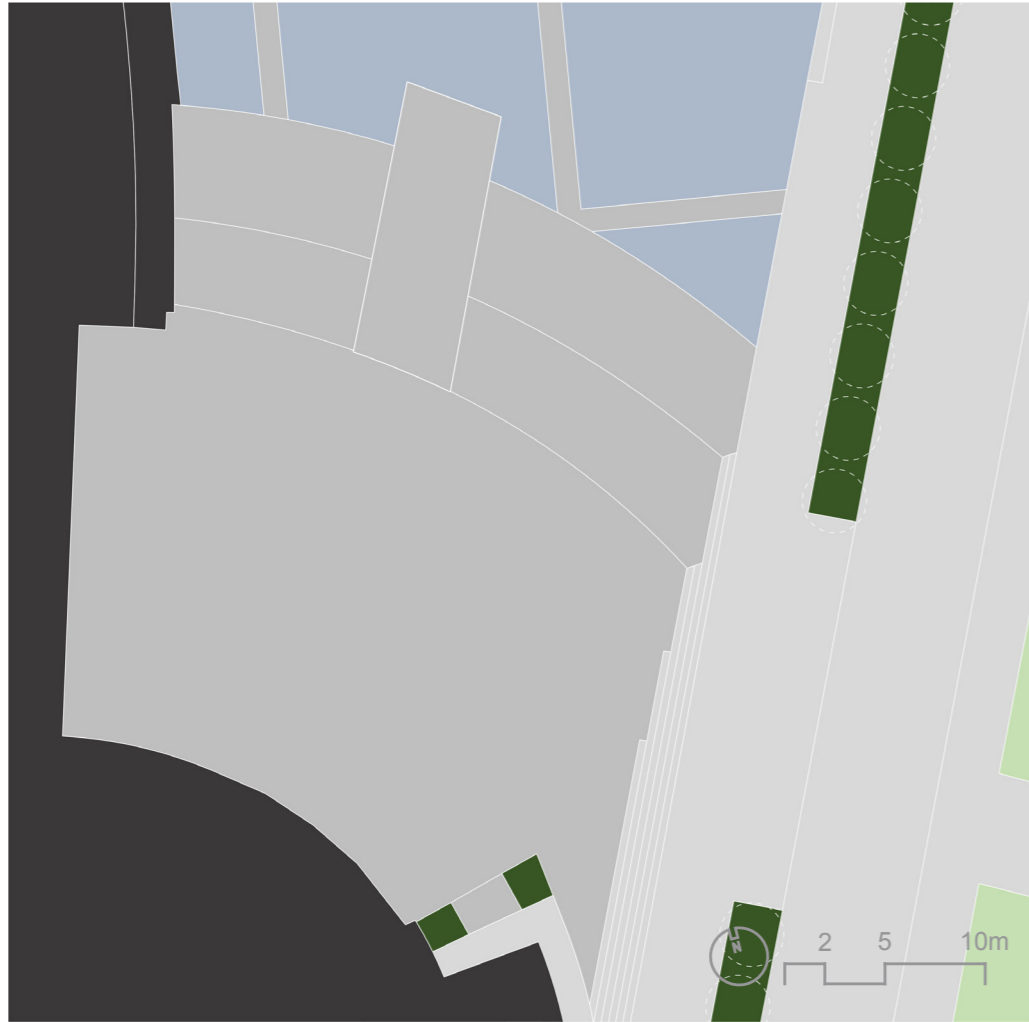
Photo: Felix Lüddecke

Proposed Design



Collage: Julie Högner

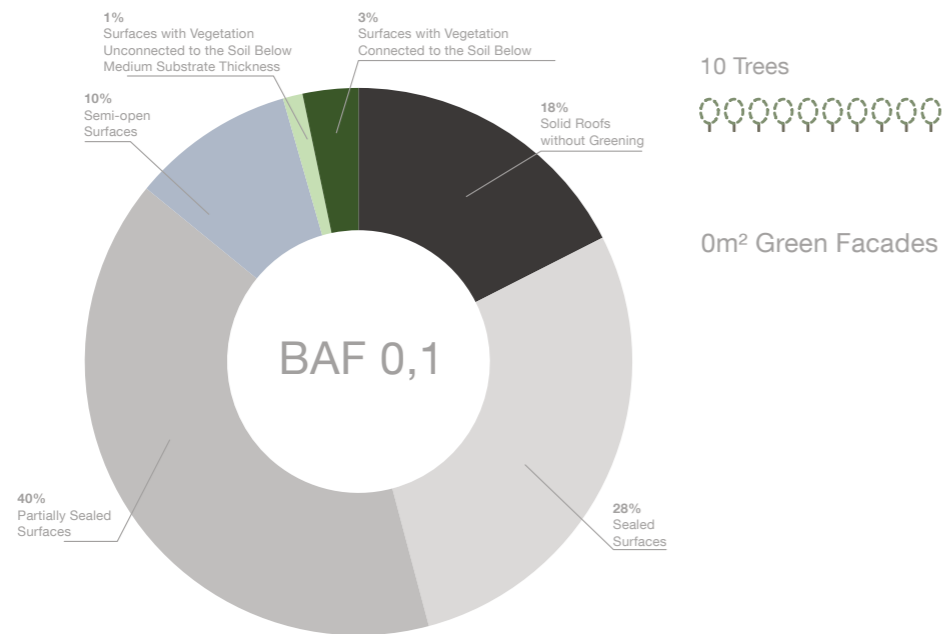
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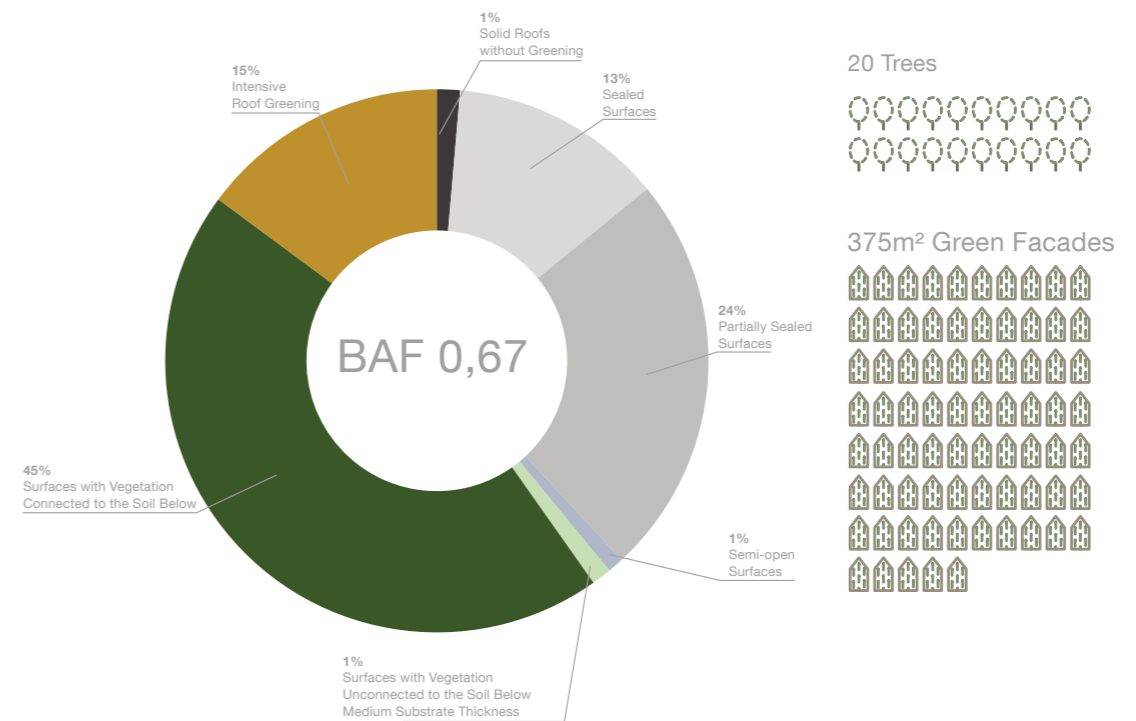
Proposed Design



Existing Quantification



Proposed Quantification



Location 05 – Merlin Pott

Existing Situation



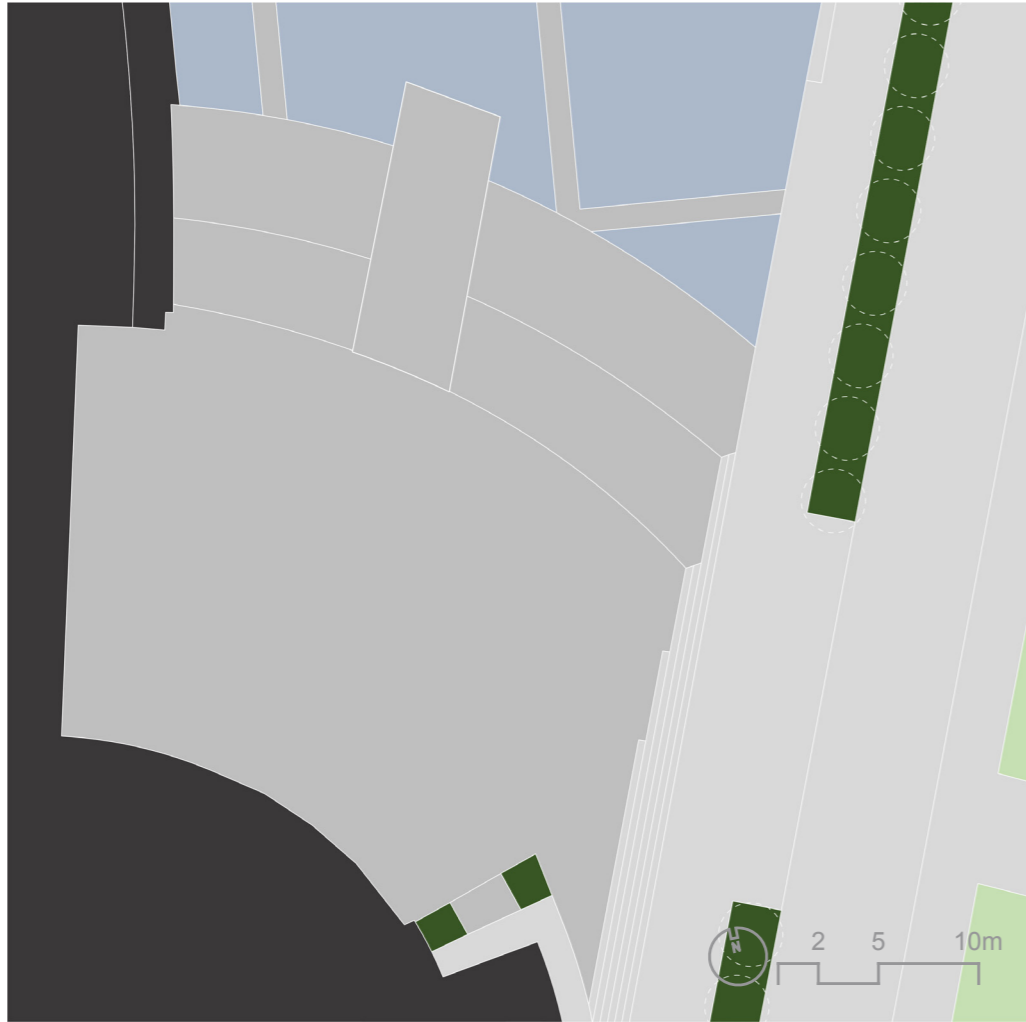
Photo: Felix Lüddecke

Proposed Design



Collage: Merlin Pott

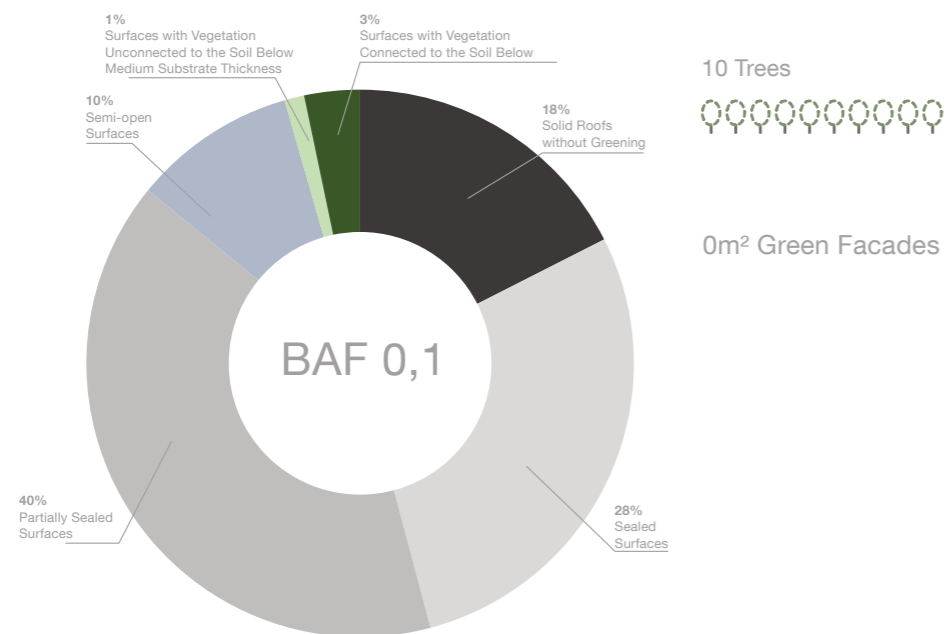
Existing Situation



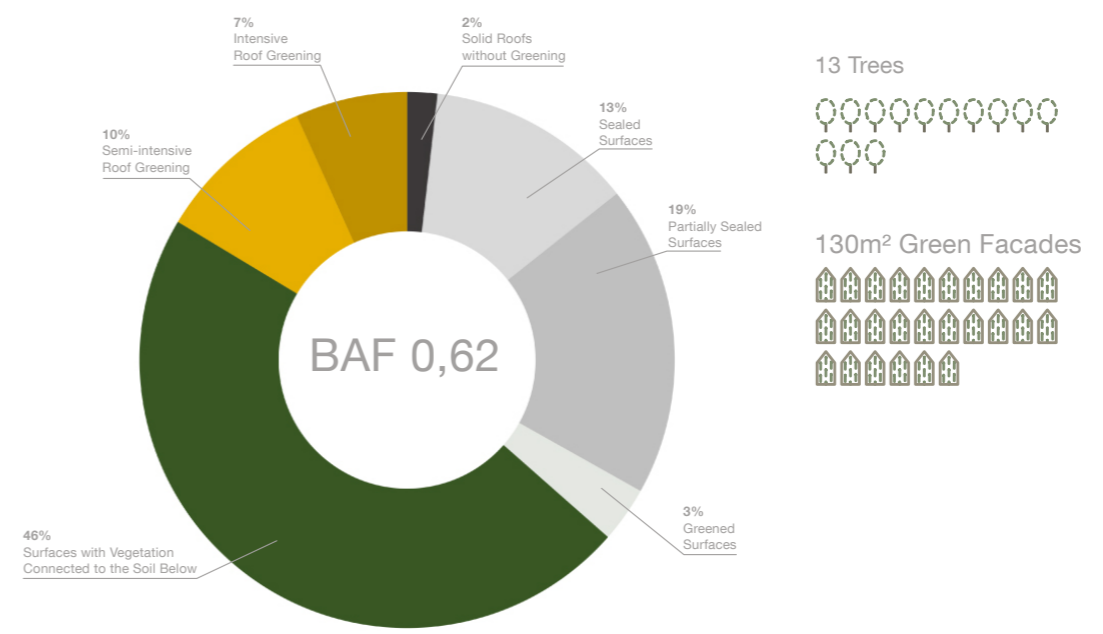
Proposed Design



Existing Quantification



Proposed Quantification



Location 05 – Sangeun Cho

Existing Situation

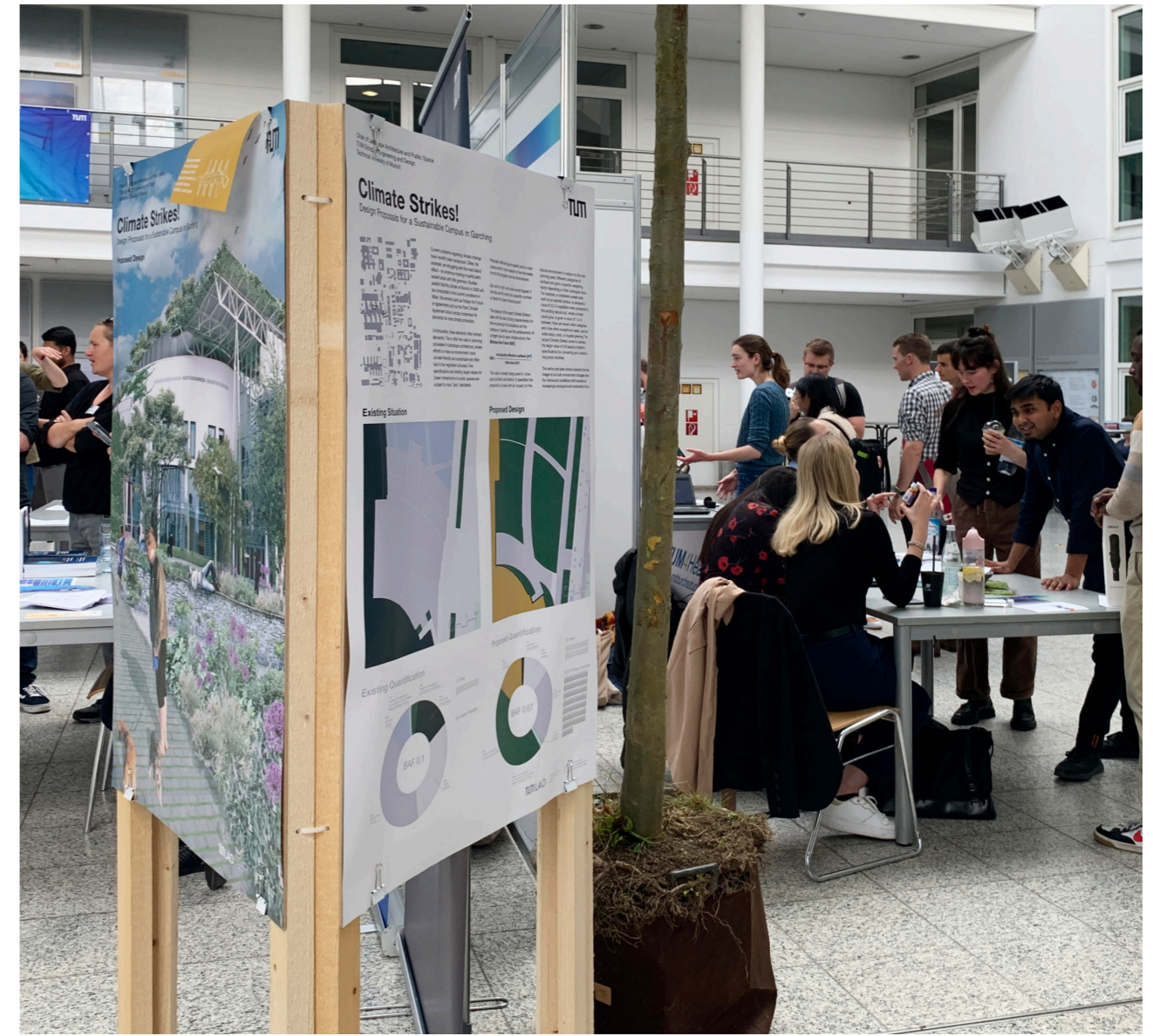


Photo: Felix Lüddecke

Proposed Design



Collage: Sangeun Cho



Impressions of the poster exhibition "Climate Strikes" at the TUM Sustainability Day in Garching in June 2024
Photos: Gero Engeser



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Project Brochure

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