

## **Quotation request - design "three modules for climate-robust roof garden" for pilot project Library Couwelaar - as part of the 'Stadslab2050 climate-robust roofs': in-depth phase \***

### **What is it about?**

The City of Antwerp supports **experiments on climate-robust roofs** \* and uses its urban laboratory, 'Stadslab2050' (=city lab2050), to help realize **4 pilot projects**. In 2018, 4 roof owners were selected from 23 candidates. The aim is to transform the 4 pilot roofs into innovative, climate-robust roofs. There is a "design phase" (October 2018-October 2019) and an investment phase (November 2019-end 2020).

In the design phase, Stadslab2050 provides route guidance for the selected roof projects, for example by bringing in experts who help to make the plans climate-robust.

- First, a consortium under the leadership of Stramien architects helped the roof projects to get their climate-robust roof vision sharp. The **vision phase** is now behind us.

- Time for the **in-depth phase**, in which specialized experts are dealt with to further elaborate the plans (this assignment).

Various calls for expertise are being launched for the different pilot projects. This assignment is specifically about the plans of **candidate Couwelaar**, a library in a protected building that wants to include its roofs in its public activities. (At the end of this document we give some more context and explanation.)

### **Who are we looking for this assignment?**

'Stadslab2050' is looking for a result-oriented expert (or expert team) on roof projects, who have experience with climate robustness and biodiversity on roofs; water techniques, is driven by the search for synergies between different roof functions and is good in cooperation with various actor groups.

### **What is the context of the roof project to be supported?**

As a **library, Couwelaar** is a public space par excellence. The library resides in a protected building with three roofs, each of which has its own characteristics and points of reference in terms of climate robustness. The aim is to use the various roofs in the public activities of the library. In the following years, the monumental building will be undergoing thorough renovation work. The large flat roof above the first floor has a beautiful location and view and requires upgrading. The architect plans a quiet rooftop garden here with a predominantly green character. In order to offer an (educational) experience year round, the greening is built up of three types of green modules. The design team of Couwelaar is looking for support for the climate-robust details of these green modules. (More details at the end of this document.)

### **What is the assignment?**

You feed the architect of Couwelaar in translating the roof vision\* into feasible detailed plans. You develop detailed plans specifically for the roof case Library Couwelaar: "three green roof modules" that differ in structure and drought resistance ("brown module", "ecological module", "park module") but complement each other in terms of image. You draw up a coherent solution that treats **rainwater + roof structures + vegetation** in its entirety in terms of climate robustness \*.

The solution must lead to the rooftop garden being just partially irrigated ('park module'), but thanks to the three modules, it still offers an (educational) experience year-round and shows the possibilities of roof gardens. You use nature-based, low-cost, low-tech solutions for this.

A: **Designing the (green) roof structure**, with as objective:

1. fine-tuning the concept of the three complementary climate-robust roof modules\*
2. create optimal growth conditions for the 3 chosen planting schemes (retention capacity, acidity, composition and substrate thickness ...) (<-> C)
3. taking into account the structure and bearing capacity of the different roof zones

4. suggestions for recup materials for roof substrate, application of technical options, details, materialisation, cost estimation

**B: Designing the water management, including:**

1. find out what the water requirements of the different roof garden modules are for an ideal operation (-> consequences for C and A)
2. Calculate supply and demand for rainwater recuperation: the necessary volumes (whether or not incl. watering 'park module' and flushing toilets) and calculate the "harvestable" volume of rainwater and bring these in balance
3. making the most of synergies: looking at the roof in its broader context – e.g. harvesting rainwater from higher roofs
4. design in detail the rainwater flows for the various user functions.

**C: Planting scheme:**

1. contribute to attractive rooftop garden experience
2. biodivers planting schedule, adjusted to the growing conditions of the "3 modules" (-> interaction with A, B)
3. suggestions for the vegetation of the pergola and the facades adjacent to the cemetery
4. first step towards a maintenance schedule: management plan

**Customization and innovation:** the designer starts from nature-based solutions, looks beyond what is currently available on the market, but the offered solutions are available and feasible. The solution challenges the green building sector to further innovation. Low-cost / low-tech, circular solutions are preferred to promote replicability.

**Raising the learning potential of the case:** The solution primarily responds to the specific case and climate-robust roof vision of Library Couwelaar, but contains elements that are also inspiring for other buildings looking to make an attractive and climate-robust roof garden with few resources. 'Stadslab2050' has the right to share the designs and plans in detail and thus to promote the climate-proof solutions.

**Collaborating with the roof lab members** (team Couwelaar), sounding board group (a team of experts from the city services, building sector) and 'Stadslab2050' with the aim of further enriching the designs and increasing the feasibility of the proposed solutions.

**Knowledge dissemination via 'Stadslab2050':** within the framework of your assignment you are also prepared to give two lectures on the subject of this assignment to a (semi) professional audience and to be available for a 'consultation-hour' for three other roof owners (with similar questions).

**Results to be delivered**

At the end of your assignment, team Couwelaar must have a clear and detailed plan about the following questions:

- What is the structure for the "3 climate-robust rooftop garden modules"?
- What is the composition of the water management system (collection, buffer, evaporation, reuse, infiltration)?
- Which plants come where?
- What will it cost and who can do this all?

This way Library Couwelaar can go on with the design of the rooftop garden and look for executors.

At the end of your assignment, the sounding board group must have clear answers about the following questions:

- What are the minimum conditions and guidelines for the design of "climate-robust roof garden modules" that are economical on material and water but still provide an acceptable image for the users?
- How do the three modules work together - or complement each other?

- What kind of "climate-robust roof garden modules" are feasible for existing roofs with limited capacity and investment budget?
- Which solutions of the Case Library Couwelaar are relevant for other roof owners in Antwerp?
- What are the obstacles in the current roof policy that prevent the large-scale rollout of this solution?

With this information, the sounding board group and 'Stadslab2050' can get to work with knowledge dissemination and reflection on the municipality's roof policy.

Note: A lot of technical research has been done around this specific roof in preparation for and in the aftermath of the vision phase (construction plans, current water consumption, preliminary design of the rooftop garden...). You will receive this information at the start of the assignment. You also do not need to carry out a stability study of roof, that is the responsibility of the owner.

### When?

Submitting an offer for this assignment can be done **until 18 March 2019** at 11 am.

The assignment of this assignment (after approval by the Mayor and Aldermen) will take place in **early April 2019**.

The order must be fully executed **before June 15, 2019**.

So there are **2 months time** to work together with Library Couwelaar and the sounding board group for the in-depth phase.

### Process approach

- *In advance*: At the start of the in-depth phase (end of January 2019), Library Couwelaar and Stadslab divided a lot of to-dos based on the vision document. For example, the architect is working on a detailed stability study and new versions of the , preliminary design of the future roof garden.
- *Concretizing of the assignment in detail*: Before the execution of this assignment effectively begins, Library Couwelaar and the sounding board group will meet up(29 March) to hear what has already been researched and demonstrated on both sides during the in-depth phase.

**Please note**: If unexpected twists would occur in the meantime showing that the assignment described above is partly no longer useful, **it may happen** that we still have to **adjust the instructions in terms of content**. If this is the case, we will do this in consultation with the chosen candidate of this assignment.

- *Start Workshop*: At the **start of your assignment**, 'Stadslab2050' and your team will **visit the roof at Library Couwelaar** for a start workshop. We would like to bring all content experts from your team together here. In this way, we can brief everyone in detail and immediately search together for synergies between the three theme components.

- After this, you may propose an approach to bring this assignment to a satisfactory conclusion. You can work in a concentrated way or spread over time. You should make practical arrangements about this yourself with the contact person of the pilot project.

In the meantime, we expect **at least one workshop** in which you (with at least one representative of the pilot project) **report** the sounding board group on the progress and challenges that have been achieved. The sounding board group can provide both ideas and point out important context factors that the pilot project must take into account. You can invite other people for this moment that you find relevant. 'Stadslab2050' will block the agendas of the sounding board group on the basis of your process plan (preferably on a Friday morning) and will be happy to help with the organization of this workshop.

- *Knowledge dissemination*: In the spring (probably on Friday 14 June 2019), 'Stadslab2050' plans – just as [last year](#) - a knowledge afternoon for professionals and a more accessible version of this for owners and semi-professionals the same evening.

At this event we also count on your cooperation and contribution - details to be discussed. We also consider donating a few 'consultation-hours' to engaged roof owners (who are not selected from the

23 candidates for the planning phase, but who still intend to continue with their ambitious roof plans and would like to ask a question about this) - we collect the questions in advance.

**Budget:**

There is a maximum of 10,000.- euro budget for the expert assignment in-depth phase of the case Library Couwelaar – including your hours for 2 public lessons (including all costs and VAT) Optional extra: 3 ‘consultation-hours’ for other roof owners.

**We assess your offer on the basis of:**

- Relevant references on climate adaptation in an urban context, innovative roof projects, realizations (30 points)
- Vision, creativity (20 points)
- Intended output (for roof owner and for knowledge distribution ‘Stadslab2050’) (20 points)
- Process approach (proposed method) (10 points)
- Daily rate including all overheads and expenses (20 points)

Maximum: 100 points.

Are you interested in this assignment?

Send us your offer in **pdf format** until **March 18, 2019 at 11 o'clock** with the price **including VAT and all expenses** (incl. Travel, possible overnight stay).

Please include a **detail** with your quote.

Also include the following information in your offer:

- date;
- company and legal form;
- address;
- enterprise number;
- company contact.

Please note, the city of Antwerp does **not** work with advances and invoices are paid as standard 30 days after invoicing.

Do not hesitate to contact ‘Stadslab2050’ if you have any questions:

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\* = **Context**

**‘Stadslab2050’ climate-robust roofs**

The City of Antwerp supports experiments on climate-robust roofs and uses its [urban laboratory, Stadslab2050](#), to help realize **4 pilot projects**. Together with property owners and experts, Stadslab2050 wants to convert 4 pilot roofs into innovative, climate-robust roofs with an eye for biodiversity.

*What does this project mean by **climate-robust roofs**?*

Roofs where there is room for **rainwater management, heat control and biodiversity** like for example interesting combinations of solar panels and natural habitats, sun canopies that generate energy, water collection on the roof for watering, overgrown shadow elements and windbreaks.

The focus of the pilot projects is on the combination of climate-robust measures **with other roof functions** such as space for recreation, energy generation, nature or rainwater management.

### *Timing of the 'Stadslab2050' process:*

In the summer of 2018, candidates could apply to be selected as a 'lab project' with their roof project if they had the desire to establish at least 100m<sup>2</sup> of roof area in a climate-proof way.

During the selection procedure we asked their current plans, why they would like to upgrade these to climate-proof, to the support of their stakeholders and whether the roof has the potential to function as a demonstration roof in the future. The pilot project that you would work on, scored very well in all these areas and you can expect a pleasant cooperation.

### Process guidance by Stadslab2050: October 2018 - October 2019

**Vision phase** (vision formation, learning questions, recommendations for the follow-up): winter 2018 - see articles made in this phase with the candidates and vision architect [here](#) (NL).

**In-depth phase** (concretizing climate-robust plans with additional tailor-made expertise): February - end of September 2019 (**this assignment** is part of this phase). After your assignment, candidates can process your input in their plan and, if necessary, submit an building permission.

At the end of the planning phase, the candidates can submit their detailed plans for the implementation phase (no later than 15 October 2019) and have a chance of an **investment budget**.

### *Who is the **sound board group** and what does it do?*

The sounding board group consists of at least four experts in climate adaptation, rainwater management, spatial quality and biodiversity, of which at least one external expert. This sounding board group assesses the candidacies, draws up a ranking and **follows up** on the climate-robust roof experiments and the process guidance. In addition to experts from the city of Antwerp (team Director City Planning, Energy and Environment, Spatial Planning, Building Permits, we also have members from 'Aquafin' (the sewers and wastewater treatment company in Antwerp), 'Confederatie Bouw' (the Flemish Construction Confederation) and 'Vibe' (a non-profit organisation to promote bio-ecological building techniques).

### *What does the Process Guidance of 'Stadslab2050' mean?*

The process guidance offers advice and support to the selected candidates by 'Stadslab2050', the members of the sounding board group and other experts who participate in the design phase. Your assignment is seen as part of this process guidance.

### *Climate-robust roof vision and advice for Speelhuis Library Couwelaar (by Stramien January 2019 - fragment)*

#### **"Ecotheek De Couwelaar**

- A protected monument
- A library with a maximum range
- A park
- Lightweight constructions with a temporary character
- An invitation
- An educational project about ecological roof gardens of tomorrow
- A stepping stone
- ... an Ecotheek!

#### **Energy**

The limited permissible roof load requires the use of lightweight solar panel constructions in combination with water extraction of rainwater falling on the roof.

## **Use**

The limited permissible roof load invites the use of lightweight constructions.

The roof gets a platform ending in a terrace. Because the roof is accessible to small groups of people, paths are consciously dimensioned smaller. In order to be able to use the roof as a place to stay, there is a need for shade provision, shelter from rain and wind and easily movable furniture.

## **Nature**

To offer an (educational) experience year-round (in case of drought, through the different seasons) and to show the possibilities of roof gardens, the main roof is built up of three green modules, each with its own combination of substrate type substrate thickness - planting - water requirement:

module 1 'brown module': a fast and inexpensive ecologically extensive green roof based on from rubble

module 2 'ecological module': a green roof based on organic material and blowing seeds

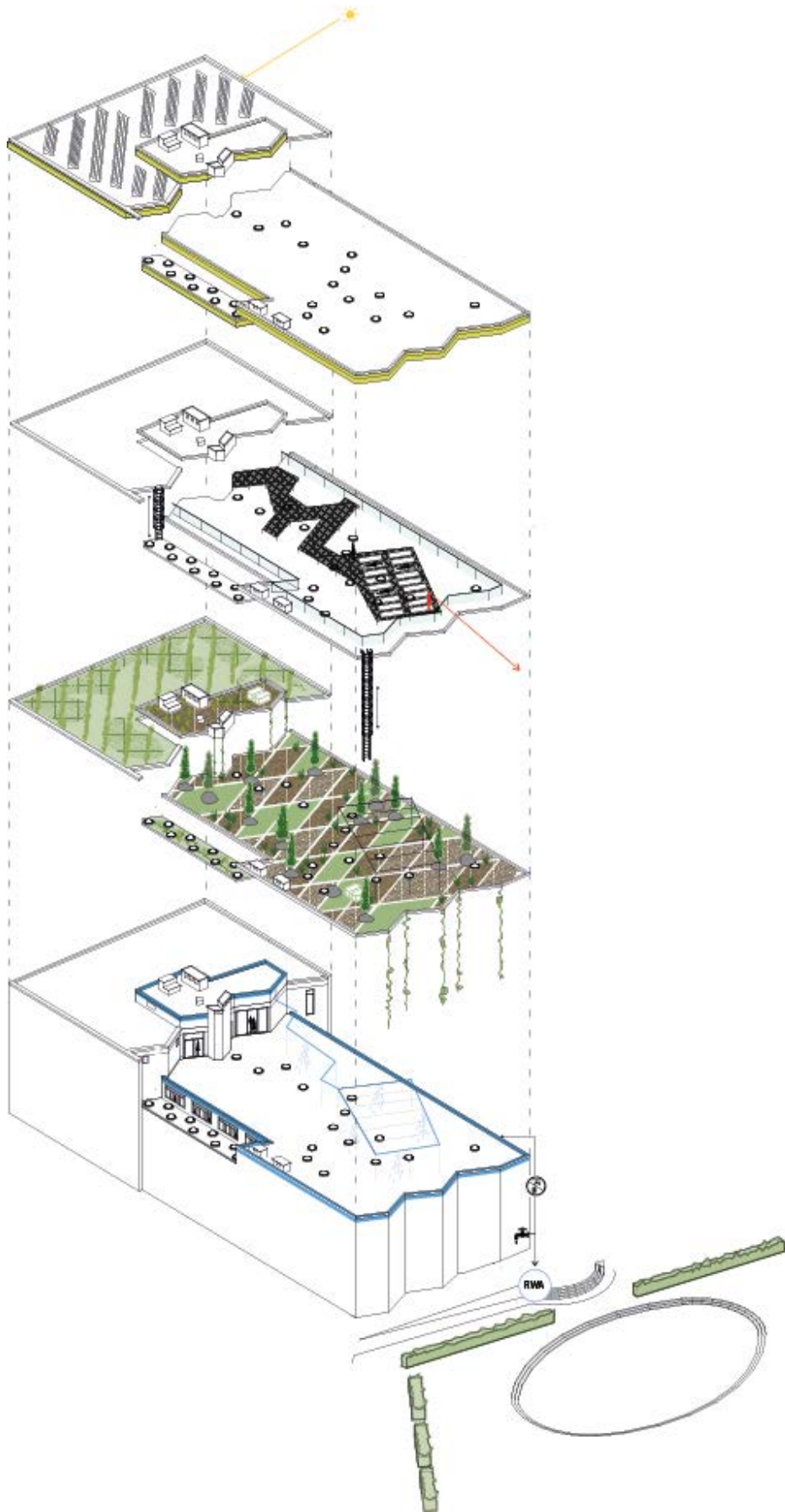
module 3 'park module': an intensive green roof following the park environment (incl. fruit trees)

## **Water**

Water, harvested on the two highest roofs, can be used gravity to irrigate the solitary planting of the main roof. "

**The complete vision report of Stramien architects** with situating, wishes of the owners, points of interest, potentials, the climate-robust roof vision with accompanying advice and further to do's for the in-depth phase can be downloaded [here](#) (NL - link works until March 14, 2019)

**Note:** Not all advices and to do's from the list of the vision report apply. Some have been taken up by the candidate himself or have been dropped by the candidate together with 'Stadslab2050'. Your assignment is described in **this** document and will finally be finished or fine-tuned on the basis of additional information that would occur in the meantime.



*Climate-robust roof vision for Library Couwelaar with aspects of energy, use, nature and water. (by Stramien architects 2019)*