

## **Quotation request - design "multifunctional planting for a compact, shared roof garden" for pilot project Tabaksvest - 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 Tabaksvest**, an association of three co-owners in the city center without outside space, who wants to develop the common roof into a compact, shared roof garden with multifunctional vegetation. (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?**

The roof of Tabaksvest 5 is situated in the middle of the city and is managed by an association of co-owners. The roof of this modernist building is typological for many roofs in cities: it has a beautiful view of the historic city and fantastic potential to exploit but it also has various challenges such as creating comfortable access, strict building rules regarding the use of the roof and the carrying capacity differs from roof zone to roof zone. The three owners dream of establishing a lush collective roof garden. Because the roof is limited in surface area, they want it to be as multifunctional as possible. The owners ask for help with the design of the green elements that preferably also have different functions (such as supplying food, shade, wind protection, etc.).

(More details at the end of this document.)

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

You feed the architect of Tabaksvest 5 in translating the roof vision\* into feasible detailed plans.

For this you develop detailed plans for the roof case Tabaksvest including:

- a "multifunctional planting plan" that is biodivers and offers various functions on the limited surface.

- a coherent solution that treats rainwater + roof structure (s) + planting (s) as a whole based on the principles of climate robustness \*. The solution must ensure that the plants are not only aesthetic but also provide food, shade and wind protection. You are looking for nature-based, low-cost and low-tech solutions for this.

Below the various assignments in detail:

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

1. providing the correct structure for the various (green) function (s)\*
2. create optimal growth conditions for the chosen planting schemes (retention capacity, acidity, composition and substrate thickness ...) (<-> C)

3. Providing technical options, detailing, materialization, cost estimation
4. Taking into account the structure and bearing capacity of the different roof zones.

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

1. find out what the water requirements are for the "multifunctional roof vegetation" elements for an ideal operation of the various functions (-> consequences for C and A)
2. Calculate supply and demand for rainwater recuperation: the necessary volumes (whether or not incl. watering the higher rising green in dry / hot periods) and calculate the "harvestable" volume of rainwater and bring these in balance
3. making the most of synergies: can enough water be kept on the roof and managed or is underground water collection also necessary?
4. design in detail the rainwater flows for the various user functions (green for protection, edible green,...).

**C: Planting scheme:**

1. contribute to a pleasant and intensive roof experience ("surrounded by greenery"), whereby various green functions are applied:
  - a. green for coolness and shade
  - b. green to look at (drought-resistant assortment that survives with rainwater that falls and can be retained),
  - c. green to hide away the view at the rear side
  - d. green as a lightweight fall protection,
  - e. green for gardening
2. biodiverse, drought-resistant plant assortment that makes it with available and retained rainwater, optimally adapted to the growing conditions of the chosen roof structure (-> interplay with A, B)
3. 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 Tabaksvest 5, but contains elements that are also inspiring for other which aim at a multifunctional and climate-robust roof garden on a limited surface. '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 Tabaksvest 5), 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 Tabaksvest 5** must have a clear and detailed plan about the following questions:

- What is the required structure for the various elements on this multifunctional roof?
- What is the composition of the water management system (collection, buffer, evaporation, reuse)?
- Which plants come where?

- What will it cost and who can do this all?

This way the owners of Tabaksvest 5 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 compact shared roof gardens in terms of vegetation?
- How do they work?
- What kind of roof garden functions are feasible for existing roofs with limited capacity (100kg/m<sup>2</sup> / 185kg/m<sup>2</sup>) and investment budget?
- Which solutions of the Case Tabaksvest 5 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 28 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 Tabaksvest 5 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), team Tabaksvest 5 and Stadslab2050 divided a lot of to-dos based on the vision document. For example, the Tabaksvest team is busy with a preliminary interview with the building permits unit of the city, 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, Tabaksvest and the sounding board group will meet up (29<sup>th</sup> 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 Tabaksvest** 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 8,000.- euro budget for the expert assignment in-depth phase of the case Tabaksvest 5 – including your hours for 2 public lessons (including all costs and VAT) and 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 28, 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 Tabaksvest (by Stramien January 2019 - fragment)*

##### **"A collectively used rooftop garden**

The roof garden owners of Tabaksvest want maximum use and enjoyment of the roof garden during the different seasons. Because of the limited surface area, maximum integration of functions should therefore be pursued, both for green areas and for the use space. The water requirement is met by

retaining water on the roof. The energy demand is limited; therefore no special measures are taken in this area.

### **Energy**

The roof must be insulated according to current standards. The energy demand on the roof is limited. Sustainable energy generation on this roof is therefore not further investigated.

### **Use**

The roof must be usable throughout the year. Use spaces tailored to the different seasons (shade provision, shelter against rain / cold ...). Because of the limited surface area, usage areas and consumer objects designed in such a way that they occupy a minimum area. They are multifunctional and circularly designed.

### **Nature**

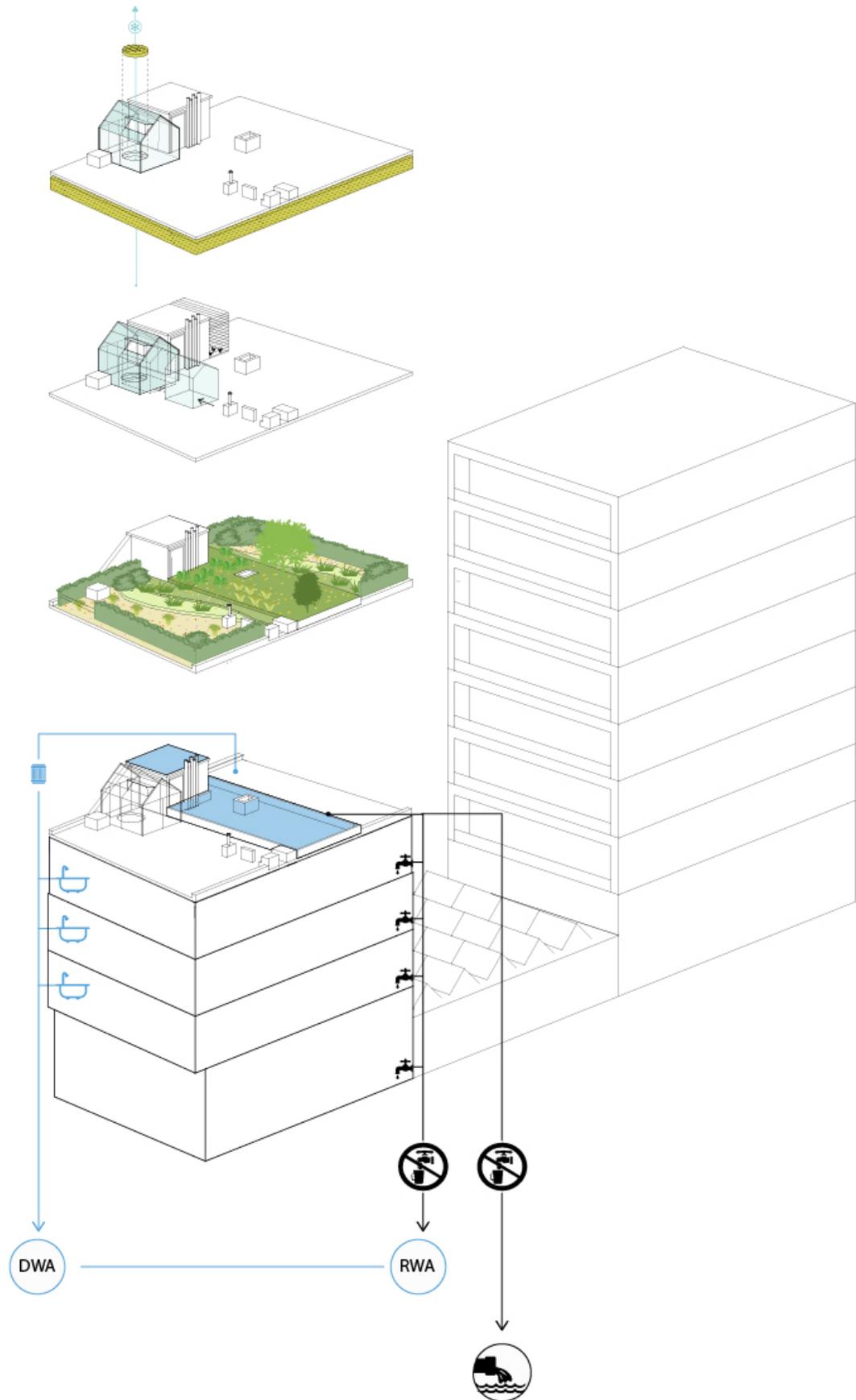
The planting applied is biodiverse and has several functions due to the limited surface. Plants are not only aesthetic, they are also food, provide shade, wind-protection, ... Permaculture is an ideal source of inspiration.

### **Water**

The garden has a certain water requirement. Therefore bet on water storage on the 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 Tabaksvest 5 with aspects of energy, use, nature and water. (by Stramien architects 2019)*