



Toit vert **CLARO** Green Roof



IMPLEMENTATION GUIDE



IMPLEMENTATION GUIDE

CLARO GREEN ROOF

The Clarence–Rockland (CLARO) green roof project was spread over several years, from the fall of 2008 to this date. Long coordination process, the CLARO green roof went through highs and lows. This document aims to make it easier for other groups wishing to embark on the establishment of a green roof.

CHOICE OF LOCATION

Let's start with the selection of the location of the green roof, a very important choice. In our case the choice was obvious by the visibility of the selected location. The roof being visible from the École secondaire catholique L'Escale and the Recreational and Cultural Complex of the City of Clarence–Rockland, the location was perfect for a green roof. Moreover, it was the only portion of the complex's roof that had the bearing capacity to support the additional weight. Since we wanted the green roof to have a concrete ecological impact and to serve as an educational tool, we wanted it to be observable by the greatest possible number of individuals. Consequently, the choice of the lower roof of the municipal library seemed the best choice.

Once you have selected potential sites, it is necessary to communicate with structural engineers or architects to evaluate the bearing capacity of the building. For our project, we contacted the architectural firm that built the complex. Given the relatively recent construction of the building, it was not difficult to get the contact information of the engineering team that worked on this construction. Also, since we were a nonprofit organization, engineers have generously volunteered their expertise to indicate us whether the structure was able to bear a green roof or not. It is also important to note that sometimes engineers work in companies specializing in green roofs. It is not always necessary to contact an engineering firm or architects because the building plans submitted to the engineer of the company specialized in green roofs can allow the latter to draw its own conclusions.

The findings of the engineers in regards to the bearing capacity of the building will influence the type of green roof systems. For example, as the location for our green roof could only support a maximum of 15 lbs/ft² we had to proceed with the

installation of an extensive green roof. Although it is possible to reinforce a structure, this proves to be very expensive once the building is built. Thus, it is highly advisable to choose a structure already able to accommodate a green roof or if not, to plan a reinforced structure during the construction stage. It is therefore important to seek the advice of engineers early in your green roof project in order to properly structure your project and not waste time with locations that cannot accommodate green roofs or the type of plantation you desire.

It is also important to take into account the accessibility of the roof for the installation, the maintenance and the usage. If you wish to install a vegetable roof garden or a roof terrace, it goes without saying that a difficult access roof is not recommended. A roof that is difficult to access can also increase the costs of installation or of the long-term maintenance. Also, the question of insurance is to consider when it is time to choose a location if you want the green roof to be accessible to the public. Finally, it is important to study the municipal or provincial regulations to ensure compliance with the provisions in place concerning the choice of location.

CHOICE OF PLANTS & MAINTENANCE

The next step is the selection of plants which is greatly influenced by the choice of location. When the time comes to choose plants, it is important to take into account the hardiness zone, the winds, the thickness of the soil, the irrigation and the shading, if applicable. It is often recommended to use plants acclimated to a colder hardiness zone than the region where the green roof is installed because, given the height of the roof and the winds to which the plants may be exposed, climatic conditions are more rigorous than on the ground. The thickness of the soil influences what can be planted. The thicker the growth substrate is, the broader the variety of plants that can be planted will be. For example, the structure of our roof allowed the installation of mounds in specific places. Thus, we could select larger plants than ground covers at these locations. You will need to determine if you plant only perennials since for the annual planting of annuals, you will need to reserve funds each year for them. However, even if you decide to exclusively plant perennials, also keep in reserve some money since it is still possible that some perennials will not survive the winter.

The question of watering is also important to consider for the plants' selection. Our pre-cultivated mats comprised of sedums require very little irrigation once well established as the sedums are very resistant to drought. In regards to the mounds, although they retain more water than the pre-cultivated mats because of the soil's thickness, irrigation is still a factor to consider. Consequently, it is important that the issue of the installation of an irrigation system is decided at the planning stage where the choice of plants is decided. There are several irrigation systems for green roofs and you will have to decide among a multitude of features such as a manual or automatic irrigation system.

With respect to maintenance, it is important that you choose your plants based on the funds and time you want to invest. The less the selected plants require maintenance and watering, the less your green roof will require long-term supervision. For example, a green roof composed exclusively of pre-cultivated sedum mats requires very little maintenance once established. It will only be necessary to weed occasionally to ensure that undesirable plants do not take roots and damage the roof sealing membrane, to water during drought, to apply fertilizer and to ensure that drains are not blocked. Thus, we see that the choice of plants is directly related to the time and amounts of money required. If you want to make the maintenance yourself, that does not necessarily pose a problem, however, if you do not have a long-term maintenance budget or plan to delegate the maintenance to a third party, this can become an important issue.

In regards to the choice of a third party to perform the maintenance, not all companies doing the installation of green roofs offer maintenance services. It is therefore very important that the maintenance aspect is studied during the green roof development stages. It is possible that the company performing the installation may do the maintenance, and if this is the case, take into account the travelling costs of the company. Not all regions have companies installing green roofs and travel costs can quickly increase the maintenance fees. If the installing company does not perform the maintenance, you may contact nurseries or companies specialized in landscaping in your area. Also, some schools specializing in horticulture or green infrastructure might be interested in doing the maintenance. It is important to ensure that the people doing

the maintenance have the required insurance to perform work at heights. There are regulations that govern the work at heights and it is important that the maintenance crews comply. Thus, do not underestimate this component when planning your project since finding a maintenance team represents a potential difficulty.

The plants' selection is therefore a step of great importance in the development of your green roof. It will influence the long-term maintenance of the green roof and the public perception of your project. Do not hesitate to consult nurseries and landscaping specialists who will guide you in choosing plants. Although it is an uncommon landscaping project, the horticultural knowledge of these specialists will help you make the right choices.

FUNDING & LOGISTICS

The installation of a green roof requires significant financial resources and imply many logistical elements. The first step in regards to funding is to develop a budget. It is important to evaluate all the costs associated with your project so that you can have an overall picture of the funds needed to complete it. It is often easy to forget elements, therefore developing a budget ensures that all costs are identified. It is advisable to get more than one quote for the work to be done as this reflects sound management principles to get a fair price for the work that will be undertaken and it also adds credibility to your approach.

The second step for the funding stage is to identify the sources. When you are at the stage of finding some funding, your project should be well defined. This facilitates the search for funding since the amounts required and the characteristics of the project are known. There is a significant amount of foundations and organizations that provide grants for environmental and community projects. It is therefore important to identify all of these organizations and to dissect the amounts that can be obtained, the conditions for obtaining funds, the evaluation criteria, etc. This allows to gain an overview of available funds and to assess whether it is possible to obtain sufficient funds to finance the project. If you are missing some information or would like to discuss your application, do not hesitate to contact the organization. The majority of the support staff of these organizations will be happy to guide you in this process. For

example, the evaluation criteria may be useful when writing your grant application, so if these are not available, contact the organization. It is also important to check if there are financial incentives from the different levels of government since there are sometimes programs that promote green initiatives.

Now that you have identified potential funding organizations, you will proceed to the third step, the grant applications writing. There are several resources to assist you with grant applications. For example, we got hold of a resource regarding funding applications from the Community Futures Development Corporation, an organization of our area, to help us in our efforts. Sometimes, a little bit of research is all that is required to find a document of great relevance. There are already individuals and organizations that have undertaken such projects and it is not necessary to reinvent the wheel. With respect to our advice on preparing grant applications, it is important to write applications that authentically reflect the project you want to implement. They must remain true to your vision. All aspects of your project must also fit well all together. For example, our project included workshops in schools of the region and the creation of a website to educate individuals to green roofs. Therefore, the awareness component was very well integrated to the green roof installation since the result was the outcome of several initiatives to educate people on this type of infrastructure, and to give a concrete example to the knowledge gained.

Furthermore, during the preparation of your grant applications, it is important to establish performance indicators that will be achievable and measurable. You need to identify performance indicators that will actually measure the level of success of your project. It is very important to keep in mind that your performance indicators need to be measurable and that if you get funded, you will need to provide data for the indicators that you have selected. For example, we wanted to measure the energy savings that would result from the installation of our green roof. However, we quickly realized that this would be extremely difficult, if not impossible, after communicating with the municipality and researchers in the field. So we decided to abandon this performance indicator.

Finally, in regards to funding, it is important to coordinate your grants application requests. Each organization has a different timetable as to the rounds of grant applications, and it is important to keep this in mind as for the submission of your requests concerning the project completion. Your project could be funded by an organization that requires a final report at a specific time. So you must make sure you have obtained all necessary funds in time, and that your project is completed so that you can produce the report by the requested date. Therefore, you will need to well coordinate the round of requests to avoid this type of situation. You must also remember that the deadlines arrive quickly and that it is required to submit several documents, so it is highly recommended not to wait until the last minute.

Concerning the issue of logistics, it is crucial to have a detailed plan of how the various aspects of your project will unfold. For example, we conducted awareness workshops in schools. Consequently, we practiced the presentation several times to find out approximately how many minutes we needed. This allowed us to define good timetables for the presentations and to provide an adequate buffer zone between each workshop. We also confirmed with each teacher the presentation time, tested the material in advance, etc. to minimize the risk of problems. The importance of having a detailed plan is to allow a smooth execution and to limit problems since a well-prepared logistics has alternative plans. Although the above examples are in relation to the awareness workshops, those tips are equally applicable to the installation of the green roof. In preparing for the worst, you ensure that the logistics will not be a problem.

PARTNERSHIPS

Partnerships can be an excellent path to explore in such projects. Given the many facets that such a project comprises, it is clear that a single individual or organization will not have all the skills and knowledge to maximize the results. Thus, this puts forward the need to build a team and partnerships based on the strengths and weaknesses of each. For example, in our project, Tucker House had a broad experience in awareness workshops and funding applications; the PEPO Institute for artisan agriculture inc. had a great expertise at the horticultural level and also with funding applications, etc. Their expertise was very important to enhance the quality level of our

project. There is an amazing number of organizations and individuals working in the communities and their skills are valuable assets that can benefit your project.

It is also important to consider the legal status of your partners. Sometimes, organizations require either a nonprofit organization or even a registered charity to submit a grant application. So you need to work with organizations possessing these legal statuses in order to submit your application. Resources and money invested in the project will potentially be important, therefore it is wise to conclude a collaboration agreement so that everyone has a clearly defined role.

Finally, use the available resources and partnership opportunities in order to limit costs. When we were conducting our community awareness workshops, we used school premises in order to minimize costs. Also, we filmed the installation of the green roof to create a time-lapse video of the installation. To do this, we borrowed camcorders from a school in the area. Although these examples seem simple, they can not only reduce costs but also root the project in the community and increase community reach.

AWARENESS WORKSHOPS

Awareness workshops are a great way to change mentalities and to educate the population about the benefits of green roofs. They can be a great complement to the installation of your green roof. To successfully conduct awareness workshops, you need to establish a quality educational content. In our case, we developed two presentations; a short version of about twenty minutes and a longer version of about forty-five minutes. Both workshops included a large amount of information on green roofs, disseminated adequately to facilitate its assimilation and several videos and pictures of concrete examples. This combination of different elements has enabled awareness workshops to be successful with different target groups. In addition to these elements, we used the components of a green roof to demonstrate the construction of a miniature green roof. This allowed the public to touch the membranes and to understand their installation process.

Despite high-quality presentations, the publicity aspect must not be overlooked. Promoting your awareness workshops is crucial to ensure success. Thus, use the local media, spread your message to community organizations, write notes destined to parents in schools, display promotional posters on boards in various businesses, advertise in church bulletins, etc. The energy invested in advertising your workshops will only enhance the success of these and will further anchor your project in the community by increasing its visibility. Finally, as previously stated in the partnership section, do not hesitate to use the school and community facilities to limit the costs of your awareness workshops. Schools are a great way to reduce your rooms' rental costs for presentations.

FINAL FEEDBACK

The installation of a green roof can be a long-term project and is not an initiative to be undertaken lightly. Although you will potentially face several challenges during your project, take advantage of the many pre-existing resources. The Canada Mortgage and Housing Corporation has excellent documentation on green roofs and it is strongly recommended to take a look at it prior to your preparation. There are also many other organizations working in the field, such as Green Roof for Healthy Cities or even educational institutions providing courses on these types of green infrastructure. We can think of the Algonquin College in the Ottawa-Gatineau region. To help you in your project, take a look at those resources and contact those organizations.

In conclusion, it was a pleasure for us to share the expertise that we have gained in this project and we hope that these tips will be useful. We wish you great success in your green roof project and congratulate you on your initiative that will have a lasting positive impact on the environment!