



## **THE PILESTREDET PARK URBAN ECOLOGY PROJECT OSLO, NORWAY**

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**Presented by:**

Ann Elin Bratset, Director, Planning Division, Statsbygg (The Norwegian Directorate of Public Construction and Property),

Terje Tollefsen, Project Head, Pilestredet Park Urban Ecology Project, Statsbygg,

**Chris Butters (paper editor)**, NABU – Norwegian Architects for Sustainable Development.

**Outline:**

This paper presents a large urban renewal program in the heart of Oslo city, where state and municipality are cooperating to create a pilot urban ecology project with ambitious environmental goals. The paper underlines the importance of the processes of change which lead towards more sustainable development in building and planning, including the need for new knowledge, attitudes, methods and organisational structures. The importance of cross-disciplinary work is highlighted. The paper focuses in particular on the planning of the outdoor spaces, which aims to create a diverse and ecologically healthy urban landscape where developers, residents, and future services structures and maintenance staff all contribute to achieving and then maintaining high environmental standards. The paper is divided into the following sections:

1. The background: government policies and initiatives for sustainable building
2. The project: major urban renewal in the centre of Oslo
3. The program: Statsbygg's Urban Ecology Program
4. The processes: background studies, research, partnerships
5. The challenges: attitudes, methods, technologies, life cycle planning
6. The public outdoor spaces
7. Other concrete examples: CO2 evaluations; recycling materials; the "MOP".
8. Conclusion: steps on the way



Pilestredet Park

# **THE PILESTREDET PARK URBAN ECOLOGY PROJECT, OSLO, NORWAY**

## **1. THE BACKGROUND**

Although the Brundtland Report has a Norwegian birth certificate, Norway has been behind other northern European countries in introducing renewable energies and sustainable building methods. The level of awareness, and urgency, has been rather low, partly due to an abundance of unspoilt nature, and partly to the abundance of very cheap hydropower as well as oil. And perhaps a general conservatism. However, during the last few years this has been changing quite rapidly. Government legislation, Local Agenda 21 initiatives, and other indices, as well as developments within the building industry itself, all show that things are starting to move fast.

Four ministries are participating in a "Green Government" project, which covers a range of aspects from environmentally friendly office equipment to major policy decisions. Statsbygg is a part of this. Statsbygg is the Directorate of Public Construction and Property, which means it is the authority in charge of most public buildings, totalling 3 million square metres, including both rental and owned property. It is thus also one of the largest commissioners of new construction in Norway. As such, what Statsbygg does in the field of sustainable planning and building can have a very significant influence on the Norwegian construction sector as a whole.

This signal effect is one of the stated aims of the government; the policy states that Statsbygg is to take a lead in this field.

However, most governments these days talk a lot about sustainability, and in some cases it is not – at least not yet – much more than fine words. Statsbygg's task is to develop ways of translating these intentions into practical policies, methods and projects.

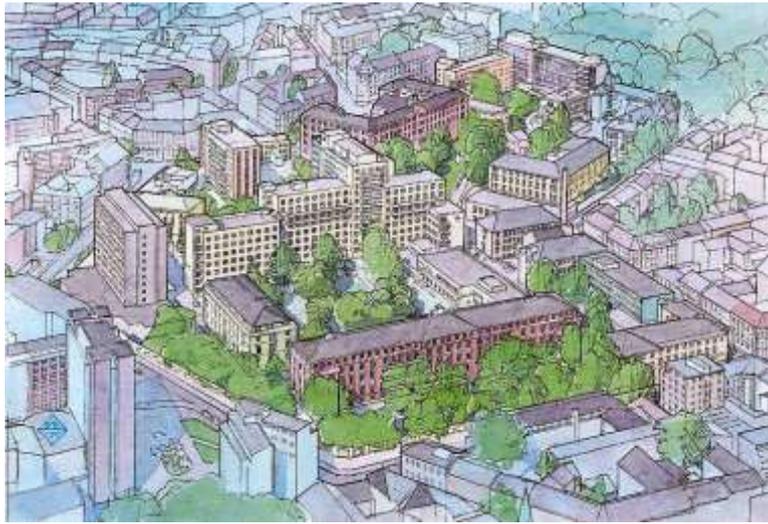
## **2. THE PROJECT**

The construction of a very large new national hospital complex on the outskirts of Oslo has just been completed. This means that the old hospital, in the heart of the city, is being vacated, and the Pilestredet Park project covers the total renewal of this area. It is a large urban area, covering 7 hectares, and it is a very complex one too, with all the old hospital buildings which were built there over the last hundred or so years, in many different styles, with different construction methods, a large range of technical infrastructures, and in various degrees of quality or decay.

The buildings comprise over 110,000 square metres of floor space today. Approximately half of this is to be demolished, and there will be about 85,000 sq.m of new construction plus about 50,000 of renovation of existing buildings. Of this, about 60% is to be housing, the rest offices and commercial premises of various sorts. The outdoor areas are to be landscaped as public spaces.

It was decided in 1997 to make this into a pilot project for urban ecology, in a collaborative project where Statsbygg and the municipality of Oslo are the main actors. However, there are at the same time strict market conditions attached. Statsbygg itself will build some of the areas, but most are to be sold to developers, and the environmental targets therefore have to be accepted by those developers. At the start, no-one really knew how this was going to be done or how it would work out.

## Old situation



- New situation



A project team was set up within Statsbygg. However, it is of course a large organisation and naturally it is not an easy task to change it. For the intent of this project is, ultimately, to influence the way all of Statsbygg operates, so that it achieves a genuine, well-grounded environmental profile. In this, there is firm backing right up to the very top of the organisation. Many people have noted that implementation of environmental policies is dependent on such moves being well anchored at the very top levels.

A large public organisation also tends to be rather careful, since mistakes are politically accountable, and there is bound to be resistance against trying out new, ecological ideas which are seen as risky. One has to be pragmatic, but, taking that into consideration, it is our feeling that a lot of progress has been made and it is very satisfying work to be involved in.

### 3. THE URBAN ECOLOGY PROGRAM

To begin with, it was necessary to create a clear picture of the ambitions and goals. What is urban ecology, what is sustainable planning, what is environmental architecture? Of course there are different views about these subjects. The first task was to define goals, to delineate the main areas of attention, and to look at what sorts of concrete targets could be established in each area.

The first question most people want to know, is just how experimental or futuristic the ecology targets are. As stated, the Pilestredet Park project is quite strongly bound by market forces, however alternative solutions are firmly encouraged wherever the economic costs are not a lot higher than conventional solutions. What helps, is the fact that the major construction companies are all looking seriously at environmental building now, since they see that it is where the future lies. So they are in some cases just as keen as we are to "think new" and to take a lead.

The initial steps were to set up expert groups, with resource people from different fields, to discuss and define the main ecology criteria. Which implied, not least, a training for many of Statsbygg's own staff – and that, again, was essential, because within one's own organisation an open discussion and a common understanding must be built up, if it is to work.

On the basis of these preliminary studies, the Urban Ecology Program was formulated. It covers seven main areas:

- Urban environmental qualities, including public green spaces, reduction of traffic, noise etc,
- Infrastructures favouring public transport and pedestrians, district heating, waste separation,
- Selective demolition including sorting, recycling and minimum transport of wastes,
- Maximum re-use of existing buildings, including specific projects with re-used materials,
- Integrated design of the outdoor areas as an urban ecology park,
- Environmental architecture including energy design, healthy materials, climate controls etc.,
- Energy conservation throughout, including renewable energy and strict consumption limits.

The outline of the program as a whole is attached as an annex. Having thus far outlined the background, the existing situation, and the intentions and goals of the project, the following sections will describe some of the processes, challenges and concrete steps being taken.

#### **4. THE PROCESSES**

To start with, we might mention one of the potential future criticisms our Pilestredet Park faces. As architect-planners, we understand it only too well. It is going to be: where are the super ecological buildings? Where is the exciting, high quality urbanistic space?

To take an example: right in the middle of the old hospital complex is a ten-storey concrete monster, which is the old surgical block. Most planners would have preferred to demolish it, since that would have opened up the whole urban space in another way. It is not a beautiful building either. But it is more resource effective to reuse buildings than to demolish them, and this one had considerable value and potential. Statsbygg analysed it very carefully. And of course it is a question of money. So it is going to be renovated, as apartments. It's not an ideal decision, and architects are not going to give us any prizes. But it is, we believe, the right solution.

In a complex urban renewal project, in other words, one is not going to have the freedom to create ideal solutions – neither on the level of the planning, or the architecture. For ecology is about remodelling an unsustainable world, a world which is very far from perfect, and making the best use (or re-use) of what we have. So one should not expect the physical result to be anywhere near ideal.

And this is where we have to keep in mind that ecology and sustainability ARE about processes, at least as much as they are about products. We have to ask "how", as much as "what". How do we handle the water cycle? The water in Pilestredet may run in the same sort of pipes, but it is to be infiltrated in vegetal roofs first to reduce the storm drainage, retained in tanks to water the gardens, and used as a sculptural element throughout the landscaping plan. New walls may still be

made of bricks or wood, but it is a question of how we harvest the wood, how we treat it, how we can recycle it. A park may still be made of trees, plants and pathways, but here the pathways are to be made of recycled building materials from the old hospital, the plants chosen for their ecological qualities, and the whole place is to be maintained with energy-effective and biological methods.

Thus many of the environmental innovations - this applies to all ecological projects - are not immediately visible. One does not really see when a new building consumes half as much energy as an old one, or how it is supplied by energy from district heating. One doesn't see a building process organised in cooperation between different specialists, or how every step in the process has been subject to new environmental checks and controls. One doesn't see how staff at Statsbygg itself have had to rework their skills, remake decision processes, and rethink their whole design approach in terms of sustainability.

During the course of this project Statsbygg is bringing in many consulting firms covering different disciplines. This leads to a general development of professional skills in the environmental field. This is a deliberate intention of the project. It has also highlighted the considerable lack of environmental skills, not least amongst today's architects. In some cases, such as in connection with selective demolition, foreign expertise had to be called on.

Those are the general issues concerned with processes. On the specific level, the project has already involved a large number of background studies and research reports, which are useful for others. Plus innovative partnership agreements such as between the developers and the municipality. This kind of cooperation is a key to implementing ecological projects, both in the planning phase, and not least as regards future organisation and maintenance.

## **5. THE CHALLENGES**

### **ATTITUDES**

Ecology requires wholistic thinking and, more than that, it requires a wholistic knowledge base. The different specialist disciplines need this in order to be able to integrate their work. This is the only way to create win-win solutions, not least economically speaking. Ecology also requires a longer term view of planning, which again has the important economic implication that life cycle costing has to be made possible, and prevalent, in the building sector. Awareness about this is developing within official Norwegian circles.

Picture: Jiri Havran



Picture: Jiri Havran



Picture: Jiri Havran

It is not an easy task to change the specialist mentality and compartmentalised division of work in large organisations like Statsbygg, and the biggest challenge of all perhaps is to start off by creating a positive frame of mind and an openness. Without those, nothing is going to happen. Until a few years ago, this would have been far more difficult, because environmental thinking was seen as something freaky and irrelevant. It seems now that there is a tide, which is flowing the right way. Rio, Kyoto, Habitat, climate agreements and many other forces have now combined to bring today's ecological imperative to the fore. So it is easier to change the attitudes than it was - although there is still a lot of resistance. What one also has to be careful of, is environment and sustainability becoming a fashion, these days, so it may become superficial and commercial.

## METHODS

Environmental projects require new methods for planning and design, as well as for implementation and evaluation. Energy and life cycle analyses, environmental profiles and so on are being developed internationally, however many of the existing systems are still too complicated to be really useful in practice. Similarly, in Norway we have developed methods for clean construction site management, environmental checks and evaluations, and these are playing an important part especially in relation to contractors and the building industry. As far as evaluation goes, the Pilestredet Park project is also involved in developing new methods, but as things stand today there is a need for much more evaluation of ecological buildings. What evaluation there is, focuses often only on a few easily quantifiable parameters such as energy and water use. Because it is usually designed by technical people! We have to develop evaluations which look at projects in more wholistic and qualitative ways.

A particular methodological issue which has come up, is that of architecture competitions for ecology projects. In this respect, one could say that Pilestredet has illuminated a problem, rather than finding any answers as yet, but that is also a kind of a contribution. Very briefly: if ecology is to be highlighted, the competition program needs to be specified differently, the priorities must be made clearer, and the jury must be environmentally qualified, therefore multidisciplinary. It may also be more appropriate to have a concept type competition, rather than a sketch design. And conventional presentation is not appropriate; one also needs to rethink what kinds of drawings and descriptions are required in order to illustrate ecological issues.

## TECHNOLOGIES

A third challenge is that of the technologies. Naturally, there is a lot to be done here, but it can be argued that technology is the least of the challenges. There are alternative solutions available today, many of which are quite well tried out and not much more expensive either. This applies to renewable energy and energy conservation technologies, to healthy building materials, to waste water treatment and other systems. Not to mention alternative transport solutions!

The greater part of the technology challenge lies in the fact that most architects, engineers and builders have little knowledge of or experience with environmental alternatives in construction. In a way the biggest single contribution clients such as Statsbygg can make, lies in actually getting projects built which will show these alternatives and spread them.

## LIFE CYCLE PLANNING

A final challenge is that of life cycle thinking, that is, what happens in Pilestredet after it's built. It has already been noted how important it is to integrate this life cycle thinking into the financial system, and that developers must be obliged to plan with a view to the interests of the future users. This includes for example energy use, water, waste handling and outdoor maintenance.

Secondly, it is imperative to set up a form of obligatory, common organisation which brings together all future owners, so that their interests will coincide and so that none may be able to degrade or neglect the environmental qualities of the area. There must be cooperative and user-friendly organisational structures for maintenance.

Thirdly, a project which is to be maintained ecologically using a minimum of resources, needs to be designed with that in mind. In other words, it calls for a different kind of design.

Setting specific targets such as for energy and water use is one aspect of life cycle thinking, another is making bioclimatic surveys obligatory. Information strategies, including for example maintenance manuals for buildings like one has for cars, are also important tools in ecological projects.

Participation is a central theme of sustainability. However in this particular project the possibilities have been limited. In Pilestredet Park, there is little user participation since apartments are to be built mainly by private developers, but the future owners and users will all have a role to play within an association which is, together with Oslo city, responsible for management and maintenance of the whole area in the future. Both conventional buildings and outdoor areas often require large quantities of machinery, energy and chemicals to maintain them. When the future users come together with the developers, early on in the project process, it is much easier to find a common interest in environmentally clean solutions.

## **6. THE PUBLIC OUTDOOR SPACES**

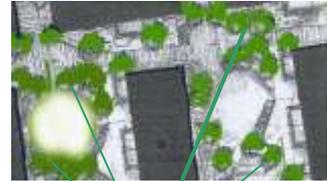
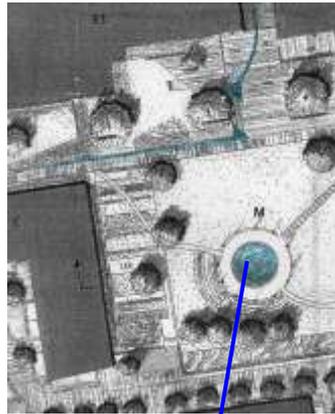
In Pilestredet Park, all the outdoor spaces are being planned as an integrated landscaping project, applying ecological principles. Most of this will become public space. However, it is important to create a variety in the spaces, from fully public areas to semiprivate courts in the residential areas, and small private garden areas too for some of the ground floor apartments. This plan is being prepared by a multidisciplinary team, with architects, infrastructure engineers, waste managers, and other stakeholders participating in the design process with the landscape architects.

In our case, it has been interesting to see even the city Parks Board becoming actively involved in the actual project design. This is a signal of something new and significant. Very sensible, too, because they are amongst those who are going to have to look after it all for the next fifty years.

The landscaping project aims to re-use old building materials - stones, timber, bricks and so on - in imaginative ways in pathways, paving, seating, walls, outdoor pergolas and furniture. In this way the history of the area will live on in the new landscape. Water is to become another central feature of the outdoor areas, its cycle being expressed clearly and its qualities being used, again, in an imaginative way as a positive resource. Some of the rainwater is to be stored for watering the outdoor areas.

Energy cycles are also to be made visible, and elements of the outdoor constructions are designed so that children and others can use them actively – water, colours, textures and sounds providing a kind of rich "biodiversity" on the human and social level. Similarly, vegetation is to be as varied and indigenous as possible, and with a focus on natural growth rather than formal-type gardens. One area is thought of as a "wilderness", other area will have useful shrubs and trees and there will be some allotments for gardening.

It is also hoped to create a small "urban farmyard", where children especially can have daily contact with animals. This might usefully be combined with a future maintenance and information centre for the residents. There are several such ecological projects in existence, including one in Kampen in Oslo, and they appear to be a great success.



Existing trees and vegetation have been evaluated carefully, and both the vegetation and the soil generally are to be very strictly safeguarded during all the coming construction stages.

Waste separation and composting are to be integrated into all parts of the project. Local infiltration of rainwater, and systems for local biological treatment of grey water, have been analysed in depth. Due to ground conditions, however, the options are limited. In some urban ecology projects, one can also note that biological water treatment systems and so on occupy large areas, and in a dense urban situation where one has such limited outdoor space, this does not seem to be appropriate.

Within the park areas themselves, there is to be almost no vehicle traffic. But there is underground parking. In an ecological perspective, it is highly desirable to reduce the amount of car parking provided, however at present this unfortunately still is not politically acceptable. In this regard, we hope that more progressive ideas for reducing private cars, in ecological projects in countries like Holland and Germany, will spread to Norway.

Bioclimatology should be an important field in urban planning. Statsbygg commissioned a series of climatic studies which led to detailed recommendations as to the placing of buildings, paths and vegetation. Normally such studies, if done at all, might be used as a guideline but not really taken into account very much at all, the real choices being made on the more conventional basis of urbanistic principles, traffic circulation, economics. Here however the project has also broken new ground, in that the bioclimatic recommendations have been made into the obligatory basis for all further planning in Pilestredet Park.

## **7. FURTHER EXAMPLES**

### **CO2**

A large number of background studies and reports have been made during the initial two years of the project. One of these involved testing different development scenarios in terms of their CO2 impact. Statsbygg tested two alternative mixes for the buildings, one with a high proportion of office space, the other with a high proportion of residential; and two alternative locations, comparing a development in the city centre to the same development if it were placed on the outskirts of Oslo. The energy and transport implications were then studied. To simplify, what this showed very clearly were for example the very large added transport emissions associated with the outskirts alternative, compared to the city centre, as well as a quite different mix of transport and energy carriers in the two cases. The importance of this study is not just the result itself for this particular project, but equally that it is the first example of CO2 analysis being done for a large project in Norway. CO2 emission studies are of course limited, but useful not least because they make international comparisons possible. They are being done in many places now. So this project has contributed to establishing both a methodology and a practice in Norway.

### **MATERIALS RECYCLING**

Research studies have been carried out investigating the technical and economic feasibility of recycling various materials. In particular concrete, brick, stone and timber components. This also involved developing systems for analysing the materials in existing old buildings. A catalogue of the materials in every single building has been made. Without going into details, here again Statsbygg has contributed to developing new, ecology-related methodologies and skills. Naturally, the first step involves finding out what has been done in other countries, so these projects help to establish networks and bring experience to Norway. Since they involve some of the most important Norwegian research institutions, we contribute to developing their capacity.

New ecological solutions always imply a certain risk, or at least nervousness on the part of those responsible. These studies provided Statsbygg with sufficient confidence to go ahead and stipulate detailed requirements which then become part of the builders contracts – for example that 90% of demolition materials by weight shall be recycled or reused, and that all the new buildings shall have at least 25% by weight of recycled materials. As well as strict guidelines for handling and removing materials which are health hazards. The client can pose these conditions because the studies showed which ones are realistic and feasible.

Similarly, it will be obligatory for builders to provide full environmental certification of the five major materials in all new construction. The general principle again deserves to be highlighted; it is a question of how far one can reasonably push reality towards the ideal ecological solution. At any given time and place.

Now that the costs of dumping solid waste have been raised, these studies have helped to cause a very major change in the construction industry within only 3-4 years. It can now be shown to be profitable for builders to recycle nearly all materials instead of transporting them to the dumps, as well as to reduce their own construction wastes (offcuts, packaging and so on). Recycling, re-use and cleaner construction sites are therefore fast becoming the rule rather than the exception. This is one of several areas where the Statsbygg project has not done something alone but has been a major contributor in the process towards more sustainable construction practice.

#### THE MOP

As a last example, we need to explain what on earth a "MOP" is. In English, a mop is something one uses to make things clean, so there is a sort of connection! The expression MOP stands for "Miljøoppfølgingsprogram", which literally translated is an "environmental following-up program".

We all have planning and building codes, but these only define minimum standards required for building insulation, water use, noise levels and so on. And we have various bits of environmental legislation which again, only lay down minimum requirements for pollution control, waste management, health and safety, or user information. None of these are much help when one wishes to implement a project with a stronger, innovative ecological profile. And for a project of this scale, unless one has millions in special project grants, what is the alternative?

The MOP is an obligatory agreement which is part of the contract of sale to the developers. For those parts which Statsbygg itself is going to build, it will be binding too. It defines, firstly, a considerably higher level of ecological ambition, and secondly, it stipulates procedures to be followed throughout the process which ensure good environmental planning and implementation.

The MOP, therefore, is the concrete tool for stipulating energy and environmental targets, clean construction processes, and quality control. It also stipulates sanctions and fines. It is a binding contract with developers. The important principle we should observe here, is that it is thus a type of legal agreement which operates on the level of civil law, not public regulation. This may be more effective than conventional public tools such as area plans and building codes.

It goes without saying that such a program can only be based on a certain consensus between Statsbygg – representing here the environmental ambitions of the state – and the marketplace. When the terms and conditions of the MOP were drawn up, and the first properties put out for sale, there was a lot of worry about whether property developers would object, or simply that the bids received would be very low. In that case there would have been real trouble. But as mentioned, many of the big property companies are themselves actively interested in developing their environmental skills and market profile these days. It came, then, as a surprise, and a big relief, that not one of them raised objections, and high sale prices were obtained.

Some people are saying that perhaps Statsbygg was too cautious and could have imposed even stronger environmental conditions. That is something to think about next time. However, it must be added that there are two important factors in this project's favour; the one being that the economy is doing fine in Norway at present with high prices for apartments, the other is that these are very attractive, central urban properties.

## 8. CONCLUSION: STEPS ON THE WAY

To return to the project title itself: what is urban ecology? The term itself is controversial, but most would agree on certain basic characteristics. The goal of sustainability in our urban environments is to make them more resource-effective, less polluting, less space consuming, less burdening on their hinterland and ecosystems around them; as well as more quiet, pleasant and community-strengthening environments for people. We must in other words consider both the material, resource-related aspects, and the human, cultural aspects of environment and sustainability.

There are other projects like this around Europe, including several in Scandinavia, though only a few on this scale. Some of them have come further in application of environmental solutions. But it is fair to stress the processes involved, how each country must work on its own level.

The outdoor landscaping project, in particular, is the difficult one where all considerations have to be brought together – from the infrastructures under the ground to the public paths to the individual buildings – and then resolved together. There are, naturally, many grey areas here and many borderline situations where a cooperative effort will be imperative.

Finally: in the catchphrase "sustainable development", both of those words imply time, change, processes. Pilestredet Park should be understood as much in terms of a series of attitude-changing, method-evolving steps, as in terms of what it will become in concrete form. On the concrete level, the aim is quite a high ecological profile, with at least some pioneering construction, and an pioneering landscaped urban environment. Of course, the concrete and visible results are what most people will judge the project on.

Naturally, this kind of work involves a lot of compromises as well as successes. Sustainable development is a hard learning curve. The products and the processes of Pilestredet Park are equally interesting, and equally important.

Drawing: Bjørbekk & Lindheim AS

