

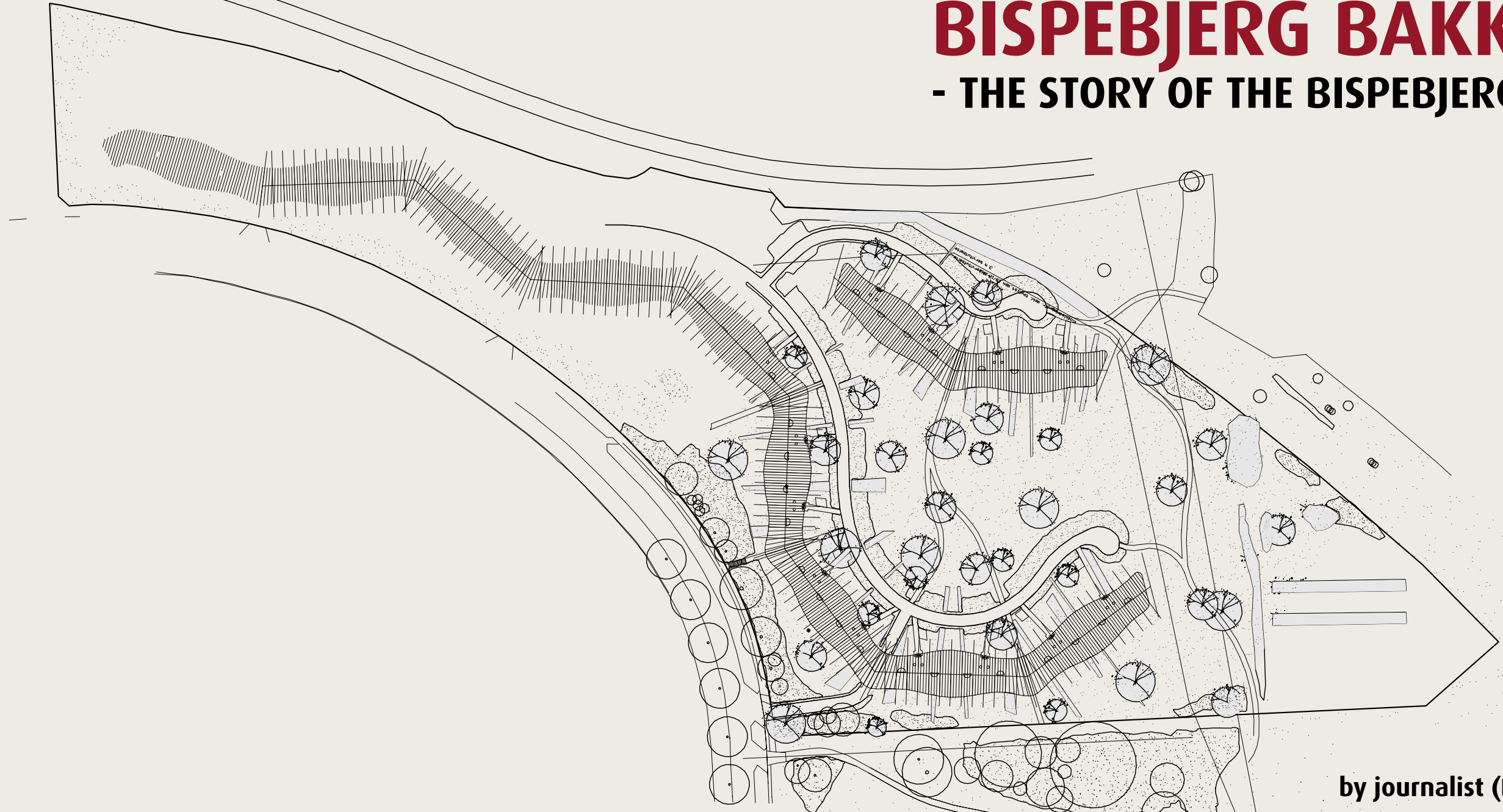


# **BISPEBJERG BAKKE**

**- THE STORY OF THE BISPEBJERG SNAKE**

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by journalist (DJ) Signe Kierkegaard Cain

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## Foreword

"An imaginative, beautiful and ground-breaking residential building with obvious references to southern European Art Nouveau, but interpreted in a contemporary fashion that deeply roots the building in the community".

With these words, Bispebjerg Bakke received an honorary award from the Society for the Embellishment of the Capital (Foreningen til Hovedstadens Forskønnelse) in December 2006. With the award and the moving in of the first residents, a dignified and appreciative end was put to the creation of a unique residential building; a building that was initiated back in 1997, when Bjørn Nørgaard, the sculptor, and the Chairman of The Copenhagen Association of Crafts, Klaus Bonde Larsen, had their first informal talk about dreams, visions and wishes for a different kind of residential building. Today – nine years later – the building is complete. Like a snake with its head held high, Bispebjerg Bakke

winds its way through the Northwest neighbourhood of Copenhagen – on a natural site that combines rural peacefulness and the vibrant pulse of the city.

Slim columns in red and yellow bricks, balconies in shining ceramic glaze and a beautiful copper roof that wriggles and winds through the landscape. This is the sight – created by handpicked materials and superb craftsmanship – that meets residents and visitors at Bispebjerg Bakke. And it is in these materials and the skilful use of them that a large part of the Bispebjerg Bakke vision is to be found. The vision of a building that both exemplifies craftsmanship and is a work of art. Realea, who together with The Copenhagen Association of Crafts is behind the building, wishes with this book to give an insight into a long and complex process of creation. A process that stretches from the first diffuse vision to the completed building; a process in which hopes have been challenged, and throughout which

the artist, the architects and the building owners have had to re-evaluate parts of the vision.

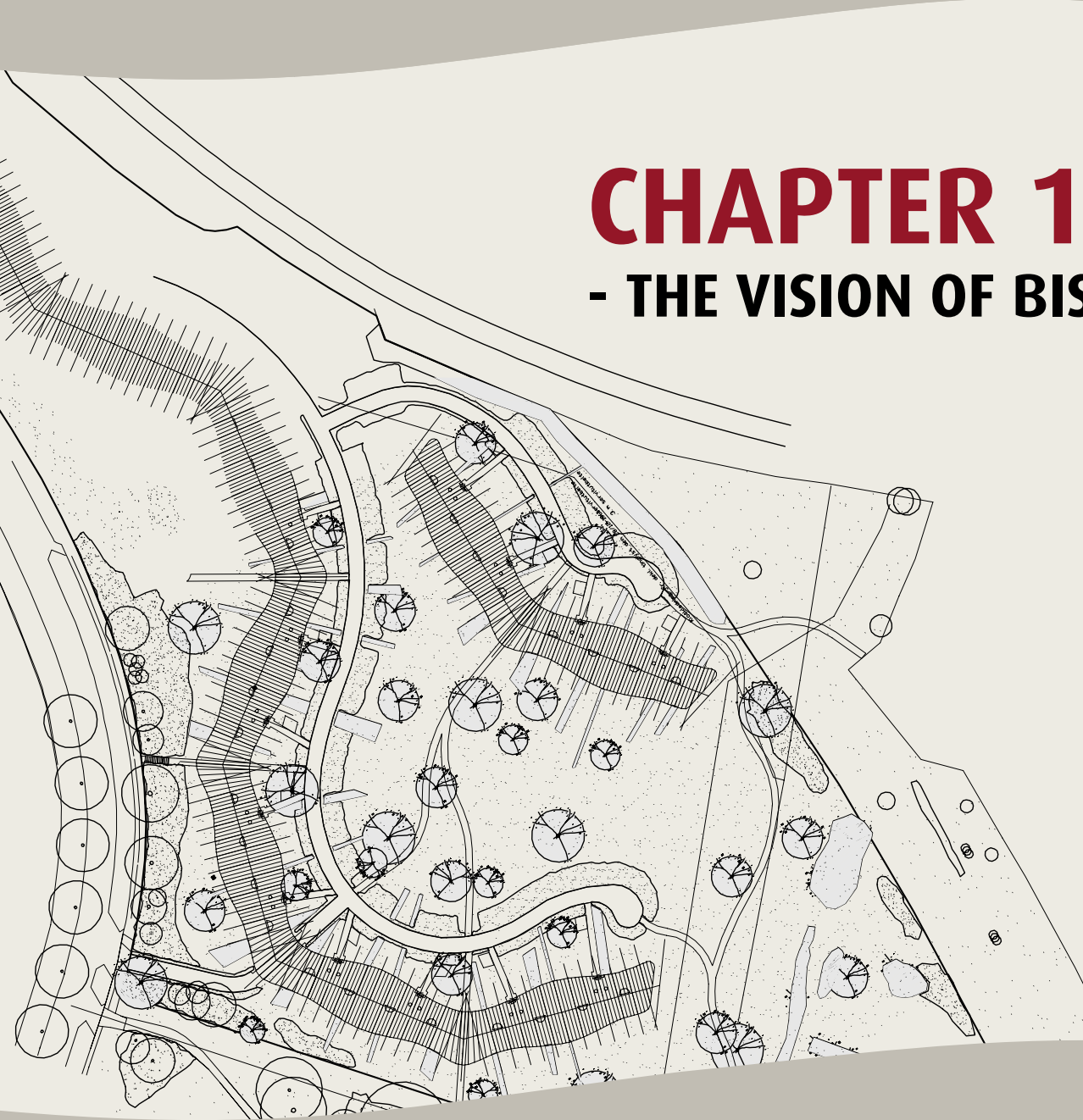
First and foremost, though, this has been a process that has encouraged innovation and sharpened the strong collaboration between the building owners, the originators of the project and those who carried out the vision. New digital solutions have found their way out of the computer, architects have stepped into the sculptural universe of art, and craftsmen have been challenged by snaking copper surfaces, curving walls and crooked angles. The snake lies there now. Now, the fine craftsmanship, the handpicked materials and the rounded shapes have to prove their worth as a setting for the everyday life of future generations. But nothing comes into existence by itself. And were it not for the persistent effort and insistent belief in the vision and the project from all of the many, many people who have been involved along the way, Bispebjerg Bakke

would never have been carried out. A warm thanks to EVERYONE involved, and not least the people who pass on their hopes, ideas and solutions in this book. Hereby they help to keep the story of the creation of Bispebjerg Bakke alive.

Realea  
March 2007.

# CHAPTER 1

## - THE VISION OF BISPEBJERG BAKKE



## The Vision of Bispebjerg Bakke

**"Let's build a house that industry can't make".**

Bjørn Nørgaard

They wanted it to be the work of both artist and craftsman. A building emphasizing aesthetics and built with the traditional methods of craftsmen. In 1997, the chairman of The Copenhagen Association of Crafts, Klaus Bonde Larsen, was a member of the Committee for the Protection of Traditional Craftsmanship (Udvalget til sikring af traditionelle håndværk), which had been appointed by the Minister of Culture and the Minister of the Environment and Energy. The sculptor, Bjørn Nørgaard, was also on this committee. He and Klaus Bonde Larsen soon started discussing how it would be possible to construct a building which could prove that fine craftsmanship was still alive and able to compete with

industrial solutions. "We wanted to show that it was possible to build a good quality building without involving the large contractors that normally control the building process", says Klaus Bonde Larsen. The idea was to give the builders a great deal of influence over the construction of a building with full-brick walls without prefabricated sections; a building drawing on the proudest traditions of craftsmanship. "I asked Bjørn Nørgaard whether he would consider designing a building for The Copenhagen Association of Crafts, and he assented. We agreed to build attractive, modern apartments that were an expression of the fine craftsmanship that we had talked so much about", says Klaus Bonde Larsen. He had worked with Bjørn Nørgaard before, when the artist designed a target for him at the Royal Shooting Society of Copenhagen (Det Kongelige Københavnske Skydeselskab). Klaus Bonde Larsen had gained the impression that Bjørn Nørgaard was both an insightful and a fascinating sculptor. "He doesn't cut corners. I think we had 16



meetings in connection with the design of the target! While he was making it, he asked at one point if I had a motto. In the end we put 'And we did it' on the target".

That particular statement is a good illustration of the pioneer spirit that characterised the first conversations about Bispebjerg Bakke between Klaus Bonde Larsen and Bjørn Nørgaard. On the committee there was a great deal of talk about how to reinforce craftsmanship, but Bonde Larsen and Nørgaard wanted action. Bjørn Nørgaard's vision for Bispebjerg Bakke was to fuse art and architecture in a residential building of the highest craftsmanship quality. "It has always interested me how a work of art plays a role in society here and now and at

the same time contains the formal artistic qualities that transcend time and space. In modernist thinking, some claim that pure function has its own aesthetic quality, but aesthetics are functional in themselves and if they are not assigned a particular realm in which to act they are overshadowed by economics and politics. In my opinion aesthetics contribute something very unique that does not necessarily relate to function", says Nørgaard. In his opinion we tend to emphasize economic and rational values and forget aesthetic ones when we build. "Some believe that the discussion is over. They believe that it no longer makes sense for some idiot to spend his time designing a different kind of roof. The attitude seems to be that the cheapest roof is also

#### **Bjørn Nørgaard, Sculptor**

Bjørn Nørgaard graduated from The Experimental School of Art in 1964. He was a professor at The Royal Danish Academy of Fine Arts from 1985 to 1994 and his work forms part of the collections at Louisiana Museum of Modern Art and the Danish National Gallery (Statens Museum for Kunst). Bjørn Nørgaard is behind a series of tapestries depicting Danish history made for the Danish Queen, the granite square 'Amagertorv' in Copenhagen and the group of sculptures 'The Genetically Modified Paradise'. Together with Klaus Bonde Larsen he is the originator of Bispebjerg Bakke.





#### The Copenhagen Association of Crafts (Haandværkerforeningen i København)

The Copenhagen Association of Crafts has a fund, Alderstrøst, which owns fifty percent of Bispebjerg Bakke. Klaus Bonde Larsen, who has been chairman of the association since 1992, took the initiative to build Bispebjerg Bakke together with Bjørn Nørgaard. The Copenhagen Association of Crafts was founded in 1840.

the most beautiful roof. But I believe that considerations of what is beautiful and inspiring are crucial to the way we shape our surroundings. Bispebjerg Bakke is part of that discussion”, says Bjørn Nørgaard. With Bispebjerg Bakke he wanted to create an organic whole. A building which expressed the connection between art, architecture, craftsmanship and technology. But first, the ideas needed to be transformed into sketches and models in collaboration with architects Jørn Boldsen and Jesper Holm.

#### Towards a Sketch

“When we joined the project, no sketches were drawn and no models had been built”, says Jesper Holm. “Bjørn came to visit our drawing office, so we could see if the social chemistry was right. That day we made the first sketches. And soon we built clay models, because we needed to see a spatial version of the sketches”. Bjørn Nørgaard elaborates: “As a sculptor I thought of the house as a whole. This is also why

we modelled the house in clay. In architecture, there is often the problem that buildings are not thought of as one large shape, but only as fragmented elements. With clay you get volume, mass and an overall impression”. The vision for Bispebjerg Bakke was shaped by the sketches and the three-dimensional clay model. For Jesper Holm, working with Bjørn Nørgaard meant a new way of thinking. “As architects we are greatly influenced by the construction business of which we are part and we tend to think like contractors. But working with Bjørn has been very different – a truly unique experience and an inspiration”, he says. Bjørn Nørgaard’s first sketches were free-hand drawings in intense colours, which bore little resemblance to classic architecture sketching. At first it was rather difficult to visualise Bispebjerg Bakke when looking at some of the sketches, says Klaus Bonde Larsen: “You had to write ‘building’ on the sketches, because no one could see what they were supposed to be! But Bjørn established a very fine symbiosis with the



architects, and that has made his ideas sufficiently tangible to be built". Even so, engineers were sceptical when introduced to the idea of the alternative building with its rounded shapes. The Chief Engineer at Carl Bro, Poul Erik Haurbæk, remembers: "When we were first presented with this project, our reaction was that it couldn't be done. And more than one person said we would have to change it so that the building had straight walls and a flat or sloping roof – at any rate a roof that only sloped in one direction!" But the enthusiasm of Bjørn Nørgaard and Jesper Holm quickly rubbed off on Poul Erik Haurbæk. And he started gathering a team of Carl Bro engineers, who could help do the job. "It's not enough for me to be enthusiastic. I need to make a construction engineer, a plumbing engineer, an electrical engineer and a number of other engineers and technicians enthusiastic as well. Part of the team was an expert on acoustics who looked at the possible effects of the Farum railway line that runs just next to the site", explains Poul

Erik Haurbæk. "We agreed that we didn't want to send the message to the outside world that it wasn't possible to build Bispebjerg Bakke. Our goal then became to optimise as best we could – to find solutions that would not make the craftsmen say that we hadn't been thinking straight when planning the project. If they turn up at the building site and tell you that this is easier to draw than to build, you know you've done badly".

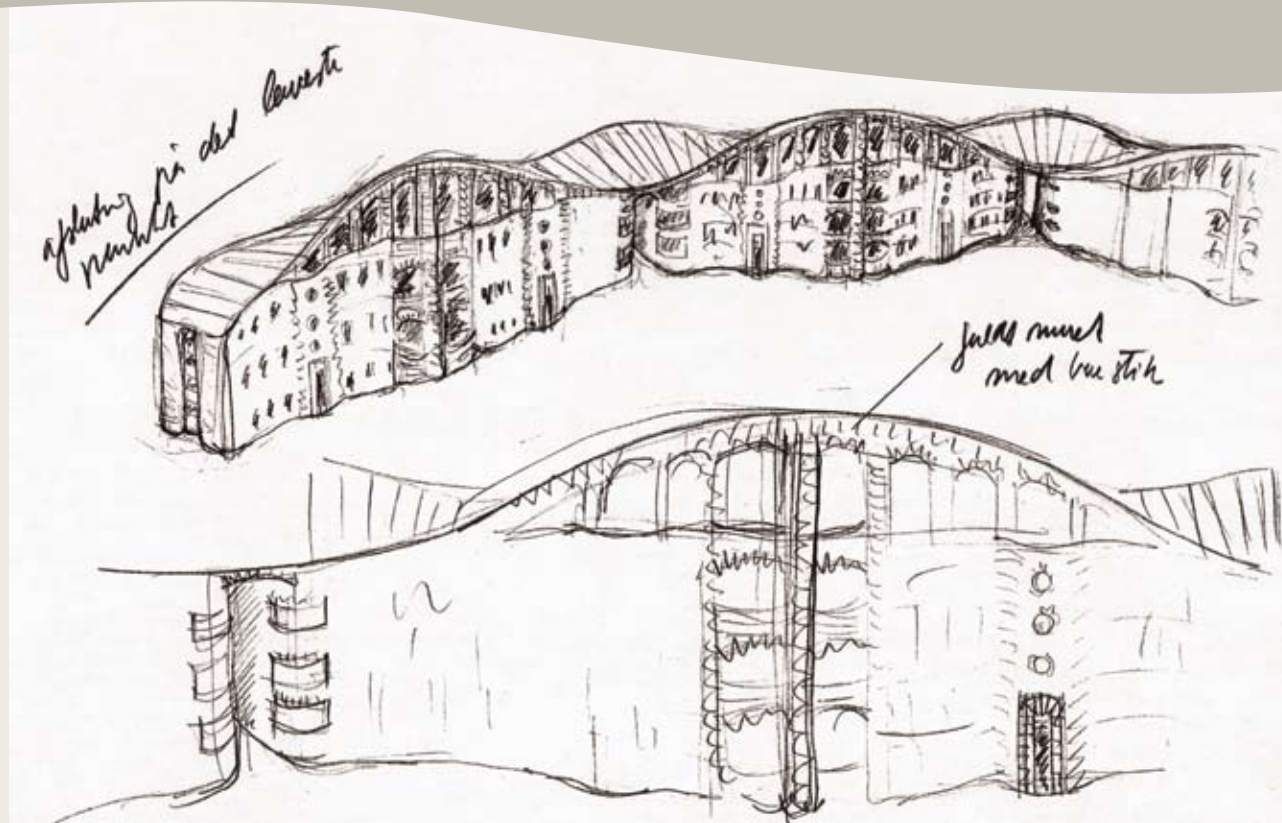
### **The Meeting of Art and Architecture**

Bispebjerg Bakke is a dream come true for Bjørn Nørgaard. Ever since his artistic childhood in the 1960s he has been investigating how art can effect the physical environment. "In those days we were inspired by the Bauhaus tradition, in which architects, engineers, craftsmen and artists sought a common platform and worked together. And we believed that art can contribute to society with unique qualities that are



#### **Boldsen & Holm Architects**

Boldsen & Holm Architects was founded in 1998 and employs 10 architects. The drawing office is behind the residential buildings 'ECO Towers' in Islands Brygge and 'Æblehaven' in Værløse. Furthermore it has done 'Dahlerups Torv' in Langelinie that closely interacts with Bjørn Nørgaard's group of sculptures 'The Genetically Modified Paradise'. Jesper Holm is one of the founders of Boldsen & Holm Architects.



One of Bjørn Nørgaard's first sketches of Bispebjerg Bakke.

often considered to be unnecessary luxuries", he says. Nørgaard and his contemporaries on the 1960's art scene were also influenced by 19th century Pre-Raphaelites, who had the era before Raphael and the renaissance as their artistic ideal, and were fascinated by the middle ages, when architect and sculptor were often one and the same person. Bjørn Nørgaard has always dreamt of creating a place, where all these thoughts could form a synthesis. "This was a real windfall for me", he says. And it makes a significant difference that Bispebjerg Bakke is the product of collaboration between an artist and an architect. "The building is very different from other Danish residential buildings. The organic shape stands out, and it is evident that an artist has been involved in this project from day one. In Denmark we are used to box architecture – most residential buildings today are boxes with a flat roof", says Jesper Holm. In his opinion one reason why close collaboration between artists and architects is so rare is that architects

find it hard to give up responsibility. The extraordinary collaboration between the artist and the architect was the main reason why Realdania decided to invest in the Bispebjerg Bakke project. The Chief Executive Officer of Realdania, Flemming Borreskov, emphasises: "For us the target was to integrate art and architecture. In modernism there has been a tendency to cultivate function and strip buildings of all art. I believe that times are changing, in the sense that we are increasingly inspired by older architectural schools – amongst others by the Baroque and Rococo styles, in which art and architecture were intertwined. The two disciplines have been separated for many years, but Bispebjerg Bakke is a model example of the combination of the two". Later in the process, Realdania's subsidiary company, Realea, took over the role of building owner. Realea's Chief Executive Officer, Peter Cederfeld, has this to say about Realea's decision to invest in Bispebjerg Bakke: "The ambition to use traditional craftsmanship was not in

itself interesting for us. We do that all the time in our restoration projects. What was different was the integration of art and architecture. Bjørn Nørgaard's vision was exciting – also because he has worked with architecture before. Also there is probably no doubt that a lesser known artist would have had a harder time convincing us. The heading for our choice of projects is: 'What others can and will do, we shouldn't do'. And in Bispebjerg Bakke we saw an opportunity to test some things. Even as a model the building was spectacular and

innovative". It was Bjørn Nørgaard's idea to create one large sculpture that people could move into and be affected by. With aesthetic values taking pride of place, Bispebjerg Bakke was meant to be a space which offers unique visual experiences and makes art a part of everyday life.

### **The Ambition of Traditional Craftsmanship**

The dream was to build Bispebjerg Bakke with full-brick walls, without prefabri-

#### **Realea**

Realea A/S is a subsidiary of Realdania. The primary object of Realea is to acquire and promote existing, unique properties and thus preserve significant examples of architecture and building methods from various historical periods and geographical areas throughout Denmark. Another objective is to support new, experimental constructions. Properties acquired by Realea A/S have distinct architectural, cultural or historical qualities that might otherwise be lost for future generations. Peter Cederfeld has been the Chief Executive Officer since 2003. In Realea's headquarters in Odense there is a plaster model of Bispebjerg Bakke – cast from Bjørn Nørgaard's first clay model.





cated sections; to avoid concrete and to work around industrial building methods. For Bjørn Nørgaard, building industrially has its obvious flaws: "When choosing to build industrially, you often don't think very far ahead. Initial costs may be low, but numerous examples show that it brings its own punishment when the building requires expensive renovation after ten to fifteen years. The advantage of craftsmanship is that it is possible to repair things, which is not the case with industrial solutions. They need to be replaced. And in the industrial way of building you don't view buildings as a whole. In my opinion a building is not an isolated object; it affects the whole neighbourhood, the whole town. Therefore buildings must be looked at as part of a larger context". Klaus Bonde Larsen is especially critical of the contractors, who normally run the building process: "In our opinion large contracting firms have ruined craftsmanship and erected buildings that were so controlled by profit that craftsmen got

caught in the process. We wanted this project to be different". On the Bispebjerg Bakke project, craftsmen and their work were to play the leading part. The joy of fine craftsmanship was to be the engine that powered the building process, and Klaus Bonde Larsen and Bjørn Nørgaard wanted to prove that it was possible to build high quality buildings without involving contracting firms and industrial building methods. It turned out to be more difficult than they thought, though. And the two originators and other of the project's players had to moderate their vision along the way. But before we embark on that story, we will dwell on the area that Bispebjerg Bakke is part of, and in which Bjørn Nørgaard grew up.



# CHAPTER 2

## - THE PLACE

## The Place

Bjørn Nørgaard was born in 1947, and he grew up in Northwest Copenhagen. The design of the Bispebjerg snake has been greatly influenced by the apartment blocks in the neighbourhood; in fact, Bispebjerg Bakke is in many ways inspired by the neighbourhood and its architectural history. We will get back to that, but first we are going to take a trip down Bjørn Nørgaard's 'memory lane': "When I was growing up, the Northwest area was very alive and dynamic. All the factories that are now empty were booming, and people both lived

and worked in the area". Bjørn Nørgaard was a child of the post-war years and grew up in a one and a half bedroom apartment in what is called the 'bird district', because all the streets are named after birds. Even after moving away from the area, he went back to visit his parents and grandparents until they passed away. "I have seen factory after factory close down, and many of the people who lived in the area have moved out of the city", says Nørgaard. He believes that the Northwest Copenhagen area has very unique qualities: "Northwest Copenhagen lies on higher ground – and that means lots of good light.

### Bispebjerg

The oldest part of the Bispebjerg district was built in the 1920s next to Grundtvig's Church. Apart from that, most of the neighbourhood, of which the largest part lies south of Tagensvej, was built in the 1930s and the beginning of the 1940s. The name of the neighbourhood was originally 'Bissebjerg', which means 'the hill where the cows stampede'. It dates back to the 1600s when cattle moved freely on the hill between Utterslev and Emdrup.

Source: Christian Kirkeby, 'Bispebjergkvarteret', Lokalhistorisk selskab for Brønshøj, Husum og Utterslev, 2003.





Northwest Copenhagen has plenty of light and space and there is only a fifteen minute drive both to Kongens Nytorv in the centre of town and the recreational area, Utterslev Mose. And even though many new districts have been built up around it, the area has kept its feel of openness and being on the outskirts of town”.

Here, where the Bispebjerg snake now winds its way through the landscape, was previously the site of the Copenhagen Parks and Gardens Nursery, established at the beginning of the 20th century. Bispebjerg Bakke’s next door neighbours are Bispebjerg Hospital – designed by architect Martin Nyrop – and the S-train tracks that run next to the site. The site is a part of the Northwest Copenhagen area and yet forms its own enclave, shielded from the road by tall trees. In March

1999, Bjørn Nørgaard went to see the site for the first time with the architect, Jørn Boldsen. “When I saw it, the Parks and Gardens Nursery had been phased out and the site was completely overgrown. It was filled with trees and plants run wild and the Nursery’s little green sheds were still there. The place was run down but very fascinating. And it was full of animals and birds. It was a bit like being in the countryside”. Bjørn Nørgaard was enthusiastic. The site did indeed lie next to the railway tracks, but the noise from the trains was limited and on the other side of the site was a road with very little traffic. But before Nørgaard and his collaborators could start implementing the vision of Bispebjerg Bakke, The Copenhagen Association of Crafts had to secure the right to the land. Klaus Bonde Larsen says: “We negotiated with the municipa-

ATS Satirical newspaper comment about the squatters (Politiken 3.9.2004)

“Mr. Squatter, did you gain anything from occupying a few trees in Northworst Copenhagen? – Yes, we’ve never had a higher profile in the pulp press than we have now”.



On December 1st 2004, the then Lord Mayor of Copenhagen, Lars Engberg (second from left), officially laid the foundation stone of Bispebjerg Bakke. Also the Managing Director of Realdania, Flemming Borreskov (third from left) and the Chairman of The Copenhagen Association of Crafts, Klaus Bonde Larsen (far right), took part in laying the foundation stone of the unorthodox residential building that welcomed its first residents two years later. At the far left is Søren Ulslev, at that time the CEO of NCC.

lity about taking over the site, but it was difficult because they couldn't sell us the land without making a public invitation to tender. At that time we had already done sketches of the building. It was our luck that the municipality ended up inviting tenders that had to include a building project – and they were very interested in our project!". Not everyone was enthusiastic about placing a large residential building on the site, though. The project was met by opposition when a group of squatters occupied the site in 2004. Just as construction was about to start, 20 young people invaded the trees on the site to stop work being done there. Their objective was that the site should be used to create a place like Christiania or other alternative facilities in Copenhagen. Both NCC and Realdania declared themselves ready for dialogue, but the case was closed after a week when police forced the squatters out of the trees.

### Inspired by the Blocks of Nørrebro

'The skateboard ramp', 'the ski jump', 'the roller coaster'. These are some of the associations people have when they see the highest point of the building that now towers above the landscape next to Bispebjerg Hospital. At the highest point on the site, the Bispebjerg Bakke building rises from three floors to eight floors. The snake has been equipped with a head held high. But long before Bispebjerg Bakke became a snake with its head held high, the concept of the building had to become a reality. "We quickly came up with the idea of making a snake. We knew from the start that we wanted to use the topography of the site as a starting point for the building. It should be varied and alive and move with the site. The building shouldn't work against the site, but should interact closely with it", says Bjørn Nørgaard. The Bispebjerg Bakke site slopes 10 metres from the highest to the lowest point. And to accommodate for that slope, Nørgaard



and the architects started working with a concept of gates dividing the 11 buildings that Bispebjerg Bakke consists of. The building is shaped like one long snake plus a shorter one next to it, but the two unbroken sequences actually consist of 11 buildings, nine in the long snake and two in the short one. The buildings are held together by the characteristic gates that also connect the front and back of the buildings. The experience of the gate being the border between the inside and the outside world is something Nørgaard remembers from his childhood in the Northwest neighbourhood – a part of Nørrebro: “There were gates in the block that I grew up in on Svanevej. And the gate is a symbol of the difference between outside and inside. You couldn’t just go into someone else’s yard or you’d get beaten up. In that sense the gate signalled that this is our yard. When you entered your own yard, it was a refuge”. Jesper Holm says about the gates at Bispebjerg Bakke: “The gates split up the snake into smaller units

and with their different angles they contribute to the way the building follows the landscape. Bispebjerg Bakke was inspired by the massive Nørrebro blocks that represent some of the best high-rise apartment building done from the 1930s to the 1950s. They are solid brick and really high quality. The blocks are usually closed off, with streets on all four sides, or open at one end. The distinctive feature is that the block creates an inner, private space in the yard and a public space facing the street, and we wanted to repeat that motif here, but because of the considerable slope in the terrain and the location of our site, we have ended up making a completely open block”. The challenge of the inclined site is one of the reasons why they chose to build the gates, Bjørn Nørgaard explains: “On Bispebjerg Bakke we have used the gates to define the plateaus that make it possible for the buildings to be placed at different levels. Simultaneously the gates enabled us to place the various modules of the building at different angles, which



makes the building organic". The idea was to create the sensation of going for a walk in the woods when moving about at Bispebjerg Bakke. "When you walk along a square building, you have to go round it, but here we wanted to create a sensation of walking among the trees", says Nørgaard. And the building does make you think of natural elements. The relatively slim, brick columns that rise upwards along the whole building look like trees, and the entire building undulates in a movement that more than anything resembles that of a wave. And because each module is turned at its own angle, you can stand at one end of the snake and look almost directly at another module in the same snake. This gives a sensation of never quite knowing where you are in the snake – each spot in the building offers another way to look at it. Another motif from the Nørrebro blocks appears at Bispebjerg Bakke: The mix of yellow and red bricks. "In the old days they used red bricks on the street side of the building and yellow bricks towards the

yard, because yellow ones were cheaper", says Bjørn Nørgaard. "And in the Northwest neighbourhood both colours of bricks are represented. Here you can find yellow stones on the blocks along Tagensvej and on Grundtvig's Church and red bricks on for example Bispebjerg Hospital and the church yard wall. We brought that mix to Bispebjerg Bakke. I also wanted two colours, because red bricks can seem heavy on their own". At Bispebjerg Bakke, yellow and red bricks are used next to each other, so the façade alternates between the two colours. Bispebjerg Bakke is not only inspired by the history of the area. Even though it is so different, the building is actually in keeping with the Danish architectural tradition, where light is essential. "It is very important to us in the north to get the sun into our homes. We want both a view and lots of light. And these considerations are also incorporated in the design of Bispebjerg Bakke", says Jesper Holm. The red and yellow buildings have been equipped with tall windows that make the buildings





almost transparent and fill them with light. Not just the buildings but also the space between them and around them is carefully thought out. In close collaboration with Bjørn Nørgaard, landscape architect Knud W. Ø. Larsen has worked to create a close interplay between the curved building and its surroundings. He explains: "We had the opportunity to do a very comprehensive registration of the plants on the site. That has given us an idea of the narrative of the site and what to preserve". They have kept many of the original plants. That goes for the trees that provide a shield against the road, a small copse of lime tree and a large area towards the tracks. Another 35 trees have been placed in a temporary nursery next to the ground and will later be planted in new spots throughout the

grounds. "We wish to pass on the story of the large garden centre that was situated here. The land is very fertile, and some of the trees have been here for a very long time", says Knud W. Ø. Larsen. New plants have also been added. Rows of bushes follow the winding building and will, once they grow, come to resemble hedges. The rows will have very different appearances: dog rose, wild cherry, lavender and many, many other plants grow here. "Normally a landscape architect would choose to plant more bushes of the same kind, but here there are more than 20 different kinds of bushes. What's different about the plantation scheme used here is the great variation that Bjørn Nørgaard has chosen", says Knud W. Ø. Larsen.

#### **Knud W. Ø. Larsen Landscape Architects**

For more than 20 years the drawing office has worked with all aspects of landscape architecture: private gardens, recreational areas for public institutions, office buildings and buildings. Among other things, the drawing office is working on a number of jobs at Holmen in Copenhagen.





# **CHAPTER 3**

**- CRAFT AND INDUSTRY MEET**

## Craft and Industry Meet

**“If you can’t make a model of it, don’t try and build it”**

Bjørn Nørgaard

This was Bjørn Nørgaard’s mantra, and it was constantly recited in the creation of Bispebjerg Bakke. Today, one of the plaster of Paris models of Bispebjerg Bakke adorns the Realea offices – a mute witness to a construction process which was atypical from the start. The planning phase of Bispebjerg Bakke revealed exponents of two specific visions: on the one hand, the project owner, Realdania/Realea, envisaged an opportunity to combine art and architecture; on the other hand, the Copenhagen Association of Crafts grasped at the chance to revive craftsmanship as the central element in a construction project. Bjørn Nørgaard nurtured these same visions, but as the planning phase

proceeded, it became increasingly clear that his dream of erecting a building from the bottom up without prefabricated elements and without involving building contractors was not realistic. As Klaus Bonde Larsen puts it: “We ran a pre-qualification to find the right craftsmen for the job. We got them all together for a seminar at the Molskroen Conference Centre, where Bjørn Nørgaard described the building in some detail. All those present made an agreement, promising each other that this project would be the main focus of their attention. All agreed to support each other to prove that it could actually be done. In the old days, the master carpenter designed the roof, for example, but in this case all crafts were to be involved in one common design project for the whole building. Everything went smoothly until we reached the pricing stage, and then it all fell completely apart. Everyone was piling on the overheads to such an extent that the project would become unfeasible. It was getting more and more



### NCC

Torben Sørensen is Senior Project Manager at NCC, which is one of the largest building development and contractor concerns in Denmark, with about 4,000 employees. In Denmark, NCC was formed in the period 1996-99 by merging the building contractor companies of Rasmussen & Schiøtz, Arnton and Superfos Construction, as well as the asphalt company, Phønix.

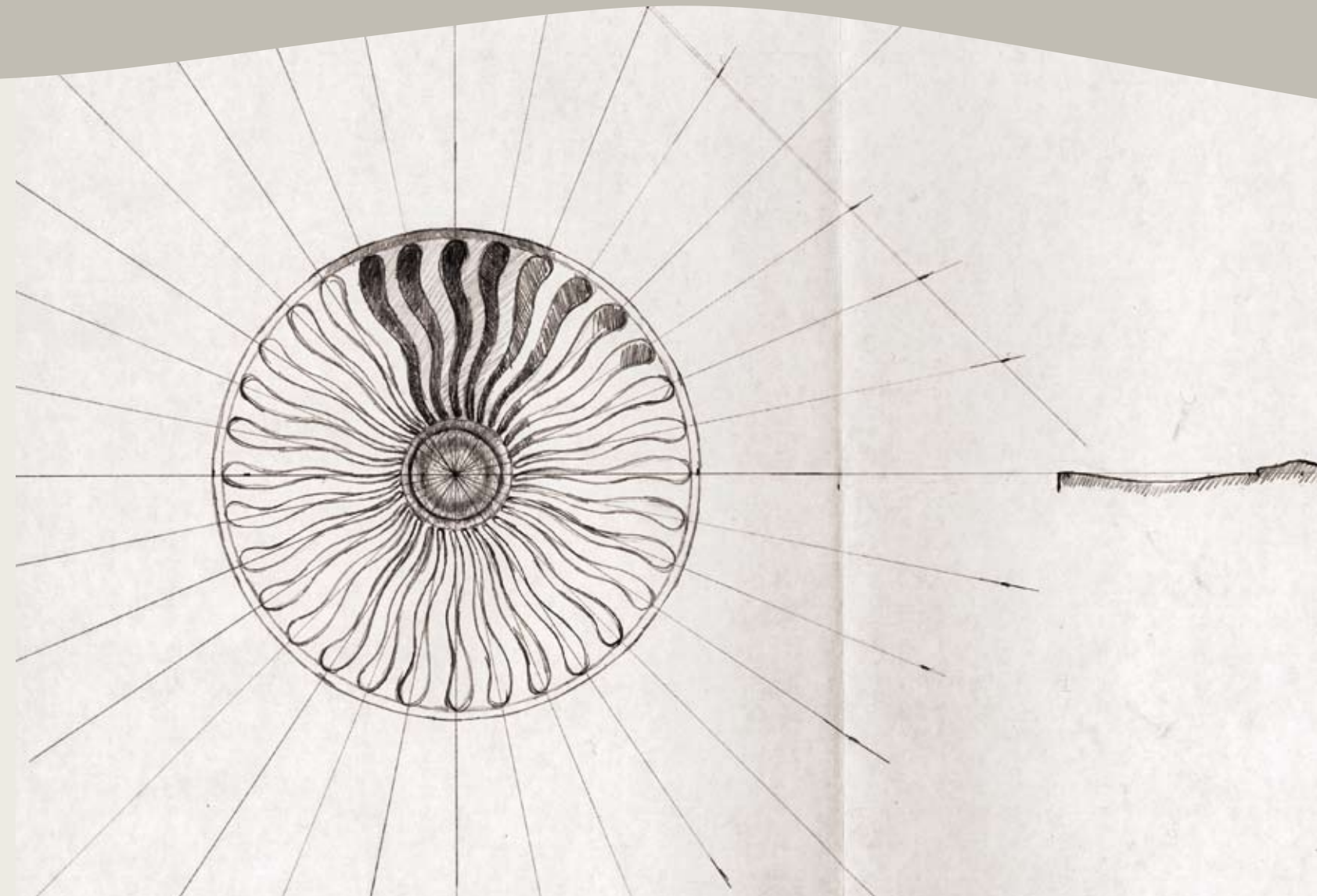
expensive at every meeting. In the end the mood was so unpleasant that Bjørn Nørgaard emailed everyone telling them not to come to any more meetings. We just had to swallow the pill, so I called the NCC concern and asked them to step in as the contractor”.

Bjørn Nørgaard: “Cooperation with the master craftsmen simply broke down, though I can’t really say why. Money certainly played a role, but it was also a question of ingrained habits. The master craftsmen were not able to take a long, hard look at their own working culture, and then move on to show that the craft-centred approach could compete with industrial production. One of the things we discussed was a readiness to accept that one could not always have one’s own way. Were they prepared, for example, to put their own finances on the line and reveal them to the others?” A large number of the master craftsmen were not prepared to do this, so when they put in their bids

for the construction of Bispebjerg Bakke the upshot was that it would cost fifty percent more than first estimated. “We were shocked how expensive it would be to construct the whole thing from the bottom up. We couldn’t go along with it”, explains Flemming Borreskov, Chief Executive Officer of Realdania. The whole Bispebjerg Bakke project was in danger; in fact, there was considerable doubt as to whether it could be built at all. As Peter Cederfeld, Chief Executive Officer at Realea, puts it: “When it became clear how expensive it would be to construct the building without prefabricated sections, we began to consider whether it could be done at all. On more than one occasion we began to doubt that the project would ever be realised”.

### On the Way to New Solutions

Not only did the dream of constructing the building from the bottom up have to be abandoned, but also the idea that the



One of Bjørn Nørgaard’s early sketches of a cast-iron grating.



master craftsmen could manage the process themselves proved to be unworkable. The main question at this point was how to construct a building that lived up to the ambitions of the designers and yet

was economically feasible. In this phase, when the first model for the building of Bispebjerg Bakke had been abandoned and an alternative had to be found, those behind the project became more closely

involved in running the project. As Flemming Borreskov explains: "After the first attempt, it became clear that the owners of the project would have to be much more closely involved in the process. So we set up a building owners' committee, which met once a month if the need arose. When there is an imbalance between price and quality in a building project, it is especially important that the building owners constantly play an active role in judging whether the plans are realistic or not. It means a lot to us that our project can be a model for others, in financial terms as well. If Bispebjerg Bakke had cost half as much again – which was what things looked like when cooperation with the master builders broke down – then neither would other people have been able to build anything similar. We would have ended up constructing a spectacular building, eligible for a hall of fame, but in fact the result of a quite unrealistic process". When NCC came into the project, a so-called partnering agreement was en-

tered into, which called for the contractor to work closely together with those project partners who were still in the game. Together, they went ahead to find ways of saving money that would make it possible to build Bispebjerg Bakke. Torben Sørensen, Project Manager at NCC, explains: "When we came into the picture, there was a lot of really good material from the earlier process which we were able to continue working on. But it was painfully evident that the building owners, the architects and Bjørn Nørgaard himself were harbouring a lot of holy cows that would have to be slaughtered. So we got involved and pointed out areas where costs could be cut by finding new solutions". In terms of the partnering model, the craftsmen were also invited to participate in the development of the building project. One of those involved in finding alternative solutions that could cut costs and make the building project more viable was Kim Cordsen, a prominent person in the Danish Bricklayers Association. He re-



counts: "I was involved in making a large number of changes to the building. For example, the design called for about forty-three different kinds of moulded bricks to be used on the rounded corners of the building. But forty-three different bricks in two colours are far too complicated to handle on a building site. I was aware from an early stage that I was going to be involved in the building project, so I was insistent that things should be made as simple as possible. So I tried to figure out if the job could be done with fewer types of moulded bricks and it turned out to be a piece of cake! When we called the architects they were walking on air to be told that it could be done." So in the end, instead of using upwards of three million bricks to build Bispebjerg Bakke, as originally planned, 800,000 bricks were enough to do the job. Kim Cordsen relates that at the time when ideas about Bispebjerg Bakke had to be changed, Torben Sørensen invited people in for round-table discussions. Anyone could throw in

their suggestions as to how the building of Bispebjerg Bakke could be rationalised and done cheaply. When people began to look closely at the details, it became clear that even buildings with curving walls could be built using a template. Kim Cordsen explains how they set about devising a system to cope with the unusual shapes: "Most bricklayers have experience of laying rounded surfaces. This is normally a very time-consuming business, but usually there's not much of it, so it doesn't matter if it takes a long time. But in this case, rounded surfaces were almost 90% of the building, so we had to work out how we could make the production of this kind of surface more systematic. So we devised a system of metal riders and aluminium templates, with the result that in the end it was easier to build this building than a square one". At the outset, neither Bjørn Nørgaard nor Jesper Holm were ready to abandon the idea of a building without prefabricated sections. Amongst other things, Bjørn Nørgaard was afraid



#### The Walls

Petersen Tegl, a brick-making firm in South Jutland, delivered the special bricks, which were laid by hand up against the specially-designed concrete forms. The following bricks were used in the construction of Bispebjerg Bakke:

368,144 antique gold water-strucked

228,256 red water-strucked with colour play

177,214 moulded bricks in 6 different shapes



that he would have to compromise on the curved, organic surfaces of the building if the walls were to be built using industrial production methods. Unfortunately, there was no turning back; alternative solutions had to be found. In fact, the transition from a building exclusively constructed by craftsmen to a collaboration between craft and industry put pressure on all those involved, forcing them to think creatively. As Flemming Borreskov explains: “People under pressure either give up or have to work harder to find a solution. When we finally realised what it would cost to build without industrial sections, we began to consider using concrete. Bjørn Nørgaard wouldn’t hear of it. In the end, though, we succeeded in convincing him and Jesper Holm, partly because the indoor climate is just as good when using concrete and partly because you can’t see that the walls are not full-brick. When the walls are rendered, the full-brick and the concrete areas look alike, so the building had the appearance Bjørn Nørgaard had

been looking for all the time. However, no sooner had we convinced Nørgaard and Holm, before NCC announced that they could not make concrete sections that curve in more than one direction! As we were under pressure, we just said: ‘Give it a go!’, and so they just kept on trying”.

### **Digital success**

As traditional craft methods were supplemented by industrial methods during the building process, a whole range of innovative digital solutions had to be worked out. As it had been accepted that not everything could be done by hand, industry had to step in to support handicraft to get the job done. It was quite a challenge to get concrete twisting and turning to follow the lines of the Bispebjerg snake, and it was here that the latest digital technology was worth its weight in gold. Poul Erik Haurbæk explains: “We have achieved what we call ‘building without measure’.

They are not many straight lines in the building and as it was difficult – in some cases impossible – to note measurements on the drawings, we decided to leave them out. Instead we got together with the architects to make a digital model, which everyone could contribute to and which was used as a common frame of reference”. The digital model was created by a process in which every single specialist engineer contributed information and requirements. For example, the plumbing engineer told us where to leave space for ventilation channels, the electrical engineer identified the placing of plugs and

switches, and so on. The end result was a common 3D model, which all those involved in the project used as their point of departure. Thus, before Bispebjerg Bakke begin to rise as a building in the Northwest, it already existed in a digital version which everyone could relate and respond to.

Working digitally with the project has made the whole building process a lot easier. Digital drawings are extremely precise and by using Computer Aided Design (CAD), information about the sections to be produced can be communicated di-

#### Grontmij | Carl Bro

Carl Bro forms part of the Dutch concern, Grontmij, which is one of the biggest players in the field of consultancy engineering in Europe. Grontmij provides a wide range of consultancy and engineering services relating to building, infrastructure, environment, water, industry and energy. They have branches in The Netherlands, Denmark, England, Germany, Belgium, Poland, The Czech Republic, Hungary, Ireland, Sweden and Vietnam. In Denmark, Grontmij | Carl Bro has some 1,200 employees. Poul Erik Haurbæk is the Chief Consultant at Carl Bro.



rectly to the production facilities at the factories. The old-fashioned way involves more links in the chain, all of which are open to human error. Working digitally reduces the risk that the section delivered from the factory does not match the drawing one has made. Torben Sørensen comments: "Keeping in mind the complexity involved and the large number of curved surfaces, it seems to me pretty remarkable that we completed the building without having to reject sections that did not fit". One of the aspects that those involved constantly invoke as a digital success story, is the roof of Bispebjerg Bakke. Digital project planning enabled Taasinge Træ A/S, who took up the challenge of

making the twisting, winding roof, to produce complete roof sections at their factory. The sections could be mounted directly on the building, thus reducing damp, for example.

In this way it became possible to realise that double-curved roof which Bjørn Nørgaard had dreamed of; a roof that writhes and buckles in several directions. But it was not all that easy, as Jesper Holm relates: "At the outset we thought we'd found an advanced computer program that could be used to design the double-curved roof, but the program was too limited; we couldn't draw the wave shape that we wanted. In the end we found a

#### Digital Solutions

Before Bispebjerg Bakke began to take shape as a residential building in the Northwest area of Copenhagen, it already existed in a digital version: a 3D model, which all those involved in the project had helped develop. By finding a series of innovative, digital solutions – such as a design programme normally used in mobile phone technology – traditional craft methods were aided and abetted by industrial ways of working.



design program called Inventor, which amongst other things is used to design mobile phones. Inventor could do things that the architectural program could not". Bjørn Nørgaard has this to say about these major digital advances: "By refusing to knuckle under and by making demands based on sculptural and architectural considerations, we forced the computers to accomplish more than people thought they could". The pride of Bispebjerg Bakke is in the details, and innovative approaches made it possible to incorporate challenging shapes into the building. One good example of this is the staircases, which are crowned with unique concrete domes. If you look up when ascending the stairs, at the very top your eye will be caught by an elliptical dome with a window to the sky. The firm of PL Beton in Rønne delivered these concrete domes, all cast as one piece in a wooden mould cut according to a computer-designed model, which makes for great accuracy. Details such as the window on the sky

through the massive dome make Bispebjerg Bakke a quite extraordinary place to live. Inside the flats, as well, tenants are surrounded with special constructional details, such as the semi-circular shower cabins. The windows have been specially made for each flat, using wood from the South American jatobá tree, which has a ruby-red sheen and a high content of protective oils.

### To China in Search of Tiles

The balconies at Bispebjerg Bakke are also quite unique: luminous and robust at the same time. They are clothed with unique Chinese ceramic tiles in red and yellow – the same tiles that adorn the entrance halls to the staircases. Bjørn Nørgaard, Jesper Holm and Torben Sørensen went to China to order the tiles in person. "I myself was lucky enough to have been in China to order these ceramic tiles. Even the task of getting the Chinese to produce tiles in just the right colour was a



#### Chinese Tiles and Hardwood

Some 17,000 ceramic tiles have been used on the façades and balcony railings at Bispebjerg Bakke. The wood of the jatobá tree (Brazilian Cherry), used for the windows at Bispebjerg Bakke, is especially hard and exceptionally durable. It is akin to oak and its structure inhibits rot.

challenge: people at the Chinese factory could not understand that we wanted to use this special red colour, which they would normally associate with art objects rather than buildings. So Bjørn explained to them that our building was also a work of art”, explains Torben Sørensen. Bjørn Nørgaard had previously had a piece of sculpture made at this Chinese factory, so he knew that they were equal to the task. He explains: “I knew that they could make these tiles from drawings. We also have superb producers of ceramics in Denmark, but they would not be able to reorganise themselves to produce these tiles, whereas the Chinese had the whole production apparatus. There was some trouble getting them to make the tiles exactly as we wanted them, but we succeeded, not least due to Torben Sørensen’s skills as a negotiator. These tiles have introduced one more layer into the building project. One of the major qualities of Bispebjerg Bakke is precisely that we have so many layers. We have hi-tech, advanced digital

technology, industrial products like concrete and craftsmanship in the form of brickwork and copper roofing. And then we’ve got ceramic tiles with a glazing more than a thousand years old, which at the same time represents the globalisation layer, as the tiles are produced in China”.

### **Blessing in Disguise**

The vision of a full-brick building constructed by craftsmen carrying on their traditions had to make way for concrete sections and a construction process in which the building contractor exerted a certain influence. But even so, ambitions related to the use of craftsmanship came to have a decisive influence, so much so that changes in approach have in fact improved the snake-shaped building. Today, when those who have created Bispebjerg Bakke look back on the project, they are convinced that the building process was enhanced and the building itself became

more innovative because the idea of letting craft methods completely control the building process was abandoned. As Jesper Holm puts it: “This is very interesting, because in fact the building has gained both architecturally and in terms of indoor climate by moving away from the sublime vision of craftsmanship to a more industrial approach, in the sense that it has been improved in a number of areas, the roof, for example. The original idea was to construct the roof by getting the carpenters to shape each individual beam or rafter and put them in place one by one. This is a very time-consuming process, and as the whole thing is exposed to the weather, there is a real danger that the roof would have been attacked by mould at some later date. Not only that, it would have been a very heavy roof in architectural terms. Using the industrial approach, the roof was laid using complete roof sections which were made indoors without the fear of damp. So now we have this light roof construction and the whole process has been

a development project, which our drawing office has benefited greatly from”. Bispebjerg Bakke has become a model for how one can combine the noble traditions of craftsmanship and industrial construction methods. As Klaus Bonde Larsen points out, craftsmanship has in no way lost out in this process: “The building was controlled by the contractors, but even so the old techniques and quality materials of the craft tradition have been drawn in. The shape and appearance of the building are much as they were meant to be from the start. None of us would have believed that the building of Bispebjerg Bakke would involve innovation, but this has turned out to be the case. The concrete factories have never before made the curving units they have produced here. So in this way there have been a whole lot of new products which can set the trend in the future. The building could not live up to the vision that the craftsmen could run the whole process with no help from the building contractors, but in my view it lives up to the

vision that it should be more creative and stamped by high quality and strong craft traditions". Even Bjørn Nørgaard himself is satisfied with the fact that Bispebjerg Bakke was not built by the work of men's hands alone: "Today I am really very much at ease with the fact that it isn't one hundred percent craft built. I would still like to make such a building, but right now it is not possible to erect a building of this size in that way - not least because it would mean snapping up every single team of bricklayers in Copenhagen! When the idea of the full-brick building was abandoned, I was afraid that we would end up with straight inner walls, which would have been no joke, as the outer framework would just have been a stage set. Now we have succeeded in making sure that the external architecture is mirrored in the way space is shaped within the flats. And this is vital for the whole project, that we not only have a building that is attractive when driving past, but which has unique interior spaces", says Bjørn Nørgaard. So,

even though the building was constructed otherwise than expected, we have succeeded in preserving the correlation between the external and the internal. "It has been a bit of an eye-opener that industrial products can be more varied than what we are used to. At the same time, the roof sections were made by carpenters and the copper roofing was done by the roofers, so the building is quite definitely the product of good craftsmanship", says Bjørn Nørgaard. Peter Cederfeld is also more than satisfied with this innovative approach: "We have achieved the effect Bjørn Nørgaard wanted, but on the basis of modern architecture and modern building techniques. So this was a real boost to the whole process and matched Realea's strategy very well. Presented with the project today, I'm not sure that we would have supported it, because from our point of view there's not much innovation in using old-fashioned craftsmanship techniques. But, as we have seen, innovation came in later in the process".



An architectural site plan drawing showing a complex layout of buildings, courtyards, and landscaping. The drawing uses various line weights and hatching to represent different materials and structures. Numerous circular symbols of varying sizes are scattered throughout the plan, representing trees or specific planting locations. The overall design is intricate and detailed, typical of a professional architectural drawing.

# **CHAPTER 4**

## **- A STRONG COLLABORATION**



## A Strong Collaboration

When those who took part in the creation of Bispebjerg Bakke talk about the building, their enthusiasm and commitment shine through constantly. It is the kind of project you are proud to have a share in. This is evident, for example, at Carl Bro, where large wall displays showing the building decorate the wall in one of the offices. But it also shows the eagerness of those involved to talk about the building, explain the vision and point out the many innovative solutions that have been reached along the way. Bispebjerg Bakke is the result of a very close and very open collaboration between different professions. The artist and the architects have formulated thoughts together, the building owners have stayed close to the process, and everyone involved has been united in a partnering model. The collaboration with NCC is a continuation of the original idea about project design in collaboration with

the craftsmen, and the craftsmen have played a key role in the construction of the building. There has been a constant focus on dialogue. Torben Sørensen: "In NCC we have a lot of experience with partnering projects. I am used to being part of a process where you involve building owners, relevant contractors and suppliers in the most important decisions, so I have not found it difficult to involve the different players early in the process. It is important that you meet and discuss the job instead of just sending out an invitation to tender. That way you also get a feel for whether the social chemistry is right, and whether the other parties are committed enough to take part in a collaborative venture that may be different from what they are used to. Here they have the opportunity to leave their mark on the building right from the start". In the partnering model there is room for talking things through. Poul Erik Haurbæk: "The model proposes that if you are dissatisfied with what others are doing, you should say so. That means





you don't have to write each other angry letters. Quite often people talk nastily to each other in the building business, and partnering is supposed to prevent that". Poul Erik Haurbæk met once a week with Torben Sørensen, Jesper Holm and Adviser to the Building Owners, Jørgen Bendiksen from Kuben: "There has been fantastic collaboration – also because the social chemistry was right. The four of us, who represented the different parties involved in the project, were the project manager group – corresponding to a company's board of directors", says Poul Erik Haurbæk. The word dialogue keeps appearing when talking about the process of planning and building Bispebjerg Bakke. It is obvious that those involved like each other and

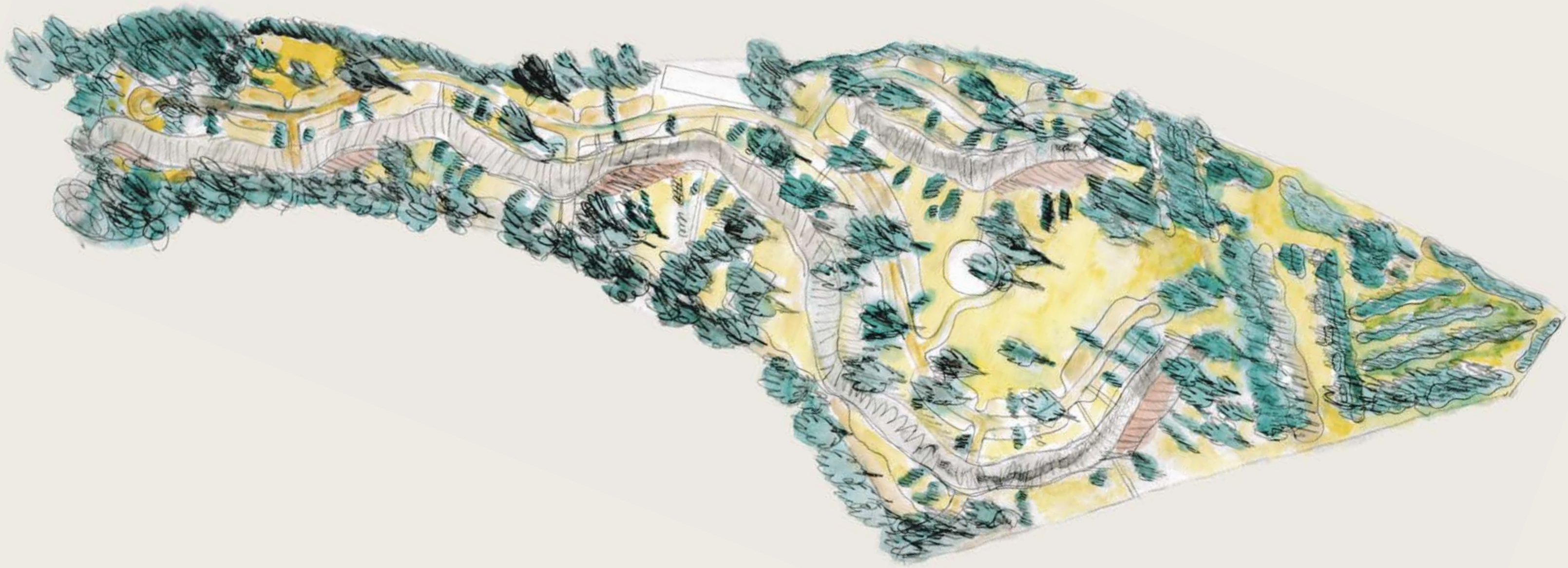
appreciate working together. That goes for Torben Sørensen as well: "I really appreciated the design process, when I worked closely with the collaborators, building owners, architect and engineer. We brainstormed, made jokes, presented ideas, and you felt a huge commitment. It was fun and exciting, and everyone had their heart set on this. And again and again it showed that this is not the work of just one man. Two and two suddenly came to five, and together we came up with the ultimate solutions".

### Keeping Abreast

At Bispebjerg Bakke the philosophy has been that it pays to do long-term plan-

#### Kuben Byggeplandata

Kuben Byggeplandata was established in February 2004, when Kuben bought Byggeplandata (established 1968). The company has more than 35 years of experience in advising building owners on many different types of projects, for example the university building Nobelparken, the ARoS museum in Århus and the headquarters of HK and KL in Copenhagen. Jørgen Bendiksen is chief adviser at Kuben Byggeplandata.



ning. "We deliberately chose to spend quite a bit of money on detailed planning from the beginning, because in the long run it is cheaper to discover problems while planning rather than having to redo things on site in the middle of the building process", says Torben Sørensen. Bispebjerg Bakke was almost twice as expensive to build as other NCC buildings. The price of the turnkey contract is about 20,000 Danish kroner per square metre. There has been an emphasis on agreeing what the building should look like before starting to build it. Poul Erik Haurbæk says: "The procedure used to be that a number of engineer and architect plans were drawn up and then handed over to the contractor, who would build the building. Then the contractor would often come to you and point out details that he thought were impossible to do. That dialogue took place after the plans were done, which could give rise to irritation among the different parties, because the contractor wanted to change

something that the engineer and the architect already considered to be settled. Now we have turned it around, so that in the partnering process all parties participate earlier in the process. The advantage is that you don't make mistakes. The drawings are finalised once they reach the building site, because everyone has seen and approved them. Those working on the building on site also get a sense of ownership. The carpenter who fits the window frames, for example, has been directly involved in developing the fittings that are used". At Bispebjerg Bakke they also chose to use building materials and working methods that may make the building more expensive to build, but which will save money in the long run. Bjørn Nørgaard emphasizes the importance of planning ahead: "We have had the opportunity to do something extra and will end up with a price per square metre that is somewhat higher than the 5,000 Danish kroner which some projects aim for. But on the other hand we have



used materials that will last a long time. When you build industrially, you can reduce the price per square metre, but a lot of the buildings done that way need to be renovated at a pretty high cost after 15-20 years. I am a consultant for a residential area, Vejleåparken, in Ishøj, which

was the largest industrialized building in Denmark in the early 1970s. It is a good example of the industrial way of thinking. The blocks were planned according to how the cranes could move about most rationally. The problem is that concrete buildings don't last but have to be reno-



vated again and again. This means that over time the price per square metre has become very high". Klaus Bonde Larsen elaborates on the idea about preparing Bispebjerg Bakke for lasting for many years: "Many of the residential buildings owned by The Copenhagen Association of Crafts are between 60 and 100 years old, but work fine today without having needed a whole lot of renovating over the years. On the contrary, a lot of modern buildings have required renovation that was almost more expensive than what it originally cost to build them. That is food for thought. One example is the Association's building on Nørre Allé in Copenha-

gen. The roofs were starting to leak, and we had an engineer to advise us what to do. He suggested that we put on triangular mouldings that have a 10 year guarantee, because the natural slate that was actually on it was too expensive. But then a bright member of the board asked how long the old roofs had been there, and they had lasted more than 100 years. So if you add it all up, they cost a lot less than the new solution. And this is the idea that we have also had in relation to Bispebjerg Bakke. It may be that the solutions we choose now are more expensive but they will pay for themselves in the long run". Bispebjerg Bakke is not only

#### The Copper Roof

At Bispebjerg Bakke 8,200 square metres of copper have been used for the roof (an area the equivalent of a football pitch). 8-10 men have been continuously occupied creating the roof on site. Copper is a precious material, and it is considered to be an excellent material for roofing. It is pleasant to work with as it can be shaped and made soft. And finally it has a very unique colour that looks good both when the copper is first applied and in the long run.

supposed to last 100 years, it should also age gracefully. That is why natural materials such as wood, bricks and copper were chosen. They become patinated and stay beautiful, even though they come to look different over time.

### Challenges and Compromises

Despite the foresight in planning Bispebjerg Bakke, the building process has turned up some surprises. Torben Sørensen says: "The cost of appliances and machines on the building site that have been used, for example, to mount the roof and façades is somewhat higher than we expected. Primarily due to the fact that ordinary machines couldn't be used because the walls were curved. Only in a few places, however, have things been more complicated than we predicted. But it still hurts economically: it mainly affects NCC's finances, of course, but the building owners also suffer". The building owners have injected extra money along

the way, but they have also had to accept that they couldn't get everything they wanted. This applies, for example, to the surface of the roads between the buildings. Here they had originally planned a clinker brick surface, but that wasn't possible, so we ended up with gravel. The building owners can then choose to change the surface later if that is what they want. And in this way the vision has continuously been adapted to reality. When the artistic ambitions of Bjørn Nørgaard and Jesper Holm have collided with the financial good will of the building owners, they have also had to change their vision. Bjørn Nørgaard says: "We didn't want partition walls in the apartments. We wanted to let each tenant decide where the partitions should be, but we didn't succeed. We also had ideas about special, curved tiles for the bathrooms, but the budget was too tight for that". Flemming Borreskov has this to say about the weighing of artistic details against economics: "Artists and architects often want more





and more, but as a building owner you have to force them to choose. That's why we gave Bjørn Nørgaard special funds - six million Danish kroner - that he could prioritize. Far from everything on his list of wishes was carried out!"

### **The Unique Role of the Craftsmen**

The first turf was cut at Bispebjerg Bakke in October 2004 and work was started on clearing the site and laying the foundations. Since then, between 100 and 150 people have worked on the site daily. The originators of the project, site managers and craftsmen have been in close contact throughout the process. The craftsmen have been continuously initiated into the ideas behind the building project, and the collaboration with those who were to build Bispebjerg Bakke has been essential to Bjørn Nørgaard. He says: "It is crucial to a project such as this one that those who work on the building every

day have an idea of the vision behind it. And the building process depends on the craftsmen being enthusiastic and feeling that they are working on something visionary. Whenever a new group of craftsmen started work here, we told them about the project in detail so that they knew the background. This has also benefited me subsequently. When I go to the site, people know me and we chat and discuss details. It is a mutual learning process, in which I share experiences with those working on the site. We have also made it a priority to discuss the drawings with them. That way we agreed how we should build before making the final drawings. That whole dialogue has been an important part of the building process and makes it fun being here". Throughout the process it has been important to him to visit the site as often as possible. Among other things this has made it possible for him to prevent mistakes. "One day, for example, I discovered that they were mounting the ventilator caps on the roof.

The caps were projecting high above the roof and that didn't look right. We then managed to lower them five centimetres, so now it looks correct. But if you don't visit the site, you don't see that kind of thing. The fact that Jesper Holm, Torben Sørensen and I held our meetings here on the site has been crucial. Sometimes it helps to open your eyes!" NCC is part of the so-called BygSol – a collaboration between educational institutions, companies and professional organisations that have the common objective of creating a new and improved building process. Besides the partnering model, NCC has also worked with Lean Construction and the so-called BygLØK in connection with Bispebjerg Bakke. "BygLØK means learning from each other on the level of the craftsmen. They tell us how they experience the building process and what they would like done differently. And in the same way we tell them how we see things", says Torben Sørensen. Kim Cordsen says about the collaboration between

craftsmen and other professions: "It has been really, really good. Normally we don't collaborate like that. Quite often you are handed a drawing on the site and you think: Why do they do it this way? In that sense it has been a really good experience to be able to leave our mark on the building". Also the collaboration with Bjørn Nørgaard worked well. "When he saw the brickwork starting to rise from the ground, he was so happy", says Kim Cordsen. And Bjørn Nørgaard is not the only one who is happy. It has been Klaus Bonde Larsen's experience that the craftsmen were generally very enthusiastic about working at Bispebjerg Bakke. "The eyes of the bricklayers shine, when they talk about the building, and they take their families to see what they have done. There is a lot of craftsman's pride", he says. Kim Cordsen confirms this. The atmosphere on the building site has been really good, he explains. "In the beginning the men on my team were sceptical, because it was so different. But when



#### The Building Site

Close to 20 different groups of craftsmen have worked at the building site. Initially, 25-50 people worked on the site, but almost 150 worked there in the most intensive phase of the building process.



they started to see that it was possible, they became very enthusiastic about what they were doing. And that lasted all the way through. It was our experience that we made something resembling art function as well as an industrial building process”.

### Focus on Safety

Not just collaboration, but also safety on the building site has received special attention. In December 2006, NCC was awarded the ‘Award for the Best Working Environment’ for Bispebjerg Bakke. By taking preventative measures they succeeded in keeping the Bispebjerg Bakke building site free of accidents. And at NCC they emphasize how unique the working procedures at Bispebjerg Bakke are. In relation to the award, the Head of Working Environment at NCC Construction, Kåre Christensen, said to the business internet newspaper, ‘Ugens Erhverv’: “The building site at Bispebjerg Bakke, which

has received the ‘Award for Best Working Environment’, is one of the building sites that we are most proud of at NCC. Here we have worked in a way fundamentally different from what is customary in the business. At the Bispebjerg site we are dealing with a very close collaboration between all those working there and a readiness to listen to everyone’s opinions that historically the construction business does not have a tradition for”. Also Torben Sørensen says that first-rate communication between the different professions has meant an excellent working environment on the site and helped improve safety. “NCC has a clear policy that we want to raise safety on the site. Therefore we have a safety representative that has no other interests in the project (financial, for example), but is there exclusively to take care of safety. This means that when he is on site, he only focuses on safety issues. For us, good safety also pays. If people get hurt, they don’t come to work, and that costs us a lot of money. Specifically,



we have worked with safety by arranging information meetings every two weeks. At these meetings we have mentioned everything that wasn’t in order on the site. And we have celebrated the fact that we have avoided accidents.

We have kept a record of the amount of working hours without accidents, and we celebrated the anniversary of one year

without accidents. We gathered people, had a cake baked and hoisted the flag. That way people get a pat on the back and confirmation that they are doing a really good job. On the other hand you have to be careful that workers don’t start competing about being the one with the fewest injuries to a degree where they won’t tell you if they do get hurt!”

# CHAPTER 5

## - LIVING ON THE HILL



## Living on the Hill

Slim columns in yellow and red brick. Balconies in shiny glazing. And a copper roof that twists and turns – awaiting the green colouring that time and the elements will bring. Bispebjerg Bakke is spectacular to behold, but for Bjørn Nørgaard it was always important that the building be spectacular to live in; as we have said, the outside and the inside had to be coherent. Jesper Holm explains how the inside of Bispebjerg Bakke was shaped: “In the beginning, we tried out the sculptural model on the types of apartments we usually build, but that turned out to be pretty hopeless. We then began to discuss how

people could live in the building, and arrived at the ground rules that we’re now using. We have constructed circular cores that house bathrooms and ellipsoid ones for the stairs and lifts. The cores provide a rhythm that runs through the building, making a reverse imprint on adjacent flats, thus helping to prevent the creation of uninterrupted rectangular spaces and introducing organic forms into the building as convex and concave shapes. This also gives you spaces that not only make external sense, but also internal.”

Peter Cederfeld: “Round shapes are not easy to furnish. Usually, the dining table can only stand in one place, but it’s not

### The Homes of Bispebjerg Bakke

When the first show house event was held at Bispebjerg Bakke, about 3,500 people showed up to inspect this very different residential complex. The flats in Bispebjerg Bakke are between 85 square metres and 238 square metres in size, with monthly rents ranging from 8,197 to 24,504 Danish kroner. The flats are in one, two or three storeys, and all have a least one balcony.





like that here, and that of course presents some challenges in terms of functionality. One could have chosen to let a designer produce prototypes of furniture that match the particular shapes, but we have left it up to people themselves, which in fact means that entirely new ways of expressing oneself become possible.” There was one area, though, where Realea chose to emphasise functionality. “We forced Bjørn Nørgaard and Jesper Holm to design more functional kitchens. The original concept was far too minimalist”, explains Peter Cederfeld.

Bjørn Nørgaard has this to say about the kitchen discussion: “The kitchens are one of the things we are a bit dissatisfied with. It was decided that in rental flats it was best to have these boring kitchens! Jesper Holm and I had already developed what we called a minimalist kitchen, with a great solid plank counter, recessed burners, and a sensible, well-designed sink. Moreover, we wanted to design it so that

people could buy modular cupboards and place them wherever they wanted”. However, minimalist kitchen or not, from the outset there was overwhelming interest in living at Bispebjerg Bakke. When an open house day was held in May 2006, several thousand people turned up to see the spectacular building with their own eyes. Jørgen Bendiksen at Kuben, adviser to the building owners, says about people’s reactions: “Some were greatly challenged by the curved and crooked shapes and said they’d never be able to fit their furniture in there, so it wasn’t right for them. Others, however, would say that this is so nice and exciting and that they would love to live here, and that they’d be ready to change their furniture if they had to”.

It turns out that lots of people are willing to accept the challenge of the rounded shapes. From the beginning of January 2007, 125 out of 135 flats had been rented out. The first tenants moved into the snake in December 2006.

**“No matter where you sit, you’ll experience something new: Nothing is static.”**

*Ann Skov Sørensen, tenant*

### Visiting the First Tenants

It is almost Christmas. Although it is only late in the afternoon, darkness already encompasses the undulating buildings on Bispebjerg Bakke. But in several of the flats, lighted Christmas trees and candles send a clear signal: the first tenants of Bispebjerg Bakke have moved in. On 1 December 2006, the tenants moved into 48 flats on the hill next to the Farum railway line. The area between the buildings is still muddy, and the builders are still hard at work getting the remainder of the construction completed in time for the next batch of tenants. But in the smaller building and at one end of the big snake, the first tenants are unpacking crates and moving furniture into place in the curved spaces. Malene Billegrav Jespersen has moved in together

with her boyfriend, Jesper Schmidt. Both 30 years old, they used to live in her 35 square metres one-room flat a stone’s throw from here, near Emdrup Station. Now they (and their cat) can enjoy the space in their 89 square metres flat on the ground floor of Bispebjerg Bakke. For 8,300 Danish kroner a month, they get a bedroom, a bathroom, and a large room that contains both a kitchen with dining area, living room and office. Malene recounts how they had not planned in advance how to furnish the flat. “We had to be here to figure out how to furnish it, because it is so different. And we are nowhere near done furnishing yet. But we are very pleased with the round shapes, so it is important that they aren’t obscured”, she says.

Even though Malene and Jesper still aren’t fully settled, they already feel at home. “It was actually cosy even before we had furniture in the flat. I felt at home straightaway, when I came here for the first time. I also find peace of mind from





knowing that there has been a lot of focus on the construction, because then you are sure that it has been done well”, says Malene, who was carried away by Bispebjerg Bakke’s innovative shapes from the very beginning.

“In the beginning, we looked at the web site, which only showed us what the buildings would look like on the outside. I was crazy about the roofs – just the fact that they are made of copper. It will turn all green in time. I also really like the windows done in dark wood. We felt it was cool that you could live in the city, but at the same time be somewhat secluded. And in addition, you get a setting that no one else has. It is nice to be part of something that has been given this much thought. It is great to live in a place that has a human touch, and isn’t just some cold concrete box”.

Malene has great expectations as to what the surroundings will look like when Bi-

spebjerg Bakke is completed, and summer comes. “It really is amazing here, and I believe that once they finish the gardens, and everything becomes green again, this will become an oasis. There aren’t any roads that pass close by”. As she speaks, as a fitting comment on Malene’s hopes for quiet surroundings, the train passes by right outside the window – so quietly that all you hear is a faint whisper.

At the completed end of Bispebjerg Bakke’s great snake, the Skov Sørensens have moved in on the second floor. The family consists of Ann (44), her husband Jørgen (42), and the children Nana (11), Thomas (7) and Maja (3). The family has moved from a 90 square metres flat in Århus. Now they have 151 square metres – and for the first time the two oldest children have their own room.

“It was somewhat by chance that we ended up living here. We were out looking

for a house, and if we were to get one with room for us all, it would cost us more than four million. So we then began looking for rentals, and ended up speaking with Kuben, who told us about Bispebjerg Bakke", Ann recounts. She and Jørgen had not heard about the project before, but they were thrilled with what they saw on the project web site, and they were among the first to sign up for a flat. "We wanted to live here by the park where we can sit on the balcony and watch the children play football. That was very appealing to us". The flat has three balconies and two bathrooms. Facing out onto the world there are massive, oblong window sections framed in dark wood, so that Ann and Jørgen can lie in bed and gaze straight up into the treetops outside.

Regarding Bispebjerg Bakke's distinct architecture, Jørgen comments: "It's quite spectacular to look at. And indoors, it's very exciting, as everywhere you turn, new angles appear. You continuously

discover new constellations of arcs and straight lines. I don't think you'll ever grow tired of that". Ann adds: "We were fascinated by this use of innovative angles. No matter where you sit, you'll experience something new; nothing is static".

The children have christened Bispebjerg Bakke 'the wave houses', but are more interested in enjoying the increased space. So far, the family is still settling in. Jørgen says: "Moving was quite chaotic, but it was rather fun that everybody was moving in at the same time, and it went surprisingly well". And yet, the family's flat did have some teething troubles. "We've had problems with the heating, and one of our drains was out of order. Neither the Internet nor the television worked when we moved in. In that sense we are guinea pigs. The issues they discover now can be corrected before more people move in. But we also experience a clear commitment to solving the problems. The caretaker does all in his power", says Ann. And



#### Realdania

Realdania was founded in 2000. The Realdania foundation initiates and supports projects in the building sector for the common good. By the end of 2006, Realdania was involved in 309 projects and made grants of 2.1 billion Danish kroner. The foundation is managed by Chief Executive Officer Flemming Borreskov, MA (Econ), and Executive Director Hans Peter Svendler, Architect, MAA.



it definitely does present challenges when you move into a flat on a building site. For instance, the family once had their oldest daughter come home without her wellingtons, because they were stuck in the mud! On the other hand, Thomas (7) is quite taken with the large excavators working on the site from early morning. And Ann and Jørgen are also first and foremost thrilled with their new home. "We love living here", Jørgen says.

### **Bispebjerg Bakke in the Northwest Area**

When you look at Bispebjerg Bakke today, the buildings look surprisingly similar to the original drawings and Bjørn Nørgaard's clay model. Even though the construction process was redefined underway, one innovative solution after another has made it possible to construct the building Bjørn Nørgaard and Klaus Bonde Larsen dreamt of. Craftsmanship alone was not able to cope without the assistance of

industry and the contractor, but Bispebjerg Bakke has nevertheless mostly been built by craftsmen, who have been consulted throughout the process. The combination of close cross-disciplinary collaboration and digital planning has led to a construction process with few errors and a high safety level. And also to a building that sets new architectural standards. As Flemming Borreskov puts it: "I believe that Bispebjerg Bakke will set a new trend. The project demonstrates how art and architecture can be integrated in an entirely new fashion compared to 20th century practice. We've already seen architecture by people like Frank Gehry and Daniel Libeskind, who are very expressive, work in new materials and tune the building into a work of art. But here we see it in a residential building, and that has an impact on how we think about architecture and art. We have shown that it is possible to build in curves and angles at a reasonable price."

The Northwest area of Copenhagen has





gained an iconic building that generated substantial interest even before it was completed. The Danish media have provided massive coverage of Bispebjerg Bakke, and the publicity has generally been positive and enthusiastic. Along the way, the hopes and dreams for Bispebjerg Bakke have been challenged, and the artist, the architects and the building owner have had to revise their visions. But the changes in circumstances have mostly spurred on innovation and strengthened the close col-

laboration between the original visionaries, the owners, and those who brought the building into being. New digital solutions have emerged from the computers, and the craftsmen have been challenged by twisting copper and round walls. Now the snake lies here, and the fine craftsmanship, the handpicked materials, and the round, undulating shapes must prove their worth. To realise the dream that for more than a 100 years, everyday lives will be led in the building on Bispebjerg Bakke.

#### **The Site and the Rearing Snake**

The site that Bispebjerg Bakke is built on slopes down more than 10 metres from the highest to the lowest point, and covers a total of 37,854 square metres. The Bispebjerg Bakke snake rises to 26 metres at its highest point, and is 9 metres tall at the lowest point on the roof.

# CHAPTER 6

- INTERVIEW WITH  
MARIE VINTHER,  
MA IN ART HISTORY



## Interview with Marie Vinther, MA in Art History

Marie Vinther graduated with a master's thesis titled: 'Dreaming of a beautiful building – an analysis of the Bispebjerg Bakke architectural project'. With the very ambitious ideas and goals presented in the Bispebjerg Bakke project as her starting point, she investigated how the original visions related to the actual construction process. Marie Vinther followed Bispebjerg Bakke right from the beginning and she has in particular focused on the collaboration between Bjørn Nørgaard and Jesper Holm. The thesis is scheduled for publication during 2007.

### *What were the goals for Bispebjerg Bakke?*

There were two overall goals. One was promoting fine craftsmanship, a vision founded on dissatisfaction with modern construction practices where there is little focus on the durability of the buildings.

With Bispebjerg Bakke, the desire was not only to improve the quality of the completed building, but also to enhance the quality of the construction process itself. The other goal was to blend art, architecture, craftsmanship and technology. The ambition was to fuse the crafts into a single building, as one great organic union.

### *How were the ideas of the organic construction brought to life?*

The collaboration between Bjørn Nørgaard and Jesper Holm has in itself been organic in the sense that they each have built upon the other's ideas. Early in the process, Bjørn chose to work in clay, which is a method he brings from his craft and is an unconventional element in the architectural process.

Clay is an organic, sensuous material that can be plied and shaped with a flexibility that you do not have when working with rulers and cardboard models. Clay is an ancient, 'low-tech' material, but curiously





enough, it has led to modern, hi-tech solutions. At first glance, a clay model seems banal and elementary, but to be able to create the building expressed by the model, digital methods and systems, which have advanced the technical state of the art, had to be developed. So the lump of clay has paradoxically made the project more innovative and complex than originally imagined. Over and above the design process, the organic element is expressed in the winding, expressive body of the building that forms a long ornamental progression. The building has been divided into modules, and in combination with the roof, which almost seems to gyrate, this generates a rhythm that harmonizes with the topography of the location. There was a desire to reintroduce the ornamental factor into construction; to create a visual readability that enables both residents and passers-by to relate to the architecture as pleasant and welcoming.

*How was the ambition to promote craftsmanship realized?*

It turned out somewhat differently than imagined in the beginning. I think one can safely say that they had some rather romantic notions about the craftsmen producing everything on site as in the old days. But the project has been continuously adjusted – for example by abandoning the idea of using full-brick walls without prefabricated sections. However, the goal of placing craftsmanship strongly in the centre of the picture throughout the construction has not been lost.

One could argue that some symbolic significance has been lost by using brick facing, but on the other hand this change of plans led to devising a new way of producing concrete elements, and it has been done in a way that remains faithful to the original design. At the same time, the copper roof is one example of how traditional craftsmanship has been carried forward and developed, thereby demon-

strating that the crafts have extraordinary resources. The building, therefore, does not only reflect tradition, but also projects an image of a renewed industrialisation, since craftsmanship has been combined with new technical skills, thereby expanding the current capabilities of industrial construction.

*How do the visions for Bispebjerg Bakke correspond to reality?*

Generally, I think that they have succeeded in realizing the overall objective of blending the various crafts. This has been the case from the idea phase through the construction process and in the completed building. There are some areas where the results have been different than expected, but in my opinion, using the partnering approach was a very good idea. This is a way of organising the process that fits in nicely with the idea of integrating the various professions in the construction of Bispebjerg Bakke. I have

focused on the collaboration between architect and artist, and on the framework of ideas the project is based on. My analysis shows that both Bjørn Nørgaard and Jesper Holm have approached the task with an open mind, and in my experience this also goes for the other contributors. The early sketches, which I examine one by one in my thesis, show that Nørgaard and Holm were both willing to compromise to reach the optimal solution. Neither of them could have achieved this without the other. The overall design of the building is therefore a result of their collaboration.

*What traditions does Bispebjerg Bakke carry forward?*

In terms of ideas, the construction is founded on a number of traditions that thrived in 18th century Britain and in the inter-war period in Germany, where there was a focus on craftsmanship and on the connection between the social and the





aesthetic. With Bispebjerg Bakke, the approach has been that if the craftsmen are enthusiastic about the project and are continuously able to influence the construction process, this will be reflected in

the completed building. Bjørn Nørgaard once said that form is very much a question of morals. According to this school of thought, the commitment and job satisfaction of each craftsman will be directly

apparent in the building's surface in the form of a wealth of details. So the project is pervaded by the concept of the social being inextricably connected with the aesthetic. This building is also a rejection of a modernist trend to discard any form of tradition. Bispebjerg Bakke shows that some traditions are worth preserving. We are not talking about uncritical or mindless servitude to tradition here, but about forming a living process that provides innovation, and thereby leads to progress.

*What artistic impact do you think Bispebjerg Bakke will have?*

I think that many sculptors dream of participating in a project like this – as it is an opportunity to work on a really major scale. One can only hope that this will lead to an increasing willingness to involve artists at an earlier stage in the construction process. There is nothing new in involving artists in architectural projects, but what is exciting here is that Bjørn

Nørgaard has been involved right from the beginning – he even took part in conceiving the original idea. Frequently, the visual arts are added to something that has already been created: a sculpture is placed in front of an entrance; or a painting hung in a hall. Bispebjerg Bakke will hopefully – with a different, sculpture-like architecture that people will like – pave the way for new, enriching collaborative endeavours between artists on one hand and the many players of the construction process on the other.

Bispebjerg Bakke  
- the Story of the Bispebjerg Snake

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