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The Modern Wooden Town Project (1997 – 2010) in Finland

D.Sc. (Tech.) Markku.A.Karjalainen and professor Jouni Koiso-Kanttila

Department of Architecture, Wood Studio
University of Oulu, Oulu, Finland, e-mail: Markku.A.Karjalainen@oulu.fi

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Abstract

Based on an initiative of the Wood Studio of the University of Oulu's Department of Architecture, a nation-wide *Modern Wooden Town* project was started in 1997 and will at least last until 2010. The main objective of the project is to employ timber construction in creating pleasant, exemplary new residential milieus in different areas of Finland. The Modern Wooden Town project has also responded to the recent goals of Finland's government housing policy, in which production of closely-spaced town-like areas of small apartment buildings and single-family houses and development of timber construction are the main concern. Design and implementation have employed closely-spaced, efficient timber construction to achieve cost-effectiveness and sustainable development. The primary supporters of the Modern Wooden Town project have been the National Technology Agency of Finland (TEKES), the Ministry of the Environment and Wood Focus Oy (Finnish Timber Council), and since 1999 also the Ministry of Agriculture and Forestry and the Ministry of the Interior. The Wood Studio of the University of Oulu's Department of Architecture has acted as the nation-wide co-ordinator of the Modern Wooden Town project. The Modern Wooden Town project currently includes over 30 timber construction area projects in different parts of Finland. The overall yield of the areas ranges from neighbourhoods of wooden single-family homes in rural municipalities to efficient town-like milieus consisting of multi-storey timber apartment buildings. Completed wood milieu sites have received mostly positive feedback from residents, clients, designers, visitors and the media. The most desired form of living is in a closely-spaced, low, single-family home-type residential milieu, which traditionally has consisted mainly of timber construction in Finland.

1 FINLAND'S FORESTS AND UTILISATION OF TIMBER

Forests cover approximately 76 % of Finland's total land area of 305,000 km^2. Finland's 23 million hectares of forest yield somewhat over 80 million m^3 of new timber growth a year. One fifth of this growth is left unutilised, as only a little less than 60 million m^3 of timber in different forms is used per year. The use of timber in construction is fundamental: 80 % of sawmill and timber industry products in different forms are used in construction. The utilisation of Finland's forests could be increased especially in construction, interior decoration and yard and milieu construction. Since the 1990s Finland's national goal has been to promote the use of wood, raise the degree of refinement and increase exporting of timber construction products, and increase employment and education in the wood industry. The basic objectives in promoting timber construction have also included equality of materials in building codes, lowering prices in housing construction, ecology and life-cycle questions, raising the image of wood and timber construction, and bringing forth the positive milieu-related values achieved by means of timber construction.

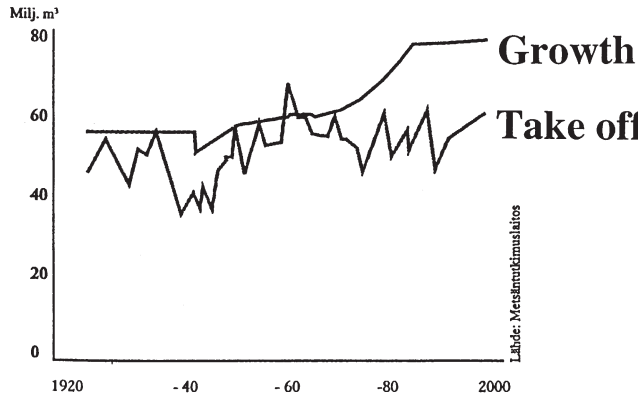

Figure 1. Growth of Finnish forests.

Since the early 1990s, several thematic programmes and plans of action for promoting timber construction have been initiated in Finland with the sponsorship of the government. One of the most significant is the nation-wide *Modern Wooden Town project 1997 – 2010*. In addition to these national wood programmes, the Finns have actively participated in mutual Scandinavian and other international timber construction research programmes and projects. Today Finland is aiming strongly for the timber construction market throughout the EU area. The objective of Finland's timber industry's Vision 2010 policy is to make wood Europe's leading material used in the system designs of housing construction and the consumer products of high-quality living.

2 THE STATUS OF TIMBER CONSTRUCTION IN FINLAND

2.1 From the wooden town heritage to stone towns

2.1.1 Wooden towns

Until the beginning of the 1900s, wood was a natural and almost only construction material used in Finnish popular construction. All of Finland's towns were also originally wooden towns. The buildings in the oldest Finnish wooden towns were primarily single-storey buildings. A rectangular street network and two-storey buildings became popular in the towns after the 1750s. Streets and yards were bordered by high, solid wooden fences, gateways and planted areas in addition to buildings. The blocks and lots of the wooden towns were large. The courtyards were closed and intimate, and they were surrounded by numerous small wooden outbuildings.

2.1.2 Breakdown of the wooden town heritage

The development of Finnish wooden towns is considered to have ended at the end of the 1800s, since from then on no new wooden towns were established in the traditional sense in Finland. Likewise, the general development of buildings and rectangular town plans also ended. At about the same time wooden buildings began to be replaced with multi-storey stone buildings. This was supplemented with an open town structure in line with the functionalistic trend which became popular during the 1930s, which dealt the final blow to the wooden town based on closed streetscapes and yards. However, a few wooden town neighbourhoods were still constructed at the edges of towns during both the period of Scandinavian classicism (in the 1920s) and the so-called reconstruction period (in the 1940s and 1950s) after Finland's last wars. The Finnish multi-storey stone town building was developed in 1860 – 1900, and the stone town replaced the wooden town because it was more efficient. What's more, a strong depopulation of the countryside began in Finland in the 1950s, followed by urbanisation and neighbourhood construction. Extensive development of concrete technology in towns and multi-storey apartment building construction began in the beginning of the 1960s, after which timber construction had to make way for large-scale construction.

Figure 2. Old Finnish wooden town, Porvoo.

Figure 3. Typical Finnish concrete multi-story residential building from the early 1970s.

2.2 Revival of timber construction

Wood has nevertheless retained its position in small-scale construction. Today 98 % of Finland's leisure-time buildings and four-fifths of single-family and row houses are constructed from wood. Wood is also extensively used in small public buildings. However, Finland's actual tradition of timber construction can be considered to be quite lost after the 1950s. Thus, in the early 1990s, after about 40 years of dormancy, Finland and the other Scandinavian countries began to purposefully develop timber construction and revive old timber construction skills. Special emphasis has been placed on over-two-storey timber-framed apartment buildings with wood façades, impressive large-scale public buildings, construction of new wooden residential milieus, and renewal and development of related construction regulations and zoning practices.

2.2.1 Development of multi-storey timber apartment buildings in 1990-

Nowadays Finland is one of Europe's most multi-storey apartment building-intensive countries: 44 % of Finland's 2.5 million housing units are situated in multi-storey apartment buildings. The use of wood in over-two-storey buildings has been restricted by Finland's building and fire codes since the 1800s. Prompted by membership in the EU, Finland's fire code was modified on Sep. 1, 1997, after which it has been permissible to also construct 3 and 4-storey timber-framed residential and commercial buildings with a wood façade. In light of housing statistics, Finnish multi-storey timber apartment buildings have considerable potential to increase their share of the market, as three-quarters of Finland's multi-storey apartment buildings have less than five storeys, which according to current regulations means they could be made from wood – if so desired.

Figure 4. This wooden multi-story residential building in Oulu is an experimental project (1995 – 1997) designed and developed by the Wood Studio under the auspices of the Department of Architecture of the University of Oulu.

As of June 2005, 29 over-two-storey timber apartment buildings, comprising altogether 455 apartments, have been constructed in Finland on an experimental basis. The publicity and feedback received regarding multi-storey timber apartment buildings has been mainly positive. However, construction of multi-storey timber apartment buildings has not yet made an actual breakthrough in Finland. This is understandable, because the construction field is conservative, and changes in established construction practices are slow to happen. Construction of multi-storey timber apartment buildings has also been saddled with many biases and a stigma of experimental and costly construction. Most of these doubts and biases have been exaggerated, since the pilot period of multi-storey timber apartment buildings has indicated that the technical issues related to multi-storey timber apartment buildings can be controlled completely.

2.2.2 A shift from multi-storey apartment buildings to small apartment buildings in line with residents' wishes

When planning new residential areas in Finland, wood is now a possible alternative in multi-storey timber apartment building up to four storeys high. According to several extensive surveys and barometers of

residents, Finnish people have lately increasingly begun to value low-slung, closely-spaced, town-like, small building-intensive residential area construction instead of multi-storey apartment buildings. Wood is already the primary construction material in this segment, and the shift in housing construction from multi-storey apartment buildings to small buildings signifies a further increase in the use of wood. There has been a desire in Finland to respond to this new challenge in timber, housing and neighbourhood construction through the nation-wide Modern Wooden Town project, for example.

3 MODERN WOODEN TOWN PROJECT (1997 – 2010) IN FINLAND

The Modern Wooden Town project is a nation-wide umbrella project initiated by the Wood Studio of the University of Oulu's Department of Architecture in 1997. The objective of the project is to employ timber construction in creating new resident-oriented, pleasant, exemplary residential milieus in different areas of Finland. The Modern Wooden Town project has also responded to the recent goals of Finland's government housing policy, in which production of small apartment buildings and single-family houses and development of timber construction are the main concern. To support this, the government has compiled a *Timber Construction Promotion Programme 2004 – 2010*. The goal of the programme is to continue the Modern Wooden Town theme. One of the primary objectives is to promote the production of closely-spaced town-like areas of small apartment buildings and single-family houses, for example by renewing zoning and housing production processes. Design and implementation employ an open timber construction system and modern small building-intensive, producer-type residential neighbourhood construction to achieve cost-effectiveness and sustainable development. With an eye on living comfort, the main themes of the wood milieu regional projects also include the use of wood in yard and environment construction and interior decoration.

3.1 Old wooden milieus serve as models for the modern wooden town

In a built-up residential environment, people usually value old buildings, closed and narrow streetscapes, small residential buildings and wood as a construction material. For example, old wooden towns are often mentioned as pleasant residential environments. Preserved wooden towns are generally valued for their architectural clarity and uniformity and their closed street and yard areas. The atmosphere, scale and rich details of old wooden towns are also considered pleasant. Man's scale has not changed much over the centuries. Therefore, the new types of human-oriented closely-spaced Modern Wooden Town residential milieus with intimate features are meant to offer a resident-oriented housing alternative to large-scale multi-storey apartment building construction.

A Modern Wooden Town area refers a cosy, pleasant, human-oriented new living environment modelled after old Finnish wooden towns, town-like neighbourhoods of wooden houses from the 1920s and 1930s, and the uniform wooden house areas from the reconstruction period. A town-like wooden house milieu also refers to a relatively closely-spaced, small-scale residential milieu with town-like physical features and a clear-cut hierarchy of spaces, where wood is the primary construction material. Phase-by-phase construction, easily expanded and modified buildings, and multi-functional outbuildings are also goals of modern wooden milieu planning. Regardless of traditional ideals, the project does not intend to produce old-looking new buildings, but rather rich modern architecture that utilises the possibilities offered by wood and meets today's building regulations and demands of living. Special attention has been paid to the fire safety and long-term durability of the buildings.

3.2 Modern wooden town partial projects

The project currently includes over 30 partial projects in different areas of Finland. The overall yield of

the wood milieu projects extends from wooden house neighbourhoods in rural municipalities to efficient town-like multi-storey timber apartment building milieus. In addition to the sites that are already built, under construction or in the planning stage, about twenty other municipalities or towns are considering wood milieu projects based on the goals of the Modern Wooden Town project. The completed wood milieu sites have received mostly positive feedback from residents, visitors and the media. Interest in the project is constantly growing.

Figure 5. The nation-wide Modern Wooden Town project's first implementation was in Oulu. Altogether 45 2 – 3-story timber apartment buildings with a total floor area of 25,000 m^2 were constructed in the Puu-Linnanmaa construction area in 1998 – 2002. The area has 308 apartments and around 450 residents. The residential area was awarded Finland's 2003 Wood Award. University of Oulu, Department of Architecture, Wood Studio.

3.3 Network of co-operation

The primary supporters of the Modern Wooden Town project have been the National Technology Agency of Finland (TEKES), the Ministry of the Environment, the Ministry of Agriculture and Forestry, the Ministry of the Interior and Wood Focus Oy (Finnish Timber Council). The Wood Studio of the University of Oulu's Department of Architecture has acted as the nation-wide co-ordinator of the project, and will continue this work under the nation-wide Wood Products Centre of Expertise network (1999 – 2006) named by the Council of State and the Timber Construction Promotion Programme (2004 – 2010) ratified by the Finnish government on Mar. 17, 2005. Undertaken actions include research and publication activity related to timber construction, disseminatin timber construction know-how, starting up new wood milieu sites by means of architectural competitions, project formation, gathering feedback from residents and exchanging experiences between different partial projects. Upon request, lectures, information events and exhibitions related to the theme will be held in different localities. The Wood Studios and Laboratories of Planning and Urban Design of Finland's two other schools of architecture (TTK and TTY) are also participating in the Modern Wooden Town development project.

3.4 Advantages of timber construction

3.4.1 Technical advantages

Based on experiences so far, the advantages of timber construction include good airborne sound insulation, flexibility, a short construction period, suitability for wintertime construction, low-cost frame material, inexpensive exterior walls and ceilings, simple fastening, joint and HVAC installation techniques, minimal patching and levelling work, light foundations, light structures and a minimal need for lifting equipment during the framing phase. The ecological, energy and life-cycle benefits of timber construction have also been recently studied.

Figure 6. Modern wooden town partial projects in Finland.

3.4.2 Positive feedback from residents

The Wood Studio of the University of Oulu's Department of Architecture conducted extensive surveys of the residents of Finland's first multi-storey timber apartment building and wooden single-family house milieus. The results indicated that people generally have a positive attitude towards timber construction. The general appearance and architecture of multi-storey timber apartment buildings and wood milieus were considered good. In their feedback the residents felt that soft values such as cosiness, comfort, warmth, pleasantness, ecology and appearance were particularly positive aspects of timber construction. Other positive items were good indoor climate and sound insulation in general. Most of the residents felt that wooden buildings are generally more beautiful than concrete buildings and that small-scale timber construction results in attractive residential milieus. They especially hoped wood would be used as a facing material on façades, interior walls and stairways. More than eight out of ten respondents said the use of wood should be increased in Finland. Based on their experiences, about half of the respondents would choose an apartment in a wooden building rather than a stone building. Living in a multi-storey apartment building is not generally favoured, though, as nine out of ten respondents would much rather live in a two or single-storey row house or single-family house. Nevertheless, they welcomed the introduction of wood in the construction of multi-storey apartment buildings.

4 CONCLUSION

As far as residents are concerned, there is a clear order for timber construction. Finland's forest and wood product industries have wished to respond to this challenge. This effort is served by the well-accepted nation-wide Modern Wooden Town project, which aims to promote the use of wood by means of wood milieu objectives, architecture, resident-orientedness, new zoning practices and small building-intensive neighbourhood construction models. The government is also committed to this development of resi-

dential milieus and enhancement of timber construction. Construction regulations have been changed to allow 3 – 4-storey timber apartment buildings, and their technical designs have been developed and tested in actual experimental construction sites. To improve the competitiveness of timber construction, a new Finnish open timber construction system and dimensional standards have been created. To support this and to ensure the quality of building sites, a considerable amount of guidelines and directives have been compiled. At the same time follow-ups have been conducted and feedback has been collected to uncover new development needs. Promoting this type of construction, achieving the benefits of practice and improving the competitiveness of this new type of construction requires continuity. That is why new timber construction sites are purposefully being continuously started.

Figure 7. Wooden Urban Village of Myllypuro, Helsinki. Aaro Artto, architect SAFA. Arkkitehtityöhuone Artto Palo Rossi Tikka Oy.

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