Ten Points for Timber on Top

Densification through upward extensions with a minimal carbon footprint

Utvandrarnas hus in Växjö
Architect: Bent Jörgen Jörgensen/
Arkitektbolaget (upward extension)
PHOTO: ANDERS BERGON

Cover: Bankpalatset/
Kv Styrpinnen 15 in Stockholm
Architect: DinellJohansson
PHOTO: GUSTAV KAISER

Ten Points for Timber on Top

Spaces and cities that people enjoy are much more likely to last. It is easier to decide to demolish buildings and neighbourhoods that are not very popular, but demolishing structures that have already been built is far from climate-friendly. Generally speaking, about a ton of material is used per square metre built, and that waste of resources is unsustainable. Urban planning of the future will increasingly involve conversions and extensions either outwards or upwards, with a decline in traditional newbuilds.

Wood is light. Wood is flexible. Wood is attractive. Wood is ideal for upward extensions! This *Timber on Top* approach has the potential to be a sustainable tool in our transition to a climate-neutral Europe by 2050 – a concrete way to contribute to the *European Green Deal*.

Increasingly, new phases of development in the built environment will be formed *on Top*, and we are convinced that the art of utilising what is already built will become the norm.

Timber on Top is an opportunity for everyone who wants to offer good living environments with the least possible use of the Earth's resources. In Sweden and the rest of the world, there is a rapidly dawning realisation that the construction sector needs to switch to a circular economy, and using what has already been built is probably the most effective way to promote the necessary circularity. The Swedish urban planning sector could be at the forefront of this.

In this document, we present ten key arguments – *Ten Points for Timber on Top*.

Tomas Alsmarker
Swedish Wood

Jessica Becker
Wood City Sweden

Gjuteriet in Malmö
Architect: Kjellander Sjöberg

PHOTO: RASMUS HJORTSHØJ – COAST

Kv Glitne in Umeå
Architect: LINK Arkitektur / BIG

PHOTO: MALIN GRÖNBORG

1. Making cost savings

The direct cost savings come mainly from making better use of what has already been built. Just think of the huge financial commitments involved in building new streets and roads, laying new foundations and so on.

Today we have difficulties in building new homes at a cost that suits everyone's budget. Pursuing upward extensions allows us to create additional housing mobility within an existing residential area. Those who live in the area already are given the opportunity to move to more modern accommodation, while at the same time, the opportunity is created for others to move into the existing property at a lower rent than if they were to move into something newly built.

The low weight of wood is the key to the cost savings from upward extensions. Putting a wooden extension on top minimises the need for expensive and time-consuming reinforcements. The low weight also enables the use of various prefabricated building components, thus shortening the construction time.

Wood is flexible and can be easily adapted to the existing building. Because the wood material is delivered dry to the construction site, it can be installed immediately, without the need for time-consuming drying times.

An upward extension can also be the catalyst for the entire neighbourhood to be regenerated. Outdoor environments and façades can be given a tasteful new design and look, while also implementing energy and climate efficiency measures. In short, the whole neighbourhood can be given a completely new aura, with new and higher value for both the residents and the community at large.

PHOTO: PATRICK DEGERMAN

Skellefteå Kraft
Architect: Collage/Björnfabriken (upward extension)

2. Minimising the climate impact

Making better use of existing buildings, roads, foundations and installations is a very concrete way to save the Earth's finite resources and to radically reduce greenhouse gas emissions from the construction sector.

Industrial wood construction is a development process based on continuous improvement in all respects and the gradual elimination of all waste – a process that goes hand in hand with conserving the Earth's resources and gradually reducing greenhouse gas emissions.

Since wood is light, a wooden upward extension minimises the need for climate-impacting reinforcements. With a higher degree of prefabrication, the amount of transport to and from the construction site can be significantly reduced, which is another major benefit for the climate.

Wood is also a renewable material that nature itself produces in our growing forests. With wooden upward extensions, carbon sinks are created on two fronts, by extending the lifespan of our existing buildings and because the trees "live on" in the new extension. At the same time, an average of two new trees are planted for every tree that is harvested.

Not having to build new streets and infrastructure, not having to excavate and put in new underground utilities, and not having to build new foundations can reduce the climate impact of the construction phase by up to 40 percent.

Trikåfabriken in Stockholm
Architect: Tengbom

PHOTO: TOMAS ALSMARKER

3. Challenging the culture of demolition

As we strive for sustainable construction, we cannot continue to casually demolish what has already been built. The key is to really do all our thinking early on! We need to fundamentally examine how different alternatives involving preservation should be valued and evaluated. What is the true cost of demolition followed by new construction? What is the cost to the planet and the climate? Perhaps the needs can be met in much simpler ways? Perhaps by creating new layouts? Perhaps by adding an outward or upward extension? In many cases, the desired outcome can be achieved without demolishing and rebuilding, and thus further depleting the Earth's resources.

We need to more closely examine the potential for development and refurbishment, to create areas that are recognisable, but with interesting new additions and expressions that reflect our time. A new twist! Upward extensions can represent a unique opportunity to create new and exciting landmarks – without demolition.

Embracing what is already built and dealing with limiting external parameters present new challenges, but are also a catalyst for creating exciting and creative new solutions.

PHOTO: PATRICK DEGERMAN

Stadshotellet in Skellefteå
Architect: Monarken

4. Saving land

The city is of course made up of houses and buildings. But the city is also squares, green spaces and parks, not to mention places for play, football practice or horse jumping. All these things come together for a good life and are highly valued by the people who live and work in a particular area. By choosing alternatives to newbuilds, such as investing in an upward extension, we ensure that land in the area is saved for just such purposes.

And because we do not automatically fall back on new construction, a fully undeveloped area of land can of course be used for something completely different. The land where new housing would have covered the entire area – if we did as we usually do – can now instead become a beautiful outdoor space, a park full of plants or a communal space that inspires creative meetings. The street corners remain intact, and the green football pitch or park can continue to be used.

We save attractive areas for their value as natural spaces but also for people's social health and wellbeing.

Invest in a smart upward extension instead of using new or already utilised land for new construction.

Strömshuset in Gothenburg
Architect: KUB/Arkitema

PHOTO: BERT LEANDERSSON

5. Utilising existing infrastructure

Adding housing and offices, for example, on top of what has already been built makes the block or neighbourhood grow upwards. And using such extensions means that we do not actually need to build new streets and roads. Instead, we can prioritise and enhance the city's existing streetscapes.

The street was created as a communication route but also to serve as an important social hub, making street spaces some of the most important parts of a city. They are in fact public spaces that should be open and welcoming to all. Unfortunately, many of our streets today are rather dull thoroughfares that have become urban barriers due to the excessive flow of vehicular traffic. We have also ended up with street spaces that seem empty and mainly serve to provide parking.

As well as helping to utilise the buildings we already have, upward extensions also allow us to make better use of our existing streets and roads and breathe new life into our infrastructure. The additions *on Top* mean that we have more people moving around the city, and that can be a catalyst for transforming the street space from a barrier to an inclusive meeting place. People are given more opportunities to move around, by bike, as pedestrians, by car or public transport. New assets can be introduced in the form of trees, greenery, social areas, furniture, lighting, etc., and in addition to saving the climate and cutting costs, new opportunities are created for a more vibrant urban space.

Several municipalities' comprehensive plans state that they want to work actively to encourage new buildings and new activities to fit into the existing street and road network. There is a growing realisation of how important the streetscape is and that the streets and roads we already have need to be better utilised and of better quality. There is also going to be a more restrictive approach to new infrastructure.

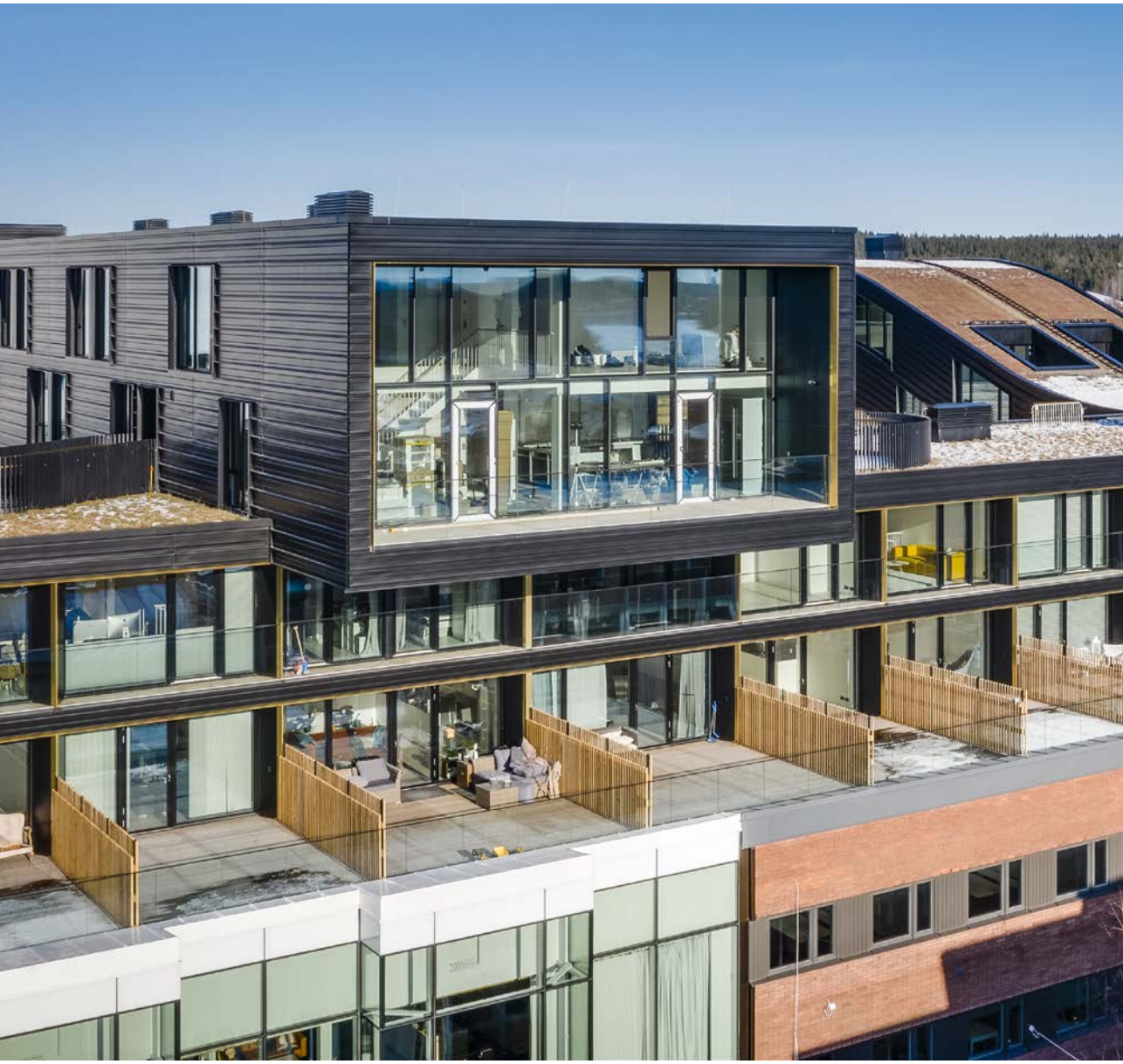

PHOTO: JONAS WESTLING

Kv Glitne in Umeå
Architect: LINK Arkitektur / BIG

6. Developing the city

Living in a central location close to all the amenities is a popular choice for many people, while the centre of small and medium-sized Swedish cities tends to be dominated by 3–4 storey buildings. Upward extensions are one of several ways to increase the density of such urban environments, and a way to develop the existing built environment. With extensions, we can create additional housing in the city centre which, unlike offices and shops, does not leave urban spaces empty in the evenings and at night.

Greater density is also an important sustainability issue. Upward extensions mean that more people are offered the opportunity to live or work in city centre locations, which in turn leads to more reasonable cycling distances and reduced dependence on cars. This creates a better basis for commerce, with more life and movement and thus an enhanced sense of security in the centre.

People are increasingly coming to value features of the living environment such as reduced car dependency and housing with facilities for growing food. The younger generation in particular wants to make a constructive contribution to sustainable urban living.

Kv Karmen in Örebro

PHOTO: TOMAS ALSMARKER

7. Creating social bridges

One of society's challenges in the coming decades is to give people living in existing housing stock the same opportunities for a modern lifestyle, good living environments and a sustainable social context as those living in new housing and neighbourhoods. Divisions and exclusion are growing and some areas are in a serious situation. In most areas, we can make a relatively large difference with relatively simple means. Refurbishments, upward extensions and mixing of functions can create more sustainable social and economic contexts, breathing new life into existing buildings and neighbourhoods. Upward extensions can be the catalyst – and the bridge!

Empty nesters still living in detached or terraced houses can be given the opportunity to sell up and move to a new inner city home in an upward extension. The houses they leave behind will then be available for families with children, and the suburban areas will gain a new mix of young and old. All this establishes new social bridges and creates improved conditions for services and amenities, both in the central and suburban neighbourhoods.

Being able to stay in one's home is almost always perceived as a much better option than having to move into sheltered accommodation in a completely different location. Conversions of existing areas often contribute to higher standards and quality, both for the neighbourhood and housing, and for younger and older people alike. Upward extensions can build social bridges in several dimensions!

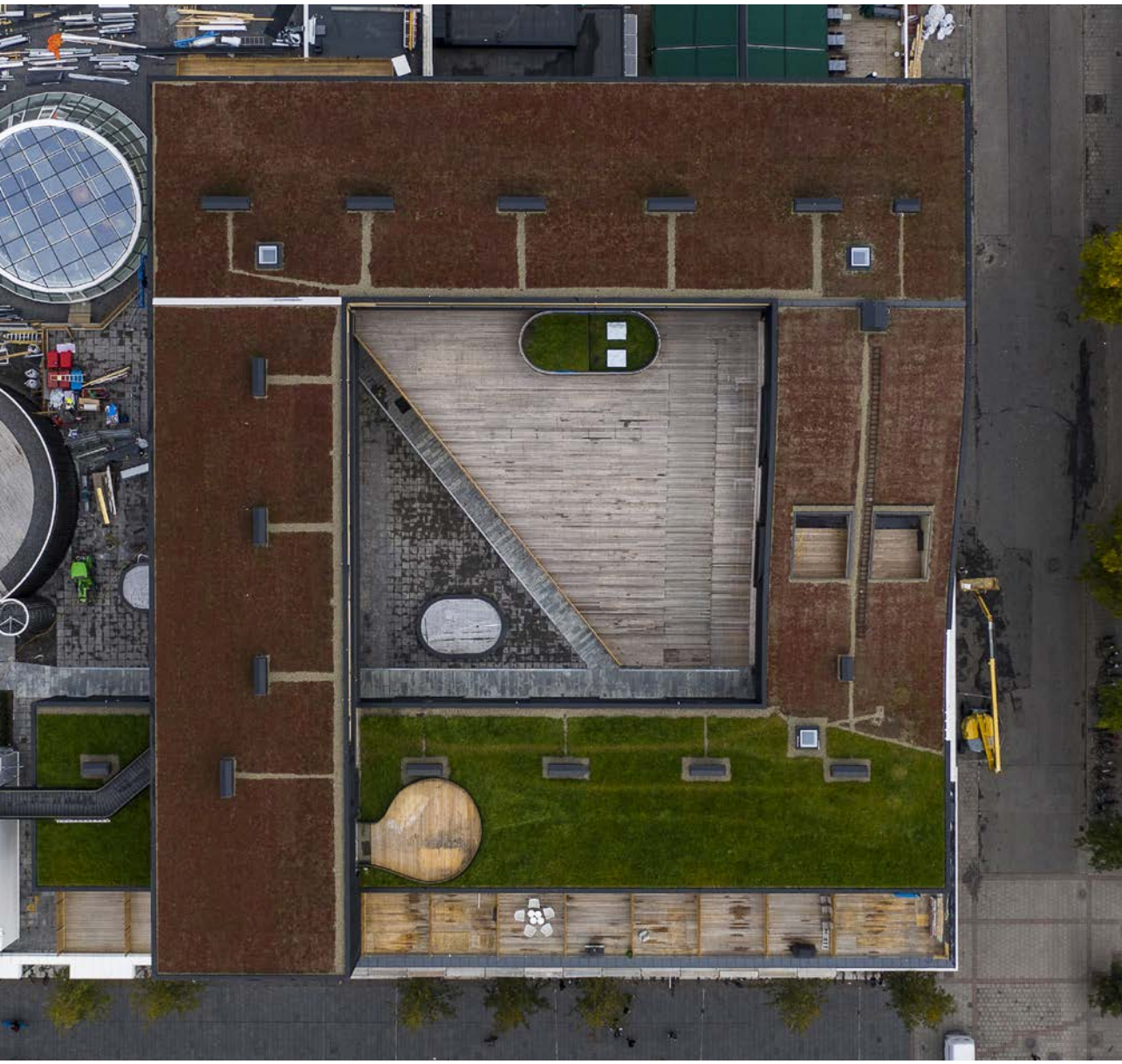

PHOTO: JASON STRONG PHOTOGRAPHY AB

Kv Glitne in Umeå
Architect: LINK Arkitektur / BIG

8. Creating vertical growth rings

Many cities in Sweden and around the world are facing major challenges as they grow and spread further and further beyond the city centre. But what does that do to the soul of the city?

Wooden upward extensions enable more vibrant urban environments where the city grows upwards instead of outwards – where the city's new growth rings are added to the city's roofs! With a three-dimensional approach to property registration, apartments or business premises can be added to existing buildings, bringing more mixed forms of tenure to an area or neighbourhood.

Extensions offer a great opportunity to create a more attractive city. Although there are some challenges associated with new additions, they can actually improve what is already there, as long as the additions are of high architectural quality. It is of course important to base the design on the history and character of the site, and from this basis, the city's identity can be strengthened and positive values added.

Kv Karmen in Örebro

PHOTO: TOMAS ALSMARKER

9. Renewing and enhancing the Million Homes Programme

The major challenge in terms of climate and sustainability is not primarily about new construction. Instead, it is about giving our large portfolio of older properties a real climate boost.

When it comes to our developments built as part of the Million Homes Programme in the 1960s and 70s, extensions offer a unique opportunity, as past experience shows. Few building types have proved more suitable for improvement and renewal by adding more floors. The carcasses and foundations tend to be robust and often do not require major interventions, while the roofs are generally flat, which is of course ideal for adding new floors.

At the same time, an extension provides an opportunity to improve energy efficiency and reduce the climate impact of the property, while creating new functional and aesthetic solutions for roofs and façades, for example. Several cases have included the installation of lifts, which have significantly improved accessibility and helped to increase the value of the property.

Kv Karmen in Örebro is one of these many success stories. Örebrobostäder's upgrading of the area through upward extensions, renovations and complementary additions created a much more vibrant neighbourhood.

Long-term residents who love the area remain, while a new generation has been given the opportunity to move into an existing cultural and residential environment. The media likened this renewal and modernisation to the legend of the phoenix! New growth rings on the city's roofs have contributed to a new neighbourhood with a new soul!

RENDERING: WALK THE ROOM

Bankpalatset/Kv Styrpinnen 15 in Stockholm
Architect: DinellJohansson

10. Catalyst for change

We are already overdrawn on our climate and resource account. It is no longer enough to be climate neutral. The urban development sector needs to become climate positive. We have a debt to repay.

Timber on Top can be a catalyst for this vital change, as a solution that makes the least possible use of the Earth's resources and minimises climate impact. At the same time, *Timber on Top* can be a driver for attractive new living environments, a new social context and a sustainable economic investment.

The most sustainable option is obviously not to build at all. This is a utopian dream, of course, but we need to think things through much more carefully rather than rushing ahead.

Taking three steps before the fourth could be the catalyst we need to make a radical difference.

- Think differently! Can we live or work in other ways that require less space?
- Optimise what is already built! Can existing spaces be used in other ways?
- Redevelop! Can we refit, extend or build on what already exists?

And if we do have to build new stock, we need to build with renewable materials; Build in wood; Build with circularity; Build for easy assembly and disassembly.

Timber on Top is a way to utilise what we have, by building on what already exists, using wood and industrial and circular methods, in harmony with the soul of the city. A real catalyst for change. A sustainable way to build the city of the future!

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Swedish Wood disseminates knowledge about wood, wood products and wood in construction, contributing towards a sustainable society and a thriving sawmill industry. We achieve this by inspiring, educating and driving technical advances.

Swedish Wood represents the Swedish sawmill industry and is part of the Swedish Forest Industries Federation. Swedish Wood represents the Swedish glulam, CLT and packaging industries, and collaborates closely with Swedish builders' merchants and wholesalers of wood products.

Wood City Sweden works to increase circular and sustainable construction in wood. The association also promotes good urban and community development with a regional emphasis. Wood City Sweden is a platform for support and knowledge exchange for municipalities, county administrative boards and regions in collaboration with companies, institutions, universities, authorities and interest organisations.

The Swedish Wood Building Council works to promote wood construction and growth of the industrial wood construction sector in Sweden. The Council's activities take place within the framework of the co-operation between Swedish Wood (part of the Swedish Forest Industries Federation) and the Swedish Federation of Wood and Furniture Industry (TMF).

PHOTO, BACK COVER: TOMAS ALSMARKER

Timber on Top

Timber on Top is a collaborative project aimed at increasing knowledge about upward and outward extensions using bio-based, prefabricated building systems, and at developing circular business models that include reuse and development of existing buildings. The project brings together actors from all parts of the value chain: urban planners, property managers, developers, consultants, architects, building system suppliers and construction contractors, with support from academia and technical institutes.

Research associated with *Timber on Top* is conducted by Linköping University, Luleå University of Technology and RISE, Research Institutes of Sweden. The Swedish Wood Building Council and Trästad take the lead on project management and knowledge dissemination respectively.

The project has 10 work packages (arbetspaket – AP) linked to all stages of the construction process: Planning, Programming, Design, Construction and Management.

The concepts of social, economic and ecological (technical) sustainability have been identified as focus areas that cut across the entire construction process.

- AP1: Urban development
- AP2: Citizen dialogue
- AP3: Architecture
- AP4: Digital twin, BIM
- AP5: Costing model and contracts
- AP6: Building systems
- AP7: Life cycle assessment and circularity
- AP8: Circular business model
- AP9: Dissemination of knowledge
- AP10: Project management

Read more at **www.timberontop.se**.

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