

BUILD



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Zamoycki Museum

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INNOVATIVE METHODS WERE USED FOR THE RENOVATION OF A QUAYSIDE

SWEDEN *The quayside in Uddevalla was in great need of renovation as the existing construction was in poor condition. For some sections of the quay an innovative solution was used - that combines concrete and Leca® lightweight aggregate (LWA).*

The existing quay in Uddevalla, which lies along a river that goes through the city, needed to be rebuilt for two reasons. On one hand, stability needed to be improved to meet the current requirements, and on the other, safer high-water protection was needed to reduce the risk of flooding.

The design specification for the stability-enhancing measures and high-water protection was thus needed. A task that the Municipality of Uddevalla allocated to two companies, Bohusgeo and Port Engineering. Bohusgeo is a consulting company with long experience of conducting geotechnical investigations. Port Engineering specializes in quay structures and port facilities. Both companies are based on the West Coast of Sweden and have great local knowledge of the area.

Reinforced lightweight aggregate concrete slab

Based on the conditions of the area and the requirements of the design, BohusGeo and Port Engineering suggested a solution that in Sweden is called LLP. LLP is a reinforced



The renovation of the quayside is now finalized and the construction is expected to last for a very long time.

lightweight aggregate concrete slab. It provides a light and relatively rigid construction based on top and bottom reinforcement and Leca LWA concrete. Henrik Lundström, a geotechnician working at Bohusgeo, was one of the people involved in the project.

"The reason for choosing LLP as a solution was because of stability for the new construction and partly because of settlement issues in the area," says Henrik Lundström.

LLP is a method that is well suited for filling that needs to be able to withstand large loads and settlements problems.

Innovative solution

The contract was subsequently assigned to PEAB and the majority of the work on the quayside was completed in 2018.

Installation of the LLP-solution is done by combining Leca LWA and cement mixture (also called slurry) in a specially developed nozzle. The mass with the two combined materials is laid out and packed in layers with welded mesh

reinforcement. The total thickness of the slab is normally 0.3-0.5 meters. In this project, a design was chosen in which loose Leca LWA was also put on top of the finalized slab. The reason for doing this was to compensate the load and minimize settlement.

"Our innovative method where we combine concrete and Leca LWA has a number of advantages. In addition to only give small and, above all, even settlements, execution is also quick and easy," says Ola Andersson, Sales Manager at Leca Sweden.

Project information

Project: Quayside, Uddevalla

Client: Uddevalla municipality

Contractor: PEAB

Geotechnical investigator: Port Engineering Göteborg AB och Bohusgeo AB

Leca product: Leca Infra 10/20.



GEO LECA® LIMITS THE RISK OF STRUCTURAL FAILURE ON THE SLOPES OF A MEDIEVAL CASTLE

PORTUGAL *Leca® lightweight aggregate (LWA) was chosen for the foundation backfill in a consolidation project for the slopes of Palmela Castle, near Lisbon. The ease of delivery and lightweight properties were the main reasons for its selection.*

Palmela Castle has played an important role throughout Portugal's history and has in recent decades been suffering from slope instability problems.

Rehabilitation work started in September 2018 following three years of geotechnical studies and archaeological monitoring, given the complexity of the necessary intervention and the rich heritage involved. The project represented a total investment of 2.9 million euros.

Stability and safety assurance

Work on stabilising the slopes was carried out on three fronts, Leca LWA was specified in the consolidation of the walls of one of the castle's bastions.

"This bastion had already been subject to several studies and assessments, in which serious structural issues were detected, mainly in its foundations. Addressing these pathologies and ensuring the safety of the structure were the main objectives", explains Rui Tomásio, Engineer at JETsj Geotecnia, the company responsible for the project.

These objectives were fulfilled by strengthening the foundations with reinforced concrete and micropiles, in

order to transfer the load to a deeper stratum, but also to preserve and restore the bastion itself. All concrete elements were furthermore treated, joints were sealed, and a revision of the drainage system was performed. Lastly, an intervention was also carried out on the existing embankment at the back of the bastion wall.

"This embankment was extremely degraded with signs of soil settlement, so it was partially removed and substituted with lightweight ex-

panded clay aggregate. This substitution helped to alleviate the impact of soil pressure against wall and, at the same time, improve drainage conditions," Rui adds.

Geo Leca: extremely lightweight and easy to use

JETsj chose expanded clay as the embankment fill material. Incredibly lightweight in comparison to other filling materials, it made the embankment consolidation possible without the need for direct intervention to the



Leca LWA was pumped directly through pneumatic delivery.



In 2015, the National Laboratory for Civil Engineering regarded the safety of the castle slopes as critical.

wall, which was considered to be a part of the historical heritage.

“We could have opted for a range of solutions to improve the embankment, but this seemed to be the best option, as it allowed us to resolve both the drainage problems and issues generated from pressure against the wall at the same time. In addition, we also saw it as the simplest solution considering the constraints affecting access to the site”, said Ana Pereira, the engineer in charge of the JETsj Geotecnia project.

JETsj Geotecnia, Pombalense and Leca Portugal join forces and rise to the challenge

Leca LWA was the specified solution, its delivery was the responsibility of Pombalense, a company specialising in the transport of goods. The project was particularly challenging from a logistical point of view given the considerable distance and height of the project where the lightweight aggregate was to be applied, as well as the fact that this is a national monument. After visiting the site, with the sup-

port of Leca Portugal, the company opted to pump the aggregate directly through pneumatic delivery. The alternative would be to supply the material in big bags via the castle’s interior. This would have resulted in a more complex and time-consuming process, which would mean navigating through narrow spaces, and possibly limiting visits to the castle while work was underway. Pumping the material through a pipe system meant that work could continue without the need to close the monument.

Leca LWA was blown to 200 m distance and 40 m high

“We saw that we had around 200 metres of hosepipe onsite that could reach a height of almost 40 metres, which would enable us to successfully complete the project.”, Renato Neves from Pombalense, told us. “We used cisterns and compressors equipped with 150 mm valves and that produce around 16 cubic metres of air per minute at a pressure of 1 bar,” he added. This option allowed the entire process to run without any setbacks and

guaranteed the area was made safe again. “Now that this part of the project has been fully completed, and with the systematic monitoring we carried out on the job, we can confirm that the solutions implemented met the expectations we had when the project was developed. From our point of view, this solution enabled us to reinstate conditions of safety while maintaining the ability to carry out the work with versatility and ease”, concludes Rui Tomásio.

Project information

Job: Structural intervention on the slopes of Palmela Castle around one of its bastions

Location: Palmela, Portugal

Main contractor: Palmela Municipal Council

Project management: JETsj Geotecnia Lda. (Engineers Ana Pereira and Rui Tomásio)

Construction: ACA Engenharia e Construção

Leca product: 474 m³ of Geo Leca® in bulk



HOUSING DEVELOPMENT WITH HIDDEN PARKING

POLAND *With residential buildings - parking facilities do not need to dominate the landscape.*

Every residential building needs a number of additional structures. Parking facilities take up most of the space. Nowadays one family has one, two, or even more cars. Underground residential garages are becoming a standard solution. However, to fit most cars in a garage below five-storey building would require a two- or three-level garage. Unfortunately, this is not always possible due to

structural ground conditions. On the other hand, building parking lots outside limits areas for natural green infrastructure. How do we solve this problem?

Underground garages extending beyond the buildings geographical perimeters

In Gdańsk, in the residential area with multiple dwellings "Chełm", we man-

aged to design and build a block of flats and surround it with a natural green design. The underground garage is much larger than the building's geographical perimeter in terms of length and width. On the part of the garage ceiling that stretches beyond the building, we decided to use tight insulation, develop a green roof and construct a recreational playground for children. Through this



Entrance to the garage



Recreation area

method, the construction of a multi-storey garage could be avoided. The building is five-storey and the cars could be parked in the large garage area. Only a dozen or so parking spaces were created outdoors near the access road. Residents now have the opportunity to look at the green space from their apartment windows and have cleaner air.

Construction work

A layer of Leca lightweight aggregate (LWA) was used on the ceiling of the

garage and the area adjacent to the building, which accomplishes several functions. Acts as a drainage and insulating layer below the gardening soil, delays the flow of rainwater during heavy rains, stores moisture and gives it back to the plants in dry seasons.

Before the start of the aggregate laying, Leca Technical and Commercial Advisor Ryszard Maślankowski provided his expertise in the selection of aggregate application technolo-

gy and the logistical organization. Some of the aggregate on the roof construction was delivered and laid using a pneumatic pump. Leca LWA laid at the outer walls was delivered by self-unloading vehicles and moved by loaders.

This way, the scenic green landscape won over the parking lots in this housing estate.



Greenery around the building

Project information

Structure: Multiple dwelling housing estate "Chełm"

Location: Gdańsk, ul. Suchanka

Investor: S M "CHEŁM"- Gdańsk,

Contractor: "ELWOZ" Sp. z o.o. - Miechucino

Project: "DOMUS" STUDIO PROJEKTOWE S.C SIENIAWSKI & SIENIAWSKI - Gdańsk,

Project realization: 2019

Leca product: Leca LWA 8-20 R

Quantity: 340 m³



The site required delivery at a distance of 70m and the speed of installation was fast and easy.

REMODELLING AND RENEWING LIFE INTO DERBY STATION

UNITED KINGDOM Sunday 22 July 2018 saw the start of an 11-week partial closure of Derby station, part of the ambitious Midland Main Line Upgrade.

Sunday 22 July 2018 saw the start of an 11-week partial closure of Derby station, part of the ambitious Midland Main Line Upgrade. Starting south of the station, the project was in operation 24 hours a day and 7 days a week to replace over 2km of track, install 11 sets of points, open a new platform and started on the demolition of platforms in the station.

Reducing journey times, improving performance and increasing speed

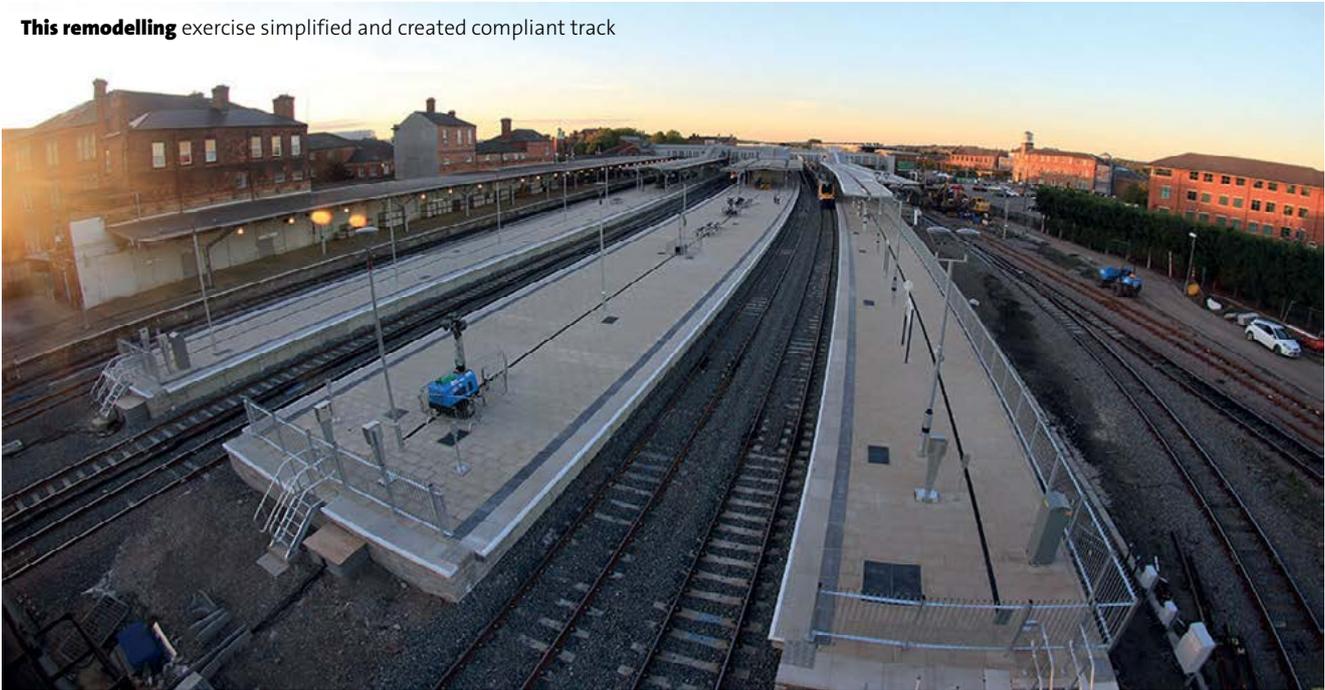
The purpose of this project was to reduce journey times, improve rail performance, increase the line speed and to segregate services. This remodelling exercise simplified and created compliant track. Furthermore, this provided an opportunity for future electrification development. Achiev-

ing those objectives involved a £200 million (226 million euro) investment to reconfigure both track and signalling in the Derby station and surrounding area, delivering a more efficient and reliable layout.

Lightweight Solution for Platform

Leca® lightweight aggregate (LWA) was selected in order to provide a

This remodelling exercise simplified and created compliant track



lightweight solution for the rail platform. The lightweight fill was used behind the riser walls in order to reduce loads applied. Leca LWA was specified in areas where small foundations were installed to accommodate electrical cabinets on the platforms. The cabinets were installed on top of the Leca LWA.

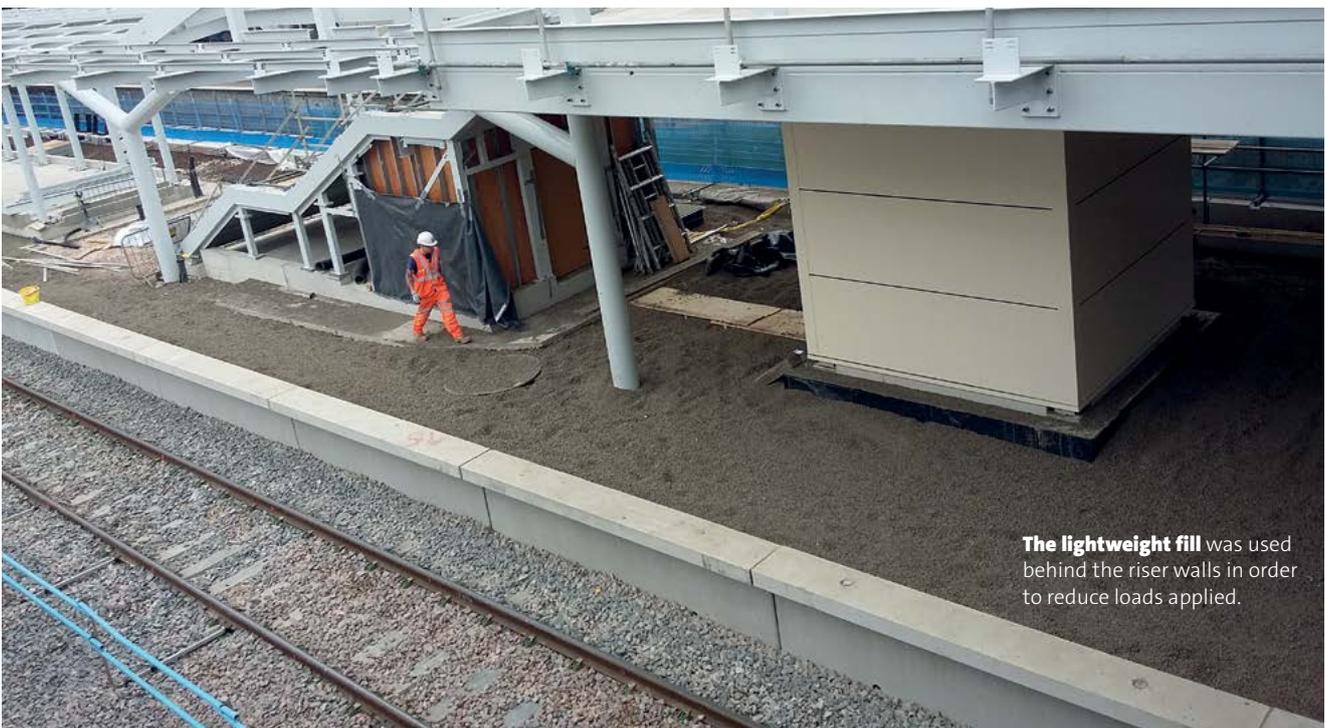
Pneumatic Delivery of 1700m³ of Leca LWA

Over 1700m³ of Leca LWA was deliv-

ered to site and was installed through the pneumatic blowing facility which was crucial for the development as time was extremely limited and access points to the project site was highly problematic – due to the station remaining partially open during much of the development. The site required delivery at a distance of 70m and the speed of installation was fast and easy.

Project information

- Structure:** Railway Platform
- Location:** Derby Rail Train Station
- Contractor:** SIG Warrington
- Project completion:** 2018
- Leca product:** Leca LWA 10-20
- Quantity:** 1700 m³



The lightweight fill was used behind the riser walls in order to reduce loads applied.



NEW INTERMODAL STATION IN LOGROÑO – CREATING A NEW PUBLIC TRANSPORT CONNECTION FOR TRAVELLERS

SPAIN *This new infrastructure will provide an improvement in passenger transport and will contribute to the urban transformation of Logroño. This project represents the biggest transformation that Logroño has experienced for decades. Initiating a decisive project for the future infrastructure and the well-being of the inhabitants of this city. Next to the underground of the railway lines and the railway station, a new bus station has been constructed next to a large urban park which spans over 60,000 m².*

This project was designed by the architects Ábalos + Senkiewicz and the work was overseen by landscape architect Teresa Galí and TYPSA engineering. Arlita® supplied 6.000 m³ of LWA for the development of the geometry of the park on the prefabricated concrete structure, significantly reducing loads from the top structures. The whole project was completed in the following stages:

1. Underground rail line.

2. Construction of a new railway station

3. Construction of a new bus station.

4. Enlargement of Felipe VI urban park.

In several of these stages, Arlita® LWA provided fundamental solutions for the development of the project. In the first stage, it developed a very important problem saving solution when the railway tracks required embed-

ding within an underground tunnel structure and allowing the development of the park on top of the railway on the over ground surface – achieving the original design concept created by the Architects.

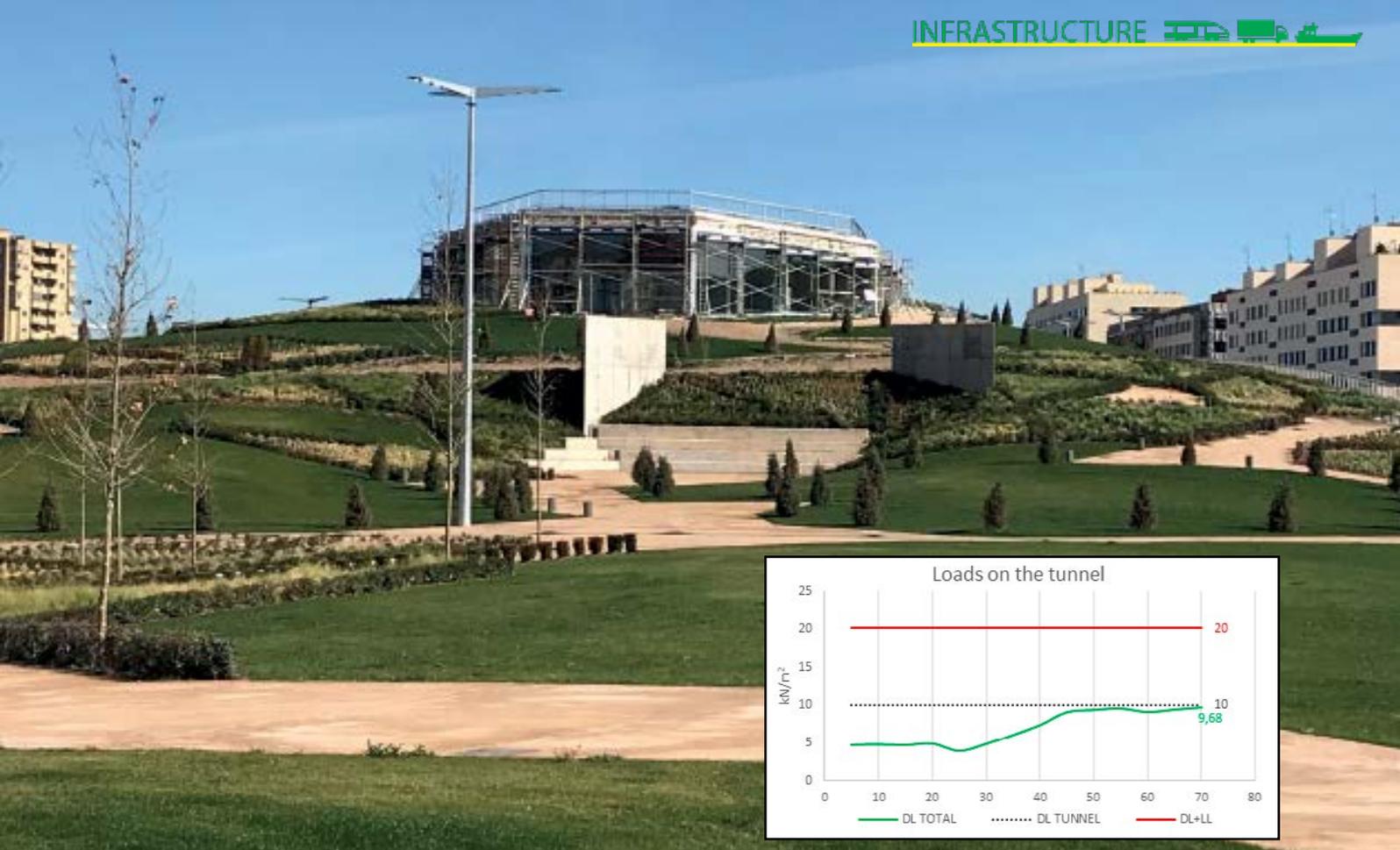
This park was fitted with irrigation systems, with protective measures in place for the possibility of heavy annual rainfall.

Arlita® LWA has properties that fit perfectly into this solution, because some of its fundamental primary benefits include:

- The ability to maintain its mechanical properties in wet conditions.
- The ability to not be affected by water absorption within the material.
- Large drainage capacity between the grains: 10-3 and 10-1m/s.
- Optimal resistance to the damaging effects of solvents, gasoline, naphtha's and other harmful gases.
- Fire resistance, as it is classified as Class A1 against the action of fire.
- Lightweight 275 kg/m³ bulk density.



Arlita(R) LWA compaction Works.



Definitive aspect of the intermodal railway station in Logroño (Spain).

- Strength to withstand the weight of transportation vehicles without the need to place transport slabs on the surface.
- Its application in Green Roofs and Landscaping elements as a drainage solution in Sustainable Urban Drainage Systems (SUDS).

The installation area for Arlita® LWA are located on the railway tunnel with a Dead Load (DL) + Live Load (LL) of 20 kN/m². Arlita® LWA in bulk has a density of 275 kg/m³ and requires 6-8% compaction to eliminate any settlement created by the passage of time with heavy vehicles driving over it. After this compaction, there is a density of 291 kg/m³ which was added to the moisture effect to determine the final load, which in this case, we will have a good drainage capacity, with multiple water removal elements avoiding in any case ascents of groundwater levels, we will consider a value of 25% that will establish a final density of dimensioning of 364 kg/m³, which corresponds to a load value on the

drawer of 3.5 kN/m² for this material. Two layers of finish surface are installed on this Arlita® LWA area. The first to receive the implantation of shrub plantations and grasslands, which will have a thickness of 0.3 m, with characteristics of lightened vegetal mantle with 50% mixture of Arlita® (for more than 100 meters). The density of this material is 1,200 kg/m³. In the areas of roads, 10 cm of crushed stone + 10 cm of Aripaq® (mix of aggregate and compacted crushed glass) and has a density after good compaction of the set for both cases being conservative of 2,100 kg/m³.

To represent the loads generated by the filling on the drawer, a graph has been prepared indicating the total load generated by the sum of both thicknesses of material, with the DL, values of Arlita® 10/20 together with the ground floor lightened with Arlita® LWA and Aripaq®, depending on the PK where it is located. DL + LL indicated in the project has also been marked, seeing that in no case ex-

ceeds the planned DL and increasing the LL capacity of the project to 10.3 kN/m².

Arlita® LWA has been a fundamental material for the development of this project being able to execute the geometries desired by the architect to achieve a more pleasant environment for the habitants of this city in a more sustainable way.

Project information

- Project:** New bus station in Logroño
- Construction:** VIAS
- Client:** Logroño Town Hall
- Architects:** Ábalos + Senkiewicz
- Engineering:** TYP SA
- Product:** Arlita® 10/20



The Leca LWA was delivered by blowing truck.
Photo: MT Højgaard



LIGHT RAIL WILL BE RUNNING ON LECA® LIGHT-WEIGHT AGGREGATE (LWA)

DENMARK Leca LWA has been used for load compensation on a 300-meter-long stretch of Odense Light Rail.

Leca LWA has been used in the geotechnical solution for Odense Light Rail, which is expected to start running in 2021. The light rail will be running on Funen from Tarup via Odense Railway Station, University of Southern Denmark to the new super hospital to Hjallesø. The contract was carried out in a consortium consisting of Comsa, the Munck Group and Efacec. The consortium chose to carry out the task as a traditional road structure with the establishment of drainage and draft pipes, as well as the incorporation of support layers in which Leca LWA was applied on a stretch of soft ground. Everything is now awaiting to be completed with the installation of a concrete layer in spring, after which electricity will be drawn and rail lines will be laid out by a rail contractor.

Load compensation with lightweight aggregates

Munck is in charge of the construction of the light rail on a large part of the route, and they have been working on the project since 2018. Leca LWA became part of the project when they encountered soft ground on a stretch across an old swamp near Odense Stadium - Nature Energy Park in 2019.

Thomas Damborg from Munck, who was the project manager of the section where Leca LWA has been used, says: "The consortium's advisers had prescribed that lightweight aggregates should be used in the section as there were challenging soil conditions. It was Chairman Martin Debel and I who contacted LECA and together with Knud and René found a solution".

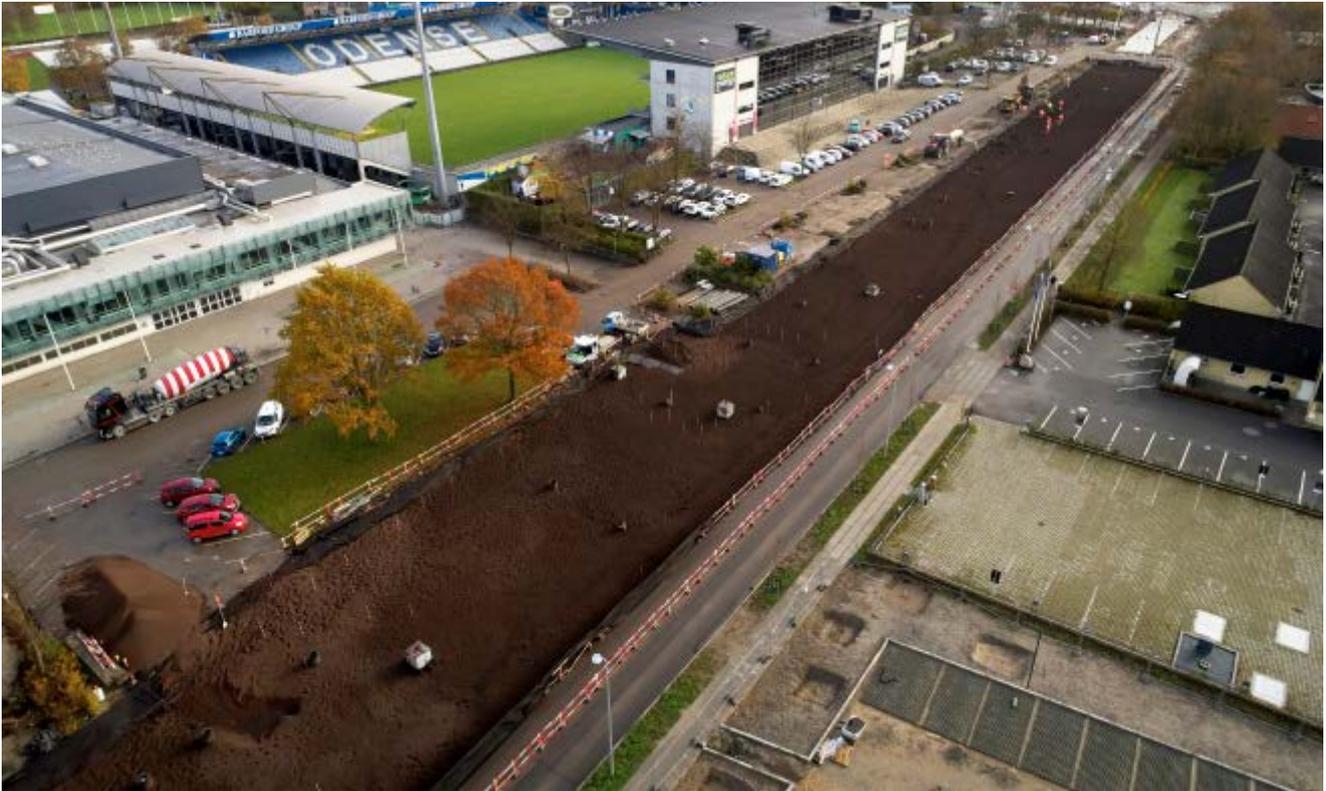
Knud Mortensen, technical advisor at LECA, and René Jespersen, Sales & Marketing Director, were able to draw on experience from similar constructions both at home and abroad.

The final solution was to use a Triax 170 reinforcement net between two 25 cm layers of small stones, followed by a 70 cm layer of Leca LWA wrapped in a nonwoven cloth/fiber cloth.

On top of the Leca layer, there is a layer of sand, and finally a layer of concrete will be cast in spring, on which the rails will be laid.

Easy delivery with blowing vehicles

4,200 m³ of Leca LWA was used in the project and they were delivered with blowing vehicles. There were 3 men attached to each blowing vehicle - one to hold the hose, one to help move the hose and one to distribute



4200 m³ of Leca LWA was used for the 300-meter-long stretch

Photo: MT Højgaard

the pellets. When the material was distributed, the thickness of the layer was measured to check how much it would settle after compression. It had to reach a maximum of 8-12 %, and this requirement turned out to be fulfilled.

Martin Debel says: “Working with Leca LWA has been a great experience. I am surprised at how compressible it is - despite the fact that it is round pellets, it stands firm. Also I'm impressed that such a hardness can be achieved on the surface of such a lightweight

material.” It's all about compensating the ground for the weight of the heavy construction, and Leca LWA has been the solution for that.

The most resource efficient solution

“At approx. 14 meters down to solid ground, it was not a possibility to remove the soft soil. Piling had been an alternative solution, but it often causes shaking and noise pollution. Pre-loading with sand was also not an option as it takes a long time for

the soil to settle – time that we didn't have. Leca LWA used as load compensation was the most resource-efficient solution for this project”, Thomas Damborg says.

Thomas was familiar with the material, having previously worked on projects in Sweden, where load compensation with Leca LWA had been used under roads. He could easily imagine using Leca LWA for future geotechnical solutions and says that he has been very pleased with the collaboration with LECA.



A layer of 70 cm Leca LWA was used for the project. Photo: MT Højgaard

Project information

Client: Odense Letbane P/S

Consortium: CME-letbane (COMSA, Munck Gruppen og Efacec)

Leca product: 4200 m³ Leca LWA



Profile:

Agata Twardoch, PhD., specialist in engineering and architecture
Agata Twardoch, an architect and town planner affiliated with the Faculty of Architecture at the Silesian University of Technology, and a member of the Polish Society of Town Planners.

She is also the co-runner of a design studio called 445TO. She has been working on accessible housing and alternative forms of housing projects. The author of numerous articles in trade magazines, Ms. Twardoch has been busy doing scientific research, giving open lectures to popularize the domain of architecture, and organizing design workshops. She designs public spaces, dealing with both external architecture and interior design. She has been a strong advocate of housing cooperatives, promoting co-housing and the idea of the right to housing. In 2019, her book "System for Housing" on future prospects of housing development was published.

The future of cities in Poland - Urban planner's perspective

The development needs of cities are very diverse and it does not always have to be just spatial development. Universal design should take into account the issues of very large diversity. The point is for the city to be friendly and universal for exactly all its users.

Would you agree that urban planning is as old as time?

That depends on what we call urban planning since urban planning is actually a science about designing cities. First human settlements were not initially cities. But if we were to talk about modelling one's space or the desire to make the space work for people, or to give it some form in a very broad sense of urban planning, then indeed the first settlements were already a model.

As you've said urban planning is a science about planning cities and dwellings, about the way they came to be, and the history of their development. It is only natural to wonder what influence do urban planners have on planning cities and the comfort of people who live in them?

Urban planners deal with a whole array of things. Planning takes place on many levels. It begins with national level, then regional, and local, followed by designing elements of urban space such as squares, parks etc. Of course, urban planners also deal with analysis and theory. But with regard to the cities and the quality of cities, in an ideal world urban planners would have a considerably bigger influence than now. However, in our current legal and organizational system this influence is distinctly limited. For example, currently you don't need a special license to design zoning plans. By the way, zoning plans focus on what structures can be developed in a given space, what functions they will have, what will be intensity and density of the developed space. But they don't put order in this space, they cannot really structure it. Hence, we can wonder what the role of this profession is. I am far from claiming that an urban planner is an all-knowing person who can decide everything alone - after all this profession involves collaboration, negotiations, and taking into account multiple points of view. In our system we do not have a real power that is necessary to create compact, structured dwellings like in western Europe that start with master plans.

What are the biggest difficulties when planning cities and what are the factors that limit the development of cities?

These are actually two separate issues. I'll start with the second one. Let's stop for a moment and think if development should be at the heart of urban planning? Taking into account the fact that Poland's population keeps on decreasing we should ask whether all our cities need to develop in terms of size and quantity? The need for development can vary, and there are very different processes at play in big cities compared to small cities. So should Polish city Łódź (which ranks 3rd in terms of size in Poland) that keeps on losing inhabitants develop spatially? For many years local zoning plans have been created with a conviction that the only possible form of development is development in terms of quantity; those plans allowed for mass dwellings. We, urban planners, would like to draw a line for high-density development.

As regards limitations, I would like to mention once again lack of power or tools. Urban planners should be involved in the system of designing plans. Unfortunately, it is local authorities that are responsible for planning and urban planners are just experts who can provide support. On top of that we have a neoliberal and increasingly permissive system so you can say that from the very start urban planners are at a disadvantage.

Since in some cases it may be justified to limit city development in terms of space then can we say that urban planners are more involved in interfering with the existing urban tissue?

Absolutely, it is very often the biggest challenge. How to bring back to life the cities that are on the verge of crisis, how to make the quality of life better, how to find niches for those cities that are now losing their inhabitants and that have lost that special something that used to attract and keep people there. It is much more difficult to man-



Zoning plans focus on what structures can be developed in a given space, what functions they will have, what will be intensity and density of the developed space.



age or make use of the existing structure in a coherent way, which is always a mixture of ownership issues, social problems, and degraded infrastructure. It's a Gordian knot that is difficult to navigate - it is definitely one of the biggest challenges.

Post-industrial areas are also worth mentioning here since they are often still located in within city limits. There is a growing desire to use them in such a way so that they are developed within already developed surroundings. In the language of urban planners it even has a name – brownfields. These types of activities limit spatial development by preserving green areas, open areas, valuable natural areas or places that have other important functions.

People are increasingly concerned about ecology, about respecting nature. How important is this from a point of view of urban planner?

I would say that it is crucial, not only from the point of view of urban planner, but rather from the point of view of the functioning of the city in general. Urban planners should be a kind of advocates because it is obvious to them how important natural systems are. They have been talking and trying to convince people about it for a long time now, although this subject now is getting so much attention that there is less and less need to convince anyone. I can't imagine these aspects being left out in any way.

How important are social factors in contemporary urban planning? For example with regard to different generations of inhabitants, culture groups or social groups?

To put it short - increasingly important. We have already departed from urban planning that relied solely on experts as exemplified by a post-war modernism period. Back then it seemed to people that a city should be planned according to certain functions. It turned out that it doesn't work, that we need more coherence. At the

heart of urban planning is, on the one hand, care for infrastructure, economy and cultural heritage, on the other hand, natural issues

and, on the third hand, society, inhabitants. In fact, it is increasingly being argued that universal design should take account of very high diversity.

Firstly, cultural and religious diversity, secondly, socio-cultural gender diversity, and finally, age differences as we need to keep in mind ageing societies. The idea is that the city should be friendly and universal for all

of its users. Take into account the needs of the disabled. As there are so many different needs, it is important that the design is produced in

cooperation with the local community through consultations, in-depth interviews. It helps to involve future users as much as possible in the planning and design processes. It guarantees that the needs of the inhabitants will be best represented.



Urban planners should be a kind of advocates because it is obvious to them how important natural systems are.

What will the cities look like in the future, say, 10 years from now?

10 years is not too distant future, I don't think they will be very different from the way they are today. Are the cities from ten years ago that different from the ones we see now? Of course, there are some trends, and certainly such trend is caring for the environment.

So sustainable development would be it?

Absolutely, sustainable development, but there is another concept that is much broader. I suggest we use the term sustainable urban planning. Besides, the idea of sustainable development dates back to 1983, so we have been trying to implement it for quite a long time. We have much better technologies, the need for growth has diminished a bit, so I think we will definitely see more of that. It is important for this change to be real, not just superficial, expressed only in greenery and green roofs. I also hope that the trend of pedestrian-friendly cities will continue to develop, which will result in a significant reduction in the use of passenger cars. This is really apparent in big cities, where cars just don't fit in anymore. There is no way that, for example, in Warsaw everyone drives a car because there is simply no such physical possibility, not to mention London, Paris or Tokyo. I hope that this trend will also grow in smaller towns, resulting in better and more modern public transport. I keep hoping that the cities will be more and more socially cohesive, that they will offer more affordable housing. Especially as these issues are increasingly becoming part of the public debate.

Another interesting issue is how the urban planner influences the planning of infrastructure and green areas.

As I've mentioned before, this depends on the level of planning. At the supra-regional planning level, these will be: ecological corridors, river basins, city ventilation. At the city level, a very important issue is surface retention. Recently this problem has been receiving more attention. Urban planners, architects, local authorities, and all stakeholders involved in the process of planning need to remember to make the whole city less waterproof. The goal is to keep as much water as possible on the surface - so that it can either evaporate or infiltrate the soil. We can

say that there already is awareness of the problem but not much is being done about it. Nevertheless, less and less water goes directly into rainwater sewage system - and rightly so. With new investments usually retention systems are used. These can be simple solutions applied around green areas or permeable surfaces, but also more innovative ones such as bioswales, water squares or rain gardens. One thing is certain - managing rainwater in the cities is one of the key issues in terms of functionality and design.

Can you give us an example of urban modernity from anywhere in the world that would be worth following?

It's hard to give one example because there are a lot of them, but I'm a fan of Viennese solutions. For years the city has been ranked as the best city to live in. This is one of the reasons why Vienna is such a good example in my opinion. One of exemplary urban planning works that I appreciate very much is the whole new Seestadt Aspern district near Vienna. It is a great example of planning and implementation. First, there was an idea, a master plan which in general is a development scheme divided into stages, so that each subsequent stage can be modified according to the needs. First of all, communication with the city was secured by building a metro station. It was only after that when adjoining areas were developed. Of course, they had very detailed urban plans that included plots, roads, green areas and parks. It was decided where shops will be, as well as schools, kindergartens, and other elements of the varied urban tissue. Nature and retention were taken care of. According to the local law, an appropriate quota of affordable apartments was guaranteed. Some plots were intended for housing cooperatives. Hence, from the very beginning diversity was catered for.





The Sivonen house was completed in Espoo in a year.



Text and photos: Dakota Lavento

A STUNNING, SELF-BUILT LECA[®] BLOCK HOUSE

FINLAND *When you have the right vision combined with skill and experience, building your own Leca block house is easy. Marja and Visa Sivonen completed their home in Espoo, Finland in 12 months.*

When considering the construction materials and building method of their new home, the couple prioritised sustainability, health and energy efficiency.

“A house must be properly insulated, energy-efficient and durable. A Leca block house will certainly be standing here in 50 years’ time. Another benefit is that, with a stone house, you don’t have to worry about humidity as you would with a wooden house,” says Marja.

A Leca house is quick to build

It took only a year for the Sivonens to build their house, even though they built it themselves. This is already the

third house project completed by the couple. Work began in October 2017. Visa says that building the frame was actually like playing with LEGO. The work was fast. The frame, including the interior walls, went up in just over three months. The frame was made using Leca Design blocks, the load-bearing interior walls with Leca Lex blocks, and lightweight partition walls with the EasyLex system.

A great deal of work, such as levelling, remained to be done after that. The interior walls were plastered with weber TT+ filler and Weber LR+ surface filler in dry rooms, and Weber MT wet filler in wet rooms. The ceilings are made with Gyproc plasterboard.

Marja and Visa say that the year passed quickly at the building site. They did not have to give up on normal family life entirely. “We tried to keep Sundays free so that Visa could spend some time with the children,” says Marja.

Advice whenever needed

According to Visa, the construction project was well under control. “We didn’t become mentally exhausted, as happens to some families.” It certainly helped that Marja and Visa were already experienced builders. “Whenever we had any problems, I could always rely on Päivi Pöyhönen, Saint-Gobain Finland’s Technical Ser-

Project information**Location:** Espoo, Finland**Developer:** Marja and Visa Sivonen**Design:** Helst Arkkitehdit Oy**Leca products:****Fence walls:** Leca LVH-150 cast block**Building frame:** Leca Design block LTH-420**Load-bearing interior walls:** Leca Lex block RUH-200 and UH-150**Lightweight interior walls:** EasyLex system**Carport:** Leca Lex block RUH-200**Visa and Marja Sivonen built their Leca block house themselves.**

vice Manager, for assistance,” says Visa.

The family moved into their 200 square meter home in November 2018. Downstairs are the girls’ bedrooms, a handy utility room and a beautiful sauna department. An impressive staircase leads upstairs to

an open space, with the kitchen and living room area connecting to a large terrace via floor-to-ceiling windows. The master bedroom is also upstairs.

The house as a whole is superbly designed and carefully built. Spacious, well-lit spaces make it appear larger than it actually is. There are also sev-

eral fine details, many of which were designed by the couple themselves.

Now that he has some time to think about the future, Visa is contemplating building one more Leca block house. “Now that I know how to do that, too!”

The upstairs living area runs along the length of the house.





Text and photos: Inger Anita Merkesdal

Brann football club is one of Norway's leading football clubs, playing in Norway's Premier Division of Football. Brann is from Bergen, Norway's second largest city, and the team has very enthusiastic and demanding local supporters. In Norwegian, Brann means "fire", and the club's slogan is "My heart is on fire".



Brann's legendary coach Mons Ivar Mjelde talked about building a football team brick by brick. Now, Constructa Entreprenør AS has built the stadium block by block. A total of 286 pallets of Leca blocks were used in the walls of the "new" Brann Stadion.

FIREPROOF AND DURABLE WALLS FOR A FOOTBALL STADIUM

NORWAY Churches and other places of worship are blessed. There are probably those for whom Brann Stadion, home to Bergen's football team, is equally as sacred.

It's no simple task making major changes to an iconic landmark like Brann Stadion, the football stadium in Bergen. But that's exactly what Constructa Entreprenør AS did. They demolished sections of this historic icon of the city, and replaced it with a beautiful and impressive building. Constructa has erected a new building to house the football stands,

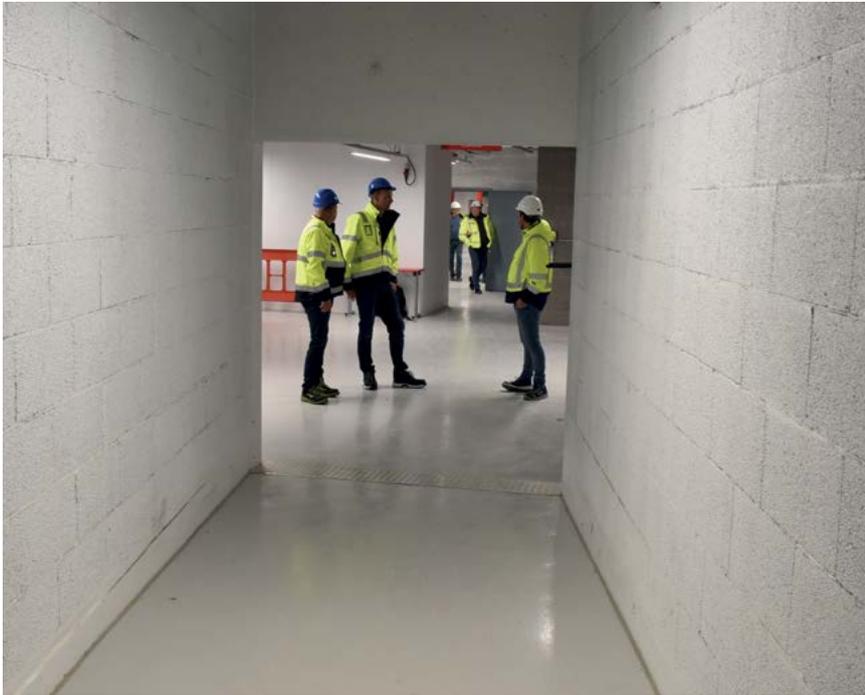
which includes 282 student flats, commissioned by Brann Stadion AS.

The building is 3–4 floors and contains everything from a supporter's room, locker rooms, to kiosks and other amenities. The whole project took just 16 months from when Constructa carefully removed the red chairs from the stands to completion. The student

flats were ready in time for this year's autumn semester, and the stadium remained operational throughout the entire construction period.

How did you manage that?

"A project like this demands good coordination and planning," says Per Thiesen. He is the Operations Manager in the masonry department at Con-



Project information

Project: Brann stadium, Bergen

Contractor: Constructa a/s

Leca product: Leca Blocks

At Brann Stadion, huge quantities of Leca blocks have been used, including the indoor partition walls and stands.

structa, and he took us on a tour just before the project was completed.

Fireproof and durable

A football stadium is subject to tremendous wear and tear, and is used by tens of thousands of people within a short space of time. This places extreme demands on the materials, and in the new part of Brann Stadion, they used unusually large quantities of Leca blocks. There are Leca blocks in the partition walls in the locker rooms, in the entrance areas, in the corridors, in the basement areas and in the connection with the 282 student flats.

“Leca blocks are fireproof and durable, and easy to build with,” says Per Thiesen. “Leca blocks last a long time and it is also extremely robust.”

“Leca blocks were already used extensively in the many sections of the building, so it made sense to use those in the new sections as well,” adds Arild Polden. He is a sales consultant at Bygg Engros AS and has been responsible for delivering the materials.

It just works

Constructa Entreprenør AS was the

contractor for this project, which was a large project – even for them. With a construction time of just over a year, a lot has to happen in a short amount of time.

“Building with Leca blocks is quite simply effortless, at least now that we’re done!” quips Per Thiesen.

We have already learnt from the sup-

plier, Bygg Engros, that Constructa has been using a lot of Leca blocks recently.

Why?

“Because it’s an easy product to use. It’s that simple. We also appreciate being able to use a product manufactured in Norway,” says the Operations Manager of Constructa’s masonry department.



The partition wall above is made of Leca’s Isoblokk 25, plastered and painted with Brann’s team colour. From the left: Hans Økland, Constructa’s Construction Manager and Operations Manager in Constructa’s masonry department; Knut Bjørkheim, Weber’s District Manager for the western region; Arild Polden, Sales Consultant at Bygg Engros AS; and Knut Bjørkheim, Sales Representative for Leca.



VERSATILE LECA[®] LIGHTWEIGHT AGGREGATE (LWA) ROOF IN A MARINE SETTING IN HELSINKI

FINLAND Housing company Verkkosaaren Wanda's charming townhouses installed a rainwater absorbing green roof. Underneath the vegetation is an easy-to-install, ventilated Leca LWA roof.

Text: Dakota Lavento

Images: Kasper Garam / Markkinointiviestintätoimisto Kuulu Oy

Skanska is building Verkkosaaren Wanda for SATO. The project is due for completion in Verkkosaari, Helsinki, in spring 2020. It consists of a brick-clad, block of flats and a lower part comprising of two or three-tier townhouses with a green roof.

Charming townhouses

Verkkosaaren Wanda will consist of 63 owner-occupied homes, ranging from compact studios to spacious

family homes. A communal sauna and club room will be located on the top floor, with two business premises at street level. There will be a pleasant courtyard contained inside the development.

In terms of the architecture, Verkkosaaren Wanda will blend perfectly into its environment, which was historically an old industrial area. The distinctive look of the townhouses

will be created by wide windows, brick-lined entrances, and the comfortable yards, separated by brick walls, for each home.

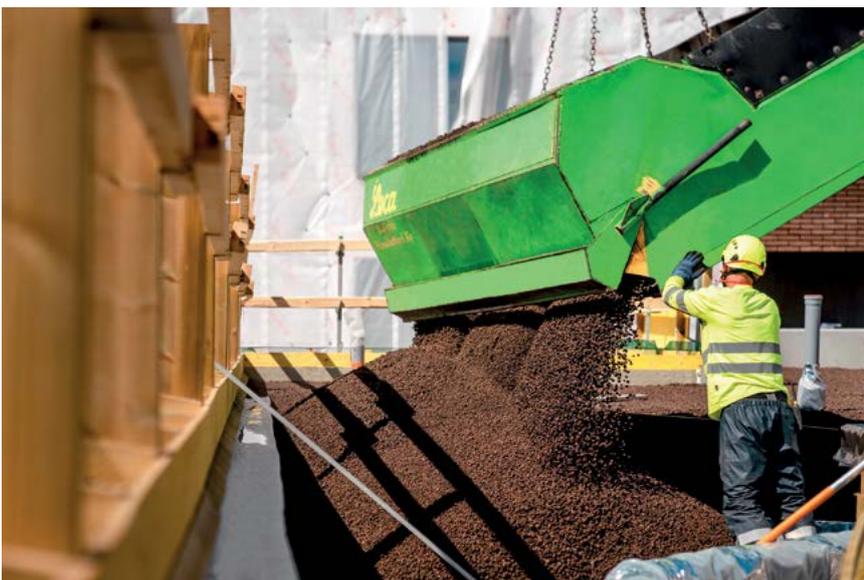
The architectural design is by Anttinen Oiva Arkkitehdit Oy, with Tapani Lehtinen as the main architect.

Solutions that save energy and increase living comfort have been introduced in the Verkkosaari area. The minimisation of the new development's carbon footprint was taken into account from the start, by choosing low-emission building materials.

Multi-purpose green roof

The townhouse's green roof will play an important role in reducing the building's carbon footprint. Not only will the green vegetation bind carbon, it will also help to increase the property's energy efficiency by reducing the need for both heating and cooling.

Green roofs are beautiful to look at, but in tightly built urban environments they are also important in terms of storm water management. In addition, they help to reduce noise and clean up urban air. The number



Leca LWA was delivered quickly and easily with a lifting box.

The townhouse consists of a brick-clad, block of flats with a green roof. Illustration Anttinen Oiva arkkitehdit Oy.



of green roofs in densely built urban environments will increase in Finland.

Functional Leca LWA roof

The Leca LWA roof is a traditional solution for sloping roofs in the development of apartment blocks in Finland. There are many positive experiences and case studies for Leca LWA roofs over the last 60 years, due to its excellent properties such as longevity, durability and the peace of mind of the need of maintenance in challenging Nordic weather conditions. Furthermore, air ducts and other HVAC technology are easy to install into the insulation layer by using Leca LWA.

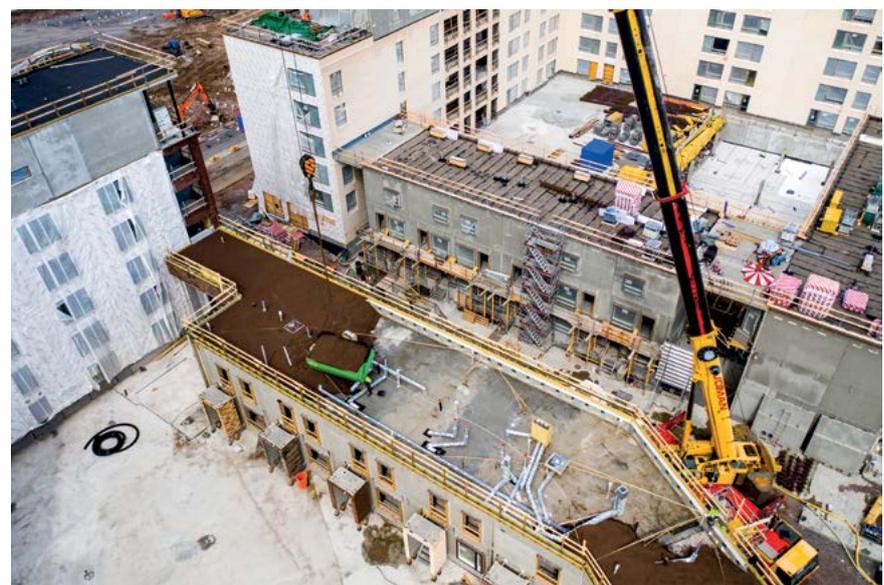
Easy and fast installation

The green roof in the Verkkosaaren Wanda townhouse rests on a Leca LWA roof. The installation was completed by AL-Katot, whose site supervisor, Kimmo Suvanto, explains that his company has had ten sites in the Kalasatama area in the last two years, most of which use Leca products.

Suvanto says that a Leca LWA roof is quick and easy to install: “It takes two

days to install a Leca LWA roof: on the first day, we spread the Leca pellets and on the second we take care of the casting and water proofing. Installation runs smoothly and on schedule. On this site, we spread 4–20 mm of Leca LWA on the roof.

In Suvanto’s experience, Leca LWA roofs are properly ventilated and retain good heat insulation capacity over time.”



The charming townhouses will get a rainwater absorbing green roof.

Project information

Location: Verkkosaari, Helsinki

Developer: SATO

Main planning and architectural design: Anttinen Oiva Arkkitehdit Oy

Main contractor: Skanska

Roof contractor: AL-Katot Oy

Leca product: Leca® lightweight aggregate 4–20 mm



Several housing projects are being built into the hill above the indoor ski park at Løren.

LECA[®] LIGHTWEIGHT AGGREGATE (LWA) PROVIDES STABILITY FOR AN INDOOR SKI PARK

NORWAY Lørenskog outside of Oslo is getting a new railway town with an indoor ski park and 1,000 flats – and Leca[®] lightweight aggregate (LWA) is an important piece of the puzzle.

“We need a light backfill between the concrete structure and the bedrock. One that does not put too much pressure on the building,” explains supervisor Tor Einar Hoffmann. Together with his colleagues in Betonmast Boligbygg, he is in the process of building what will be the Snølia and the Tribunen complexes, which could be called “Snowy Mountainside” and “The Stands” in English.

All year-round skiing right next door

Both projects are located next to Lørenskog station. Just outside the Oslo city limits, the winter sports park with Norway’s first indoor ski park Snø can be found, which means “snow” in Norwegian, that has received the most attention.

The housing projects in this new railway town have all been given

names that evoke associations with winter sports. Projects that have already been completed are: Oppløpet (“Home Stretch”), Formtoppen (“Peak Condition”), Skrensen (“Slide”), Sprinten (“Sprint”), Langsiden (“Straight”), Startskuddet (“Starting Shot”), Blinken (“Target”) and Unnarenet (“Landing Slope”).

Project information**Project:** Snølia (360 flats) and Tribunen (62 flats), Lørenskog railway town.**Developer:** Selvaag Bolig.**Main contractor:** Betonmast Boligbygg.**Leca product:** Leca Iso 10–20.

Andrzej Bojarczuk (left) and Eirik Navelsaker make sure that the backfill doesn't put too much pressure on the building.

Hard-to-reach

Snølia will be the ski park's closest neighbour, while Tribunen is in an open area in the upper part of the railway town.

"This area is difficult to reach, which is why we are mostly using pneumatic blowing to deliver the Leca LWA," says Construction Manager Runa Løvseth.

In the steep terrain, she is pleased to have the option to deliver the Leca LWA backfill using a 40-metre-long hose from the blowing vehicle. "So far we have filled almost six metres, which will be seven or eight by the time we're done," she says.

The right level

Jon Hauge also emphasises the height. He is Leca's Sales Manager for lightweight aggregate. "The special thing here is that the height is so great," he says.

There will be outdoor facilities around the buildings. "When you are laying

flagstones or gravel, it is important to maintain the right level – that the ground doesn't settle later. After we pneumatically deliver the Leca LWA,

the amount of settling later will be reduced to almost nothing," Hauge explains.



"Here, there will be 360 new apartments," explain Runa Løvseth and Jon Hauge.



The Zamoyksi Museum after renovation

MAINTAINING A STUNNING LANDMARK FOR FUTURE GENERATIONS

POLAND *Supporting historical and cultural heritage*

The history of this palace and park complex in Kozłówka dates back to the 18th century. For nearly 150 years the palace and park belonged to Zamoyksi family that turned it into one of the most glamorous baronial residences. Since 1979 the perfectly preserved and reconditioned palace rooms have been a house to The Zamoyksi Museum. In 2007 the complex was recognized as a historic monument.

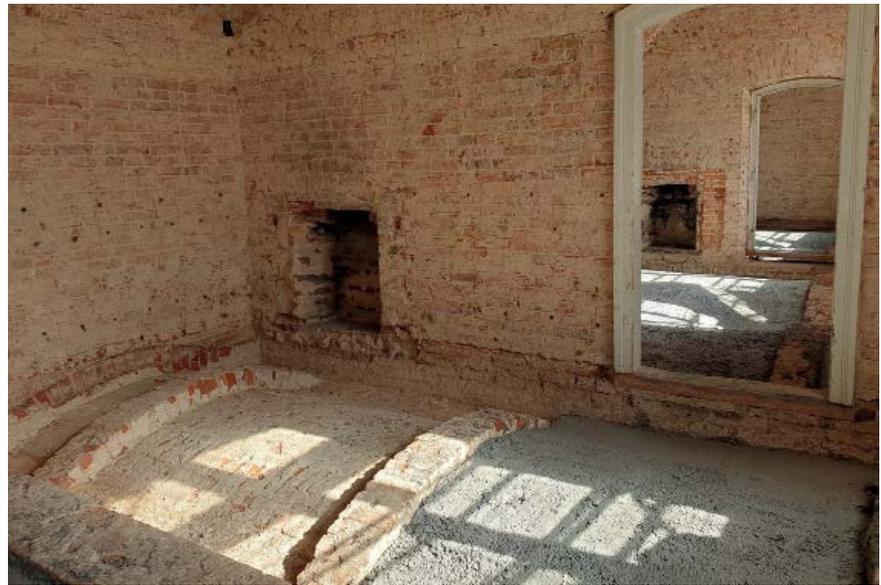
Last year a number of other structures were reconditioned. They were carefully renovated in order to re-

store them back to their original character and appearance but also to incorporate new functions. Such undertakings require not only extreme diligence on part of the contractor but also a thoroughly planned project. Undoubtedly, the latest technological methods need to be used, but materials are equally important. Everything has to be achieved under close scrutiny of the developers.

Solution to last for hundreds of years

The design was prepared by a studio that specializes in renovations and the reconditioning of heritage sights

- Pracownia Rewaloryzacji Architektury "Nowy Zamek". The designer had no doubt that the best material for renovating historic brick ceilings would be Leca® lightweight aggregate (LWA). Through choosing Leca LWA the designer made excellent use of all its unique properties and above all its light weight. Leca LWA replaced a much heavier rubble and sand solution which was originally used for the intermediate floor. Thanks to a lighter load on the construction, the building is safe to use and heavier weight can be applied on the floors. The stability and durability of Leca LWA guaran-

Project information**Historic sight:** Zamoyski Museum**Location:** Kozłówka**Investor:** Zamoyski Museum in Kozłówka**Design:** Pracownia Rewaloryzacji Architektury „Nowy Zamek”**Contractor:** FURMANEK RENEWAL Sp. z o.o. S.K.A.**Date:** 2019**Leca product:** Leca® lightweight aggregate L for insulation**Quantity:** 300 m³**One of the renovated** ceilings/floors.

tees that the intermediate floors can go on for hundreds of years to come.

Advantages of Leca LWA appreciated by the contractor

The Contractor responsible for the work was FURMANEK RENEWAL Sp. z o.o. S.K.A. company with extensive experience in renovating such historic sights. The company has specified Leca LWA before a few times. The workers are aware of the material's advantages and know how to make the best use of them. Working with clay aggregate was easy and quick. This time to move the aggregate to the desired spot a pneumatic pump was used to accurately and quickly install the material. Thanks to this solution it was possible to work efficiently with a reduction of staff required. Leca LWA was fed directly from the vehicle using hoses to the intermediate floor. Thanks to this pneumatic solution there was no need to store the aggregate on the premises of the park surrounding the renovated buildings.

The quick completion of the renovation works made it possible to make the new facilities available to the public even before the beginning of the tourist season.

**Aggregate laying with** the use of a pump.**Vehicle with a pump** for feeding aggregate.



THE OLD LECA LWA WAS TESTED AND HAD THE SAME CHARACTERISTICS AS THE CURRENT CE MARKED LECA LWA 4-32 MM



RECYCLED LECA® LIGHTWEIGHT AGGREGATE (LWA) IS A VALUABLE RESOURCE

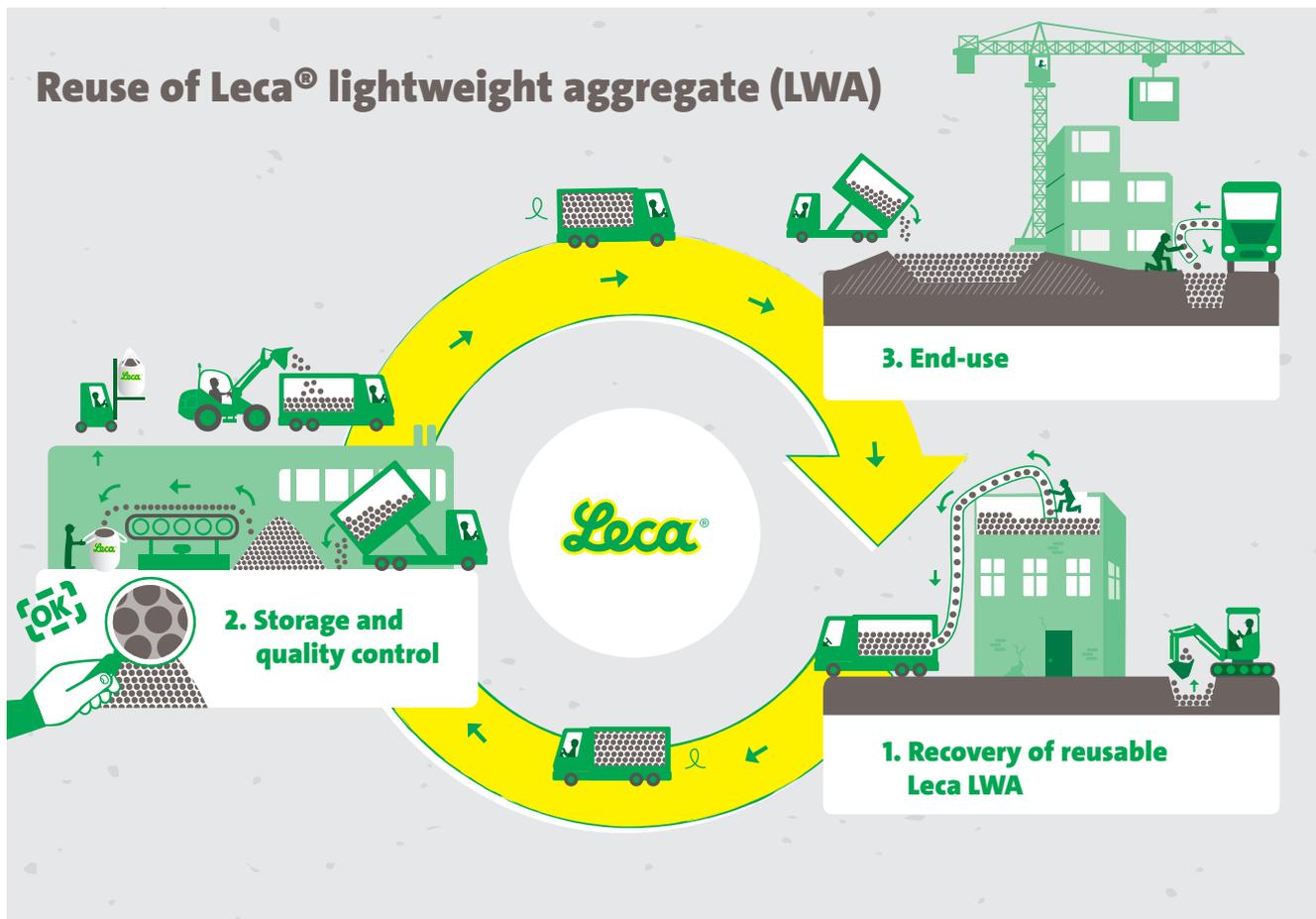
Leca LWA recovered from roof structures is recycled for use in earthworks. Recycling has become a business activity for Anpe Oy.

In Finland, the construction industry is one of the largest producers of waste, but such waste has not been utilised particularly well. However, when a property is either renovated or demolished at the end of its lifespan, this should just be the beginning of a new phase for construction waste, which can serve as raw materials.

The EU Waste Framework Directive requires Member States to recycle most of their construction and demoli-

tion waste: Finland aims to achieve the required 70% recycling rate this year.

Use of construction and demolition waste is completely safe and its quality is inspected. Recovery of civil engineering waste is governed by the MARA Regulation. Furthermore, the MASA Regulation on the use of waste soil from construction and equivalent activities will be issued this year.



Construction waste can be recycled

The recycling of demolition waste also makes financial sense. Due to the rise in value of used construction materials, the global recycling market has developed into a billion-dollar industry. Growing markets are developing for many demolition materials in Finland.

It can be difficult to find a sensible use for some demolition materials. Due to its properties, Leca LWA is one of the

VERY FEW MATERIALS HAVE LONG HISTORY OF USE AND POSSIBILITIES TO RECYCLE DECADES OLD MATERIAL AGAIN AND AGAIN.

easiest materials to recycle. This sustainable natural material is of the highest quality when recovered from, say, roof structures. When reused, Leca LWA is ideal for landscaping, road repairs and for lightening structures.

Leca LWA can be excavated from a lightening structure and used in a local similar structure. This occurred in the Vt 12 Southern Ring Road 1B project in Lahti this year. Due

to rerouting of the road, the old Leca LWA structure from the late 1990s was dug up.

“Laboratory examinations showed that 2,500 m³ of the Leca LWA was in perfect condition,” says Risto Ketonen of Afry Finland Oy, who is working on geotechnical design for the project.

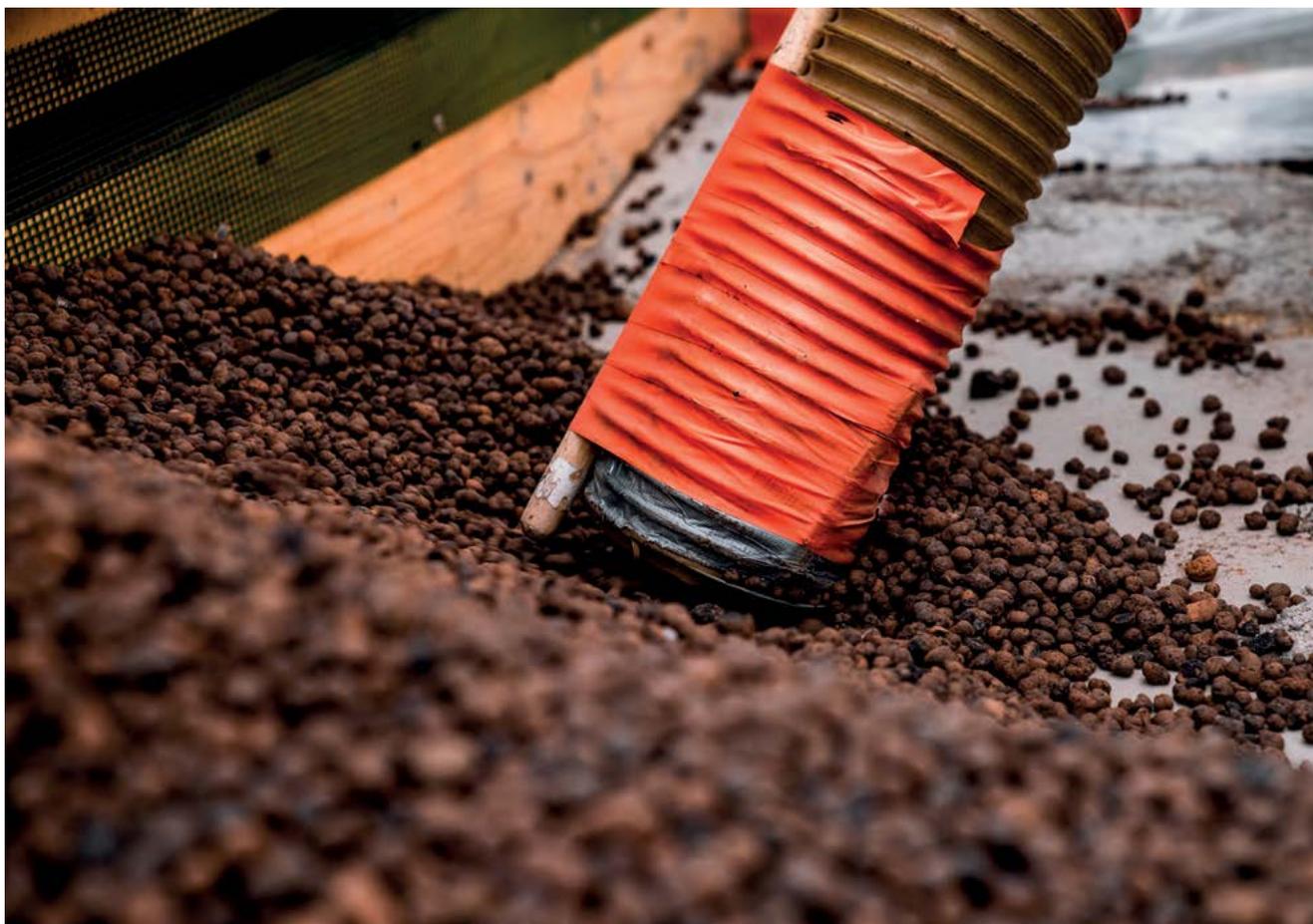
Recycling the old Leca LWA material was a very economical solution. “In practice, the project saved a sum equivalent to the cost of the entire recycled material,” says Enni Mälkönen, who works as site manager on the VALTARI project.

Pneumatic recovery

Demolition contractors mainly deliver Leca LWA for re-use in new sites slightly further away than was the case in the Vt 12 Southern Ring Road 1B project.

They recover the Leca LWA from the renovation, check its quality and then place it back on the market. Recycled Leca LWA must meet site requirements in the same manner as new Leca LWA. This is not a problem, because Leca LWA retains its properties for decades.

Since 1976, Anpe Oy has been a specialist contractor in blowing wool, high-pressure pneumatic blowing and



Leca LWA. Recycling has always been an important part of Anpe's business. On building sites, the company has been blowing wool made from recycled material for over forty years, and its services include the recycling of Leca LWA.

CEO Hannu Pesola comments that the recovery and recycling of Leca LWA accounts for only a few per cent of the company's turnover, but this activity is growing all the time. "When the apartment buildings of the 1980s and 1990s enter the renovation phase, their flat roofs will yield high amounts of recyclable Leca LWA.

The main building sites for Anpe are large apartment and commercial buildings, where the building technology is being replaced and Leca LWA removed during roofing renovations. The company recovers Leca LWA in the area of Finland south of the Pori–Jyväskylä–Kuopio line, where Leca LWA has primarily been used on flat roofs.

"Once the roof is dismantled, we can use our large industrial vacuum cleaner to remove the Leca LWA. We recover Leca LWA ranging in volumes from 20 to hundreds of cubic metres.

Leca LWA is vacuumed off roofing renovation sites several times a week in the summer, less frequently in the winter.

The recovered Leca LWA is either taken directly to the customer or temporarily stored at Anpe's yards in Hollola, Nurmijärvi and Kaarina. Pesola explains that the longest viable haulage distance for Leca LWA is a few hundred kilometres.

Recovered Leca LWA must be clean in order to be reused. According to Pesola, this can be checked visually, but samples are nevertheless taken to confirm the result.

Everyone benefits

Recycled Leca LWA is about 30% cheaper for end users than new Leca LWA.

Pesola points out that recycling Leca LWA makes sense in all respects: for the environment, the end user and the owner of the original building. "If Leca LWA insulation on roofs were not recycled, it would be taken to a landfill. It is not wanted in landfills and transporting it there would be expensive.



INFLATABLE Leca® LIGHTWEIGHT AGGREGATE (LWA) CONCRETE

Inflatable Leca LWA concrete is an advanced and multi-purpose product that is delivered to site with transport equipment developed specifically for this purpose. The transport equipment works like a mobile concrete station, which brings the necessary raw materials when it arrives; mixes the Leca aggregate concrete mass and it is pneumatically delivered to the right place. Inflatable Leca LWA concrete differs from traditional Leca LWA concrete due to its delivery method and usability. Inflatable Leca LWA concrete also has a unique composition.

Thus, the production of inflatable Leca LWA concrete takes place only on site, when the raw materials, ie Leca LWA, water and the cement that acts as a binder, are mixed together. After mixing, Leca LWA concrete is ready to be blown with compressed air to the desired location. On-site manufacturing and small and quick-to-prepare batch sizes make Leca LWA concrete's material loss almost non-existent, eliminating the need for waste to be disposed on site or transported away. This brings clear cost savings and reduces unnecessary work steps.

Significant advantages of inflatable Leca LWA concrete include its inflatability, lightness and formability. Leca LWA

concrete can be blown up to 100 meters and to a height of 50-60 meters thanks to its composition and the efficient blowing equipment available. Due to its composition, making different surface shapes at once is effortless, whether the shapes are ramp-like or round. Deep infills also do not cause problems and, due to material's light weight, do not cause heavy loads on the structures. Leca LWA concrete is about five times lighter than traditional concrete.

Inflatable Leca LWA concrete has good thermal properties and its thermal conductivity is close to that of loose Leca LWA. Inflatable Leca LWA concrete can be used to replace some of the thermal insulation that may be designed for the structure.

The applications of Leca inflatable LWA concrete are very diverse, such as infill castings, various load-bearing slabs in civil engineering and road construction, and slope castings for yard decks and flat roofs.

Positive experience has already been gained from utilising inflatable Leca LWA concrete and it is currently being used in Helsinki, on Vuosaari high school's construction site for slope castings for yard and entrance decks and green roofs.



**LECA® LIGHTWEIGHT
AGGREGATE (LWA) AND
WATER ABSORPTION**

Leca LWA is ideal for water management due to its porous structure. This image clearly shows how the grain size of the selected Leca LWA affects the water retention capacity. Crushed LWA absorbs approx. 64% of the 1000 ml of water and large, rounder Leca LWA absorbs approx. 48% of the same amount of water.

**LECA® LIGHTWEIGHT AGGREGATE
(LWA) IN GABION BASKETS**

Gabion baskets are used in various ways within infrastructure construction, e.g. as noise barriers, providing groundwork stability for structures and within landscaping. Gabion baskets are typically large and due to their large weight, their placement on construction sites with soft soil is challenging and often requires significant foundation reinforcement measures.

Fortunately, creating a large gabion basket structure is possible with the Leca LWA solution, where construction is quick and easy, and this is through filling the gaps in the stone baskets with lightweight fill (Leca LWA), creating a structure, which is around 50% lighter than gabion baskets using traditional material.

The lighter gabion basket can be designed in the same way as a conventional gabion basket. Leca lightweight fill can also be applied to control the settlements in the soil structure under the basket. When lightening is used, the structure below the gabion basket acts as part of the frost insulation or completely replaces it.

The construction of even a large noise barrier can be created without any special measures, and the internal filling of the structure can also be done, for example, with pneumatic delivery. A pilot project was carried out in Finland in February-March 2020 (image). The gabion basket acts as a noise barrier between an industrial property and a residential building. This innovative solution has been developed in co-operation with SSTec Ltd. and Ramboll Finland Ltd. Additional information: Leca Finland and SSTec Ltd.





**LECA® BLOCKS ARE CHARMING
INTERIOR DESIGN ELEMENTS**

Leca blocks are mostly found on construction sites or in terrace foundations, but nowadays, coarse, lightweight blocks are becoming more popular elements in interior design. While blocks seem coarse at first glance, they can be used to build the most beautiful and spectacular elements in public spaces, homes and gardens. The advantage of these designs is that using the blocks do not require years of experience, they are inexpensive and the end result is unique. The blocks are also available in many different shapes and sizes, so your imagination is the limit. An excellent example of this can be found in the restaurant world of the Tripla shopping center in Helsinki, where lightweight aggregate blocks are used for example in the bar counter and as dividing space walls. After seeing these pictures, you will definitely want to get a few Leca blocks for your home too!



LECA 'LIVE AND INTERACTIVE' WEBINAR

We recently completed our new 'live and interactive' Green Roof Webinar, which was aimed to provide a thorough overview of the fundamental properties of Leca LWA within Green Roof development. This live online presentation highlighted the key reasons why LECA® LWA is emerging as a popular lightweight solution for Green Roof designers. This was attended by many key contractors throughout the country and predominately London, where green roofs are becoming increasingly popular!



**NEW SOLUTION DEVELOPED FOR LECA® LWA
IN TRENCHES WITH A NETWORK OF PIPES**

Leca Sweden has together with Stockholm Vatten och Avfall, which is a company owned by Stockholm municipality, developed a new principle solution where you use Leca LWA within trenches containing a piping system.

A leak can have devastating effects and must be taken care of immediately and to perform this the Stockholm Vatten och Avfall required a technical solution to perform servicing and maintenance which was both reliable and quick.

In the new solution, heavier conventional filling material was used closest to the pipes and Leca LWA was applied for over-compensation around the conduit. This provided robust stability – making it easy to open and maintain the pipe network. The solution is especially important when installations are made in less favorable ground conditions.

Live tests were executed in late 2019 and the results were satisfying for all parties.



LECA® FLOWER IN THE UK

LECA Flower has been released in the UK and is available now in 10L and 50L bags. This is suitable for large or small and compact gardens and is highly suitable for use in-doors. Through effective water retention and lightweight properties, LECA® Flower provides a perfect solution for effective plant growth.



2 months, 7 countries, 18 Webinars

Due to the Coronavirus pandemic - meeting customers at fairs, conferences and conducting face-to-face meetings was not possible, but we looked to develop new tools and initiatives to meet the new market conditions with an agile focus on Webinars, where we continued to promote and discuss the key properties of LECA LWA with 100's of key customers.



4

One dark winter morning no less than 4 Leca®-trucks were ready for delivery at the same project at the same time. For the new light rail track in Odense, Denmark, Leca® LWA was used in an area with soft sub-soil. A tight time schedule demanded as much Leca® LWA per day as logistically possible. The LWA was pneumatically delivered by our pneumatic blowing trucks.



794

The number of containers with Arlita® (Leca®) Solar that traveled from Portugal to Dubai, from June 2019 to April 2020 used in the thermal insulation of tanks in a solar plant.



50 m

Pneumatic delivery. LECA® LWA was selected as a replacement for traditional soil material for a new green roof project in Salford. This project required 50m of piping to pneumatically deliver the material. The key properties of LECA® LWA were perfect for the green roof development and this included effective root growth and fire resistance.

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ESTONIA

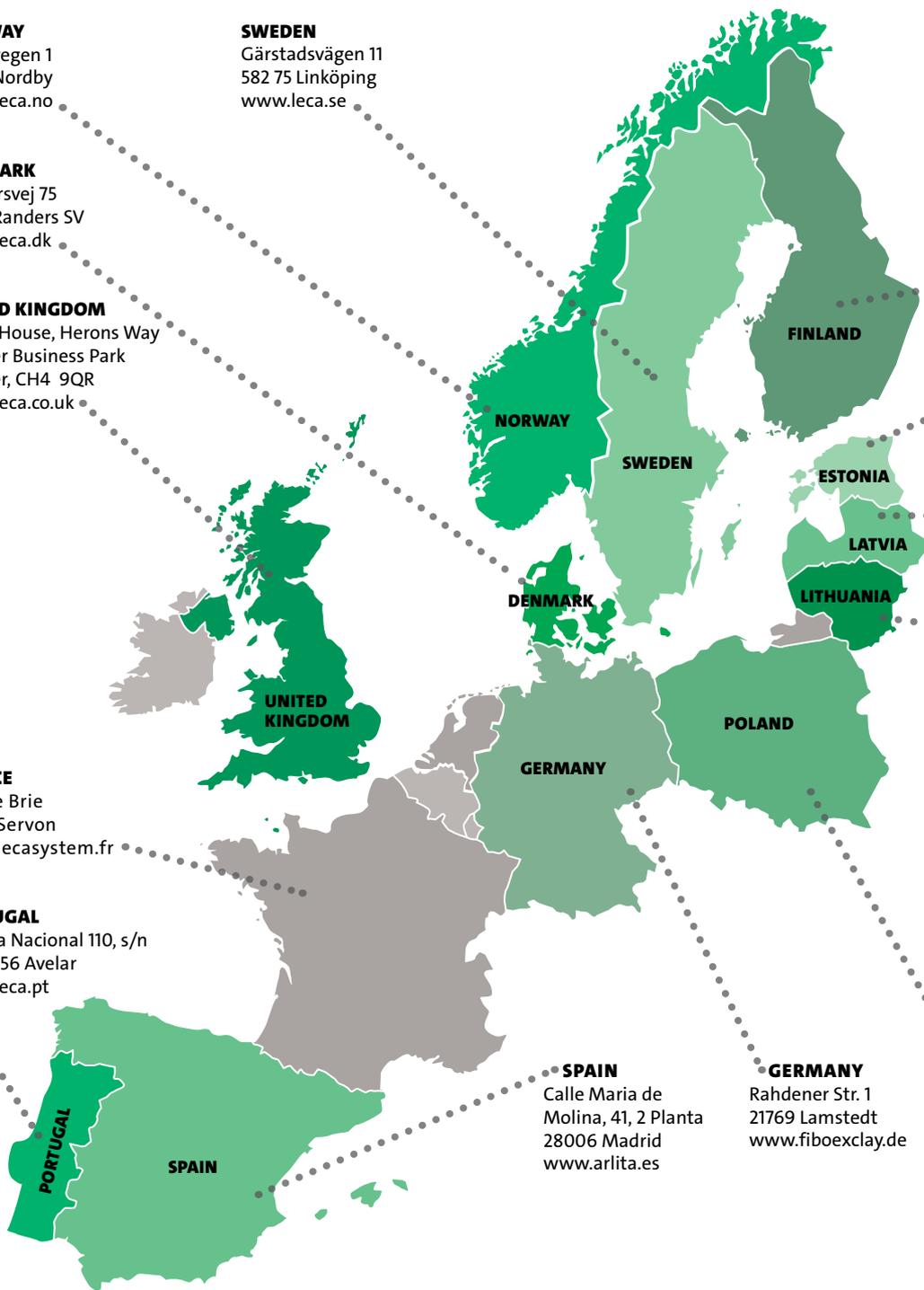
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