

2024



BUILD

A MAGAZINE FROM LECA

Water Management



Housing



Infrastructure



1-2024



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BUILD is a magazine published by Leca International
Cover: Bryga green roof, Finland



Flash Facts



114 METERS

Leca Finland delivered Leca[®] lightweight aggregate (LWA) to the roof of the 33-story Atlas tower, under construction in Helsinki's Vuosaari, with two 5m³ lifting boxes. The height of the building measured from the ground is 114 meters. The adjacent 24-story Hyperion also has a ventilated Leca LWA roof. In high-rise construction, the importance of expertise, safety, and logistics is emphasized. Upon completion, Atlas and Hyperion will offer over 500 apartments above the rooftops of Helsinki.

10.000

Models can be found in the BIM library on the leca.pl website. Leca BIM is a comprehensive, free database of ready-made partition models useful for designing in Revit. The library has solutions for walls as well as insulation for under floor and green roofs..

2 HOUR INSTALLATION

Leca UK recently delivered Leca[®] Insulation Fill (50L Bags) to a property development in Nottingham for a new underfloor system. Two layers of Leca[®] Insulation Fill raised the floor by 300mm over a 50m² area. The underfloor installation took only 2 hours to complete and eliminated the need for wheel barrows and traditional hardcore entering the property – saving time and reducing the environmental damage to the surrounding area.



NORGE BRUKER EN GASSDREVET LASTEBIL SOM GÅR PÅ FLYTENDE BIOGASS

Leca Norge gjør det enkelt å få levert Leca® lettklinker når det nå satses mer og mer på utslippsfrie byggeplasser.

Sammen med Unneberg Transport AS kan de levere Leca ved hjelp av en gassdrevet lastebil som går på flytende biogass (bio-LNG). Denne bærekraftige leveringsmetoden gjør det mulig for oss å redusere CO2-utslippene dramatisk sammenlignet med en konvensjonell dieselbil - opp til 80-100 % reduksjon.

Ved å ta i bruk grønnere leveringsløsninger reduserer vi miljøpåvirkningen vår og tar et neste skritt mot en mer bærekraftig fremtid.



LECA UK + RESAPOL

Leca UK has started an exclusive distribution partnership with Resapol for the launch of Leca® Uno, which forms part of the Leca® Underfloor Insulation solutions.

Last week our team were educating and demonstrating Leca® Uno with retail branches along the south of England. Leca® Uno (25L) bags weigh only 15-17kg and generates a rapid, unique and innovative solution for filling and levelling floors in a single layer - increasing thermal and acoustic improvement of floors and much more.

We are excited to begin this partnership with Resapol.





Av: Jan Vestre

Anleggsleder Matthias Lepkowski i NCC (t.v.) og salgssjef Frank Nornberg i Leca Norge foran det som skal bli Trondheims største kontorarbeidsplass. (Foto: Jan Vestre)

LECA LETTKLINKER SIKRER HISTORISK BYGNING I TRONDHEIM

Når en 100 år gammel trikkehall skal integreres i morgendagens kontorbygg så setter det krav til hvilken fyllmasse som kan benyttes. -Leca lettklinker er et etterspurt produkt i dagens ROT-marked, forteller Frank Nornberg i Leca Norge.

“Teknobyen” er med sine 2500 ansatte og 115 000 kvadratmeter fordelt på fem moderne kontorbygg et av Trondheims viktigste områder for næringsvirksomhet.

Nå utvides Teknobyen med en helt nytt bygg på 48 400 m² kalt “Teknostallen”. Byggherre er KLP Eiendom, mens NCC er totalentreprenør for prosjektet som er beregnet til å koste i overkant av 1 milliard kroner.

I tillegg til å huse morgendagens kontorplasser vil “Teknostallen” også inneholde treningssenter, butikker, spisesteder og en 3000 m²

stor innglasset helårshage som vil være åpen for byens befolkning.

Sentralt i det som skal bli Trondheims nye senter for teknologi og innovasjon står også en gammel trikkehall fra 1923. Trikkehallen ble tegnet av arkitekt Hagbarth Schytte Berg som også tegnet flere jugendstilgårder i Trondheim.

HISTORISK BYGNING

-Trikkehallen på Dalsenget er en av fire bevarte trikkehaller og er et flott arkitektonisk kulturminne og et viktig minne om transporthistorien i Trondheim, forteller byantikvar i Trondheim, Mette Bye.

I følge Bye er det langt fra hverdagskost at et kulturminne transformeres såpass kraftig som det blir gjort i forbindelse med byggingen av “Teknostallen”.

-Noe av grunnen til at vi allikevel har kunnet anbefale prosjektet er at bygningen tidligere har brent og at det innvendig er lite igjen å ta vare på. Man har også unngått å bygge høyt inne i selve gårdsrommet, forklarer Bye.

Byantikvaren sier det hele veien har vært lagt vekt på å spille inn at det skal være høy arkitektonisk kvalitet på det nye som tilføres.

-”Teknostallen” blir et tyngdepunkt i etableringen av et nytt sentrumsområde langs Elgeseter gate der trikkehallen blir en historisk identitetsbærer. Fasaden er et flott fondmotiv og en viktig byromsvegg mot en sentral ny plass.

Prosjektleder i KLP Eiendom Trondheim Lasse Volden sier det har vært viktig å ta vare på historien til den gamle trikkehallen.

-Vi ønsker ikke bare å bevare et stykke av Trondheims historie, men også å bruke dette prosjektet til å skape fremtidens kontorbygg. Det handler om å respektere fortiden mens vi bygger for en fremtid hvor arbeidsplassen ikke bare er et sted å jobbe, men også et sted for trening, shopping og sosiale aktiviteter rett ved siden av der man jobber.

Å skulle integrere trikkehallens historie med moderne fasiliteter har imidlertid ført med seg ekstra kostnader.

-Vi anslår at dette har lagt til rundt 20 millioner kroner til prosjektets totale budsjett. Dette har vi investert i nøye restaurering og for å sikre at vi beholder bygningens unike karakter, forklarer Volden.



I tillegg til å bli Trondheims største kontorarbeidsplass, vil ”Teknostallen” også inneholde treningssenter, butikker, spisesteder og en 3000 m2 stor innglasset helårshage. (Illustrasjon: KLP Eiendom)

UTFORDRINGER

Matthias Lepkowski har jobbet i byggebransjen i 30 år og har vært med på en rekke store prosjekter som blant annet Lerkendal Scandic Hotell, Gardermoen Pir Nord og Campus Ås.

Nå er han NCC sin anleggsleder for fase 2 i byggingen av det som vil bli Trondheims største kontorarbeidsplass.

Lepkowski forteller at det er flere utfordringer når et historisk bygg som den gamle trikkehallen skal integreres i et nytt og moderne bygg.

-Utfordringen er å beskytte eksisterende konstruksjoner for store skader med tanke på alle arbeidsoperasjoner som pågår. Særlig gjelder dette i forbindelse med jetpeling, utgraving av tomt, avretting og komprimering av massene for nybygget. Vibrasjoner og rystelser er en real utfordring, forklarer Lepkowski.

Inga Krattebøl er prosjekteringsleder i NCC og har vært en del av prosjekteringssteamet allerede fra samspillsfasen.



Den gamle trikkehallen på Dalsenget i Trondheim ble bygd 1923. I 1956 brant store deler av bygget sammen med

mesteparten av vognparken til daværende Trondheim Sporvei. (Foto: Trondheim byarkiv, fotograf ukjent)

PROSJEKTINFORMASJON

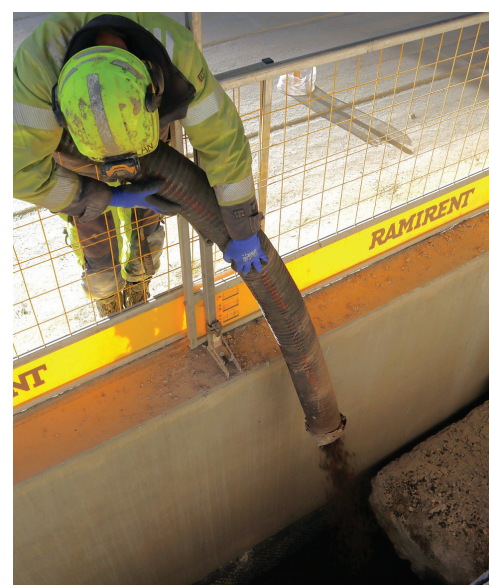
Prosjekt: Teknostallen

Kunde: NCC AS

Hovedentreprenør: NCC

Sted: Trondheim

Leca product: 1,000m³ Leca LWA 8/20



En arbeider hos entreprenøren NCC sørger for at Leca Lettklinker blåses på plass (Foto: Jan Vestre)



I forbindelse med fasaden til den gamle trikkehallen har hun bistått med å koordinere den tverrfaglige koordineringen mellom arkitekt, geoteknikker, rådgivende ingeniør bygg og NCC som utførende part.

Krattebøl forteller at byggingen av en parkeringskjeller på 3550m² under den gamle trikkehallen har bydd på flere store utfordringer.

-Siden kjelleren ligger under fundamentene til den gamle fasaden har vi vært nødt til å refundamentere hele fasaden. Jetpeling ble valgt som løsning fordi jetpeler fungerer både som refundamentering og sikring av byggegrop. Jetpelene lages med en teknikk som heter jetgrouting og blir en del av den permanente konstruksjonen. Innenfor jetpelene settes prefabvegger opp som kjellervegger.

De skråstilte jetpelene tar i hovedsak opp vertikalktrykket fra den eksisterende fasaden og ikke like mye horisontaltrykk fra jordmassene rundt.

Da man under bygging ikke har tilstrekkelig horisontalavstivning av kjellerveggene før betongkonstruksjonen i sin helhet er på plass, ble det behov for å bruke lette fyllmasser for å minke kreftene fra jordtrykket mot kjellerveggene.

-Det var også behov for isolasjon på utsiden av kjellerveggene, så i og med at vi hadde liten plass til å arbeide mellom jetpeler, eksisterende fundament og vegger, var Leca lettklinker med sine isolerende egenskaper et fint alternativ, forklarer Krattebøl.



Teknohallen blir på hele 115 000 m² og blir Trondheims største kontorarbeidsplass. I bakgrunnen skimtes Nydalsbrua, et tidligere prosjekt for Leca Norge. (Foto: Steffen Ødegård / KLP Eiendom)

LECA LETTKLINKER

Totalt leverer Leca Norge 1000m³ med lettklinker til byggingen av "Teknostallen".

Salgssjef for region nord, Frank Nornberg, sier et av de største fortrinnene til Leca lettklinker er hvordan man klarer å løse de logistiske utfordringene på byggeplassen.

-Logistikken er ofte en stor utfordring når det bygges midt i et etablert sentrumsområde. Dette løses imidlertid enkelt med egne biler som gjennom lange slanger kan blåse på plass 50 m³ i timen. Med denne løsningen reduserer man også tradisjonelle inngrep som kan skade bygningene.

Nornberg forteller at det ved dette prosjektet ikke bare var viktig hvordan man kunne løse innblåsingen, men også fyllmassens gode isolerende egenskaper.

-Fraksjon 8/20 egner seg godt til Teknostallens krav til u-verdi. I dette prosjektet erstatter også Leca lettklinker andre isoleringsmaterialer.

Nornberg sier ROT-markedet (rehabiliterings-, ombyggings og tilbyggsmarkedet) er et viktig satsningsområde for Leca Norge.

-"Teknostallen" er kun et av flere ROT-prosjekter hvor Leca har utarbeidet løsninger for levering av lettklinker på en effektiv, skånsom og kostnadsbesparende måte. Vi jobber tett med både kommuner og rådgivende konsulenter for å finne de beste løsningene, avslutter Nornberg.

"Teknostallen" er planlagt ferdigstilt i september 2025.



En arbeider hos entreprenøren NCC sørger for at Leca Lettklinker blåses på plass (Foto: Jan Vestre)



Slangen som skal blåse på plass Leca Lettklinker klargjøres av sjåføren fra Westgaard. (Foto: Jan Vestre)

-Fraksjon 8/20 egner seg godt til Teknostallens krav til u-verdi. I dette prosjektet erstatter også Leca lettklinker andre isoleringsmaterialer.



MALAGA TOWERS - A GATEWAY TO THE MEDITERRANEAN



The project, located in the city of Málaga, comprises three towers unified by a singular aesthetic. It prioritizes sea views and sunlight, aiming to become Málaga's finest residential project and transform the area into the city's golden mile. The selection of materials has been guided by quality and sustainability criteria.

Málaga, one of Spain's most beautiful cities, has been undergoing rapid transformation. This project is set to become a new benchmark for high-quality living - with apartments priced up to EUR 3.5 million. Estudio Lamela Arquitectos is committed to providing a high-quality product, emphasizing sustainability and environmental respect.



Arlita reduced the number of trucks needed - lowering the CO₂ footprint

MEETING THE NEEDS FOR QUALITY AND SUSTAINABILITY

The construction includes materials from Saint-Gobain, such as Placo, Isover, and Weber. A challenge was to achieve the necessary urbanisation level without overburdening the parking slab. Upon completion, the urbanised area will be handed over to Málaga City Council, requiring adherence to quality, durability, lightweight, and sustainability standards. The landfill also accommodates services for the towers, such as electricity, water, and wastewater. Arlita was selected for its lightness and strength, offering easy installation without special equipment.

Arlita is familiar to Málaga City Council and the engineering company EDP, having been used in various city projects.

WATER MANAGEMENT WITH SIMPLICITY

The lightweight fill, with thicknesses ranging from 0.8 to 1.5 m, was secured by double waterproofing. The first layer, beneath the Arlita, seals the parking slab, while the second, atop the concrete slab, ensures drainage and leak protection. Arlita's core contains drainage pipes to prevent water accumulation and potential overloads on the parking slab.



Arlita's core contains drainage pipes to prevent water accumulation and potential overloads



The landfill accommodates services, such as electricity, water, and wastewater



The lightweight fill, with thicknesses ranging from 0.8 to 1.5 m

REDUCING CARBON FOOTPRINT THROUGH REDUCED DELIVERY REQUIREMENTS

SACYR Construcción S.A. undertook the construction, requiring a daily fill of 600-700 m³, significantly reducing the number of trucks needed and thus lowering the CO₂ footprint and improving air quality. The compaction process involved one-meter layers compacted by small 6T tracked equipment, achieving the project's required performance with a single piece of equipment.



Arlita's core contains drainage pipes to prevent water accumulation and potential overloads

PROJECT INFORMATION

Project: Malaga Towers

Location: Malaga, Spain

Developer: Metrovacesa

Architects: Lamela Arquitectos EDP Engineering

Main contractor: SACYR Construcción S.A.

Leca Product: Leca® LWA (Arlita)
5,700 m³



The truck was easily set up right next to the building.

INNOVATIVE REUSE OF LECA® LWA FOR NEW HOUSING

Willhem is building 165 new rental units on Malcusgatan in Halmstad. The project has a strong focus on sustainability, and as a result, Willhem and Peab have chosen to preserve the existing Leca LWA during demolition, with the aim to reuse it later in the new construction. For us at Leca Sweden, this procedure is considered a central part of building sustainably for the future and is something we encourage.

LECA LWA FROM THE '60S IN THE ROOF

Willhem aims for the least possible environmental impact throughout the process. This involves resource-efficient methods, as well as the reuse and recycling of existing materials. The new buildings contain a total of 165 apartments, and the project will be environmentally certified according to Miljöbyggnad Silver.

The project includes the demolition of two building bodies where the existing basement is preserved since it contains both a shelter and a new geothermal heating system. There is also a utility tunnel between the buildings. It turned out that Leca LWA was already in place at Malcusgatan in a roofing solution that was installed there in the 1960s, which benefited the project.

Beatrice Fredriksson is the project manager at PEAB, which is the main contractor for the project with the new property. Regarding the basement construction, PEAB had a performance contract in which they, among other things, perform reinforcement work and install new drainage around the basement.



We received the assignment in March 2023 and immediately started working on the basement and demolition. The project is planned to be completed in May 2025, Beatrice says and continues:

We found Leca LWA in the existing roof, which was a concrete construction. For the lightweight aggregate, we saw opportunities to be able to reuse the material for the new building to ensure that the load on the ground was not too high."





The lightweight aggregate in the roof from the 60's was analyzed and could be reused.

REUSE MADE SIMPLE

After material samples from the Leca LWA had been analyzed, the logistics could be planned. The solution for PEAB turned out to be vacuuming the existing material from the roof. Only two people were needed on the roof, one to hold the hose and another to clear away the large pieces of concrete that were not to be vacuumed up.

“Instead of transporting material away, we could save costs by storing the material on-site. We found a solution using molds that are normally used for casting walls, and with these, we were able to create a storage bin. The work proceeded smoothly without any significant challenge” says Beatrice.

When the vacuum truck was full, the driver could simply move a few meters away and dump the vacuumed Leca LWA. In total, about 500 cubic meters of Leca lightweight aggregate were repurposed for reuse. Beyond the reuse of Leca LWA, bricks from the old buildings will also be reused, and solar panels are to be installed on the roofs.



One person operated the suction hose and one person removed concrete pieces that were not to be vacuumed up.

PROJECT INFORMATION

Project: Multi-family housing,
165 apartments

Location: Halmstad, Sweden

Client: Willhem

Contractor: PEAB

Project duration: 2023–2025

Leca product: Recycled Leca® LWA /
LECA® TUR-RETUR



The Skypark Business Centre at Luxembourg's Aitport is currently the largest timber construction in Europe

INNOVATIVE LIGHTWEIGHT CONCRETE FOR SUSTAINABILITY AND STABILITY

The Skypark Business Centre at Luxembourg Airport is a remarkable building project that sets new standards for sustainable and environmentally conscious construction thanks to its high focus on energy efficiency and sustainability. The skilful combination of modern timber-framed construction and unique architectural features makes this project unrivalled. It serves as a compelling example of how innovation and environmental protection can be harmonised to create impressive buildings.

This building, which is currently the largest timber construction in Europe, houses four parking levels on the five lower floors with direct access to public transport. On the upper floors, with an area of around 100,000 square metres, there is a wide range of amenities; these include, among others, catering facilities, retail shops, fitness facilities, a first-class hotel, modern office space and even a day care centre for children.

In close cooperation with Mörtel Mich S.à r.l. and the concrete technologist from Fibo ExClay, Jörg Kleinschmidt, a highly specialised lightweight aggregate concrete with open structure was developed, which is being installed in this outstanding project as a special screed with an extremely low bulk density by the company Günter Schlag S.à r.l. This special screed complies with all required standards in terms of fire protection, sound insulation and the strength required for further construction. It is worth mentioning that this special screed was mixed and pumped directly on the construction site in a suitably equipped, fully automatic screed machine.

A LOOK AT THE TECHNICAL DETAILS REVEALS THE FOLLOWING:

- Fibo ExClay lightweight concrete LAC 4 D 1,0
- Density: 1000 kg/m³
- Strengths of 6-10 N/mm² for absorbing point loads
- Pumpable (screed pump with a hose length of up to 200 metres in vertical and horizontal direction)
- Non-combustible (A1)
- Installation thickness of 40 mm
- Lightweight aggregate of type FIBOBAU 0/5, round design
- Special admixtures and additives to achieve the desired properties



PROJECT INFORMATION

Project: Skypark Busines Center, Luxembourg Airport

Client: Lux-Airport

Project management: Beissel & Ruppert

Architect: BIG (Bjarke Ingels Group Copenhagen, Denmark) in partnership with metaform architects & Jim Clemes Associates, Luxembourg

Engineering office: Au²

Contractor: Steffen Holzbau S.A.

Production & processing Special screed: Mörtel Mich S.à r.l. & Günter Schlag S.à r.l.

Product: 1.350 m³ FIBOBAU 0-5 mm

SPECIAL PROPERTIES OF FIBO EXPANDED CLAY ARE KEY TO THIS PROJECT

Undoubtedly, this special lightweight concrete, designed with expanded clay as a lightweight aggregate, plays a central role in realising the sustainable building concept. As a lightweight aggregate for lightweight aggregate concrete with open structure, expanded clay offers a wealth of benefits that excel in various aspects, from sustainability to material quality.

As an environmentally friendly aggregate obtained from natural raw materials, expanded clay is recyclable and can therefore be used several times. Lightweight aggregate concrete with open structure, using expanded clay as a lightweight aggregate, is particularly characterised by its pumpability, which considerably simplifies and speeds up handling and installation in construction projects.

As a natural material, expanded clay contains no harmful chemical additives, helping to protect both health and the environment. Due to its excellent fire protection properties, it can significantly increase the fire resistance of construction projects.

The combination of low weight and high compressive strength makes this special lightweight concrete the ideal choice for the construction of lightweight, yet highly robust structures. Furthermore, the addition of expanded clay makes it resistant to frost and retains its shape and strength in extreme temperatures.

All in all, expanded clay is an excellent choice as a lightweight aggregate for lightweight aggregate concrete with open structure, which not only offers environmental benefits, but also significantly improves the quality and performance of construction projects in many ways.



Text: Dakota Lavento

RESPONSIBLE ACTIONS MAKE A DIFFERENCE

Landscape architecture firm Maanlumo chooses Leca® lightweight aggregate (LWA) for growing media. The product has good water retention.

In all its activities, Maanlumo strives not only to act responsibly but even to be ahead of its time. Environmental, economic, and social responsibility are key criteria in the planning.

“In the tough world of construction, we also consider factors that have no direct monetary value. Accordingly, our work must also

benefit urban nature and animals, as well as other urban dwellers who may not be able to make their voices heard. We design with respect for nature and an environment that remains accessible to all. The urban environment should be planned in such a way that it makes life easy and is pleasant and accessible for everyone, at all ages,” says landscape architect **Krista Muurinen**.

Responsibility built-in

Greenwashing is a very common problem nowadays, as it’s tempting for companies to make inflated environmental claims and promises to improve their image. But responsibility and sustainably ultimately require action, not just words. In Maanlumo’s design projects, this is done in a variety of ways.



“Our mission is to design outdoor environments that last, and we think about the ethical aspects of the work from several perspectives. It is crucial to us that we can fully and proudly stand behind what we do.”

Acting responsibly is also important for the company’s team spirit. *“We share the same values and act on them. If we feel that these values are not being upheld in a particular project, we can’t go ahead with it.”*

The designers approach the area they’re working on as part of a larger whole. *“We are considering whether internal design solutions can contribute to broader ecological values or environmental solutions.”*

Choosing materials wisely

Maanlumo’s designers strive to preserve existing natural and cultural environments, structures, and materials as much as possible.

At the planning stage, the designers choose solutions that will not need modifications or repairs for a long time to come. *“This is why we prioritise materials that have a long lifecycle and can be reused or recycled later.”*

Maanlumo favours recycled and recyclable materials, and in general, materials that are as environmentally friendly as possible. However, it is not always easy to assess the eco-friendliness of products, as in many cases not

all the relevant information is given or assessed consistently. Weighing up different options can therefore be difficult, or even impossible.

“To keep transport distances as short as possible, we give priority to locally produced products, or at least within Europe. Sourcing locally also supports our economy.”

Leca LWA, for example, is a good choice as a highly water-retentive material for growing media in deck planting. *“Leca LWA is easy to recommend to customers: its carbon footprint has been calculated, the production process is transparent, and the company is a responsible operator.”*

However, Muurinen would like to know more about the reusability and recyclability of Leca LWA.

“The conversion of reclamation sites into nature reserves in Finland and Denmark is a good example of businesses doing the right thing. These are significant eco-friendly initiatives that a company can be proud of.”

The benefits of responsible action

Maanlumo believes that operating ethically also gives a competitive advantage to companies in the environmental construction sector. Respect for nature and soft values such as those that drive the circular economy are also things that end users care about, even if their value cannot be measured in monetary terms.



“Saving five trees or an area of natural rock cannot be measured in money, but it is of great value to users.”

Goals for responsible action are not always met in construction projects, however. Although clients may strive for responsible environmental construction in the master planning phase, it often happens that when the time comes to award the contracts the goals related to sustainability and responsible choices are forgotten. In the municipal sector, long-term responsibility and the recyclability of materials are already being considered better than in the private sector, because they remain responsible for the sites long after construction has ended.

“For example, in the environmental construction of Ranta-Tampella in Tampere, sustainability from a circular economy perspective has been very well implemented. Other cities could take a leaf out of Tampere’s book in this regard.”

Maanlumo is constantly striving for an increasingly sustainable present and future. *“For us at Maanlumo, acting ethically and sustainably is simply a way of life. Maybe it’s not possible to do good deeds on a large scale every day, but little ones are always possible, and over time these can add up to something significant.”*





The S6 expressway connects Szczecin and Gdańsk in northern Poland

LECA[®] LIGHTWEIGHT AGGREGATE (LWA) RESOLVES GROUNDWORK ISSUES ON THE S6 EXPRESSWAY

The S6 expressway is a high-speed road in northern Poland that connects Szczecin and Gdańsk. A large section of it runs almost parallel to the Baltic coast and is part of the TEN-T trans-European transport network.

The road primarily aims to improve connectivity by enhancing the efficiency of road transport and reducing travel time between cities, as well as facilitating tourist traffic. This is expected to contribute to the economic development of the regions. The entire S6 route in the West Pomeranian and Pomeranian Voivodeships is scheduled for completion in 2025. The S6 expressway includes, among others, the Koszalin and Sianow bypasses, with a total length of 21.1 km. As of autumn 2019, three sections of this route, totaling 13.2 km, are open to traffic. On the remaining 7.9 km section between the Koszalin Wschód junction and Sianow, geological conditions varied, necessitating changes to the road design. Work to complete the bypass began in August 2021.



The work, which was originally carried out, was interrupted due to the considerable difficulties encountered due to the complicated hydrogeological conditions

NEW DESIGN

The works could continue after an update to the design documentation (a separate project), which introduced many alternative solutions. On three sections of the main route, mattress layers of Leca LWA were designed and constructed.

PROJECT INFORMATION

Project: S6 - TRANSPROJEKT Gdańsk

Location: S6 - Koszalin and Sianów

Main contractor: Polbud-Pomorze

Leca product: 52.200 m³ Leca LWA
Leca GEOTECHNICAL 8/10-20 RX

DISRUPTED IMPLEMENTATION

Construction was carried out in two stages. The original work was interrupted due to significant difficulties encountered because of the complicated hydrogeological conditions in the Chełmska Mountain area. This section is characterized by two aquifers: The near-surface water-bearing horizon, associated with a layer of sandy and organic sediments, stabilizes at a depth of up to 1 m and is replenished by precipitation and runoff from Góra Chełmska.

And the second aquifer, located beneath a layer of glacial till of varying thickness, generally occurs at depths of more than 15 - 20 m and is characterized by significant hydrostatic pressure - the water table stabilizes about 2.0 - 5.0 m above ground level (artesian waters).



On three sections of the main route, mattress layers of Leca LWA (Leca® GEOTECHNICAL 8/10-20 RX) were designed and constructed

RAISED LEVEL

In one section, where ground reinforcement was carried out using replacement technology and displacement columns in the first stage, the level was raised. Computational analyses indicated that the previously performed subsoil reinforcement was not sufficient to support the increased loads from the raised embankment. The use of Leca LWA layers for the embankment reduced the stresses at the base level to an acceptable level.

LIMITATION OF COLUMN LENGTHS

In the other two sections, the embankment was founded on rigid reinforced concrete columns due to the presence of organic soils of considerable thickness in the subsoil. To minimize the risk of the columns penetrating the cohesive soil layer below, which strains the waters of the second aquifer (artesian waters), their embedment in the bearing soils was kept to a minimum. Incorporating layers of Leca expanded clay in the embankments significantly reduced the loads acting on the rigid columns, thus ensuring proper foundation and stability of the embankment and limiting the amount of settlement.



Veritas Stadion is an international standard football stadium situated in Turku.

EFFICIENT RENOVATION OF A HISTORIC FOOTBALL STADIUM

The old natural grass pitch at Veritas Stadium in Turku was replaced with artificial grass, with a heating system under it. The soil, which had poor load-bearing capacity, was lightened with a durable Leca® lightweight aggregate (LWA).

Located in Turku, the largest city in Southwest Finland, Veritas Stadium is a football stadium of international standard. The stadium is steeped in tradition: the oldest of its three terraces was completed for the 1952 Olympics, while the newest, the main terrace, was completed for the 2009 European Women's Championship.

Veritas Stadium's new heated and environmentally friendly artificial turf pitch meets the highest international criteria and complies with the Quality Pro standards of the International Association Football Federation FIFA.

The renovation project, which was started in 2022, involved the building of a sand-based artificial pitch in place of the natural grass pitch, which was at the end of its lifespan. The second project involved increasing the capacity of the terrace.

Having a heated artificial turf pitch significantly extends the time the pitch can be used each year and will also allow other events to be held in addition to matches.



Maanrakennus Kivelä Oy's owner Ville Kivelä (left) and Leca Finland's Area Sales Manager Marko Jelonon discussing the progress of the project.



A 10-30 cm layer of Leca LWA was added on top of the old lightweight fill.

PROJECT INFORMATION

Project: Veritas Stadium load compensation

Location: Turku, Finland

Contractor: Maarakennus Kivelä Oy

Main contractor: Saltex Oy

Leca product: Leca® LWA 4–32 mm



EASY LIGHTWEIGHT FILL WITH LECA® LWA

The renovation began with earth removal in late October 2022. “We removed a 50-centimetre layer from the surface of the field, amounting to somewhere between five and six thousand cubic metres of soil,” says managing director Ville Kivelä of Maarakennus Kivelä, the earthworks subcontractor for the field renovation.

It’s necessary to lighten the structures of sports fields built on clay, which has a poor load-bearing capacity. The Veritas Stadium ground had already been lightened with Leca LWA before. After the removal of the old surface structures, the original Leca LWA layer was left in place, as it was practically as good as new.

A levelling layer of Leca LWA of 10 cm to 30 cm thickness was added to the structural layers on top of the old levelling layer. Leca LWA was brought to the field from Leca Finland’s Kuusankoski factory by combined transport directly for filling.

COMPLETED ON SCHEDULE

At the end of February, the Leca LWA structure was almost fully in place.

The project also includes drainage, irrigation and heating systems. The drainage system, consisting of drainage pipes, the heating system, consisting of glycol circulation, and the irrigation system were all installed at the same level in the cable ducts and partly in the Leca LWA layer.

A FIFA-approved sand-based artificial turf was spread over the supporting structures in the spring, once the weather had warmed up. Maarakennus Kivelä operates mainly in the Southwest Finland region, and in recent years has been involved in several other sports facility projects as well.

“We’ve carried out several artificial turf projects over the past few years, but the Veritas Stadium renovation is our largest sports facility construction undertaking so far,” Kivelä says. The first match on the new artificial turf was played on 22 May 2023.



LECA[®] LIGHTWEIGHT AGGREGATE'S ROLE IN OVERCOMING SPALDING'S CHALLENGING GROUND CONDITIONS

Construction of the northern section of the Spalding Western Relief Road began in January 2022, offering a new bypass route around the western perimeter of Spalding. This project aims to significantly reduce travel delays, heavy traffic, and the impact of increased freight, ultimately enhancing the road user experience.

LECA[®] LWA ENHANCES SAFETY AND EFFICIENCY IN SPALDING'S ROAD CONSTRUCTION

This road connects the A1175 and A16 from the south and east to the B1356 in the north, passing through the B1172 Spalding Common. The construction of the road seeks to alleviate the area's heavy traffic, reduce travel delays, improve road user experience, mitigate the effects of increasing freight traffic, and relieve congestion in Spalding town centre.

PIONEERING STABILITY FOR SPALDING'S ROADWAYS

For this project, over 28,000m³ of Leca® 10-20mm Lightweight Aggregate (LWA) was transported using Walking Floor vehicles to construct an MSE Wall, in collaboration with the Tensar Grid System. This innovative approach was particularly vital due to the challenging ground conditions near waterways, requiring a reinforced soil embankment with a reliable lightweight fill solution. The combination of LecaLWA and the Tensar Grid System, previously demonstrated in the 2017 FARRRS bridge project, provides a durable and effective method for managing such conditions.

PROJECT INFORMATION

Project: Spalding Western Relief Road

Location: Spalding, England

Main contractor: Eurovia

Leca product: 28.000 m³ Leca® LWA 10-20



Initiated in January 2022, aims to connect major roads and improving traffic flow



The use of LECA LWA in areas with poor ground conditions near waterways has proven to improve ground stability

LECA® LWA'S CONTRIBUTION TO THE SPALDING WESTERN RELIEF ROAD

The direct transportation of Leca LWA from a site less than 10 miles away reduced the need for extensive trucking, thereby minimizing road mileage.



The project minimized environmental impact by sourcing LECA LWA from a location less than 10 miles away



Innovation Meets Infrastructure: The Synergy of LECA LWA and the Tensar Grid System in Spalding

LECA® LWA'S ROLE IN SPALDING'S ROADWAY REVOLUTION

The use of Leca LWA in extensive cut and fill operations and on unstable soils improves ground stability, reduces the risk of landslides and deformation, and offers a solution that exerts lower horizontal earth pressures than traditional backfill materials. This significantly contributes to the stability and safety of road embankments, promoting an efficient and sustainable construction approach.

BYGNINGSVERN ER NOE SOM ER LØNNSOMT FOR BYENE



Byantikvar i Trondheim Mette Bye (bildet) mener en by har mye å tjene på å ta vare på sine historiske bygg.

METTE BYE

Byantikvar i Trondheim Mette Bye mener byer som oppfattes som vakre lettere tiltrekker seg nye bedrifter



Med 7000 bygninger på kulturminnekartet har byantikvar i Trondheim Mette Bye, mer enn nok å henge fingrene i.

-Trondheim er en historisk by med mye særpreg og en flott arkitekturarv det er viktig å ta vare på. Selv om det koster viser studier at bygningsvern ofte er noe som er lønnsomt for byene, sier Bye som overtok som byantikvar i 2016.

Bye sier byer som evner å ta vare på den verneverdige bebyggelsen gjør mer enn bare å tiltrekke seg turister.

-At en by oppfattes som vakker kan også være avgjørende for å tiltrekke seg nye innbyggere og bedrifter når andre forhold er på plass. Dette er en tendens vi ser i hele Europa. Å ta godt vare på og foredle det gamle, samtidig som byen vokser og fornyer seg, gjør oss mer robuste i kampen om innbyggere, studenter, næring, aktivitet og turisme, forklarer hun.

Av Jan Vestre



STORE PROSJEKTER

As City Antiquities Officer, Mette Som byantikvar har Mette Bye de senere årene vært involvert i flere store prosjekter og plansaker.

-Bryggene i Kjøpmannsgata har vært en særlig satsing hvor det har skjedd mye positivt. Ellers kan nevnes samlingen av Campus på Gløshaugen, ombyggingen av det gamle hovedpostkontoret i Dronningens gate til kunstmuseum, utbyggingen av Trondheim Katedralskole og restaureringen av Lademoen Stasjon.

Som byantikvar er Bye ikke bare opptatt av hvordan det enkelte bygg blir seende ut til slutt, men også av at det underveis brukes riktige materialer

-Vi er veldig opptatt av at det brukes riktige materialer med gode egenskaper i restaureringsarbeider. Det er avgjørende både for kvalitet, varighet og utseendet. Det er et stort spenn både i typen bygninger vi gir råd om, og hvordan disse er blitt behandlet over tid. Så hvilke råd vi gir varierer fra prosjekt til prosjekt.

HISTORIE OG ARKITEKTUR

I følge Bye er det flere ting som er med på å gi Trondheim sitt særpreg.

-Nidarosdomen trumfer så klart, med sin mektige størrelse, alder og tunge kulturhistoriske betydning. Bryggene er også noe folk gjerne forbinder med Trondheim. De mange trehusene i sentrum og på Møllenberg er også noe som er med på å gjøre byen spesiell. Trondheim har også flere flotte jugendhus fra rundt år 1900 spredt over hele byen.

Byantikvaren trekker også frem trepaleene på Torget og Stiftsgården, og de mange lystgårdene.

-Lystgårdene Lade gård, Ringve, Devle, Leangen og Ilsviken er vakre vitnesbyrd om Trondheims rikdom som handelsby fra 17- og 1800-tallet. Ellers er Cicignons byplan med brede og rette gater og akser, som tegnet opp Midtbyen på nytt etter brannen i 1681, et av byens fremste kulturminner.





NEW HEALTH CENTRE IN MOREIRA DE CÓNEGOS, GUIMARÃES, STANDS OUT WITH UNIQUE STAR-SHAPED DESIGN

The innovative “Life Star” design of the new Moreira de Cónegos Health Centre in Guimarães, Portugal, makes it a standout project, celebrated for both its symbolic meaning and practical benefits. The structure’s rooftop was enhanced with 250 m³ of Leca® lightweight aggregate (LWA) to ensure efficient rainwater drainage.

INNOVATIVE ARCHITECTURE AND PRACTICALITY

The center’s star-shaped architecture, inspired by the six-pointed Life Star—a symbol commonly associated with emergency medical services across several nations—was chosen to underscore its healthcare mission and improve the facility’s internal layout for easy navigation, according to Ricardo Bastos Areias of StudioCAN, the architectural firm behind the design. The Health Centre is set to feature multiple entrances, separate waiting areas for adults and maternal-child care, numerous offices for nursing and consultations, treatment rooms, a dedicated breastfeeding and nappy changing room, an intern room, and adequate sanitary facilities. It will also boast a blend of pedestrian walkways, vehicular routes, footpaths, parking, and landscaped areas, sprawling across an area exceeding 5,000m².



EFFECTIVE RAINWATER DISPOSAL SYSTEMY

The center's star-shaped architecture, inspired by the six-pointed Life Star—a symbol commonly associated with emergency medical services across several nations—was chosen to underscore its healthcare mission and improve the facility's internal layout for easy navigation, according to Ricardo Bastos Areias of StudioCAN, the architectural firm behind the design. The Health Centre is set to feature multiple entrances, separate waiting areas for adults and maternal-child care, numerous offices for nursing and consultations, treatment rooms, a dedicated breastfeeding and nappy changing room, an intern room, and adequate sanitary facilities. It will also boast a blend of pedestrian walkways, vehicular routes, footpaths, parking, and landscaped areas, sprawling across an area exceeding 5,000m².

PROJECT INFORMATION

Project: Moreira de Cónegos Family Health Unit#

Location: Guimarães

Client: Municipality of Guimarães

Architect: StudioCAN

Main contractor: NVE Engenharia S.A

Product: 250 m³ of Leca® LWA for rainwater drainage



The center's star-shaped architecture, inspired by the six-pointed Life Star,

COLLABORATIVE INVESTMENT AND SOCIETAL BENEFITS

The construction, led by NVE Engenharias, is a collaborative effort between the Northern Regional Health Administration and the Municipality of Guimarães, with additional funding from the Northern Regional Coordination and Development Commission (CCDR-N) under the Northern Portugal Regional Operational Programme 2020. This investment highlights the project's significance not only to Moreira de Cónegos but to the broader Northern Portugal region. The new Health Centre is more than just a building; it is a symbol of the Municipality of Guimarães' dedication to improving healthcare accessibility and enhancing the well-being of its community, marking a pivotal advancement in regional healthcare services.



Approximately 250 m³ were applied to the building's roof through direct pumping.



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