**PRESS RELEASE**

Unique ground engineering solution at Clairwood Logistics Park is a first for SA

**Zutari opts for EPS geofoam as road fill and honeycomb geocells for container yard pavement**

**9 December 2021:** The application of geofoam as a lightweight fill solution for road construction at the Clairwood Logistics Park in Durban is a first for South Africa. In addition, leading consulting engineering and infrastructure advisory firm [Zutari](http://www.zutari.com) also provided a unique geocell solution for the founding and pavement design of the container yard at Pocket 2B. This proved a more economical and viable solution for the container yard infrastructure compared to the rigid inclusions applied elsewhere on-site.

The design was carried out last year, with construction commencing in November 2020. The container yard is complete, and geofoam as road fill construction will be completed in 2022, according to **Dr. Gabi Wojtowitz**, Associate Design Director at Zutari. The scope of work for client [Fortress Real Estate Investments](https://fortressfund.co.za/), represented by **Nico Prinsloo**, involved the planning and concept to detailed design development and implementation of the Clairwood Logistics Park, situated on the old Clairwood racecourse site in the industrial suburb of Mobeni East in the eThekwini Municipality.

The 76.6 ha site is bordered by Transnet railway lines to the west and south, by a fully developed industrial area to the north and the M4 highway to the east. The development consists of a light industrial park and associated infrastructure. The new Spine Road will serve as the main internal road, running in a north-south direction. An existing 406.4 mm fuel pipeline is also located within a portion of the site, with Spine Road crossing it in Pocket Area 7 of the site.

To achieve finished grade level, the proposed road embankment would be in-fill, higher than the current ground level above the pipeline, thereby imposing a surcharge load onto the sensitive pipeline. In order to reduce the load resulting from the construction to an acceptable level, a lightweight fill consisting of an expanded polystyrene (EPS) geofoam solution was proposed as a substitute for conventional fill material for the embankment coupled with a piled structure to protect the pipeline. This will ensure that the imposed load on the pipeline and underlying soils is not increased as a result of constructing the new access road.

The lightweight EPS geofoam is placed onto a 100 mm bedding sand layer. The system is wrapped in a geomembrane as protection against corrosion from potential contaminants in the groundwater. A load distribution slab is placed on top of the geofoam, while the road pavement consists of a continuously reinforced concrete pavement. The pavement was designed with anchor blocks or base anchors to prevent the pavement from ‘creeping’, which can have detrimental effects on additional structures. Creeping is largely due to moisture and temperature movements within the pavement.

Due to this being the first application of its kind in South Africa, Zutari received technical assistance from **Steven Bartlett**, Associate Professor in Civil and Environmental Engineering at the University of Utah in the US. The EPS geofoam itself was supplied by [Iso Moulders](http://isomoulders.co.za/Default.asp) of Durban. Group Technical Manager **Eric Axelrad** explains that the product, branded as Geo Block™ Geofoam, is a lightweight alternative to conventional fill material such as natural soil, gravel, cobbles and crushed rock, which has dominated construction for centuries.

EPS geofoam is specified specifically for its soft soil remediation, slope stabilisation, lateral load reduction on retaining structures, structural void fill and buried utility protection. It offers major benefits in terms of construction schedules and project costs, and is designed and constructed to ASTM standards.

The design of the container yard itself had to take into account the equipment loads from the machinery, which are generally carried in the pavement structure, and the container stacking loads. “The loads on these platforms are massive, with the typical vehicles used here having a wheel load in the order of a 250 kN, which is similar to the load exerted on a heavy aircraft apron, for example,” notes **Dr. Anton Hartman**, Pavements and Materials Lead at Zutari.

Geosynthetics were considered to be the most economical and practical approach, whereby the earthworks and layer works are engineered to deal with the anticipated settlement. The proposed solution was based on a geocell-centred design with a geogrid as a structural separation layer. A geocell is a 3D honeycomb geosynthetic product that functions like a semi-rigid mat in distributing the surface loads over a wide area of the foundation soil, significantly improving the bearing capacity of soft soils in particular. “Feasibility and cost were major factors in terms of selecting an appropriate solution,” says Dr. Hartman.

The Clairwood site is underlain by unconsolidated soft clays and silts which, when loaded, will be subject to long-term consolidation settlements. These layers are highly variable and the resultant settlements will vary across the site. In addition, the site has an overlay of imported unconsolidated bulk fill which will contribute to the variable settlements. The shallow water table varies from natural ground level to 2 m below ground. “The site is literally a ground engineer’s dream due to the multiple issues we had to deal with related to the soil conditions,” highlights Dr. Wojtowitz.

The design of the system required close trans-disciplinary collaboration between the Pavements, Civils and Geotechnical disciplines, as all of the components were intrinsically interconnected and affected how the system ultimately worked. The Zutari team included Civil Engineer **Diran Hurnanan** and Civil Technologist **Johan Kotze**.

“The project involved an iterative work flow and interface between each discipline and a deep understanding from each team member as to how everything was interconnected. It was true team work and co-creation,” concludes Dr. Wojtowitz.

***Ends***

**Notes to the Editor**To download hi-res images for this release, please visit <http://media.ngage.co.za> and click the Zutari link to view the company’s press office.

**About Zutari**

As engineering consultants and trusted advisors, Zutari co-creates an engineered impact that enables environments, communities and economies to thrive. Few others can match our local capacity, long-standing presence and understanding of the challenges required to operate successfully across various regions in Africa.

We have created an impact across Africa for the past 89 years (1932 to 2021) and remain committed to this continent, making us the perfect partner to those less familiar with working in Africa. We are experienced in international projects and our Global Design Centres allow us to bring world-class solutions to our clients.

As a private management-owned company, our commitment is true and we have vested interest in our clients’ success. Our strong relationships allow us to connect the right expertise, processes and resources to match client’s needs and bring stakeholders that have shared interests together.

We blend the old and the new. We have moved beyond traditional engineering and work collaboratively to integrate technical and creative thinking. This process of co-creation allows us to unearth new opportunities with our clients and partners.

Zutari’s broad collective of in-house, industry-recognised engineering consultants and trusted advisors provide seamless and integrated delivery. This unique ability to offer scaled engagement allows Zutari to solve complex challenges more efficiently.

Grounded in digital engineering, we continuously deliver better results.

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