

Biennale Architettura 2023

501RTH

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AlBara Saimaldahar	Architect
Basma Bouzo	Curator
Noura Bouzo	Curator
Joharah Lou Pabalate	Assistant Curator
Cyril Zammit	Assistant Curator



**HH PRINCE BADR BIN
ABDULLAH BIN FARHAN
AL SAUD**

**Minister of Culture,
Saudi Arabia**

The participation of the Kingdom of Saudi Arabia at the 2023 Venice Architecture Biennale coincides with a great cultural resurgence across our country.

The title of this year's 18th edition of the Venice Biennale, the Laboratory of the Future, is not only fitting for Saudi Arabia but also timely for the Kingdom. The Ministry of Culture, represented by the Architecture and Design Commission, is proud to develop and foster the country's diverse cultural assets and resources, as well as sponsor and enable local designers of tomorrow.

We welcome all visitors to our pavilion and will, through design, envision and deliver a better future for generations to come.



**DR. SUMAYAH SULAIMAN
AL SOLAIMAN**

**CEO of Architecture and
Design Commission**

The National Pavilion of Saudi Arabia supports and celebrates the Kingdom's thriving artistic and architectural community, and we hope it can serve as a meeting space for dialogue between creative minds and an exchange of concepts and ideas.

The Pavilion provides a home for research and exploration from the nation's aspiring cultural voices. By learning and presenting our vision with new partners, we can build new bridges of understanding and dialogue through the theme of the 18th edition of the Venice Architecture Biennale 2023 under the title "The Laboratory Of The Future", in which the participating team presented work highlighting the tangible and intangible qualities of materials in relation to Saudi architecture, offering an interactive journey that uses the notion of earth as a starting point to engage with the vernacular of Saudi architecture and understand its core building blocks, titled "IRTH".

We welcome visitors to our pavilion for this year and invite them to have a unique experience that reflects to them the ability of the Kingdom of Saudi Arabia to provide contributions that inspire the world.



BASMA BOUZO

Curator

As an interdisciplinary creative rooted in scientific research, Basma has cultivated a distinct passion for championing cultural narratives. Basma is currently the co-founder and CEO of &bouqu, an experience-led cultural and creative consultancy.

Basma co-founded Saudi Design Week and Saudi Design Festival. She has also curated the Saudi Pavilion in the inaugural edition of London Design Biennale.



NOURA BOUZO

Curator

In her twelve years as creative director, Noura has honed her love for research and worked on cultivating various contacts and connections in both the art and design world. Her curatorial briefs led to her team being chosen to represent Saudi Arabia at the first London Design Biennale and Design Days Dubai.



ALBARA SAIMALDAHAR

Architect & Designer

AlBara brings over a decade of professional design and execution experience to his role as the Managing Partner of Dahr Studio.

Dahr Studio explores and develops objects and destinations marrying elements of craft and architecture. With attention to detail and a focus on materials, Saimaldahar oversees the design and execution of various projects on land and offshore, ranging from historic buildings to hospitality.



CYRIL ZAMMIT

Assistant Curator

Cyril has established himself as an independent design advisor and consultant, having worked with the Dubai Culture & Arts Authority, the UAE Ministry of Foreign Affairs and International Cooperation, and, more recently, the Uzbekistan Art & Culture Foundation. Cyril created Design Days Dubai and Dubai Design Week.



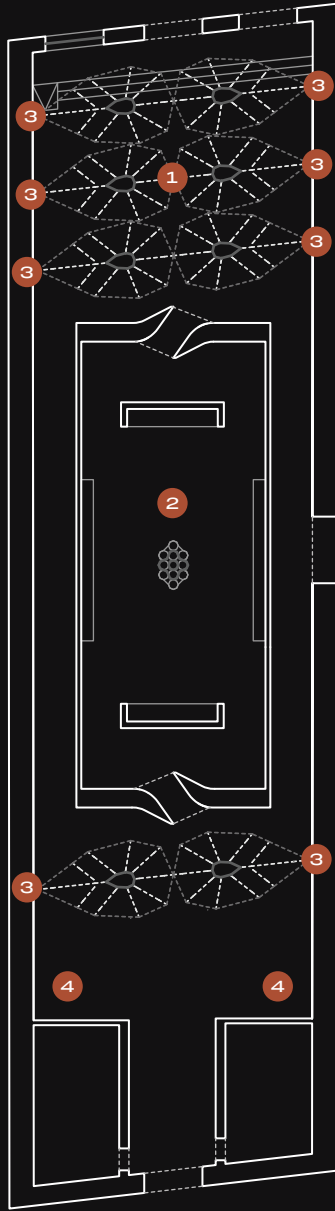
JOHARAH LOU PABALATE

Assistant Curator

Joharah (Jou) is a strategist specializing in narrative building and program ideation and development. She is a strategy director at &bouqu, an experience-led creative and cultural consultancy firm, and Saudi Design Festival.

Jou has worked on complex national branding and communication pilot initiatives and projects focusing on culture, tourism, entertainment, design, and the arts. She is the former managing editor of the first English lifestyle magazine in Saudi Arabia.

Pavilion Plan



1 Journey
2 Destination

3 Exhibition
4 Legacy tiles

"The architectural design concept combines ideas of nostalgia, legacy, and ongoing adaptation. The design ponders the future through nostalgia for the past." – AlBara Saimaldahar

IRTH

In response to the 18th International Architecture Exhibition – The Laboratory of the Future – the Saudi Pavilion examines the symbiotic relationship between material and immaterial. The cohesion of both informs perception and generates the interpretation and response to the situatedness of a nation's inhabitants.

This interactive journey brings to the surface the narratives embedded within materials– the tangible and intangible qualities which define the character of spaces, places, and things. Earth is used as the primary focal point for exploration and organic material experimentation to create a slate upon which future–proofed legacies and practices can be built.

The multi–part exhibition allows the visitor to experience the curatorial brief from multiple perspectives and engage the vernacular of Saudi architecture and its core building blocks.

The intent is to present the empirical as a window into the essential, allowing visitors to access a raw sensory experience and urging them to draw introspective conclusions stripped of conscious and unconscious biases.

The pavilion brings to the forefront the notion of collaborative practice as a foundation of the laboratory of the future. It invites visitors to breach their role as spectators and become active agents of the process. The experience mirrors the future of architecture and materiality as a work in progress, determined by the practitioners and its occupants.

Our challenges are universal, and searching for one's place, legacy, and belonging is human. And perhaps, it is in this shared vision of the future that our diverse identities, realities, and point of views can find common ground in answering the conundrums of tomorrow.

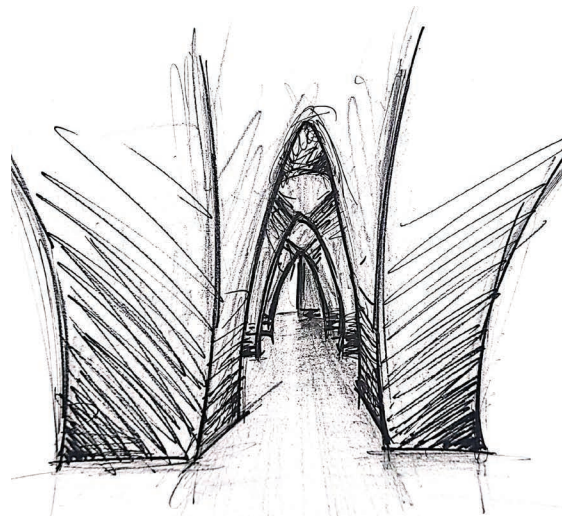


IRTH, in Arabic, can mean either legacy or prized possession. The pavilion reflects the semantics at play— a celebration of the dynamism of architectural legacy explored through the dialogue between vernacular lenses and material topographies.

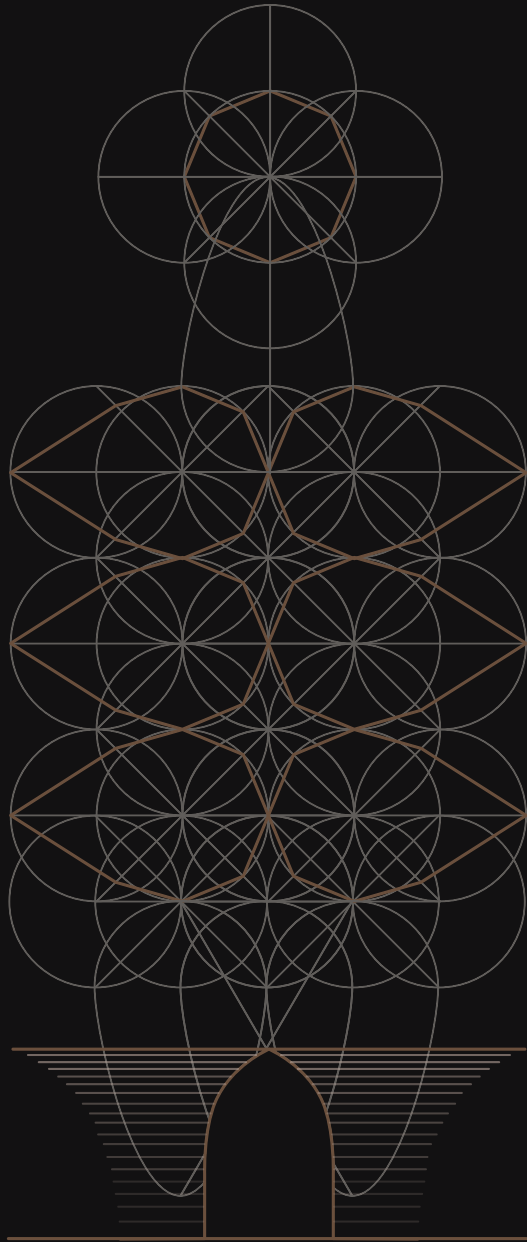
AlBara Saimaldahar on the Pavilion's Design

In response to this year's theme, The Laboratory of the Future, Architect AlBara Saimaldahar, Managing Partner of Dahr Studio, examines the converging point between tradition and innovation, material and immaterial, pondering the future through nostalgia for the past. As a result, the space that has transpired is a homage to Saudi vernacular architecture and the evolution of the country's landscape.

The architect aims to evoke contemplation on the role of materiality and legacy in architecture and explore the relationship between inhabitants and their environment, the interplay between natural topologies of inland and coastal scapes and how this ultimately influences the Saudi built environment. This reliance on antecedent materials and context as a starting point for future expression and application is manifested through Saimaldahar's pavilion design.

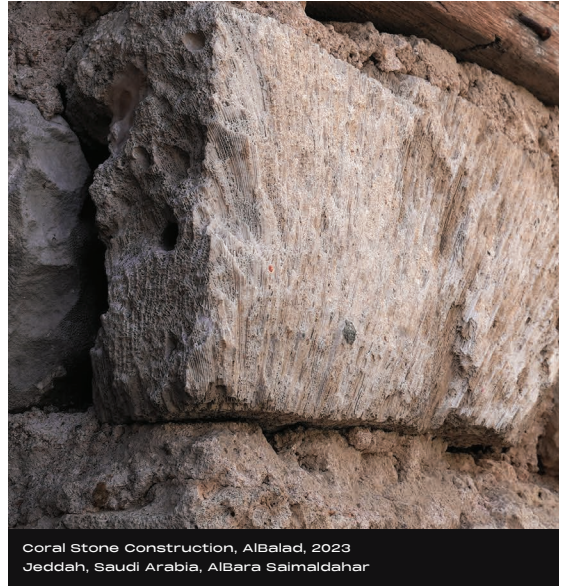


Initial pavilion sketch, 2023
AlBara Saimaldahar



The architectural design concept combines ideas of nostalgia, legacy, and ongoing adaptation.

UNESCO describes traditional craftsmanship as the most tangible manifestation of intangible cultural heritage, and architecture presents itself as one of the arenas where this reverence of the past can be manifested and actualised as a viable tool in the laboratory of the future.



Coral Stone Construction, AlBalad, 2023
Jeddah, Saudi Arabia, AlBara Saimaldahar

The pavilion design encapsulates the interplay of cultural legacy and progress through the intricate wood and earth artifacts. It takes traditional patterns from Jeddah's old town, a coastal city west of Saudi Arabia where Saimaldahar was raised and had his initial architectural influences.

It morphs these elements into fluid forms in an attempt to challenge the evolution of heritage as a progressional trajectory with a singular point of arrival. Instead, it purports a disruption of linear inclinations towards a more pluralistic and adaptive perspective that accounts for the intangible as much as the tactile and apparent.



Favia Coral, Red Sea, Saudi Arabia
Courtesy of Prince Sultan Fahd Salman

The design is anchored by two volumetric typologies. The journey within it crosses a series of arched gateways that lead to a central, immersive node, with a coral skeleton installation as a focal point. It traverses tonal differences between inland and coastal regions. The earth is both a structural element and a cladding layer.



Dunes
Empty Quarter, Saudi Arabia

The gateways comprise a system of 3D-printed ceramic tiles that, when assembled, convey both mass and lightness. The tile's textures and varying densities follow the lines of sand dunes.

Mass is conveyed through earth and its voluminous density, depth of hue and large continuous surface forming a palpable presence. The mass further renders contextualisation, with the vault space reminiscent of the architecture of heavy materials, stones, and underground spaces carved into the mass, the stone, and the ground.

The crevices between every tile and its porosity create passages for luminosity to seep through. Its presence and absence erode the surfaces progressively until it disappears. The structure and timber cladding stream in horizontal lines with small interstices where the gaze and light can travel.



Earth and Stone Facade Al-Jahma Village, Asir, Saudi Arabia
2019, AlBara Salmaldahar

Both elements balance each other to create gateways, an ode to city gates and the Haramain interiors, they fuse tradition with cutting-edge design. These volumes have a long lifespan as standalone cultural modularity that can be used again.

The central space is an immersive sensory node, offering a glimpse of the future through the lens of tradition with a focal installation that consists of an octagonal column of 3D-printed ceramic illuminated by interior lights, unique in texture and the size of the cavities. These differences are revealed by the luminous patterns projected beyond the piece onto the floor, walls and ceiling of the pavilion.

Upon completing the Pavilion's showing, the piece will be serving as an extension of a natural reef at sea to stimulate the growth of a marine ecosystem. Underwater structures play a pivotal role in habitat formation. Slowly, as more columns are printed, this first object will be joined by new neighbours. One, six, thirty, and so on until the image of a single object artificially present in the natural environment gradually transforms into a field, a labyrinth, a maze of vertical lines from which corals and other life will spring. The contrast of the pure shape of the columns and the biological growth within it visually depicts something made and brought by man being reclaimed by nature to embody a vision of balance or equilibrium that is at once fragile and durable. A network of sometimes broad, sometimes narrow cavities that hold multiple entryways and perspectives for the viewer and endless possibilities for underwater life to develop habitation patterns.

The destination itself is not the end but rather a call for reflection and eventual examination of how one's senses take and generate imprints within space and time. It is here that architecture contemplates the value of the unseen. Triggering the olfactory through scents derived from culturally resonant notes enables an existential experience, embedding a memory of the pavilion that would be unique to each preceptor, dictated by inhabitants' distinctive response to the culmination of architectural stimuli.

About Dahr Studio

A family-run multidisciplinary design house based in Jeddah. The Arabic word for eternity, "Dahr," embodies our dedication to crafting and realizing design interventions with everlasting impressions.

Dahr aims to utilize technology and craft to unleash the potential of the built world. At the heart of it, Dahr is a celebration of objects and destinations where through the exploration of materials and innovative technologies, we unlock new possibilities.

Material Alchemy

THE PERSPECTIVES

In exploring the notion of The Laboratory of the Future in relation to materiality, the curatorial team engaged with various institutions, grassroots organizations, architects, and individual practitioners to gain insight into the different experimentations and innovations being conducted in Saudi Arabia and the wider region.

Through these interactions, different perspectives emerged, manifested in various projects being undertaken by practitioners. Samples of which are now here on display at the Saudi Pavilion. The exhibition is meant to introduce the audience to the architectural potency of these materials. It acts as a conduit for the larger conversation on the perspectives at play and what it means for the future of materiality and built environments.

Architecture is responsive and humanized through the function it serves, its interaction with its surroundings, and anthropogenic influences. Building blocks are dictated by topographical context, their endemic availability, structural soundness and durability. As such, a homogenous approach cannot be expected; each generation and environment offer a unique set of requisites and challenges to be addressed.

Material Alchemy

THE PERSPECTIVES

Albeit, amidst this diversity lies commonality in vision and particular challenges confronting nations regardless of their place in the world. The building sector, for example, is known for large-scale carbon emissions, waste, and contribution to the depletion of natural resources. In the advent of climate change and the turn towards sustainable development, it is imperative to seek interdisciplinary solutions.

In the subsequent pages, we have gathered the perspectives of architects and studios on sustainability and the significance of the material they have chosen to showcase and how they contribute to the overall conversation on alternative materiality.

Whether it be the modernization of earth matter through function, the revival of craftsmanship as an architectural technique, a zero-waste response and upcycling approach to the aftermath of rapid urbanization and modern architecture, creating building blocks for underwater communities, or a turn towards hybrid, novel, experimentations to create carbon-neutral blocks and new materials— the implications of these pursuits are profound.

These modern-day material alchemists represent the residents of the future laboratory, characterized by a multidisciplinary approach and collective desire to be part of a dynamic legacy towards a sustainable architectural horizon.

REVIVING TECHNIQUES

Palm Weave as an Architectural Application

The palm weaving technique is equally as important as the material.

Azaz Architects has designed a pavilion for the Dubai Design Week 2019, exploring the architectural applications of the weaved palm.

The idea is to broaden the skill set of artisans, providing them with an opportunity to shift their focus from traditional artisanry to informal building and architecture. This process involved using endemic resources to enhance their techniques and skills to meet the sector's demand.



Palm leaves, Azaz Architects, 2019
Courtesy of Azaz Architects

MATERIAL:

Palm Frond

Throughout the recent history of the Gulf region, palm frond weaving has been an integral fabrication technique, with the raw material and surplus of palm trees available in abundance, especially in AlHasa Oasis in the Eastern Province of Saudi Arabia. However, as industrialization and technological advancements sweep the region, the palm frond weaving industry is now at risk. Looking forward, it is obvious that a sector intervention is required to revive the art and profession of palm frond weaving. This is where the research-based project, SA'AF was born.

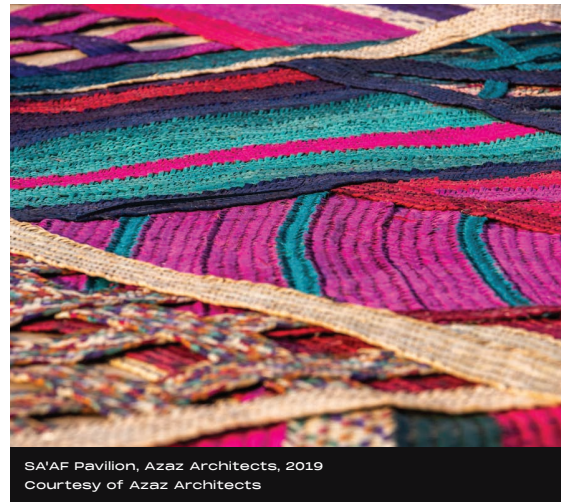
"The future of architecture using palm fronds is filled with limitless possibilities, guiding our approach to materiality within our projects. Every single project involves a unique discussion where we assess the viability of using earth matter to critically support and enhance the architecture and vice versa."



CASE STUDY:

Sa'af

As part of Dubai Design Week 2019, Azaz Architects – a leading architectural firm based in Riyadh – created the pavilion representing the Saudi Arabia during the Abwab exhibition. During the project, lead designer and architect Shahad Alazzaz, knew she had to create something indigenous to the region, in order to represent the Eastern Province adequately.



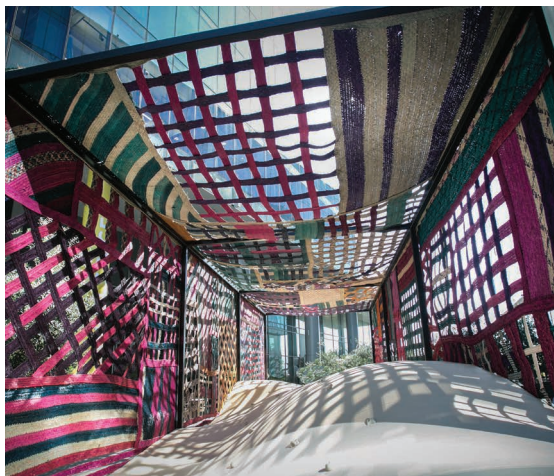
Sa'af, named after the material used in the ancient technique of weaving palm fronds, is a research-led project aimed at safeguarding the ancient architectural craft of the Eastern Province. Shahad's research involved extensive travel to the Eastern Province, mainly Al Ahsa, where the craft of weaving has continued to this day.

She has worked directly with local craftspeople, particularly women in the Eastern Provinces, experimenting with applying innovative textiles. Conceptually, each textile can be interpreted as a story that can be used as a symbolic representation of the people.

Through many workshops, Shahad and the women-led families working on Sa'af explored new applications for the staling technique, helping bridge modern architectural principles with traditional craftsmanship and pushing the boundaries of materiality, application, and innovation.

The pavilion stood as a giant suspended structure composed of four different types of woven styles, as per the methods used by the craftspeople. These styles mix color, scale, and texture, and the pavilion is designed to maximize interaction with the textiles' inner and outer skins. The woven mesh extends to the ground, inviting people to climb up the surface.

Visitors were invited to wander through the cocoon and, depending on where one is positioned, the surfaces are brought to life, and the scale of the weaves evokes a dynamic display of light and shadow. The project explored the potential of a classic craft in transmitting a unique spatial experience. It also allows the mind to ponder; how can the imagination fuel the application?



SA'AF Pavilion, Azaz Architects, 2019
Courtesy of Azaz Architects

"Choosing the palm fronds for the SA'AF pavilion was driven by a unique anecdotal encounter during the research phase. We came across a women-led family living on a palm farm, weaving the palm fronds day in and day out in the hopes of buying a stake in the land."

About the contributor

Azaz Architects is a multiple international award-winning boutique architecture and design services firm based in Riyadh, Saudi Arabia.

The firm provides A-Z design services to various local and international clients. The team offers architectural design services accompanied by interior design, furniture design, public art design, and master planning. To date, Azaz Architects has delivered a diverse portfolio of projects ranging from residential, multi-use, and commercial.

NATURE NURTURED

Elevating Vernacular Practice

The materials Syn architects present are rooted in regional architectural that incorporate earthen blocks & woven palm.

These designs are constructed using elements widely available within our environment, safeguarding the natural biodiversity.

This approach to materiality stems from a contextual awareness of nature and showcases the essence of the materials from where they are found.

These materials have been selected from two projects that the architects, Sara Alissa and Nojoud AlSudairi have engaged in.

"The compressed earthen blocks are used in our Riyadh Mosque, and the woven palm was used in a site-specific installation at the Islamic Arts Biennale 2023, titled 'Anywhere can be a place of worship.'"

MATERIAL 1:

Compressed Earthen Block

The compressed earthen block is a building material composed of a mixture of soil and crushed stone. It includes elements that exist abundantly within the context of Saudi Arabia.

Earth has been one of the primary building materials in the past, yet it still provides a necessary continuity for our future architectural practices. We have incorporated this material in numerous projects and experimented with its composition. We have found it to be a malleable, flexible, and adaptive material that can be made with any soil in the world.



Compressed Earth Block, Syn Architects, 2023
Sample Courtesy of Earthman

MATERIAL 2:

Woven Palm

Palm weaving is a practice adopted in various vernacular-built environments. The palm tree is deeply connected to our region's cultural and architectural landscape and extends beyond that to serve as a national symbol. One palm reed has no structural strength, yet a woven cluster of palm reeds provides an adaptable surface that can be integrated into roofing and shading structures, as well as walls and screens. There are more than 31 million palm trees in Saudi Arabia, most of which are maintained by cutting off the edge reeds annually, enabling the plant's dates to grow. The excess is then used by weavers to create various structures.



Our material selection methodology analyzed the intersection between the site, historiography, and social understanding relative to the context at hand. Materials hold testimony to the history and narrative of place, and reintroducing its memory through the built environment is important in expressing a vital part of our contemporary culture.

About the contributor

In 2019, Sara Alissa and Nojoud Alsudairi co-founded Syn Architects, an integrated design and research practice based in Riyadh, Saudi Arabia.

They focus on ecologically sensitive architecture projects. In addition to Syn, they have established the Um Slaim collective, a critical investigation of the displacement of vernacular Najdi architecture in central Riyadh. They are also the co-founders of saudiarchitecture.org, an independent organization that aims to research and archive modernist and post-modernist buildings in Saudi Arabia.

ZERO WASTE ARCHITECTURE

Construction can produce a lot of waste, including concrete, metal, electrical cables, duct tubes, and more. Given this, the AlMashtal Creative Incubator and Community House values the concept of zero waste, which they strongly enforced while constructing their space in 2019, and continue to do so today.

Understanding the value of scrap material from the construction process plays a big role in the future of architecture and creates a myriad of opportunities for innovative architectural design solutions. Architects, designers, and contractors must share the responsibility of understanding that upcycling and reusing materials could solve many of the problems caused by construction waste.

The AlMashtal Creative Incubator and Community House created several innovative solutions from the removal of demolition waste on-site and produced several up-cycled components, including flooring inspired by the excess wood.

MATERIAL:

The Splendor of Thebes

Inspired to use innovative solutions when faced with problems and challenges on-site, Splendor of Thebes (named after a district in the Diplomatic Quarter, Riyadh, Saudi Arabia, where the site is located) – (Splendors of Thebe) came to life.

The material is made of leftover wood that was damaged due to weather exposure as the site had been abandoned for a few years. It is a mixture of epoxy, paint pigment, and wood chips.

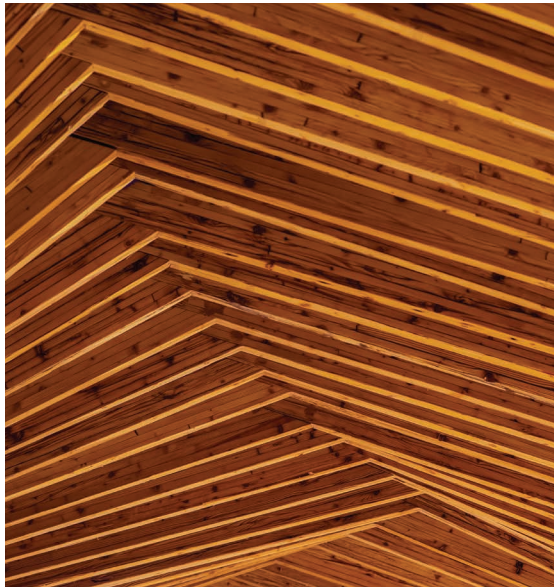


CASE STUDY:

AlMashtal Space

The site of the AlMashtal Creative Incubator and Community House was previously a children's school built in the '80s. During the demolition and removal process, the existing vinyl floors were removed, and we found wide engraved electrical pathways underneath, all over the site. We could have filled in the gaps and raised the floor, but it would have been problematic for the higher outside corridors. The idea came when we realized that we had wood that could not be reused and would otherwise have gone to waste.

The site's integrity was also important to us, and we didn't want to alter or change it too much as it would be a foundation for learning, nurturing, and building future generations. We felt connected to that as a creative incubator targeting local creatives working towards a better future.



The Spine, AlMashtal Space, 2023
Courtesy of Elham Ghanimah

The solution was quite unique; we decided to clean the wood and used a woodchipper to create wood chips that were added to an epoxy mix poured into the floor. The result was uniquely attractive, blending in well with its surroundings, and telling a story about accountability, initiation, and collaboration.

With the whole site, we upcycled as many of the items as we could use and integrated them into our spatial design. Those items not used, were donated to other entities.

A holistic approach was taken to infuse the concept and application of sustainability in architecture and design. A lot of wood was removed from the site and reintroduced to the space as the terrazzo-like material and serves as a spacial canopy feature which we named 'The Spine.'

In addition, items such as lighting fixtures, local SIPOREX building blocks, and the terrazzo-like material composition, together with the original polished concrete floors were used and designed to prevent energy loss in the building process. We used materials that limit heat transfer and were made with as little environmental impact as possible. In a hot climate such as Riyadh, it was important to insulate and regulate the temperature inside the space.

Upcycling the wood and using it for the flooring and furniture gave the space added value and uniqueness. It is durable, has a long lifecycle, and works well with the existing concrete flooring. We saved a lot of money when we chose this solution, and no maintenance has been required since it was installed, which has really made all the difference.

As a result, our entire process, from our approach to creative thinking and problem solving, to application, really added value to the site and contributed to the legacy of the architecture.



About the Studio

Elham Ghanimah is a multi-disciplinary designer focused on developing innovative solutions for architectural & interior design challenges. Together with the co-founders of the AlMashtal Creative Incubator, they were able to create an architectural splendor with a holistic approach towards zero waste.

AlMashtal Creative Incubator is an entity that nurtures young Arab creative professionals to contribute to growing a robust creative economy in the region, enabling them to achieve sustainable socio-economic success. Their vision is to leave a global footprint by revolutionizing home-grown creative economies.

Human impacts and climate change are rapidly degrading corals on a global scale.

Recovery is slow because most corals only deposit millimeters of carbonate skeleton each year.

Using coral 3D printing solutions, King Abdullah University of Science and Technology (KAUST) scientists have been exploring ways to speed things up.

These technologies integrate into a blue architecture approach developed at KAUST, which aims to restore and create coral reefs, extending the landscaping of coastal developments into the sea.

MATERIALS:

Coral reefs are the largest biological structures on Earth. Created by tiny marine animals that secrete a calcareous skeleton, rocky structures accumulate over time to form reefs. Vital to human livelihoods, these complex, three-dimensional frameworks provide coastal protection, support fisheries and the tourism industry, and are home to marine organisms.



3D Printed Coral, CORDAP, KAUST, 2023
Courtesy of Alvise Busetto

Fossilized coral limestones were one of the essential building materials for houses in Al Balad, the historical area of Jeddah, now listed as a UNESCO heritage site due to its unique architecture. Coral stone is porous and has good insulation properties against the salty air of the Red Sea coast. Clay was excavated from the seabed and mixed with lime, then used as mortar to bind the stone blocks.



250,000 year-old fossilized coral limestone, CORDAP, KAUST
Courtesy of Alvise Busetto, 2023

MATERIALS:

The concrete industry is responsible for about 8% of carbon dioxide emissions. Partanna is a new kind of carbon-negative concrete inspired by corals. Together with the Bahamian Startup Partanna, KAUST scientists are exploring ways to integrate this novel carbon-negative material into construction projects within Vision 2030 in the Kingdom of Saudi Arabia, on land and underwater.



Partanna Block, Partanna, 2023
Courtesy of Alvisè Busetto

About the Contributor

The Coral Research & Development Accelerator Platform (CORDAP) is a G20 initiative created to fast-track research and development solutions to save the world's corals.

CORDAP is hosted at King Abdullah University of Science and Technology (KAUST), a graduate science and technology research university globally renowned.

HYBRIDS

Materials of the Future

Architect Samantha Cotterell shares her insights and extensive experience in developing projects through collaboration with various creative talents in Saudi Arabia and the Middle East.

Cotterell's approach to the future of architectural materiality is grounded on choosing materials that reinstate and restore the built environment's relationship with nature and human health.

Cotterell and Roth Architecture Research and Development are showcasing salt based materials as part of the exhibition.

Additionally, she presents a 3D printed Sand and PLA binder sample in collaboration with The Material Balance Research Group and Fahed + Architects.

What does the future of architecture regarding material selection mean for you?

Since the beginning of time, man has used materials put at his disposal by nature to create the built environment which reflected the long and intimate relationship between peoples and their natural environment. It's only since the industrial age that the built environment has started to overpower nature resulting in catastrophic environmental, social and economic impacts. Today is a critical time in our history, which commands a response by professionals in the field of architecture and design to deliver research and solution-based innovation to help restore the relationship between humankind and nature.

What approach do you take regarding future building blocks and materiality? How does this relate to sustainability and what factors do you consider?

I seek to foster the development of innovation in the built environment to ensure the evolution of new sustainable materials. Linking academia, profession and industry is important to ensure a collaborative process to discover new answers.

Over the last 20 years I have held design leadership roles on major government projects in the Gulf region, and most recently as Executive Director of Design for the Royal Commission for AlUla. In these roles, I am responsible for commissioning large public works, which I believe come with the responsibility to advance the global discourse on sustainable architecture. By bringing academia, the profession and the industry together to work on the development of alternative materials, I foster the development of innovation that at once addresses pressing issues of climate change while attempting to restore dignity to the built environment. Such an approach also aims to ensure the client body acts as a knowledgeable and responsible client and a point of reference for future developments.

Why did you choose the particular material you're showcasing?

Saudi Arabia has wide swathes of sand, spanning its desert landscapes and has a lot of salt from its desalination plants. We have been testing their potential use as sustainable building materials in some of the projects I have been leading. The application of the materials by the creative and visionary designers is producing unconventional and surprising architectural qualities.

Salt and sand are locally sourced materials and represent a sustainable option for construction. The use of these materials offers opportunities for innovation in the construction industry, allowing for the development of new products that can replace materials such as concrete and steel.

Brine, often viewed as a waste product, can be transformed into an innovative building material that offers a range of benefits over conventional materials. If used on a large scale, it can also decrease the amount of brine that requires disposal, thereby reducing environmental pollution. Additionally, combining sand with by-products of oil with 3D printing technology offers a novel and sustainable approach to building construction, which can contribute to developing a circular economy through recycled plastics. Using salt and sand helps us rethink conventional building materials and methods and develop innovative and sustainable solutions that can benefit the industry and the environment.

How do these materials inspire the concept of sustainability and contribute to the legacy of architecture?

The use of familiar and abundant materials available in a place is core to the concept of sustainability. The innovation in the proposed adoption and adaptation of the salt and the sand is the beginning of supporting new directions in architecture.

Architecture has the responsibility to say something about the time in which it was designed and built. I sit on juries for final-year students in architecture, and I witness the creation of spaces, facades, places, and structures that are unlike anything that has been seen before. The technology of today is facilitating the creation of what to the eye would seem unbuildable with the tools and materials traditionally available in the construction industry. This means the industry must advance and find ways to realize what is being designed by the architects of tomorrow.

Sand and salt are abundant in Saudi Arabia, and they can contribute to the development of sustainable architecture by reducing the environmental impact of the construction industry. This approach contributes to the legacy of architecture by enabling the industry to maintain its relevance while ensuring its resilience in the long term.

About the Contributor

Samantha is a professional architect with 30 years of experience in large-scale international projects, including 22 years in design leadership roles for major government organizations such as Olympic organizing committees, Expo organizing committees and most recently, as Executive Director for the Royal Commission for AlUla.

Samantha is currently the Chair of the International Chapter of the Australian Institute of Architects and a member of the Venice Biennale Architecture Committee for the Australian Pavilion.

She has an MBA in Entrepreneurship & Innovation from HEC Paris (2013) and a bachelor's degree in architecture from the University of Melbourne (1993).

MATERIAL:

Salt

As Executive Director of Design for the Royal Commission for AlUla, I have fostered the design development of experimental work in the built environment. One such project is being developed for the desert region of Saudi Arabia.

At its core is a series of experiments investigating materials available and innovative ways to treat and adapt to new building technologies. The work and samples displayed in this exhibition address the strategic use of an abundant natural material typically not used in construction—salt.



Salt & Recycled Polypropylene Composite,
Ana Bejarano & Adad Mendez, © Roth Architecture



Crystallized Salt & Borax,
Ana Bejarano & Santiago Baravalle, © Roth Architecture



Coalesced Salt (Hardened/Solidified),
Ana Bejarano & Adad Méndez



Calcium Carbonate & Salt Composite, 2023
Ana Bejarano & Santiago Baravalle, © Roth Architecture

This body of research specifically looks at salt brine, a by-product/waste material generated through desalination processes used globally and seen prominently in regions such as Saudi Arabia and the Middle East, where water desalination provides a critical resource. Using this residual material can deliver multiple benefits and encourage expanded thinking around the use of by-product and waste stream material in the design industry. These early-phase samples use high-purity sodium chloride salt as a primary ingredient and explore various base matrix materials that, when combined, form diverse composite and crystallized studies. Potential applications being developed include interior wall finish panels, wall and floor tiles, space dividing screens, lamps, chandeliers and decorative objects for interior use.

About the Contributor

Roth Architecture Research & Development is an innovative team of architects, material experts, bio-designers, and fabricators who strive to create pioneering approaches to materiality and fabrication systems for global application. Their pursuit of enhancing what already exists prompts them to explore and question, employing research to attain knowledge and drive innovation.

Expertise of Roth Architecture Research & Development includes material development, material consulting/research, technical systems design for construction and fabrication, architectural design and development, data analysis and computational design integration, sustainable design for site and building systems, prototype fabrication using digital and analogue methodologies within our onsite FabLab.

MATERIAL:

3D Printed Sand With PLA Binder

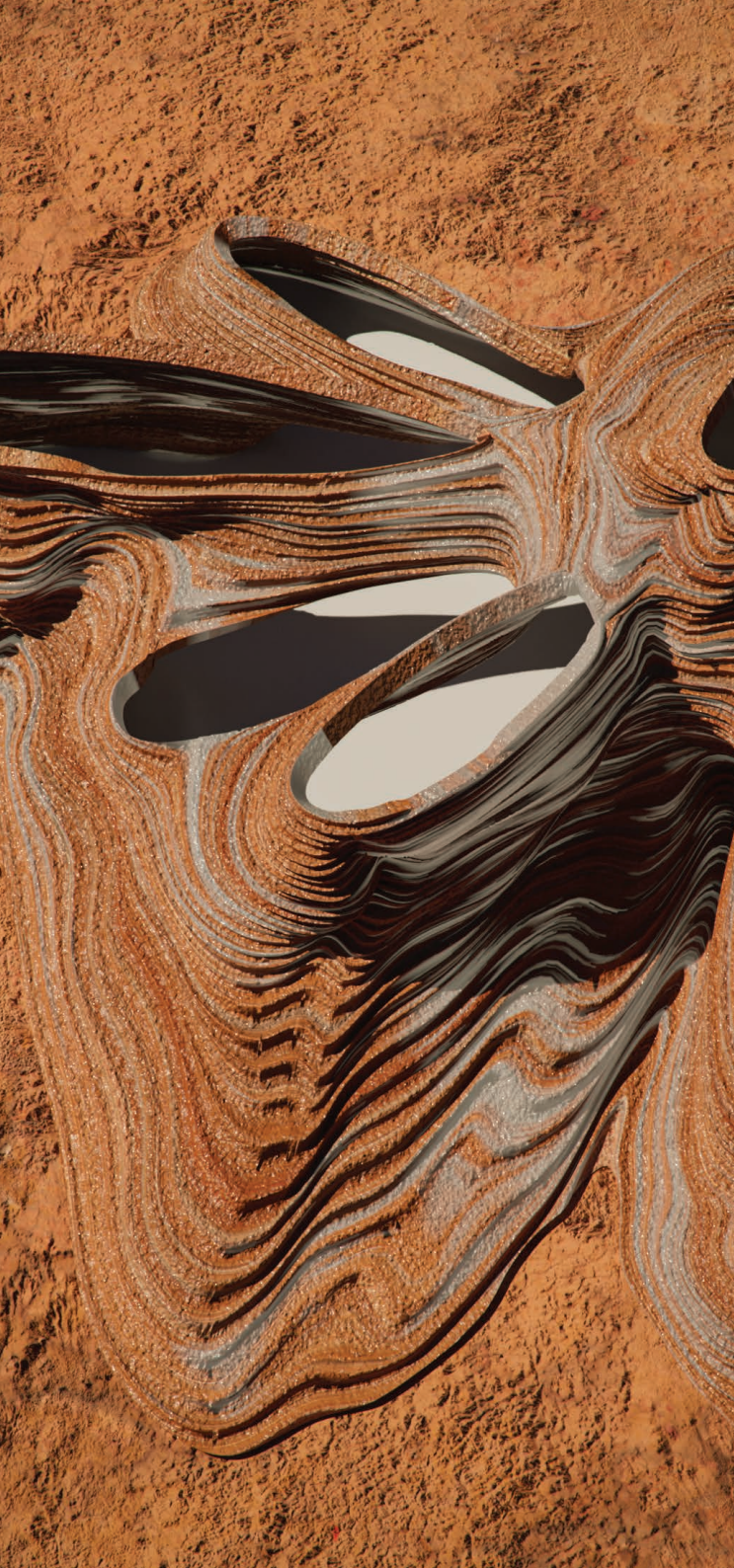
In Samantha Cotterell's role as Design Director for Expo 2020 Dubai, she engaged the Politecnico of Milan to experiment with sand and byproducts of oil as a binder to create a material that could be 3D printed. The use of these technologies progress the conversation on sustainability in the desert construction environment, while innovating our understanding and application of new building materials.

Under the name of "DESERT TECTONICS", they created a façade for a service pavilion at Expo 2020 Dubai.



Hence, the design for this facade had to fulfill the typical features of temporary architecture for the Expo, modularity, flexibility, and identity. The design is easily replicable, and the material lends well to the Arabian context. They continued experimenting with this material when Cotterell moved to Saudi Arabia as Executive Director of Design at the Royal Commission for AIUla, where she worked with Fahed + Architects to experiment with the material and design proposals for Visitor Centre pavilions in AIUla. The local environment and architecture inspire the concept.





About the Contributor

The Material Balance Research Group is a research lab inside the Department of Architecture at the Polytechnic of Milan; it states that the Anthropocene perspective has led to dealing with earth in a consumerist way, opening the path for waste, shortage of resources and climate change. This perspective is no longer viable. A new delicate but deep approach must be undertaken to modify our habits, starting with how we live, inhabit, design and build. Material Balance Research Group creates a common ground for innovating our practice, with a responsible approach, aiming to rebalance our relationship with the environment.

Fahed + Architects practice is gearing up to embark on newer creative journeys and collaborations with a key focus on research. Established in 2006, Fahed + Architects is a multiple award-winning boutique practice that strongly believes a good design can positively impact daily life. We offer architectural design as a single integrated vision. One of our key strengths, in terms of design, is diversity. We have offices in different regions – Dubai + Kochi + Bali + London with partners worldwide.

The Future is Collaborative

The experimental and explorative materials on display in the exhibition capture a sampling of the various perspectives of architects and interdisciplinary practitioners in Saudi Arabia. A common thread emerges amid the diverse approaches and architectural philosophies that have been applied. The Laboratory of the Future consists of a collaborative effort, pluralistic yet finding common ground in its desire to improve the human condition and answer the challenges confronting our world.

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