SEG

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Introduction

Sustainability Engineering Group, LLC DBA SEG International is a multidisciplinary engineering and architectural firm that offers attractive alternatives to traditional construction through an ecologically conscious approach. This approach embeds sustainable principles throughout the project's development, ensuring that every phase from initial design to final construction prioritizes environmental responsibility. SEG's commitment is to provide extra value to its consultancy services by ensuring continuous support to its clients through the entitlement, permitting, and construction processes.

Established in 2009 in Arizona by Dr. Ali Fakih, who serves as the CEO, the company specializes in civil engineering projects. Dr. Fakih holds a PhD in Sustainability and a master's degree in construction management. He has designed and managed numerous civil engineering projects for SEG. Dr. Ali has been recognized in business journals and is the driving force behind SEG's success as a leader in sustainable civil design.

Mission, Vision, and Core Values

Mission

SEG is committed to the efficient use of land, water resources, and energy in our project design solutions. We aim to lead the sustainable design movement in the communities we impact. By incorporating sustainable design concepts in each project, we ensure the longevity of the infrastructure and surrounding ecosystems.

Vision

SEG's success will be measured by the significance of our leadership role in the Civil and Architectural industry. We will provide sustainable solutions and expertise for our clients. We will address the demands of an industry-wide commitment to environmentally-sound.

Core Values

S olution Oriented • **E** ntrepreneurial • **G** rowth Focused • **I** nnovative •

1 **As is alluded to in the name, Sustainability Engineering Group emphasizes environmental consciousness. Please elaborate on the importance of sustainability in your company's mission and vision and how your services can support Saudi Arabia's Green Initiative.**

Our company, as indicated by our name, strongly emphasizes environmental consciousness. Sustainability is at the core of our mission and vision, guiding every decision and project we undertake. Our commitment to sustainability is to actively support Saudi Arabia's Green Initiative by being dedicated to reducing carbon footprints, minimizing waste, and conserving natural resources in all our endeavors. We ensure that our sustainable design practices benefit the environment and enhance the communities and economies in which we operate.

With a strategic presence in seven cities across Phoenix, *AZ,* Dallas, *TX,* Morgantown, *WV,* San Pedro, *MTY,* Cairo, *Egypt,* Riyadh, *KSA* & Toronto, *Canada,* we are well-positioned to serve our clients efficiently. Each office is a hub of expertise, contributing to our collective knowledge base and ensuring we remain informed of the specific needs and challenges of the regions we operate. This strategic presence positions us as a global player and adaptable partner with a profound understanding of the particularities of the Middle East, specifically in Saudi Arabia.

The diverse cultural and professional backgrounds of our international team contribute to a dynamic knowledge exchange that allows us to leverage the best ideas, practices, and innovations from around the world, benefiting our clients with a global understanding of their projects. Also, it allows us to promote different sustainability services to support Saudi Arabia's Green Initiative such as LEED Design Certifications, Sustainable Pavement Design, Sustainable Irrigation System, Value Engineering, Energy Analysis, Innovative Approach to Infrastructure Sustainable Design, Heat Island Effect Mitigation, Water Conservation Investigation, Storm Water Harvesting & Reuse, Greywater Design, Dust Control Mitigation, Net Zero Strategy Design & Implementation.

2 How do SEG's design and construction methods differ from a traditional approach?

SEG adopts design and construction methods that differ significantly from traditional approaches, incorporating sustainability at every stage. These methods include:

Employing a collaborative design process that involves all stakeholders from the beginning, ensuring that sustainability objectives are integrated into the project's components.

Conducting thorough lifecycle assessments to understand the long-term environmental impact of our projects, and making data-driven decisions that promote sustainability.

Integrating innovative water management solutions, including rainwater harvesting, greywater recycling, and efficient irrigation systems to promote water conservation.

Focusing on preserving biodiversity & maintaining natural resources through strategic planning and design of landscape sustainable spaces within our projects.

Committing to achieving green building certifications such as LEED ensures that our projects meet rigorous sustainability standards.

The range of sustainability strategies that SEG has been involved in developing and implementing varies widely depending on project types and requirements, encompassing a wide range of initiatives aimed at reducing environmental impact, promoting social responsibility, and ensuring

3 How will SEG fulfill its goal of becoming a leader in the Civil and Architectural industry? What are SEG's next steps for expanding its reach?

To maintain our position as a leader in the Civil and Architectural consultancy industry and to expand our reach, we continually invest in research and development, to pioneer new sustainable technologies and methodologies, to empower local talent through training and collaboration, and ensure sustainable development practices are ingrained within the Saudi Arabian context, collaborating with local and global stakeholders to amplify our impact and promote sustainable development across the region. Some of our recent achievements in R&D include:

Smart Water and Sewer Management: SEG has done several research projects to acquire the knowledge and references needed for technologies that provide real-time and automated data to solve water challenges. Smart Management delivers the user's hourly status via smart devices and wireless communication technology (ICT). By communicating with the App, users obtain all the data reflecting the "State of Health", which helps them to detect and predict potential failures in their infrastructure network (Leak, Burst, Consumption, Quality of water, pressure, overflow). SEG has been using this data and knowledge to help cities (like Gilbert and Scottsdale) use this technology and avoid water challenges.

Dust Control: Dust control is the system implemented to reduce or drop dust emissions from activities that generate airborne and fugitive dust and cause erosion. The main goal of dust control is to stabilize the road surface, reducing the rate of aggregate loss and the money spent annually on replacement. To make this control more automotive, SEG has found dust measuring devices to monitor air quality and measure dust to keep cities environmentally aware.

Noise Monitoring: The City of Scottsdale, AZ was working on adding a dB(c) weighting to accompany the 68 dB(a) level it currently has in its ordinance, to address the challenges posed by loud, thumping bass. After coordinating with the city, SEG modeled a brief research to figure out how to set that level, as well as how to define the "C" Band threshold the city should use.

Smart Lighting: Smart Lighting is an intelligent network-based lighting control solution that incorporates communication between various system inputs and outputs related to lighting control with the use of one or more central computing devices. Smart Lighting reduces wasted energy, cuts costs, and enhances safety. SEG helped with the investigation into the Village Park in Scottsdale. The study included the following elements (Network features, Requirements, Devices, Costs, and Case studies)

Greywater Technologies: The City of Scottsdale, AZ is facing a water demand problem. SEG helps the city by sharing its Greywater references (Collection, Recycling, Requirements, Beneficial Uses, Cost, Case Studies, etc....). These solutions help the city to avoid wasting water and reduce the water demand sources.

4 Are you currently operating in the Kingdom? If so, how can your innovative sustainability practices contribute to Sustainable Development Goals and the Kingdom's Vision 2023?

We currently operate in Riyadh, Kingdom of Saudi Arabia office, working on projects with local staff and collaborating with SEG staff of different locations. Our team integrates relevant technology tools and software used in sustainable solutions, using advanced technologies for efficient operation.

We bring valuable expertise from North America to the Saudi market, particularly in multidisciplinary projects with similar weather conditions and environmental challenges. Our experience in sustainable design and construction across diverse climates equips us to address Saudi Arabia's unique requirements under Vision 2030 and its Sustainable Development Goals. Drawing from our North American experience, we integrate diverse disciplines such as engineering, architecture, and environmental sciences to deliver comprehensive solutions tailored to local contexts in Saudi Arabia, our projects in regions with comparable weather conditions enable us to apply proven strategies for heat mitigation, energy efficiency, and water conservation in Saudi Arabian settings, we bring advanced technologies and best practices from North America, enhancing infrastructure resilience and sustainability across urban and rural landscapes in Saudi Arabia.

Also, our international presence positions us as a global leader with a deep understanding of the Middle East, particularly in Saudi Arabia. This strategic track allows us to engage ourselves in Saudi Arabia's local culture, understand unique challenges and collaborate with regional talents to tailor solutions that go beyond infrastructure design which become catalysts for economic growth and community pride, facilitate knowledge exchange between North American expertise and local Saudi stakeholders, foster innovation and capacity-building in sustainable development practices, align our initiatives with Vision 2030, so we can contribute to Saudi Arabia's goals of economic diversification, environmental stewardship, and societal advancement through sustainable infrastructure projects.