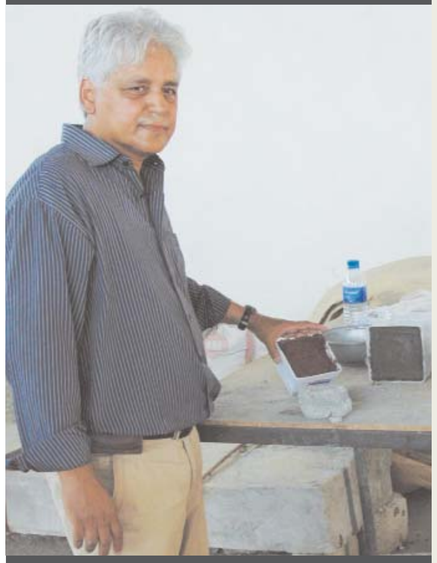
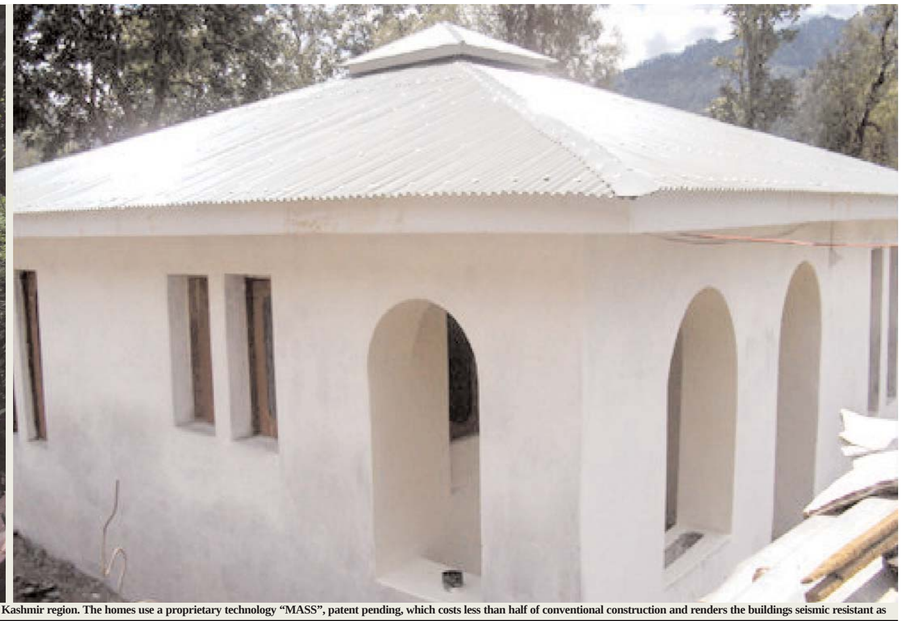
JAVED SULTAN





Javed Sultan designed and built these homes in Kashmir in 2006. The homes were commisioned by the Aga Khan Foundation as part of their reconstruction effort for the earthquake ravaged Kashmir region. The homes use a proprietary technology "MASS", patent pending, which costs less than half of conventional construction and renders the buildings seismic resistant as

MASS Technology: Innovative State-of-the-art Green Technology of the future

> "MASS is an acronym that stands for Membrane Assisted Seismic-Responsive Structures. This was coined for the proprietary, patent pending, seismic responsive wall solution that I developed for affordable housing for the earthquake stricken folks of AJK. Several structures have been built in AJK. One can essentially use 70% to 80% ordinary soil as an infill and still make the structures seismic responsive. I expect the cost of structures to come down by some 50%. It is much easier to use than block technology, masonry and brick, requires less skill sets and will allow ordinary folks to pay for their housing vis-à-vis sweat equity."

22 years ago, when Architect Javed Sultan was studying at the MIT, a delegation of university chancellors from Pakistan went to the US to learn about innovative building technologies. His professors referred the delegation to this bright student of theirs, but the chancellors seemed uninterested in meeting Sultan. Today, after two decades of research and development, Sultan has developed and patented a revolutionary new building technology, MASS, that he says will make construction simpler, cheaper and more environmentally friendly. It is a technique that does not require heavy machinery, is labor-centric, and significantly reduces the time and money required in construction. Moreover, it results in structures with enhanced thermal comfort. His lightweight, optimized wall system has an average R-value of 25.

Javed Sultan has been able to achieve all this because he integrates knowledge of architecture, structures and construction management, which are traditionally separate professions, practiced in isolation.

In spite of his successful career in the US and large projects in other countries as well, he struggles with skepticism and lack of acknowledgement in his home-country. Nevertheless, Sultan is determined to develop his innovative technology in order to make construction easy and affordable for the poor segments of Pakistani society.

Here he shares his experiences and aspirations with ARCHI TIMES.

By Arch. Zain Mankani

ARCHI TIMES (AT): To begin with, please throw a little light on your schooling, education and background?

Javed Sultan (JS): I have a B.Arch from Middle East Technical University (METU), Ankara and a Masters in Architecture and Civil Engineering from MIT, Cambridge, USA. I am a licensed architect in several states in the USA.

AT: What was your reason of selecting architecture as your main vocation?

JS: I wanted to study Physics but for various reasons decided not to pursue, and decided on architecture as I had an interest in structures.

AT: What is the meaning of Architecture to you?

JS: I strongly feel that all third world architects must strive for solutions that will increase affordability for the poor in their country.

AT: What is MASS Technology and how will this impact our economic position?

What are the benefits of MASS technology?

JS: MASS is an acronym that stands for Membrane Assisted Seismic-Responsive Structures. This was coined for the proprietary, patent pending, seismic responsive wall solution that I developed for affordable housing for the earthquake stricken folks of AJK. Several structures have been built in AJK. One can essentially use 70% to 80% ordinary soil as an infill and still make the structures seismic responsive. I expect the cost of structures to come down by some 50%. It is much easier to use than block technology, masonry and brick, requires less skill sets and will allow ordinary folks to pay for their housing vis-à-vis sweat equity.

A sister reinforced concrete proprietary, patent pending, floor slab and roof slab technology eliminates the need for shuttering and scaffolding and I have already built such slabs in Pakistan with spans of 18' plus. The floor slabs have half the weight of a comparable concrete conventional slab and are put together using manual labor in hours (first stage - it is a multistage process). No lifting equipment is necessary. No restriction in terms of building single or multi-story.

AT: How would you compare MASS Technology with masonry and brick?

JS: Masonry and brick construction rely on multiplication and aggregation of individual blocks or units by stacking and cementing the units by various binding agents or through mechanical binding. It is time consuming, and in most cases fossil fuel driven strategy, that relies on skilled labor, such as masons. It is primarily a load bearing wall system. It typically has very poor insulation value. MASS wall on the other hand utilizes some 30% less cement, is a system wall with load bearing capacity with 6 times the insulation value of a masonry wall. The wall can be put together in half the time of masonry. It significantly reduces the need for cooling and/or heating of interior spaces.

AT: What are some of the major challenges faced while developing this MASS technology?

JS: Time and acceptance of a new technology. There is a gestation period for all new technology during which one needs to convince the professional of the merits of a technology. It takes years if not decades.

AT: What are the challenges facing the construction industry?

JS: Environmentally damaging and wasteful construction technologies, profit driven and not consumer responsive; lack of innovation; lack of experimentation, to a large part driven by lack of communication between the various engineering disciplines.

AT: What opportunities are available to the construction sector at this time?

JS: Looking for ecologically responsive, less wasteful technologies that can do a lot more for the same resources.

AT: What measures would you implement to develop this technology in Pakistan?

JS: Need to inform the public of the technology and hope that they will respond positively with contracts.

AT: What are your personal plans for the future?

JS: Promote and write about the technology.

AT: How can we minimize the environmental impact through this technology?

JS: This is a green technology that primarily relies on reinforced concrete (has aspects of ferrocement) which has a significantly lower carbon footprint than steel. Also as everything is fabricated onsite very little fossil fuel is utilized for transportation, storage, mechanical lifting. It does not require elaborate road or infrastructure to reach remote areas.

AT: Are there any other new technological developments that you are excited about?

JS: Solar, hydro and wind technologies. Also just the general focus on technologies that can lower the carbon footprint, focus on renewable, and which mitigate

National Institutes of Health, Bethesda, Maryland

depletion of our forests and natural resources.

AT: Can you give us any example of projects, which you have recently worked on, that involved the learning of a new technical development?

JS: The building of homes in AJK after the 2005 earthquake using local unskilled labor. Also currently the construction of high end homes using my technologies in the vicinity of Islamabad.

AT: After a severe earthquake centered in Pakistan's Kashmir province killed more than 70,000 people in 2005, teams from a nonprofit architecture group helped the region start to rebuild. What is the role you played in rebuilding of this area?

JS: I approached ERRA for an opportunity to use my technology. After doing a demo for ERRA I was approached by Aga Khan Planning and Building Services Pakistan (AKPBS-P) to do three demonstration homes in AJK. Subsequently my technology was approved by NESPAK and by ERRA. But the approval process was long and by the time the approval was given, the funds for construction had been distributed. AKPBS-P at one time considered getting some 500 homes built using my technology.

AT: What are your thoughts on Pakistan's architecture in general? How do you think the quality could be improved?

JS: Pakistan has great talent and interesting architecture. We need to experiment more and come up with green and energy efficient solutions. We must be bold enough to lead rather than to follow. We must dare failure.

AT: How far do you believe in green building architecture and what suggestion can you give in this context?

JS: Green, sustainable and non-fossil fuel driven architecture, relying on renewables and recyclables, is a global challenge for all architects. In Pakistan we need to focus on affordable solutions for housing and other social and health institutions, for urban and rural poor.

AT: Are you incorporating sustainable design principles in your projects?

JS: Yes my solutions are all sustainable as they have a small carbon footprint, rely on renewables and recyclables, and significantly reduce use of fossil fuels.

AT: Can you identify the three most pressing problems to practice in the field of architecture currently?

JS: Inadequate education and benchmarks to measure competence and professional standards.

Lack of enforcement of building and life safety codes.

Lack of country based architectural practice priorities.

AT: Could you describe some of the projects that you have worked on?

JS: In the USA I won a multi-year (5) AE and CM contract, competitive award, for the National Institutes of Health in Bethesda. We design-built numerous labs and health facilities over an 8 year period. My company also won a construction management contract, along with 4 or 5 other firms, for the largest federally-funded (USA) road and tunnel project (Central Artery Tunnel project) for Boston. My firm in USA has worked on numerous residential, religious and commercial projects over a span of twenty years or so. I have also worked for some 5 years in West Africa designing schools and homes. My most challenging project was coming up with the MASS technology and the slab technology.

AT: What kind of projects do you enjoy more? And what projects do you currently have on the boards?

JS: I want to build using my MASS technology as it will bring great value to the practice of architecture.

AT: What are your best projects and why?

JS: I like working for the poor and resource starved. They need our help and intervention.

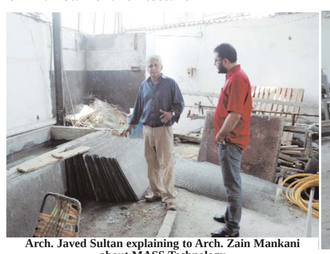
AT: Does the construction material play as important a part as the architectural design?

JS: Being a third world architect, construction material is very critical if it can increase affordability. That effort is an integral part of architectural design.

AT: Any message for the professionals and young architects/students?

JS: Young architects must explore, experiment and not be afraid to fail. Their effort has to be knowledge driven so they need to spend time learning. They must give some time to addressing the needs of the economically-deprived population of Pakistan.

MASS Technology Roof Slab on the project near Islamabad



Arch. Javed Sultan explaining to Arch. Zain Mankani about MASS Technology

Javed Sultan in his lab with his team workers

Javed Sultan standing with his team members on the 18 ft. long beam developed on Mass Technology

JAVED SULTAN speaks on ARCHITECTURE

Community Center, Boston

Mariott Marquis - New York City

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