

AVEI NEWSLETTER



The Earth Institute Team, March 2013

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Please feel free to share this newsletter with your friends and colleagues as we spread the knowledge of earth architecture to the world!

Earthily yours,
The AVEI Team
Fugiam volorum non con

**La Main de Fatima
Exhibition Hall,
Marrakesh**

The Auroville Earth Institute has finished the working drawings for the exhibition hall designed for the Institut Marocain de Recherche sur la Permaculture (IMRP) in Marrakesh, Morocco. The design for the building, which draws its form from the traditional symbol "La main de Fatima" (the hand of Fatima), is now going through the approval process at the town planning office.

Satprem Maïni visited the site for two weeks in March to oversee the progress and to provide the necessary training to the workforce engaged by the local contractor. Satprem marked out the exhibition hall on the building site to assist the contractor. He conducted a course on block production for three technicians and twelve workers. For the tech-



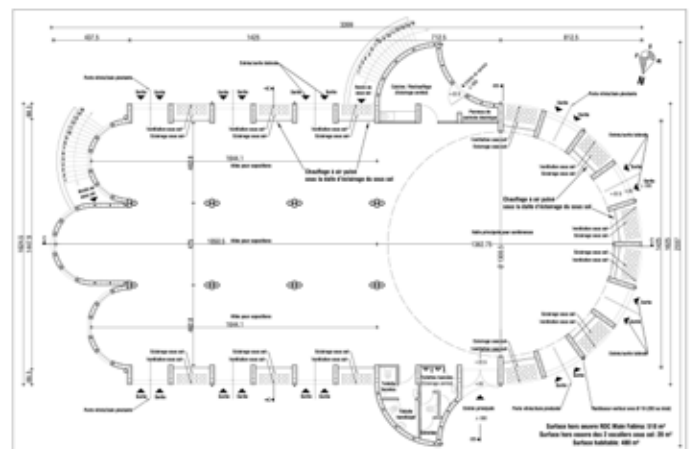
Marking the outline of the building on the site

nicians, the training was focused on soil identification and quality control, and for the workers, the focus was on instruction of how to make the sixteen types of blocks to be employed in the building. The team worked well and showed dedication to the project, producing 5472 of the sixteen different types of blocks required over the period of the training course.

Over the next two to three months, these workers will produce the 79,400 blocks required for the structure. Once the basement has been constructed and the slab floor has been put into place, Satprem will return to Marrakesh to give the training courses on masonry for walls and then vaulting.



Block production by the workers



Floor plan for the exhibition hall

Rosie and Lara give lectures at Auroville Green Workshops

Auroville Green Practices Workshops facilitated the “Sustainable Habitats” workshop, an architecture programme for professionals which ran from the 5th to the 8th of March, 2013. This workshop aimed at sustainably integrated approaches to the planning, design and construction of human habitats. Interactive workshops and site visits included the broad themes of planning and design, green building materials, energy management, integrated water management, waste management and landscaping.

On the 6th of March, Rosie Paul of AVEI gave a lecture on “Introduction to Earth Architecture”. This lecture was an overview on Compressed Stabilised Earth Block (CSEB) technology, as it has been historically developed and improved at the Auroville Earth Institute.

On the 7th of March, Lara Davis of AVEI gave a lecture on “Embodied Energy in Building Materials and Technologies”. This lecture interrogated the often deceptive nature of “green” materials and technologies, outlining the need for proper embodied energy and carbon accounting practices to establish reliable metrics for material comparison. It discussed the boundaries of analysis and showed examples from best-practice inventories

of carbon and energy. Finally, it showed an example of a carbon and energy evaluation of an Earth Institute project, demonstrating that proper carbon and energy accounting must always be weighed against the labor and material costs of a project, in order to answer the environmental, economic and social targets of sustainable development.

<http://www.agpworkshops.com/sustainable-habitats> ■



Consultancy for ISKCON, Salem

Satprem Maïni and Lara Davis visited Salem, Tamil Nadu from the 19th to the 20th of January to consult with the International Society for Krishna Consciousness (ISKCON) on the construction

of vaulting for the future Sri Sri Radha Gokulanada Temple. The temple will include a traditional shikera, a vaulted colonnade at the ground floor, and a first floor hall that will accommodate up to 800 people.

The patron of the project, Mr. Gokula Chandra Das, motivated to employ appropriate building technologies in the construction of the temple, contacted the Earth Institute to consult on the structural design and construction of the vaulted colonnade. A preliminary design in rammed earth had been developed by Biome Environmental Pvt., however, a concept design in stone had been ultimately adopted.

Stone masonry arches and CSEB barrel vaults will be built upon the sixty-five stone pillars, which are already in position. The challenge will be to establish a safe solution for the structural design of the vaulting, as the Hari Krishna “kirtan” ceremony involves danc-



Stone columns

ing and jumping, which will subject the vaults to dynamic loading. Overloading, buttresses and interlocking stone beams will be employed to equilibrate the forces and to assure an optimal safety factor for the vaults. The Earth Institute will work closely with the ISKCON team and the traditional "Sthapathi" temple builders.

During their visit, Satprem and Lara took three soil samples to test at the Earth Institute in order to determine the mix composition for the CSEB. They will calculate the structural requirements for the stability of the vaults, while ISKCON's team completes the block production and the sthapathi carve the required stone pieces. Satprem, Ayyappan, and Lara will then conduct training courses on arch and vault construction for the local masons, and the vault construction will continue under the supervision of Earth Institute masons. ■

AVEI's Work Specifications

Lara is now finishing up the compilation of a new AVEI publication, "Work Specifications for AVEI Earth Construction Techniques".

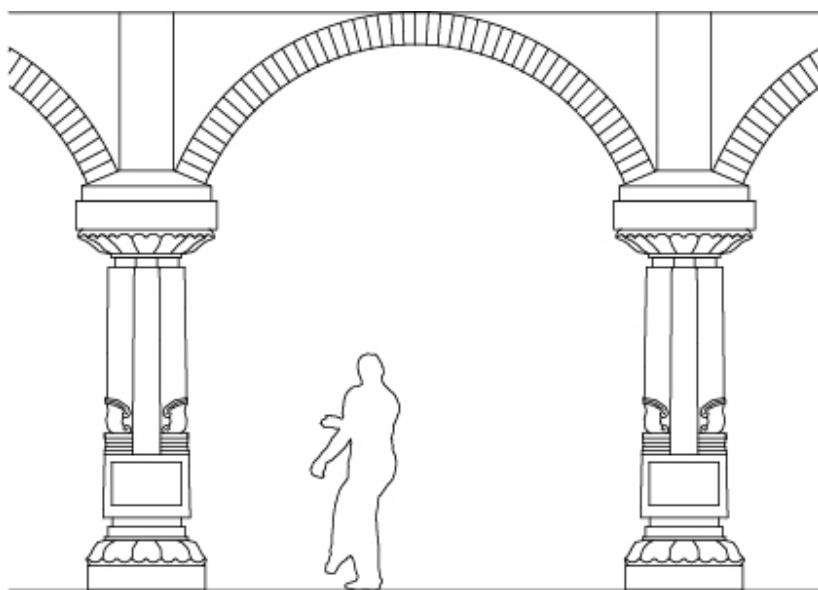
Authors: Satprem Maini, T. Ayyappan, Lara Davis
Details: 68 pages text, with drawings and diagrams

This document provides a summary of the technical specifications for the various earthen construction techniques developed and used by the Auroville Earth Institute (AVEI). It is intended for use as a comprehensive technical specifications book for contractors or clients implementing AVEI techniques, as well as for general knowledge dissemination. It is the aim of the Earth Institute to bring maxi-

mum awareness of the low-cost and eco-friendly earthen construction technologies described here, and to promote low-carbon, low-embodied energy alternatives to the industrial materials and building technologies such as reinforced concrete and fired brick.

The various technique specifications in this document are organised within the following categories: Foundations, Masonry techniques (in-situ), Pre-cast & Composite techniques, Mortars & Concretes, Wall Treatments, Floor Treatments (interior), Roof & Terrace Treatments (exterior waterproofing), Insulation, Research & Development, and AVEI Archived Techniques. The subheadings for each listed technique include "Scope & Description of Work", "Mixing & Preparation Procedure" (instructions for mixing material components), "Work Procedure" (instructions for applying the constructive technique), and "Specification Data" with mix ratios and quantities. A summary of specifications is included at the end of the document.

Note: All material ratios in this document which include soil will vary slightly according to the nature and quality of the soil used. The mix ratios in these specifications have been determined with the use of soil from Auroville, India ("Auroville red soil"). Ratios may change when using soils selected from other locations, and must be adapted to every situation with consideration for the soil quality, the local requirements and available materials. ■



Concept drawing for the temple's arches

ZBW Library Visit and CRATerre Collaboration

From mid-February to early March, Hilary Smith, the Auroville Earth Institute librarian, traveled to Germany and France to further her plans of creating a digital repository for research and publications coming out in the field of earthen architecture. She was hosted for two weeks at the Zentralbibliothek für Wirtschaftswissenschaften (ZBW), which is the German National Library of Economics, located in Hamburg and Kiel. This forerunner in innovative library services also operates a DSpace repository called EconSTOR that gives open-access to scholarly articles in the field of economics. During her visit, Hilary met with key members of the staff working on this repository project and connected projects, to expand her knowledge of potential actions she could take in the context of the Earth Institute library and how she could tailor her own DSpace repository to the particular needs of the Earthen Architecture field. Additionally, she gave two presentations to ZBW staff about Auroville, the Earth Institute, and the Earth Institute library.

At the conclusion of her ZBW visit, Hilary traveled to France to meet with CRATerre founding member Hubert Guillaud

and librarian Murielle Serlet. Hilary presented her plans for the DSpace repository and asked for the support of the UNESCO Chair network in this project.

Now returned to Auroville, Hilary is excited to start implementing her new knowledge. ■



AVEI in the Press

Indian monthly architecture journal **Architecture Update** solicited the Auroville Earth Institute to pen an article on Compressed Stabilized Earth Block (CSEB) and Rammed Earth. The resulting article that appeared in their anniversary issue called "Materials @ Architecture" described the steps for the processes for producing both CSEB and rammed earth walls. The article presented the kinds of buildings and architectural features that lend themselves well to CSEB and rammed earth construction as well as the environmental and economic properties of these earth-based building materials.

The article can be read in the digital version of the issue on

page 180:

http://www.eril.co.in/eMagazines/architectureupdate/2013/anniversary_issue/pageflip.html

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The March 1-15th, 2013 issue of the Indian science & environment magazine **Down to Earth** featured the Auroville Earth Institute in an article entitled « Let's play with mud » by Avikal Somvanshi. Covering Satprem Maïni's philosophy, the article described the environmental degradation linked to the use of Reinforced Cement Concrete (RCC) and Country-fired Brick, comparing it to Compressed Stabilized Earth Block (CSEB), with its far smaller embodied energy and carbon emissions. The article also highlighted that CSEB employs soil from one-meter down, thus preserving the topsoil, unlike Country-Fired Brick. Furthermore, CSEB lends itself to a wide variety of structural types. Finally, the article explained that while the Earth Institute has trained a large number of architects, the widespread adoption of CSEB as a building material still remains hampered by market dynamics.

The online version of the article can be found at the following address:

<http://www.downtoearth.org.in/content/let-s-play-mud> ■

Thermal Behavior of Earth Buildings

In January 2012, the University of Central Florida with the participation of the National Science Foundation and the Auroville Earth Institute conducted field research in the apartment above of the Auroville Earth Institute office to monitor the temperature and humidity inside of earthen dwellings. This was first reported upon in Issue 3 (March 2012) of the Auroville Earth Institute newsletter. Under the guidance of Drs. Hae-Bum Yun and Lakshmi Reddi, sensors were placed around the bedroom to test differences in temperature and humidity between surface and air, as well as exterior and interior walls.

The sensors were left in place for a year and this January, the researchers were able to collect

the results. Preliminary graphical representations of results have been created, and the researchers are now analyzing the findings. ■

February Training Courses

In February 2013, the Auroville Earth Institute held three week-long courses on CSEB. The first course which started on the 4th of February, "CSEB Design", is a course that the Earth Institute has recently developed to provide architects and students of architecture with training in the scope of technical requirements for the design of CSEB buildings. It has met with positive reception from attendees. After this course, two weeks were dedicated to CSEB Production and CSEB Masonry. ■

Expert Visits at AVEI

Meror Krayenhoff, founder of the company SIREWALL, made a detour through Auroville to visit the Auroville Earth Institute while traveling to promote the new book he co-edited, *Modern Earth Buildings* (Woodhead Publishing Ltd., 2012). Included in this book are vaults and domes built by AVEI as well as Lara Davis.

SIREWALL, which stands for Stabilized Insulated Rammed Earth Walls, produces a wall system that combines stabilized, reinforced earth with an inner core of insulation. The result resembles sedimentary sandstone.

<http://www.sirewall.com/>

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At the beginning of February, Korean architect, **Kim Soon-wung**, visited the Auroville Earth Institute. He is the secretary-general of TerraKorea, a Korean institute affiliated with the Mokpo National University, which is a member of the UNESCO Chair for Earthen Architecture. His two-day visit allowed him to meet with Satprem Maïni and see the activities of the Earth Institute.

<http://earth.or.kr> ■



Students working on a practical exercise



The Auram 6000 hydraulic press fully assembled and pulled by a tractor

Lara goes fulltime at AVEI

Lara Davis has become a full-time member of the Auroville Earth Institute team. She will be teaching training courses at the Institute and abroad, writing and updating AVEI publications, conducting structural calculations for vaulted structures, and assisting towards the development of the AVEI school. ■

Rosie Paul, architect at the Earth Institute since October 2010, left the Institute in March 2013. Her dedication, talent, and bright presence will be greatly missed in the office!

Training Course Schedule for 2013

April

1st to 6th - CSEB Production
8th to 13th - CSEB Masonry

June

3rd to 8th - Ferrocement
10th to 15th - AVD Theory
17th to 22nd - AVD Masonry

July

1st to 6th - CSEB Design
8th to 13th - CSEB Intensive
15th to 20th - AVD Intensive
22nd to 27th - CSEB Intensive

September

2nd to 7th - AVD Theory
9th to 14th - AVD Masonry
16th to 21st - CSEB Production
23rd to 28th - CSEB Masonry

December

9th to 14th - AVD Theory
16th to 21st - AVD Masonry

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