

AVEI NEWSLETTER



CSEB Masonry training course

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We are pleased to announce that the AVEI newsletter is now published on a quarterly schedule rather than a bi-monthly schedule, so it has exceptionally been a four month interval since our last issue in November.

We have had a productive start to 2019 with several training courses already concluded and a number of small construction projects in Auroville and collaborations with entrepreneurs in Auroville's bioregion and farther afield in progress.

A number of our alumni and former colleagues have also shared with us their recent success stories in construction, project development, and research, which we find encouraging to pass on as a measure of our impact.

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

Building Extension at Realization

By Radhika Soni

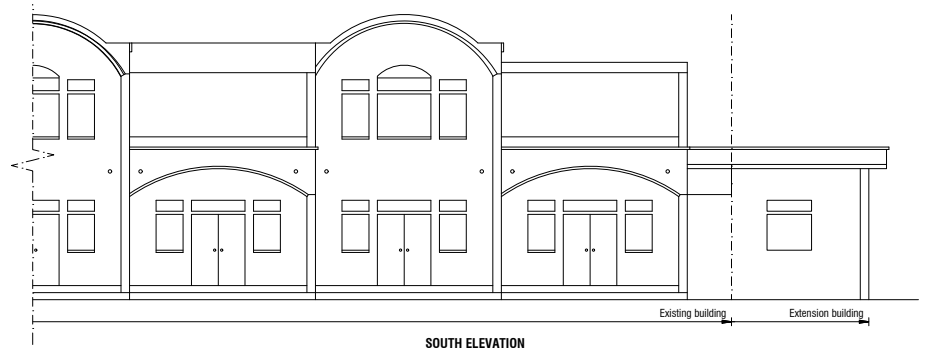
Last August, Jayaraman from Realization Community in Auroville approached the Earth Institute to design an extension for his single unit residence in the South East Block of Realization. This extension consists of two bedrooms to accommodate his growing family needs.

Realization is a residential project of 17 apartments that was constructed by the Earth Institute from 2007 to 2012. It integrated stabilized rammed earth foundations and CSEB masonry for walls, vaults, and domes.

The design for this extension is a continuation of the CSEB masonry of the original construction, but modified to incorporate a foundation system of stabilized poured earth concrete and roofing with an RCC slab.

The CSEB are procured from a new production unit in Alankuppam, Aryan Builders Earth Blocks (see following page). One mason and helper from the Earth Institute and one mason and two helpers from a local contractor are working on the construction.

The RCC slab has been cast and the construction is planned to finish by the end of April. ■



Construction beginning on Jayaraman's extension

**Aryan Builders Blockyard
in Alankuppam**

The Earth Institute has recently partnered with local stakeholders, Aureka, and InnoBlocks to set up a new CSEB production unit in Alankuppam, a village in proximity to Auroville.

Aureka is an Auroville-based steel workshop and a partner of the Earth Institute since three decades in developing the Auram manual and motorized blockmaking machinery.

InnoBlocks is a US-based company which has a long history of working in socially and sustainably minded initiatives on the global scale. It had previously partnered with the Earth Institute and Aureka for the development of the motorized Auram 4000 and 6000 block presses as well as the Auramix 5000 soil mixer and the Auram crusher.



CSEB Half Blocks

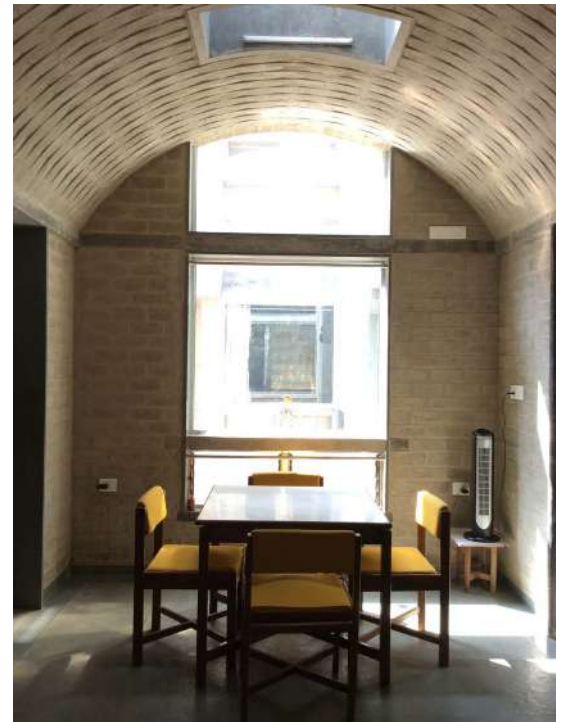
This new blockyard enterprise has been named Aryan Builders Earth Blocks and is equipped with the motorized Auram machinery: the Auram Crusher, the Auramix 5000, and the Auram 4000 Automatic Press. Aureka designed and built the motorized machines and the Earth Institute has implemented a regular and

rigorous monitoring schedule for block production and quality control, to ensure that the CSEB production remain of a high standard.

More details and the price list can be obtained from Aryan Builders: aryanearthblocks@gmail.com. ■



The Auram Press 4000



Ar. Subhash Gurjar's completed home

Earthen House Built by Ar. Subhash Gurjar

Subhash Gurjar, an architect who received training in CSEB production and masonry at the Earth Institute in 2013, has shared the news of the completion of his house in Akshi, near Alibag in the Indian state of Maharashtra. This beautiful residential building on four floors exhibits CSEB masonry walls, vaulted and domed interior spaces, and various ferrocement components. He has contributed the following write up about his house:

An article by Ar. Satprem, on earthen buildings with **CSEB** and **RAMMED EARTH** and **FERROCEMENT** components became a beacon light for me. I learned that a building made with these techniques includes 90%

earth and only 10% cement and steel. The blocks can be made in a manual machine; the building is made manually using only small hand tools like electric drill, grinder and cutting machine. This results in a unique building with a low carbon footprint.

I was sold on this concept, went to study this technique at Earth Institute, bought an Auram

Press 3000 for block-making, researched local earth fit for block-making, got labor for block-making, trained them to build walls, vaults, domes and various ferrocement components for the building. We all learned on site. The site became a laboratory for experimenting with these new techniques, an evolving methodology of putting things together. →



Vault construction in progress



Ventilated skylights and a kitchen garden

Skylights are provided in the drawing room, kitchen, dining room, and staircase for natural light and ventilation. All bedrooms are provided with a network of pipes at the apex of their vault for the removal of hot air. Windows have glass louvers on the lower half to admit fresh cool air. The upper half is generally fixed glass, thus hot air is forced out of the sky light vents. There are no ceiling fans in the house; instead tower fans are provided near the louvered windows to pull the cool air in, whenever natural ventilation is low. An opening is provided at a level of 2 m to install an eventual suction fan which can bring in the cool air outside in the evening.

Doors to the staircase are steel, but the entrance door is made from the wood of a local coconut tree. The staircase is made with 50 mm thick precast cantilevered treads and risers. The flooring of the entire house is rough Kota stone; door and window jams and soffits are in polished Kota. The CSEB wall surfaces – interior as well as exterior – are finished

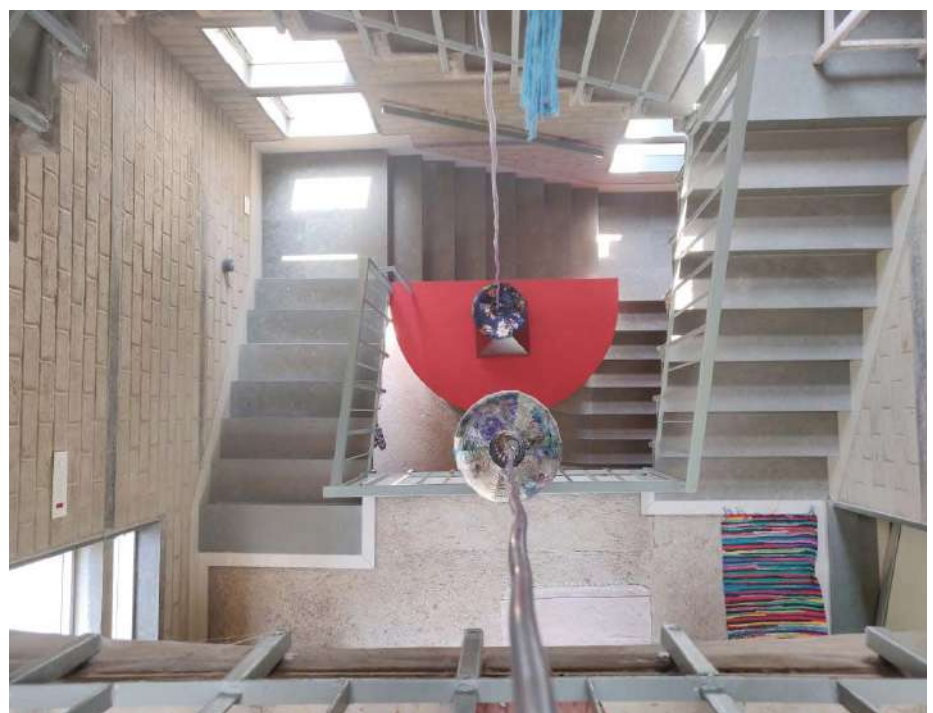
with pointing. Plastering is done selectively for surfaces facing the rain and those affected by rain water splashing. Very little paint was used, with the exceptions being the tops of all ferrocement *chajjas*, the large ferrocement surface of the semicircular store room, the steel gate, railings and safety grills.

Water is available from open

well near the house. A collection tank on the second level terrace will be fed by rainwater from the top terrace. From the second level it travels to the ground floor kitchen. This will give us zero carbon water in the house during monsoon. Grey water is collected in a wastewater recycling tank for reuse in secondary purposes like flushing and gardening. Black water is treated with two digestion pits to be used alternately, generating rich manure that can be used in the garden.

Mruge Madhurim is the name of the house, meaning an Earthen House, a sweet and beautiful home. The making of *Mruge Madhurim* has given me a joy of my life. It's a dream come true for me. ■

Ar. Subhash Gurjar



View of the stairwell from above



ÉCOLE NATIONALE SUPÉRIEURE D'ARCHITECTURE DE GRENOBLE

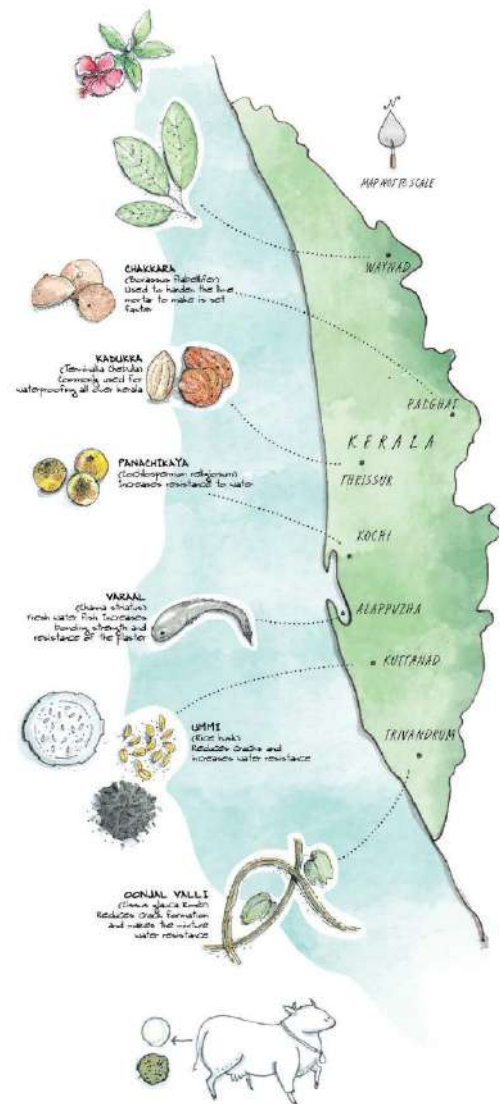
Inventory of traditional stabilisers in earthen plasters of Kerala
Inventaire des stabilisants traditionnels dans les enduits terre au Kerala

ROSIE PAUL
 DSA - TERRE 2016 - 2018

Mémoire du diplôme de spécialisation et d'approfondissement
 Architecture de terre - Mention patrimoine

Ministère de la culture
 et de la communication
 Directions générale des patrimoines

Natural Stabilizers of Kerala
 The secret ingredients of ancient traditional recipes

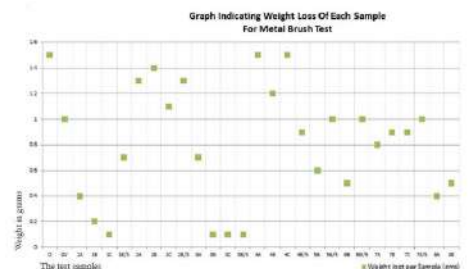


Rosie's Thesis on Organic Stabilizers

Rosie Paul, a former Earth Institute architect and principal architect at Masons Ink in Bangalore, completed her DSA degree from CRAterre at the end of 2018, publishing an important thesis for the state of earthen architecture research in India. Entitled *Inventory of traditional stabilisers in earthen plasters of Kerala* and including side-by-side English and French text, her thesis was the result of significant research into the many traditional organic ingredients used for stabilization of earthen plasters around the south Indian state of Kerala. Rosie extensively traveled through Kerala to meet with the local builders who keep

these traditional recipes alive, creating an inventory of their properties and usage. She was then able to conduct her own tests on plasters created with these recipes, examining the plasters' ability to withstand water erosion, abrasion, and external exposure, as well as their capillarity.

Rosie's thesis was well received during her thesis defense and she looks forward to continuing this research.



The graph shows the resistance of each of the samples to abrasion. It was found that out of the 5 ingredients the best performing mixers were found to be Jaggery 3C, Kadakka 1C. The detailed table during laboratory testing along with observations can be found in annexure 4.
 Le graphique montre la résistance de chacun des échantillons à l'abrasion. Il apparaît que les 5 ingrédients testés, les résultats les plus performants sont ceux contenant du jaggery 3C et Kadakka 1C. Des fiches détaillées sur les tests en laboratoire sont à consulter en annexe 4.

Abrasion tests from Rosie's thesis

Launch of the Eco-Vacances Website

Joseph Artault, a long-term trainee of the Earth Institute who is specialized in tourism management, has recently unveiled his new website for his venture Eco-Vacances. This project aims to build ecological holiday villages in France, creating a fully ecological model with buildings constructed from earth and other sustainably sourced materials and encouraging ecological patterns through green spaces, communal facilities, and holistic activities.



While studying at the Earth Institute, Joseph has developed the design for a prototype that uses raw, unstabilized earth, PEFC certified wood, and natural insulation for his scalable holiday

cottages. These buildings can be deconstructed for relocation and are completely biodegradable.

The website can be seen here: <http://eco-vacances.com/> ■

New Solar Village Search Engine

Auroville Consulting, an organization based in Auroville that specializes in ecological and socially responsible development, has recently

created the “Solar Village Search Engine”, as part of their Solar Village project that aims to solarize 100 villages in India by 2030. The search engine offers individuals a simple way to support this initiative, as funding gained through the search

SolarVillage

Solar Village Initiative is a project by Auroville Consulting, a unit of Auroville Foundation, working toward eradicating energy poverty in rural India.

engine’s advertising goes directly to the Solar Village project.

Powercuts have been a significant hindrance to the development of rural India and this initiative helps to eradicate this problem, village by village, creating a healthier, safer, and brighter future for all Indians, regardless of their geographical setting.

We encourage everyone to support this important initiative! To find out more, please visit the website:

<https://thesolarvillage.org/> ■



Elementerre in the Journey of Auroville Festival

By Meenakshi Gokhale

In mid-March, I got the opportunity to join the Journey of Auroville team in going to Trichy for their Tamil Nadu tour. The Journey of Auroville festivals are a series of festivals in honor of Auroville's 50th anniversary that have taken place in Baroda (see **Newsletter Issue 42**), Kolkata, and now in several cities in Tamil Nadu.

I left on a bus with 30 odd unknown people on this trip. On reaching the campus of the National Institute of Technology (NIT) in Trichy, everyone pitched in to get a larger exhibition on Auroville's 50 years up and running for the official start of the festival. We had a host of people from different backgrounds, conducting different sessions including presentations on reforestation, architecture, and design, workshops on *kolam* yoga, and dance performances.

My role in the festival was to give Elementerre demonstrations for students at the two university campuses where the festival was hosted. Elementerre, developed by our partners at CRAterre, is a one-hour hands-on demonstration that introduces the scientific properties of earth as a building material and the principles and techniques of earthen construction. I conducted the Elementerre demonstration for a group of 30 students of



Meenakshi conducting the Elementerre demonstration at NIT (above) and CARE School of Architecture (below)

architecture and engineering at NIT and 40 students at CARE School of Architecture. It was a great experience with a lot of meaningful questions raised which opened up discussions. I hope we can continue to have these conversations and make earth a popular building material once again. ■



Recent Training Courses

The training courses at the Earth Institute are in full swing once again, with the 2019 courses beginning with the Bioclimatic Earth Design Studio at the end of February. Eight trainees from India and France took part in this two-week course that incorporates the principles of bioclimatic design and an introduction to an array earth building techniques, culminating in team design projects that bring these principles and techniques together.

Training has continued with CSEB Design, Production, and Masonry, with 45 people attending. The trainees primarily came from India, but also from Australia, Italy, and the United Kingdom.

The next round of training courses will be Bioclimatic Earth in May, followed by Ferrocement and AVD Intensive in June. ■



Recent CSEB Production and Masonry training courses

New Team Member

The Earth Institute has welcomed one new team member!

Moksha

Currently, I am a IVth year student of architecture at Indian Education Society's College of Architecture, Mumbai. I come from a small city called Satna in the central

state of India, Madhya Pradesh. Contrastingly, even though small, the city is known as the cement city of India, contributing 8-9 % of the total cement production as it is one of the major limestone belts of India. I am seeing it 'develop' into a concrete, polluted city with a decaying state of water and air and reducing number of trees.

I believe that architecture can only be complete if it has considered the context, i.e., the surroundings, the landscape and especially-

the community. Understanding history and politics behind traditional ideas of architecture-how it evolved and transformed according to culture and context has been my constant fascination. My interest to learn about working with and for the community and earth as a material led me here.

Coming to Auroville and interning at Earth Institute has opened a wide realm of aspects and sides of architecture, and the world in general, to me. I am learning



how earthen architecture can be advanced into such a form where it adapts to the current needs of 'permanence' and changing climatic context.

As an intern, I am learning the design, structural details and nuances of working with earth

both theoretically and practically through daily discussions, detailed workshops and working on construction site. I am grateful to the AVEI team to provide me with an opportunity to be trained here, to explore these realms, exploring myself through them, and to live with nature.

**AVEI Training Course
Schedule for 2019**

May
13th to 27th : Bioclimatic Earth

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 Production
15th to 20th : CSEB Masonry

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

October
14th to 28th : Bioclimatic Earth

November
4th to 9th : Wind Generator

December
2nd to 7th : CSEB Intensive
9th to 14th : AVD Intensive

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Work beginning on the social space, which will be constructed with poured earth concrete, at Joy of Impermanence