



New Latrine in Keigold, Ranongga, Solomon Islands
Built by Emergency Architects Australia and the Community of Keigold

emergency architects australia

HEALTH
HOUSING
EDUCATION
INFRASTRUCTURE
CAPACITY BUILDING

SUSTAINABLE STRATEGIES FOR DISASTER RELIEF AND RECONSTRUCTION

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ORGANISATION STRUCTURE

PATRON	LOUISE COX (PRESIDENT OF UNION OF INTERNATIONAL ARCHITECTS) RICHARD GREEN
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INTRODUCTION

Emergency Architects sends experienced architects and other built environment specialists to disaster areas to work alongside aid agencies, local communities, governments, and funding institutions to rebuild devastated areas in a sustainable way. Together they develop appropriate and sustainable strategies for each phase of disaster relief. Emergency Architects believes the construction of permanent rather than temporary structures, using local materials, delivers a faster long-term result.

Since 2001 Emergency Architects has fielded operations in 19 countries, facilitating the work of almost 900 architects from around the world in the aid of populations affected by disaster. Emergency Architects is a global independent, not for profit organisation based in Australia, France and Canada, and is not aligned with any religious or political beliefs. Australia became operational in 2005 and has worked in Pakistan, Solomon Islands, Sri Lanka, Timor Leste PNG and Aceh with funding from Australian Red Cross, Caritas, World Vision, French Red Cross, Friends of Maliana, Agencies Development Francais and EU-Stabex.

DELIVERY MODEL

- A well planned inclusive but flexible disaster management plan with full knowledge of the extent of the environment and built fabric damage should be the first priority.
- A full understanding of the costs involved in the reconstruction is critical for forward planning and for requesting international agencies and central government for funds.
- All people have strong opinions about where they want to live and how they want to be involved in the reconstructions effort.
- All people directly affected should be involved in the reconstruction of their communities to avoid a 'victim mentality'. Their skill base is critically important in good practice for reconstruction. Retaining and reskilling may be undertaken to foster correct risk assessment skills.
- Lessons learnt from local building typologies are critically important for good reconstruction outcomes and better use of local materials.
- All projects are properly supervised during construction and correctly engineered especially large span structures such as schools.
- Training local people to know what to do in the event of a disaster is critical. Breakout areas and the distance and position of buildings relative to each other must be carefully planned.



ESSENTIAL COMPONENTS

DESIGN

Risk mitigation against further events is an essential part of all new designs. Emergency Architects engineers all design to modern standards combined with the use of local knowledge, especially from those who have lived through previous events. This understanding also highlights the environmental consequences of using various traditional, locally available building materials. Emergency Architects also investigates indigenous building typologies that have withstood previous events, the results of these investigations offers lessons in local construction methods. Understanding the building typologies used historically often illustrates tested methods of construction suitable for that event.

SKILLS TRANSFER

There is also a retained knowledge of the methods of construction in most communities which we believe must be taught to a newer generation. Emergency Architects work with communities on the redesign of their buildings and reconstruction where possible. This generates income to the community and transfers to them, the skills necessary to maintain and rebuild their buildings in the future.

We have done this in the Solomon Islands after the Tsunami/Earthquake in 2007. EAA moved from island to island to assess damage and hold workshops for local villages, instructing them on how to appropriately layout and brace their buildings, how to restump, how to lift back damaged buildings onto their stumps, therefore quickly restoring the existing houses where possible. The majority of the buildings were damaged by the earthquake and not by the tsunami. It was vital that basic earthquake resistant building techniques were taught. They had a typology that was based on tying or joining buildings together (like ships and early Chinese timber houses) instead of using metal fasteners. This made it possible for some movement without structural failure.

SUSTAINABILITY

In recent times unsustainable and unsuitable technology has replaced tried methods. Often degradation of the environment, such as deforestation, compounds the devastation. Such an example is increasing land slippage in earthquake zones. It is essential that the poor are not placed on the most dangerous land. Emergency Architects studies the whole region to ascertain why land slippage has occurred and to remediate the environment first before reconstruction begins. Stabilisation and tree planting are the first priority. Relocation to safe areas should be undertaken if the area has been rendered unstable.



STAGES OF DISASTER RELIEF

EMERGENCY

To work with other aid organisations in the immediate distribution and construction of shelter relief such as tents and their correct layout according to Sphere and the terrain.

To assess and secure damaged buildings and infrastructure.

To disseminate our knowledge by providing immediate assistance and training to the local population and other aid agencies in order to assess and classify damaged buildings.

To immediately identify local building techniques, conditions and materials, in order to assemble and distribute appropriate tool kits, whilst conducting workshops concurrently to demonstrate immediate measures the local population can take to secure and repair their own buildings.

To assess the environmental damage and consequences, and propose immediate actions to prevent further damage both in the immediate disaster phase and the post disaster reconstruction phase.

To determine what measures can be taken to salvage disaster debris into recyclable materials able to be used for immediate long term shelter reconstruction.

To supervise clean up processes utilising the best environmental practices.

TEMPORARY SHELTER

To work with and utilise the knowledge of the local authorities and architectural profession to commence work on the identification and needs of displaced persons.

To use our professional expertise to facilitate the resolution of temporary shelter needs in conjunction with feasible long term reconstruction programs.

To combine the skills of all built environment specialists to identifying long term sustainable planning and urban design solutions, taking into account the social, cultural and economical future of the population.

RECONSTRUCTION

To master plan, project design produce construction drawings, and the project management of long term reconstruction programs, and institute the teaching and employment of local tradesmen to execute this work.

To assist in the establishment of subsidiary businesses essential to the reconstruction process e.g. timber processing, brick factories, joinery, community gardens, plantation tree farming.

To introduce the notion of plantation tree management, with its twofold benefit of securing unstable slopes and giving the population an ongoing life skill, building resources and long term income.



CAPACITY BUILDING

LOCAL PARTNERSHIP

Emergency Architects forms partnerships with government agencies, local planning and architecture institutes or other entities already in the country such as International Red Cross. It is essential that an EA Rapid Assessment is undertaken immediately to understand the extent and type of damage both of the environment, the buildings, roads and bridges and other infrastructure. Only then can the full cost of the reconstruction be determined. A coordinated reconstruction approach must be considered with the local disaster management organisation.

Emergency Architects considers capacity building as fundamental. Sustainable local materials must be used along with the skills of local trades-people. All buildings are designed with the full inclusion and participation of the recipients who have lost their homes. EA has learnt that by involving them in the decision making and rebuilding of their own houses, a greater sense of ownership and therefore responsibility results. People must be given the opportunity to help themselves. This is both psychologically and economically important.

ECONOMIC VIABILITY

Emergency Architects believes that the economic viability of the community must be addressed. This means the tools they use to produce crops and food and gain access to resources are quickly replaced. Fishing boats and roadways are repaired, and schools or clinics repaired or rebuilt. Then the process of permanent houses can be determined, funding obtained and training and cooperative reconstruction started.

Emergency Architects is committed to ensuring its projects are fiscally transparent, culturally appropriate and sustainable, respecting local designs and traditions, are of a good architectural and structural design, and preserve cultural heritage where appropriate. All built work is designed, implemented and analysed with a view to minimising future risk and maintaining low organisational overheads.



PROJECTS

INDONESIA

2005 - 2008

Project Funded by:
Australian Red Cross

2009 Padang

The 2004 tsunami devastated several South Asian countries, killing thousands. After the Rapid Assessment period was conducted by using aerial and on-ground field surveys of the damage, EA sent working teams to Sri Lanka and Indonesia to develop a sustainable program of reconstruction.

Sigli Aceh, The Sigli Housing Project is still underway and Emergency Architects has completed 617 houses to date. During our initial response Emergency Architects also built 47 fishing boats and repaired fishing trawlers.

The Aceh Disaster Management Agency (BRR) appraised our recipient lists and determined the land ownership situation. It bought the land if necessary for those recipients with no documentation to prove land ownership.

Emergency Architects designed three building types with the communities' participation: a village house, a town house (for narrow sites) and a large double storey family house for extended families. Each village brought its own aesthetic to the design. Then local community members were trained to build their own house and these people gradually formed small building companies to tender on the new houses where the owners had no skills to build themselves. This allows the cost/house to be AUD 10,000 each. A wet brick factory was started manned locally to supply brick for all our projects and to provide local work. Emergency Architects funded by Australian Red Cross, have recently completed 260 earthquake resistant houses in four villages and rebuilt five schools and colleges.

On September 30th 2009 an earthquake of 7.6 magnitude hit Northern Sumatra. On 2nd October Emergency Architects sent volunteer architects to Padang to assess the damage. A rapid assessment was undertaken by David Rapaport and the Emergency Architects team to survey 20 schools. A decision was made to work with four of the schools; two in Cubadak Air, one in Tungal and one in Surambang. We are currently looking for funding to allow us to send a team back to Indonesia to begin the project.



PROJECTS

SOLOMON ISLANDS

After the earthquake/tsunami in the Solomon Islands in April 2007, EAA sent a Rapid Assessment team to report on the level and extent of damage. A new team of architects joined the National Disaster Management Organisation meetings on shelter for 6 weeks. The team then moved to the Western Province to meet with the devastated communities, to assess the situation and to start work with them immediately to provide shelter.

EAA joined forces with World Vision, Caritas and French Red Cross to send one architect to each of these three areas: Ranongga and Tapari, the Shortland Islands and Choiseul. Each of these agencies had long established cultural connections. They provided toolkits, transport, village introductions, translators, communications and local knowledge. AS part of this project EAA held workshops teaching 70 villages how to rebuild using earthquake resistant design.

Following the success of this project EAA were asked to design exemplar school buildings (classrooms, ablution blocks, dormitories, teachers' houses, dining halls and an administration building) for the Department of Education, Human Resources and Development (MEHRD). As a result Emergency Architects funded by Agences Francais de Developpement successfully built the first stage of the new community high school at Ngari on Ghizo Island. The community partnered with EAA, through an MOU, to construct the first stage in 11 weeks.

Stage 2 is underway April to December 2009 and the school will become an exemplar prototype high school for the Relief and Reconstruction Project (RARP) Schools Reconstruction Program. The prototype design, drawings and materials will be delivered by MEHRD to each community and RARP will pay the local community rebuild the destroyed school buildings themselves. EAA are preparing a Maintenance Manual for MEHRD, this will allow the schools to be sustainable for long term use.

In Titiana, near Ngari, we have worked with the community to build two teachers houses. These houses are the prototype for future housing at other schools.

Our team in the Solomon Islands has been working closely with other organisations and the government to identify other areas that EAA can assist in providing sustainable design solutions with a focus on water and sanitation.

In July 2009 EAA and the local community of Keilgold on Ranongga Island, the worst affected area, constructed 14 latrines. They were assisted by a small team of students from the University of Queensland and the University of Lae, Papua New Guinea. This project will be the exemplar for a new water and sanitation program for the Western Province.

Projects Funded by:

- Caritas
- World Vision
- French Red Cross
- EU Stabex - RARP
- Solomon Islands MEHRD
- Agence Francais de Developpement
 - NZ Aid
- Ngari Community



Solomon Islands- School Dormitory



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