

ENGINEERS WITHOUT BORDERS

# 2012 EWB Challenge

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Design Brief

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## **1 Introduction to the EWB Challenge**

The EWB Challenge is a design program for first-year University students coordinated by Engineers without Borders Australia (EWB) and delivered in partnership with Australasian universities. It provides students with the opportunity to learn about design, teamwork and communication through real, inspiring, sustainable and cross-cultural development projects. By participating in the EWB Challenge students are presented with a fantastic opportunity to design creative solutions to problems identified by real EWB projects.

Each year, the EWB Challenge design brief is based on a set of sustainable development projects identified by EWB with its community-based partner organisations. In past years the EWB Challenge has included developing innovative and sustainable project ideas and solutions to support communities in India, Cambodia and rural Australia.

The EWB Challenge is open to students undertaking a first-year university course registered with the EWB Challenge. The course may run in Semester One or Semester Two. Students studying in the disciplines of engineering, architecture, urban planning, landscape architecture, science, business and social science are all encouraged to participate.

Each university may nominate up to four team submissions for external review. The 2012 EWB Challenge Submissions process closes on 20 July 2012 (Semester One courses) and 5 November 2012 (Semester Two courses). Outstanding student teams from each region will be invited to present their work at EWB Challenge Regional Showcase events where their work will be reviewed by a multidisciplinary panel of judges. The regional showcase events will be held between the 16 and 23 November 2012 depending on the regional area. The top team in each region will be invited to present their work at the National EWB Challenge Showcase to be held in December 2012. Awardees will be announced at a special awards ceremony following the presentations.

## 2 Design challenge areas

In 2012 Universities will have the opportunity to engage in one of two projects. The first being a return of the 2011 EWB Challenge, projects identified by Pitchandikulam Forest organisation for the remote community of Devikulam in Tamil Nadu, India (see Appendix 1). The second project will focus on aiding the work of Habitat for Humanity Vietnam, providing engineering and design solutions for projects identified for Vietnamese communities located in the Anh Minh district of the Mekong Delta Region (see Appendix 2). Students' designs and innovations make a direct contribution towards EWB's work within both these communities.

Each of these projects focus on real-world problems identified by the communities and the partner organisations; Pitchandikulam Forest and Habitat for Humanity. The identified problems are characterised into specific design areas depending on the particular project, of which form the basis for students reports. Design areas include but are not limited to;

- Water, sanitation and hygiene (WASH)
- Waste management
- Housing design and constructions
- Energy
- Information communications technology
- Transport

Design teams may wish to address a single issue or provide an integrated design solution for two or more areas. Alternative projects may also be considered. The EWB Challenge is an open-ended learning experience and the breadth and depth of design is left to individual universities and design teams to scope within the context of the submission requirements, see section 3.

Information can be found in appendices 1 and 2 to assist in the development of concept designs for various projects such as physical infrastructure and appropriate technologies. These designs, coupled with knowledge and skills sharing, aim to support both Pitchandikulam Forest and Habitat for Humanity to address the social, environmental and economic issues facing people in Tamil Nadu, India and the Anh Minh district of the Mekong Delta region, Vietnam respectively. Contextual information on each design area can be found on the EWB Challenge website: [www.ewb.org.au/ewbchallenge](http://www.ewb.org.au/ewbchallenge)

### 3 Submission requirements and program rules

Design teams may wish to address a single issue or provide an integrated design solution for two or more design areas. Alternative projects may also be considered.

#### 3.1 Reporting requirements

Each university may nominate up to four team submissions for external judging. The 2012 EWB Challenge Submissions process closes on 20 July 2012 (Semester One courses) and 5 November 2012 (Semester Two courses).

Each participating team submission should include a design report, or folio written in English explaining their proposed design. As a minimum, each team design submission should:

- Contain a coversheet downloadable from the EWB Challenge website.
- Summarise the design addressing each of the selection criteria for the written submission.
- Reflection on students' learning / experience gained
- Identify the alternative options considered during the design process and a justification for the selected technology, approach and/or process.
- Provide details of the conceptual design, analysis and final design. Design calculations or an explanation may be included, appropriate to the level of team experience.
- Identify schedules and detailed design, construction and maintenance costs associated with completion and construction of the design.
- Identify how the selected design is appropriate to the social, environmental, economic and cultural context of the community.
- Discuss ethics, long term sustainability and maintenance of the engineering work that would be completed as a consequence of the design.
- Provide basic advice on the construction and operation of the design.
- Outline the details of any external support provided to the design team and identify any content that is not attributable to the design team.

Other key considerations aiding in students proposals would include the following criteria:

- Alignment with the cultural responsibilities
- Setting an example of sustainable land management.
- Creation of opportunities for locals so they can improve their livelihood in the region.
- Create centres of environmental education and training in rural and coastal contexts.
- Proposed solutions must consider the capacity of the community to maintain the equipment and build on their existing community strengths.
- To take the necessary steps to protect, preserve the existing natural environment, and encourage traditional practices.

### 3.2 Program rules

Different universities will have different submission requirements, but to be eligible for the EWB Challenge students will need to comply with the rules outlined below. Failure to comply will result in disqualification from the program.

Teams are eligible to participate in the EWB Challenge providing that they:

- Are enrolled in a first-year university course in Australia or New Zealand.  
(International universities affiliated with an Australian or New Zealand University may participate in the 2012 EWB Challenge. However team travel expenses to the Australasian National EWB Challenge Showcase Event are not covered by the program).
- Have 4 – 6 members.
- Respect the privacy of all participating organisations and communities. Under no circumstances are participants to contact the communities or partner organisations directly.
- Comply with the EWB Challenge Submission Requirements.
- Acknowledge that ideas and designs entered into the EWB Challenge program become the right of EWB to use for the development of its projects at no cost.

Universities are eligible to participate in the 2012 EWB Challenge based on the following provisions:

- A registration fee of \$2000 + GST (AUD) per university, per year. This fee provides important funding to support the administration of the EWB Challenge including presentations at universities, communication with students and lecturers, website, resources and the development of future design briefs.
- The EWB Challenge will be incorporated into first year design subjects offered by universities during Semester One and/or Two.
- Individual universities will decide how to integrate the program into their curriculum.
- Each university may enter an unlimited number of teams into the program within their institution.
- Each university will be responsible for assessing their own teams' submissions and selecting up to four team reports for submission to EWB for external review in the international finals.
- All submissions for Australasian review will be judged against a common set of criteria and guidelines. These criteria will be provided to all participating universities.
- A multidisciplinary engineering judging panel will decide upon a short-list of seven entries for the Australasian awards presentation at the National EWB Challenge Showcase Event.
- Final judging will be based upon both the original entry and the presentations.

## 4 Developing engineering graduate attributes

The EWB Challenge supports the integration of authentic project-based work into undergraduate courses with international and domestic, social, cross-cultural and sustainability dimensions. The program is designed to develop four engineering graduate attributes (from a total of ten) specified by the national accrediting body Engineers Australia.

The EWB Challenge develops the following graduate attributes:

- Understanding of the social, cultural, global and environmental responsibilities of the professional engineer, and the need for sustainable development.
- Understanding of the principles of sustainable design and development.
- Understanding of professional and ethical responsibilities and commitment to them.
- Ability to function effectively as an individual and in multi-disciplinary and multicultural teams.

The program also contributes towards the development of other important graduate attributes related to skills in problem solving, the application of basic science and engineering fundamentals and communication.

## 5 Supporting EWB's work with communities

The EWB Challenge provides undergraduate students with a unique learning opportunity based on real EWB projects. The program provides EWB's community based partner organisations with another pathway for connecting with the engineering and design sector in Australia. It enables such partners to source innovative and creative ideas and conceptual designs for a broad range of projects of interest to them.

EWB works collaboratively with our community based partners to identify projects that students can undertake as part of the EWB Challenge. Student projects of interest to EWB's community partner are identified at the completion of the year and students have the opportunity to be involved in the further development of their design.

Through participation in the EWB Challenge program, Pitchandikulam Forest and Habitat for Humanity Vietnam will receive valuable engineering proposals which can be further developed. These projects also provide Pitchandikulam Forest and Habitat for Humanity Vietnam the opportunity to raise awareness about their land and work and encourage EWB Challenge participants to learn about the problems faced citizens of developing nations.

For more information on Engineers Without Borders Australia, Habitat for Humanity Vietnam and Pitchandikulam Forest please visit the EWB Challenge Website: [www.ewb.org.au/ewbchallenge](http://www.ewb.org.au/ewbchallenge)

## 6 EWB Challenge sponsors and supporters

The 2012 EWB Challenge is sponsored by BHP Billiton. EWB would like to recognise the significant contribution made by this organisation towards this design program. BHP Billiton sponsorship enables the extensive implementation of the EWB Challenge into first year university courses across Australia and New Zealand. It also enables the EWB Challenge Awards (including the EWB Challenge Scholarship Program) and demonstrates industries commitment to sustainability education.

EWB Challenge supporters are committed to the enhancement of engineering education. They guide and assist the development, implementation and review of the EWB Challenge each year. The EWB Challenge is supported by Engineers Without Borders New Zealand (EWBNZ), The Australian Association for Engineering Education, The Australian Council of Engineering Deans and Engineers Australia (EA).