

SNAPSHOT OF PRO BONO ENGINEERING

THE FULL REPORT

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→ 2011 year
of humanitarian
engineering



engineers
without borders
AUSTRALIA

Thank you to the following organisations for participating in this research:



Thank you to the following organisations that sent through pro bono engineering case studies:

- ARUP
- Assetivity
- Aurecon
- BCA Engineers
- Bligh Tanner
- BMT
- City West Water
- Ecoteam
- Origin Foundation
- SKM
- Taylor Thomson Whitting
- Wallbridge & Gilbert
- Wood and Grieve Engineers
- Zor Engineers.

Front Cover Image: Courtesy of the Bana Yarralji Indigenous Ranger Base Partnership Team.

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1. Executive Summary

The 2011 'Year of Humanitarian Engineering' has highlighted the power that engineers and the engineering industry have to make significant and lasting impacts on communities in need. Pro bono engineering provides opportunities for companies¹ to make contributions to communities through the provision of engineering services at a significantly reduced, or no fee basis. The aim of this research was to provide a snapshot of pro bono engineering throughout the 'Year of Humanitarian Engineering.'

The demand for pro bono engineering activities should not be underestimated. There is a global need for improved access to appropriate technology, while there are also cases of employees, in engineering companies, seeking out pro bono opportunities. These employee-identified opportunities are supported by the companies and have been oversubscribed. The varying opportunities results in a myriad of different partnership and project structures, with no one-size-fits-all approach.

Motivations for pro bono engineering were found to include: the professional responsibility owed by engineers; a way to address the social and wealth inequality; the ability of engineering companies to create change; and to experience the benefits that pro bono engineering brings engineering companies.

There were a large number of pro bono engineering benefits enunciated; with communities, employees and engineering companies themselves benefiting immensely from such projects. Alone, the motivation to create a workplace of choice is responsible for large companies structuring pro bono engineering programs.

Key steps in carrying out pro bono engineering activities were examined, with the differing relationship and project structures resulting in varying agreements, as well as responses surrounding risk management. The evaluation of pro bono engineering is an area for future growth, with many companies looking to improve on methods to quantify measures of success, or capture lessons learnt.

It is recommended that companies need to develop strategic approaches to corporate social responsibility, encompassing pro bono engineering, to ensure the success of these activities throughout the company. Further, the key to companies engaging in successful, long-term pro bono engineering activities is through a partnering approach. A partnership broker is needed to connect, facilitate and manage pro bono engineering partnerships between community organisations and engineering companies.

Adequate training is also needed for individuals who are involved in pro bono engineering equipping them for culturally, emotionally and environmentally diverse environments. There is a need for further awareness of pro bono engineering throughout the industry and an opportunity exists to develop a community of practice as an avenue for sharing best practice and lessons learnt. Finally, further research is needed into community perspectives of pro bono engineering.

Widespread pro bono engineering has the ability to improve the public perception of engineering, with possible flow on effects to increasing university engineering enrolments and decreasing the gender disparity. Pro bono engineering activities engineer a better world and foster a culture of socially aware engineers who can incorporate experiences from pro bono engineering activities into everything they do.

1. 'Company' is used in this report to encapsulate the different forms of engineering organisations to differentiate from the similar 'community organisation'

'Community organisation' is used throughout this report to encapsulate the different forms of not-for-profit representative groups or 'communities,' with a structure and representatives, through which to form a relationship and assist an identified need.

Case Study: Ecoteam

Engineers volunteer their services to assist with wastewater issues.

Problem:

Due to the growing orangutan population at Nyaru Menteng, the wastewater system became overloaded. The problem was worsened by the high rainfall in Borneo. The vets at the centre were becoming concerned for the health of the orangutans.

Project Initiation:

Ecoteam was contacted by the Australian Borneo Orangutan Survival Foundation (BOS), who was looking for consultants to help, Ecoteam immediately agreed to help as the project aligned with one of the aims of Ecoteam, to implement appropriate technology for remote areas and developing countries.

The Community Organisation:

The Borneo Orangutan Survival Foundation was developed in order to prevent the extinction of the Orangutan. At the current rate, there would be no wild populations left in Borneo within 15 years. This sanctuary is home to over 600 orangutans, some of which are in quarantine prior to release back into forest reserves. The sanctuary is also home to a large number of young orphaned orangutans who need to be taken care of and taught how to survive before being released into reserves. Carers raise these youngsters for the first 5 years of their lives by imitating the roles of an orangutan mother.

The Company:

Ecoteam is an environmental engineering and consulting company located in the Northern Rivers of NSW. They are committed to using eco technology to restore land and water to good health.



Two members of Ecoteam made the journey to Borneo early in 2011 to undertake the first of three visits to the site. The first visit involved designing a sewage system which would be both simple and robust. The two designers Dr Keith Bolton and Lise Bolton came up with a subsurface flow wetland based system which would treat the wastewater reducing the risk.

When working in developing countries such as Indonesia, appropriate technology means that in order to achieve the best outcomes for the project sometimes the use of local resources and practices are necessary. The system needed to be designed to fit in with local procedures and equipment and easily operated and maintained by the local workers. The system could be built using resources that were readily available in the local area and even a local Melaleuca species was used in the design to aid in the treatment process. Further visits were undertaken by Dr Bolton to commence the works, with Jayson Winmill visiting the site in October 2011 to finish the project.

While there were many risks associated with travelling and working in Indonesia, all reasonable preventative measures were taken. All employees needed to be aware of risks of undertaking the project and weigh them up against the many benefits that could be gained by being a part of such an amazing experience.

'Engineering is only just coming to grips with what this might be.'

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2. Background

2.1. Pro Bono Engineering – the Challenge

- In 2005, approximately 1.4 billion people were living in extreme poverty [1]
- In 2006, more than 1.1 billion people did not have access to safe drinking water [2]
- In 2008, 2.6 billion people lacked access to improved sanitation [1]
- To reach the Millennium Development Goal of improved access to clean water and sanitation in sub-Saharan Africa alone, 2.5 million engineers and technicians are required [3].

There is no doubt that there is a need for engineering companies to use the professional skills, knowledge and expertise of engineers to alleviate poverty and engineer a better world. Pro bono engineering involves engineering services being provided in kind, or at a significantly reduced rate, by companies to communities or community partners in need of those services.

While engineering companies have been engaging in pro bono partnerships and projects across the country, these activities have largely been on an ad-hoc basis. The engineering sector as a whole lacks a framework for engaging in pro bono engineering and without any supporting infrastructure for companies who are interested in broadening their corporate social responsibility (CSR) portfolio, pro bono engineering has presented as a challenge. At the same time, companies that are involved in pro bono engineering are generally disinclined to communicate or celebrate the successes with a broader audience for fear of scepticism around a marketing agenda.

This individualised approach to pro bono engineering has led to companies developing their own CSR and pro bono engineering frameworks organically, and those that have invested the resources to do so have robust structures true to their business needs. However, many have not taken the initiative to develop such programs, and without an industry-wide movement, pro bono engineering is ad-hoc and widely unsupported.

When you contrast the engineering sector with the legal sector, during 2007-2008, pro bono legal activity in Australia constituted over 955,400 hours, as reported by the Australian Bureau of Statistics [4].

Ingraining pro bono engineering in the way companies do business would lead the engineering sector to be recognised by the wider community as a socially responsible profession. Instead of one day of company organised unskilled volunteering at a local soup kitchen, imagine the change engineers could make with 955,400 hours of pro bono engineering.

2.2. The 2011 Year of Humanitarian Engineering

Annually, Engineers Australia announce a core theme to be the focal point for the upcoming year, encouraging the engineering sector to engage in discussion, debate and to inspire positive change. 2011 was announced as the Year of Humanitarian Engineering (YoHE). Engineers Australia has worked in partnership with Engineers Without Borders Australia² and RedR³ in hosting hundreds of events across the country showcasing humanitarian engineering and its impact on communities around the world.

*‘Doctors save lives,
engineers save communities.’*

Merv Lindsay, 2011 Engineers Australia President

One of the themes arising from events such as the Engineers Australia Sydney Division YoHE Launch has been an interest in how engineering companies can undertake pro bono work, as is done throughout the legal industry.

Several questions raised at these events included:

- What is pro bono engineering?
- Are companies conducting pro bono engineering activities?
- How widespread is pro bono engineering throughout the industry?
- How can more companies be encouraged to become involved with pro bono engineering activities?
- How can companies structure such involvement?
- What are the obstacles to pro bono engineering activities?
- How can companies appropriately celebrate pro bono engineering within the industry?

As part of Engineers Australia commitment to YoHE, the industry body commissioned a report into pro bono engineering across Australia, which also included two technical workshops.

2. Engineers Without Borders Australia works with disadvantaged communities to improve their quality of life through education and the implementation of sustainable development projects.

3. RedR Australia provides emergency assistance to communities devastated by conflict or major natural disasters by selecting, training and providing competent and effective personnel to humanitarian relief programs worldwide.



Case Study: BCA Engineers

Building Services Consultants for the Cora Barclay Centre Inc, Adelaide.

The Cora Barclay Centre provides Auditory-Verbal Therapy for children who are deaf or hearing impaired and wear hearing aids, cochlear implants or other listening devices. Early intervention practitioners at The CBC have specialist qualifications in early childhood development and family centered practice. Therapists work collaboratively with parents, guiding them to facilitate their child's audition, speech and language development.

BCA Engineers are a medium-sized multidisciplinary building services consulting practice based in South Australia, who aim to 'give back to our community' by undertaking various pro-bono projects. The Practice has offered, without charge, to design the Electrical, Hydraulic and Fire Safety services for The Cora Barclay Centre expansion project.

BCA Engineers were introduced to The CBC via the builder and planner, both of whom BCA Engineers has forged a working relationship in past projects. The scope of this project comprises the retention of an existing office building, the partial demolition of existing attached structure and the construction of a new attached two-storey extension integrated into the existing building.

Electrical services shall include low voltage power reticulation and distribution, interior and exterior lighting, exit and emergency lighting, telecommunications infrastructure and structured cabling solutions. Hydraulic services shall include domestic water reticulation, warm and hot water plant and reticulation, sanitary plumbing and drainage, chilled and boiling water plant. The fire protection services shall be negotiated with the certifier and the metropolitan fire authority in order to obtain the most appropriate and compliant solutions.

BCA Engineers shall offer advice with respect to all necessary codes and standards and offer value management advice facilitating the progression of project planning and concept design. We shall also undertake all negotiations with the relevant authorities on behalf of The Cora Barclay Centre. These negotiations endeavor to obtain cost effective and technically appropriate design solutions.

A representative from BCA Engineers commented:

'Through the collaborative work of our office and other benefactors, we look forward to contributing to the improvement this local and reputable charitable organisation, securing a future for its excellent work in our community.'



3. Introduction

3.1. Purpose of Research

The aim of this research was to provide a snapshot of pro bono engineering in Australia throughout the 2011 Year of Humanitarian Engineering. The research endeavoured to illuminate several case studies of pro bono engineering partnerships and projects while exploring the benefits, challenges and lessons learnt throughout the process. This report also provides a set of recommendations to the engineering sector.

3.2. Research Method

This was an exploratory research project that employed a qualitative data collection and analysis method. In order to provide sufficient evidence to meet the aim of this research, a method was selected that allowed for depth and a richness of data [5].

The data collection involved semi-structured phone interviews with twenty-five respondents from thirteen organisations and companies around Australia. An email was sent to Engineers Without Borders corporate partners about the opportunity to be involved in the research. Representatives from other companies were also recommended to the researchers, due to their involvement in pro bono activities. The companies interviewed ranged in size and services offered.

In order to gain multiple perspectives within the case studies, individuals, where possible, were interviewed from different levels and roles within each of the companies. The aim to was interview: i) a Senior Manager either CSR, HR or Senior Engineer setting strategy, ii) a Middle Manager or Project Manager, and iii) an employee who had been actively involved on site working on the pro bono partnership or project.

Phone interviews were transcribed and then analysed using a thematic analysis and findings supported with literature in the writing of the report. This process allowed for ideas to emerge from the data as they were collected. Selected quotes obtained from the interviews have been included in this report. Quotes in the report without attribution can be assumed to have been said by research participants.

A wider call for articles was also made through Engineers Australia's weekly e-newsletters and Engineers Without Borders newsletter and website which resulted in a number of articles that were received.

3.3. Limitations

This research does not intend to provide an exhaustive collection or analysis of all of the pro bono engineering activities across the country, and thus, this research lacks any quantitative or statistical analysis. The aim of the research is, however, to provide a snapshot of what is taking place and to explore several of these examples through rich case studies.

The aim of this research is to explore pro bono engineering from the perspective of the engineering sector through interviews with, and case studies from, engineering companies. It should be acknowledged that this research does not aim to collect data from communities or community organisations in terms of their views on pro bono engineering due to time and financial constraints. This is an opportunity for future research.

This report will illuminate current pro bono engineering practices, however, it will not provide definitive answers and should be viewed as an initiator of discussion within the engineering industry regarding the emergence of pro bono engineering. It is hoped that this report will inspire debate on the positions raised and encourage further research into pro bono engineering to expand on the ideas and questions raised.

Case Studies: Good Return and Limelight

Volunteer Professionally, Just Like Dylan and Matt.

Origin employees, Dylan Reilly and Matthew Kerin, have found a unique way to use their understanding of energy products to make a difference.

The pair has teamed up to advise one of the Origin Foundation's partners, Good Return, on the best energy products to offer women and their families in developing countries.

Good Return is promoting a new way of giving. Their website allows people to make micro-loans to help women in developing countries start or expand their small businesses, increase their income and improve their standard of living. Good Return's Sustainable Energy Program takes this a step further by facilitating access to renewable energy systems and more fuel-efficient products.

'In helping women to improve their livelihoods, Good Return is helping many of these families access energy products for the first time. It's so important that these products meet the needs of local people because often they will be their only source of energy,' said Dylan.

'We're really proud to support this project. It's not only an opportunity to do something great, but also stretch and grow our own skills,' said Matthew.

Utilising professional skills through volunteering could help partners tackle a project or build their internal capacity in a way they might never have thought possible. The Origin Foundation's Give Time Volunteer Program offers a real opportunity to make a difference.

Aurecon Limelight Group

Aurecon Mackay have assisted Mackay North State High School with identifying localised drainage issues, Aurecon's Limelight Group completed the designs at a reduced rate.

Aurecon is a global engineering and management company. In Australia, the Limelight Group was established for interested graduates to participate in not for profit projects, which runs alongside their Emerging Professionals Program. Limelight aims to empower emerging professionals to contribute to the development of their company. The guiding principles of their activities are Involvement, Learning, and Achievement.

It was decided that the project could be charged at a reduced fee, simply the cost of the labour of Aurecon's employees. After being approached by the school, Aurecon developed an agreement and their usual client contract was signed by Mackay North State High School. Aurecon's work involved detailed drawings to be issued 'For Tender', Tender Schedule of Quantities, as well as cost estimates. Members of the Limelight Group formed the key staff for the project, while executives and senior staff supervised and were involved when required.

It has been identified that one of the challenges faced when offering pro bono work is that these projects sometimes take a lower priority than other projects and extra effort is needed to meet deadlines and provide a high quality of service to the client. The project proved beneficial to younger staff members, as they were able to be involved in all stages of the project and will form a major contribution to their Professional Development.

'Where people build, a shack, it's like, hang on a minute, you're senior water engineers and there's all sorts of flood issues going on in Pakistan - aren't you more suited to helping there?'

4. Pro Bono Engineering Activities

4.1. Characteristics

The pro bono engineering activities captured in this report illustrate the wide nature of opportunities available to engineering companies. Such opportunities can include: assistance in project management, technical advice, conceptual design and even construction work. There are many similarities in these activities, but also many differences. The three characteristics common to all pro bono engineering activities are:

- a) They are carried out pro bono by any engineering organisation (small, medium or large)
- b) They have a client, or community partner
- c) They use engineering expertise.

a) Defining Pro Bono

The commonly used term, 'pro bono,' shortened from the latin 'pro bono publico,' translates to 'for the public good.'

This report is predicated on a definitional basis that pro bono engineering consists of engineering companies utilising the skills, knowledge and expertise of engineers for a significantly reduced, or no fee basis, to assist a community organisation who would otherwise not be able to access engineering expertise.

This is distinct from the individually motivated volunteerism which is encouraged by placements with organisations such as Registered Engineers for Disaster Relief (RedR) or Engineers Without Borders (EWB). The researchers did not specify a narrowed definition of pro bono engineering in order to include activities that utilise engineering skills but may not be easily compartmentalised into engineering disciplines or expertise solely provided by the engineering profession.

For instance, such a definition does not preclude projects charged at cost, rather than no fee, or those that include: project management assistance, construction supervision or risk assessments. The researchers encourage further discussion as to an appropriate expression of pro bono engineering.

b) In Partnership with a Community Organisation

Whether at the global, national or individual community level, there are a myriad of opportunities for pro bono engineering involvement. Possibly the most significant aspect of pro bono engineering activities are the relationships that form between community organisations and companies. It is more than a 'commercial client relationship,' it is a partnership with two or more organisations working towards community identified aspirations. At one of the Pro Bono Engineering Technical Workshops, this was recognised by participants who discussed the difference from a business as usual client relationship, describing a partnership with community organisations as involving 'enlightened client relationship management.' Interview respondents and workshop participants identified the need for long-term, sustainable partnerships that build the capacity of community organisations through two-way sharing of knowledge.

The not-for-profit Architecture firm, Public Architecture, explains that the commonly understood 'without fee' translation of 'pro bono' detracts from the 'public good' focus of such ideals [6]. This is an easily overlooked, yet important aspect of pro bono engineering activities where the outcome for the community is the primary goal, notwithstanding the many benefits experienced by companies.

Case Study: The Bana Yarralji Bubu Indigenous Ranger Base Partnership

In September, 2011, the Bana Yarralji Bubu Indigenous Ranger Base at Shipton's Flat, near Cooktown, Queensland, was officially opened thanks to a landmark collaborative alliance across community, NGO and corporate sectors. This exciting partnership started three years ago with the local Kuku Nyungkal run social enterprise, Bana Yarralji Bubu Inc. contacting the Centre for Appropriate Technology (CAT) to ask for assistance in overcoming challenges with infrastructure upgrades on their community.

Scoping and Building Partnership

First, a partnership between CAT and Engineers Without Borders Australia (EWB) was developed and leveraged to engage an EWB corporate partner for construction of the infrastructure project through a pro bono tender process. Next, pro-bono support from Aurecon, a large multinational engineering company, was secured to progress the project through a complex planning approval process (which took two years) and onto construction. At the point Aurecon engaged Nick MacDonald to work with CAT in Project Management; a joint partnership was formed between Bana Yarralji Bubu Inc., CAT, EWB and Aurecon. Finally, a team of collaborators including engineers (from Arup), architects (from SKM) and trades (through Indigenous Community Volunteers) converged on Shipton's Flat and worked alongside a local Aboriginal ranger team to build an ablution block, rangers office and establish water and power supply.

Corporate Partner Outcomes

Key outcomes from this approach to community infrastructure needs include: being able to build at a high



The Bana Yarralji Indigenous Ranger Base Partnership Team

quality, consistent with relevant standards and legislation; and reducing the significant technical barriers to livelihood development in a cost neutral manner. 'While corporate partners achieve corporate social responsibility goals through exchanging with the community and participating in the project, community members gain hands-on skills in construction techniques, assisting with a build that has resulted in a great sense of pride and ownership' says Andre Grant, project manager, Centre for Appropriate Technology.

Community Partner Outcomes

Many Indigenous groups are moving towards self-managed ranger programs on country as an appropriate sustainable livelihood activity. These ranger programs are becoming increasingly well supported with funding for wages and on-ground activities. However, a gap exists in sourcing funding for key infrastructure to support people living and working on country in these remote locations. 'CAT, Aurecon and EWB's unwavering support ... in us in setting up our ranger program and office has given us an opportunity to create a sustainable ranger service business. This has reshaped the lives of some of our rangers and other Nyungkal people. It came at the right time to give us the strength we needed,' says Marilyn Wallace, CEO of Bana Yarralji Bubu Inc.



‘The [community organisation] is basically a company of [scientists], they are not project managers ... we all do what we do best and project management is an area where [company name] has a lot of strengths ... so we will help ... to project manage this exercise.’

c) Engineering Expertise

There are many different types of engineering skills, knowledge and expertise that would be valuable to those who don't have access to them. It is the provision of these skills that distinguishes pro bono engineering from unskilled volunteering and it is these skills that place engineers in a unique position to contribute to the community where no other profession can.

The findings demonstrate a need for a wide range of engineering skills, such as, but not limited to:

- Building design and construction supervision
- Water treatment design, fabrication and commissioning
- Project management across areas such as:
 - conceptual design, procurement, fabrication and installation
 - creation of a vision and timeline for the organisation's goals
 - organisational capacity building
- Technical and non-technical advice on appropriate technologies, land and river management techniques.

‘... one of the on-the-ground opportunities that EWB presents to engineers is to utilise engineering skills in a really innovative and interesting way.’

One respondent experienced frustration with a community organisation who, *‘... hasn't gotten back to us even though I know that they are really keen ... but they are just not organised enough.’*

4.2. Motivations

There were many motivations identified by respondents for participating in pro bono engineering activities. Several of these included:

A Sense of Professional Responsibility:

‘The driving force behind pro bono engineering is an acknowledgement that the acquisition of our professional engineering skills comes accompanied with a responsibility to use those skills to put back into the community, as it is the community that supported the acquisition of those skills.’

Vaughn Grey, 2008 Young Engineer of the Year

An Inclination to Address the Social and Wealth Inequality:

‘We are well off compared to many others around the world.... We have a responsibility to contribute to the industry as a whole.’

Matthew Giesemann, General Manager of Engineering, City West Water

The Ability of Engineering Companies to Create Change:

Companies are able, *‘To draw on the massive, real change capability that we have as an organisation, which is the access to engineers.’*

Matt Robinson, Regional Manager - Power Networks (Australia & New Zealand), WorleyParsons

Companies are able to make a, *‘...genuine contribution back into a community where we can make very meaningful and worthwhile contributions.’*

Keith Christiansen, Executive Officer - GHD in the Community

Case Studies: Live and Play

‘Livvi’s Place,’ Timbrell Park Playground, Five Dock, NSW.

Livvi’s Place is an all abilities playground purposely designed and built to cater for all ages and all abilities, making it the first of its kind in Australia. The playground’s unique design enables children and parents of all abilities and ages to play side-by-side on the same equipment, ensuring integration of children with special needs; while the holistic engineering design of Livvi’s Place incorporates design features that accommodate children with a multiple variety of disabilities ensuring a safe, secure environment for all children to play.

Taylor Thomson Whitting (TTW) provided civil and structural engineering services for this intergenerational playground in partnership with Touched by Olivia Foundation, Canada Bay Council and Leighton Contractors. The playground is the first of its kind and has been created in consultation with leading playground experts, disability experts, playground and early childhood academics.

The play equipment comprises of both off the shelf items and customised pieces which have been selected to provide a graduated selection of different activities. For example, there are three levels of climbing equipment and four types of swinging equipment to accommodate different levels of ability, confidence and age.

After more than two years in the making and at a cost of more than \$AUD 1 Million, only Livvi’s Place, Timbrell Park, satisfies all required standards of an ‘all abilities playground’ and so can therefore be truly termed Australia’s first all abilities, all generational, playground.

Director in charge: David Carolan

A House for Tembi

An earthquake in May 2006 caused much damage to the area around Yogyakarta in Central Java, destroying much of the village of Tembi. Most of the buildings in Tembi are small single storey brick houses with timber-framed tiled roofs.

HSBC and Out of Asia (who has handicraft factories in the area) funded a project to build 130 new houses. The aim of the project was to use local materials, labour and construction methods. The houses needed to be earthquake resistant and sufficiently low cost that locals could afford to (and would want to) copy them.

TTW Indonesia provided structural engineering design advice on a pro bono basis. Expenses and the cost of placing an engineer on site for several months during construction were charged at cost. The project was overseen and engineered by Marten Eddy (NPER) and Indonesian engineers Mochammad Baagil and Ucok Dedy each spent several months at location.

TTW advice included assisting selection of materials and construction methods for the project and applying established codes and engineering principles to the application of these materials and methods. The final designs were stiffened masonry on ‘batu kali’ (mortared stone) foundations, with bamboo framed roofs supporting local ceramic tiles. Stiffening of the masonry using ductile cast-in horizontal and vertical elements and providing a stiff diaphragm at top-of-wall level (for both wall and roof stability) were key elements of the design. The bamboo roof structure was designed using various established codes (eg AS1720 timber code) and bamboo truss prototypes were tested to establish practical ways to achieve acceptable code performance.

Director in charge: Marten Eddy

'I was always aware of the pro bono work that law firms do and it seems like such a good fit, for engineering companies to do that work, why the hell hasn't it happened?'

4.3. The Legal Profession and a Tradition of Pro Bono Activities

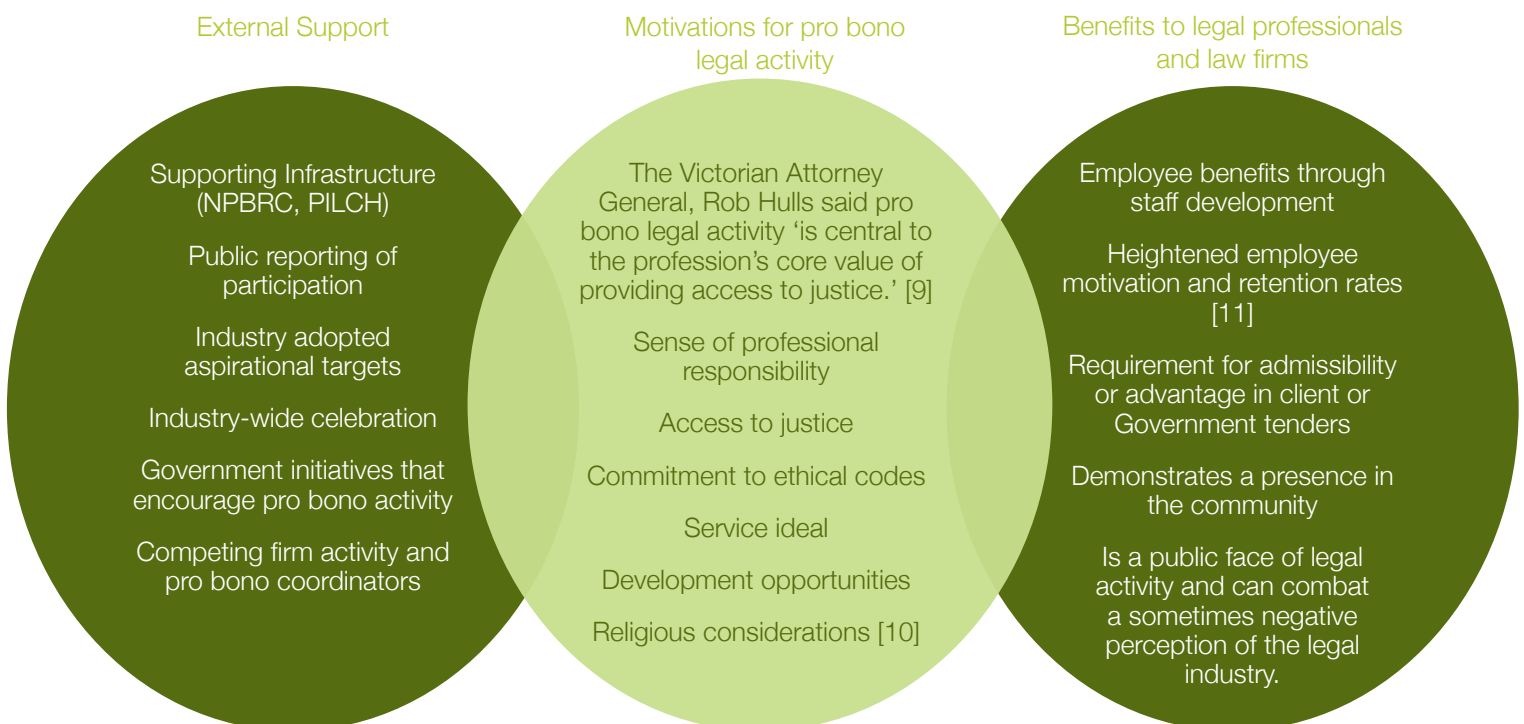
The words 'pro bono' are generally associated with pro bono legal activity. Such pro bono legal activity, throughout Australia, is widespread and well recognised [4,7]. In 2007-08, the Australian Bureau of Statistics reported 955,400 hours of pro bono legal activity, with a further 2.1 million hours of legal aid [4]. These impressive statistics are a reflection of the development of pro bono activity in the legal sector, which has gone from largely ad-hoc participation to one that is institutionalised throughout the industry. In contrast, the pro bono activities in the engineering sector are largely ad-hoc and lack an institutionalised approach [8].

Figure 1. below identifies several external influences, motivations and benefits of pro bono activities in the legal sector.

Even with higher charge out rates, and an apparent higher profit margins than engineers [12, 13], lawyers have recognised the ability of their knowledge to be leveraged for specialised and highly valued outcomes. Engineering companies around Australia contribute money in the form of donations, corporate sponsorship and employee development experiences. Another option is pro bono engineering, where a lower profit margin could in fact encourage more innovative forms of engagement that may be cost-effective and have benefits across the business. Respondents in this research have emphasised the value leveraged from pro bono engineering services. The World Health Organisation estimates that:

'Every US\$1 invested in improved sanitation, translates into an average return of US\$9. Those benefits are experienced specifically by poor children and in the disadvantaged communities that need them most [14].'

Figure 1: Snapshot of the Pro Bono Legal Sector [8]



‘The accomplishment that you feel at the end of the pro bono project, the sense of satisfaction that you’ve done something for the greater good ... the elation that you get at the end of the pro bono project is much more personal.’

4.4. Benefits of Pro Bono Engineering

The findings illustrated that the benefits of pro bono engineering can generally be categorised into three areas including: i) the benefits to the communities receiving engineering expertise, ii) the employees participating in pro bono engineering activities and, iii) the engineering companies who take on pro bono engineering activities.

Communities

Andre Grant, Senior Project Management and Technical Officer, from a third party partnership broker, the Centre for Appropriate Technology, claimed that pro bono engineering activities were ‘absolutely crucial’ for remote communities in Australia, especially where technical expertise is not available to many communities.

It is this access to engineering expertise that makes pro bono engineering activities so valuable to communities around the world. Engineering skills and expertise may be needed in communities faced with:

- An unsafe or an unreliable supply of drinking water
- Inadequate sanitation facilities
- A lack of prefabricated housing design in disaster prone areas
- A lack of amenities for the community to carry out projects
- A lack of certification including building permits.

Communities’ ability to access this expertise is currently limited to, knowing an engineering company who is willing to help, or knowing the appropriate channels to navigate to find an engineering company and finally having the capacity to hire or negotiate for assistance from that company.

Employees

Of high importance to the research respondents were the employee benefits derived from pro bono engineering activities, which were mentioned as a main business case driver. Some of the responses included:

- ‘... opportunities for our staff to broaden themselves.’
- ‘I saw it as a bit of a personal challenge and I saw it also as a project with the potential for a definite outcome.’
- ‘It lets our staff get really actively involved in the community in which they operate and make a real contribution.’
- ‘Those individuals who do step up with the ideas, they get a lot of their own development and experiential benefits, leadership benefits, organisational benefits, some technical development benefits as well.’
- ‘... we can measure success by people wanting to do other pro bono projects and saying they’ve had a really good time and they’ve learnt loads and they’re really glad they had the opportunity.’
- ‘... great way to get cross-pollination between different engineering firms, I was working with guys from ... who I would never otherwise [have] met and developed really strong friendships through that.’

Andre Grant from the Centre for Appropriate Technology claimed engineers involved in pro bono engineering activities undergo a unique learning experience leading to ‘... a more developed social conscience and a less naïve understanding of development.’

Organisations should not expect employees to become instant experts in development work through pro bono engineering, but to have a more informed understanding of working with communities.

'We're trying to move our engagement from being one of giving, just donating funds, to one of giving time.'

Peter Bowtell, Principal, Buildings Practice
Leader - Australasia. Leader of Arup's Community Partnering Program – Arup Australasia.

One of the respondents who project managed a pro bono engineering activity stated:

'The accomplishment that you feel at the end of the pro bono project, the sense of satisfaction that you've done something for the greater good, rather than just another work related project because a client needed a new design or installation and congratulations, you've completed the project on time and under budget, great, now here's the next one. The elation that you get at the end of the pro bono project is much more personal.'

Pro bono engineering activities were also seen as effective ways of providing opportunities for employee development, with companies benefiting from employees who can apply their broader experience to all of their work. Colin Duggan, Mechanical Engineer, GHD, commented that:

'Employees are engaging with the community in a different way than they probably do on regular commercial projects ... so when they go to work on commercial projects they're likely to ask questions that they wouldn't have asked before - about how that might impact on the community and give a different perspective to their way of thinking, just to give a bigger picture to the project.'

Companies

Leveraging value

In comparison to traditional financial donations, pro bono engineering enables companies to maximise the value of their contribution to the community. The potential that companies have to gain from leveraging engineering expertise was repeatedly highlighted throughout the interviews. Peter Bowtell, Principal, Buildings Practice Leader - Australasia and Leader of Arup's Community Partnering Program – Arup Australasia explained:

'We're a company of size and global footprint that can make a difference in these areas ... we gain from it too.'

'We're trying to move our engagement from being one of giving, just donating funds, to one of giving time. The reason for that is both the value of the contribution is leveraged up because it's not just a dollar for dollar exchange, but it ... actually leverages the value of the knowledge that we have as engineers and professionals in ... the areas in which our professional firm can offer service. So we can actually leverage up through the time so we get a better contribution that we make so that for each dollar we give, it might be worth three dollars.'

Matthew Giesemann, General Manager of Engineering at City West Water stated that the 'Twinning'⁴ program was, '... dollar for dollar [sic] by far the best possible [way] of providing assistance.' Another described pro bono engineering as a, '... very practical and pragmatic way of sharing engineering experience.'

Customer engagement

Multiple respondents expanded upon the opportunities to extend their involvement in pro bono engineering to their clients: 'If we can get our clients involved ... then we do ... It helps deepen and enrich the relationship with the client, quite apart from what we're doing.' The ability of community oriented projects to build future business or relationships was also noted:

'Good corporate citizenship is infectious in the locations of your work and if your customers are governments and other key companies ... [then] you're participating in local projects that are good for everyone ... we're helping our customers to establish obvious reputations in the place in which we work through a lot of community work.'

4. The 'Twinning' program involves matching qualified water experts from utilities in the developed world to those in the developing world [15].

Case Studies: Schools and Pools

Sucheta Kriplani Shikshan Niketan (SKSN) - Hydrotherapy pool, Manaklao, Jodhpur, India.

SKSN is a charity and residential school for physically disabled children in Jodhpur, India. The aim of this project is to provide a world class hydrotherapy pool for the children's rehabilitation. Taylor Thomson Whitting (TTW) was asked to provide structural engineering services by Emergency Architects Australia.

TTW are working closely with architects Conybeare Morrison to produce a preliminary scheme that is cost efficient. The building consists of a folded concrete plate roof and walls. In order to maximise on the desert location the pool will be heated using solar panels mounted on the roof. Part of the roof is to be open in order to provide ventilation within the space. TTW have already modelled the structure in order to provide preliminary information for costing.

Director in charge: Richard Green



3D Representation of Pool Complex.

Solomon Islands

TTW worked with Rice and Ewald architects to review and further develop a scheme design for a two storey school building to be used as part of the extensive Emergency Architects school rebuilding program following the 2007 tsunami/earthquake. To date Emergency Architects have been involved in the building of a single storey classroom, boys dormitory, girls dormitory, mess hall, ablution block and staff house have been constructed. The primary goal of the building program was to establish a number of prototype buildings, which could be assessed and refined once built to form a template for a wider re-building program. The two storey building has not been built, but may still be constructed by the Ministry of Education. TTW provided structural engineering services to assist with the sizing of key timber members and undertook a review to assess if simplifications could be made to the structure to aid with construction.

Director in charge: Richard Green



Photos of Ngari School buildings to date.

Benefits of Pro Bono Engineering Continued ...

Creating and Maintaining a workplace of choice

Many respondents mentioned the need, or contemporary pressure, to create a workplace where giving back is ingrained in the culture. For example:

- 'There is an expectation when staff join companies ... that they're working for an organisation that is prepared to put back into the communities where they live and work.'
- 'Our organisation is trying to grow a community of contribution.'
- Vaughn Grey, 2008 Young Engineer of the Year notes that: 'Organisations that undertake pro bono engineering are highly attractive for professional engineers to join, as a pro bono engineering program highlights a progressive, forward thinking organisation that is likely to think outside the box not only in their pro bono engineering work, but in their day-to-day engineering.'

Pro bono engineering activities were also seen to be a point of difference for recruitment and lead to a culturally rich and diverse work environment. Respondents described these benefits in various ways:

- 'Staff development and retention, recruitment as well.'
- 'The fight for talent at the moment in Australia ... It becomes an employee engagement exercise.'
- The feedback from staff: '... is very positive, you can see it by the number of repeat applications we get from people.'
- 'We'd like to recognise and reward our staff enthusiasm and be able to give them support to get involved in areas they're passionate about.'

Professor Mark Bush, current EA-WA President and former Dean of Engineering at the University of Western Australia, describes the following benefits for organisational diversity and culture when undertaking pro bono engineering activities:

- It enriches employee development through sharing knowledge and experience in new working environments, deepening their understanding of capacity building and community involvement in projects and encouraging a customer focus for delivery of services.
- It integrates the concept of sustainable development into the culture of the company through active participation. It encourages employees to volunteer their time and expertise to help others and simultaneously drives employees to reach their full potential.
- It builds a stronger connection between the company and the community by demonstrating the company's commitment, social responsibility, values and capabilities.
- It creates networks with like minded companies and organisations.

The findings illustrated that the benefits for companies are all significant when compared to the cost of employee time donated to undertake the pro bono activities.

Case Study: Bligh Tanner

About Bligh Tanner

Established in Brisbane in 1992, Bligh Tanner has a strong reputation for quality and innovation in civil, environmental and structural engineering.

As a company we had been seeking to broaden our community involvement in a way that was different to our usual project role. With our experience in prefabricated housing systems in Cape York and Torres Strait Island communities, we made an approach to Cape York Institute. Our initial idea was to assist students in some way to achieve higher education degrees in engineering related fields.

Cape York Institute put us in contact with Balkanu, an Aboriginal corporation which focuses on economic development for Cape York indigenous people. Following initial involvement with designing shelters for the Mossman Gorge Gateway project, we were asked to provide structural engineering design for the Bush Owner Builder houses.

Project Background

The Bush Owner Builder project (BOB) aims to support people in remote indigenous communities who wish to build their own houses on their homelands. The houses are to be built with the assistance of trained staff who would supervise and pass on necessary building skills to the future owners. The materials used in the construction of the houses were selected to reflect local climate, culture and availability.



Houses During Construction

The self-built houses are intended to create a sense of ownership and pride, instilling a greater sense of community and promoting natural leadership motivated by a desire to reconnect with the land. This project will help to solve an overcrowded accommodation problem as well as creating assets for future generations of indigenous people. The skills learned from the construction of the houses can be reused and passed on.

Bligh Tanner's Contribution

The project design phase involved a collaboration between a young Architect in Melbourne, Balkanu, and a retired builder who was assisting with the milling of local timber and Bligh Tanner. The houses were designed to incorporate a large canopy roof with living platform and a lock up room beneath. Being very open and lightweight, the bracing of the structures proved a challenge, especially with cyclonic conditions. The structures were design to be durable, relatively easy to build and with flexibility for extension.

Balkanu has made an offer for Bligh Tanner staff to visit construction sites and to assist with the construction process as a way of gaining practical experience and to develop the relationship with communities on the Cape.



BLIGH TANNER
CONSULTING ENGINEERS

5. Strategic Pro Bono Engineering – An Organisational Approach

5.1 CSR Strategies Incorporating Pro Bono Engineering

The findings showed that engineering companies of varying sizes and services around Australia have developed a range of Corporate Social Responsibility (CSR), or community giving strategies. This is in line with a growing global trend where companies are choosing to commit to 'social responsibility' or 'corporate citizenship' in their mission, vision and value statements and accept some accountability for societal welfare [16]. These strategies are now looking at ways in which companies can move beyond a sole philanthropic model to engaging with the community. Volunteering Australia argues:

'Corporate social responsibility involves much more than writing cheques. In combination with financial support, companies are offering the use of business premises and facilities, providing management and technical expertise, donating gifts in kind (including company products) and sharing company networks. Many businesses and community organisations enter into partnerships to achieve a social outcome [17].'

When developing CSR strategies, the provision of employee time for skilled volunteering, or pro bono engineering, is one activity available to engineering companies. Marni Oaten, Corporate Sustainability Planner for WorleyParsons, travelled the United States on an Eisenhower Fellowship and talked to many large corporations about their CSR activities. She claims that Australians have a more 'hands on' approach to corporate giving compared to the USA, with an 'attitude of helping out' through pro bono engineering activities, rather than purely sending a cheque in the mail.

Of those interviewed, a significant number of engineering companies are moving towards company-wide, structured

CSR programs. Although the scale of such programs vary according to the size of the company, respondents from small, specialised consultancies, through to large companies, reported such structures. The stage of development of these programs also varied, with some companies acknowledging their current ad-hoc approach to CSR and others outlining an evolution over recent years to structured CSR programs with a CSR Manager, nominated regional CSR 'champions' and formalised programs.

The majority of these programs found support within high levels of the company, often the board, establishing community or sustainability committees. These committees frequently act under charters that provide a mandate for their CSR program. Other structures utilise dedicated CSR Managers or employees (whose roles include CSR) to formulate strategies for their company.

These strategies provide a framework for engaging in CSR activities and often included:

- Key focus areas within the strategy
 - For example, the 'SKM and the Community' program focuses on:
 - the environment
 - communities in need
 - disaster relief [18]
- Type of CSR activities
 - For example, the Origin Foundation provides:
 - grants and scholarships
 - skilled and unskilled volunteering
 - matching workplace giving [19].

5. Strategic Pro Bono Engineering – An Organisational Approach, Continued ...

- Communications
 - Some respondents indicated a closed communications strategy with the view that pro bono engineering activities are focused on internal benefits, while others preferred to promote their CSR activities.

The findings showed that employee ‘buy-in’ or input on these strategies was an important aspect in developing a CSR strategy. This involved large companies surveying employees and smaller companies holding meetings to discuss employee interests.

Without a strategic approach to CSR, and thus pro bono engineering, company involvement in these activities is largely ad-hoc, making it difficult to create and sustain momentum.

5.2 Structuring Pro Bono Engineering Activities

The pro bono engineering aspect of a wider CSR strategy was found to be less developed than the CSR program, which concurs with pro bono engineering being in its infancy in the engineering sector. Of the respondents, the companies with structures around pro bono

engineering have only developed these in the last few years. Characteristics of these varied reported structures included:

- National committee, regional sub-committees and reporting hierarchies relating to the identification, selection and approval of pro bono engineering activities
- National, regional and overhead budgets for pro bono engineering
- Charters guiding selection and prioritisation of potential pro bono engineering activities
- Application forms that employees fill out in initiating a pro bono engineering activities, with a proposed budget attached, including the employee’s voluntary contribution to that budget
- Sophisticated internal systems to notify employees of upcoming pro bono opportunities which allows employees to indicate interest, and collates interest for selection. It then notifies appropriate managers of their employees additional time commitment and allows for regular reporting and monitoring.
- Working groups with a champion driving the process.

One respondent was in the process of formalising a pro bono engineering structure, with a history of informal participation on an ad-hoc basis, ‘not really being driven by anyone.’ The company made a decision to investigate structuring their CSR involvement, and began by setting down a rough budget, ‘[a] framework around how people can get those activities approved and what budget they have annually for that.’ In initiating these conversations, the buy-in of management can be gauged, and the level of involvement incorporated into the framework. The next step was to determine focus areas for involvement, initiate and formalise corporate partnerships and form an internal company ‘working group’ around involvement. This is an example of a smaller company, with one person taking ownership of such development and utilising involvement from across the company for a ‘grass-roots’ approach to structuring a pro bono engineering program that fits the company.

'The aspiration is that pro bono will be one part of an integrated approach to achieving corporate social responsibility, so it won't just sit as an isolated element.'

Wendy Miller, Business Operations Manager,
GL Garrad Hassan

The findings showed that of the companies without a clear pro bono engineering structure, both large and small, pro bono engineering activities were random and unplanned. In these instances, it was senior support that enabled participation. This approach is not as open or transparent to all employees when compared to, for example, an application form sent to a committee. If companies are engaging in pro bono engineering to maximise employee benefits, the process should be both transparent and open to employees from within all levels of the organisation.

5.3 Quantifying Pro Bono Engineering Activities

The respondent companies with structured CSR programs overwhelmingly used a CSR budget to manage spending. A proportion also had budgets for pro bono engineering activities that included employee time, disbursements and travel expenses as required.

Such budgets can provide avenues for employees to account for hours, enabling companies to monitor their involvement and the progress of the project against this allocated 'budget,' while supporting employees participating in pro bono engineering.

5.4 Type of Organisation

Companies that are employee owned or organised in a trust or partnership model were found to be more flexible than publicly listed companies in their approach to pro bono engineering activities. The type of specialised engineering services offered by the company had little effect in limiting its ability to carry out pro bono engineering activities. Companies who specialise in civil engineering outcomes participated in civil oriented pro bono engineering activities. Construction companies were able to participate in pro bono engineering activities that involved construction, water consultancies were able to offer their expertise through pro bono engineering research, reports, mentoring programs or other services. Invariably, if an engineering company is fulfilling a particular commercial need, it is likely that there will be a community who would be grateful to receive that specialised service pro bono.

One employee noted that he was able to: '... take those opportunities and run with it if you know you are going to have the potential for support there, otherwise you'd give up before you even start.'

Case Study: BMT Giveback

BMT Donates a Low Cost Drainage and Sewage Treatment System to an Indian Village.

BMT celebrated its 25th anniversary of BMT in 2010. To mark the occasion, the BMT Giveback initiative was launched, which invited staff to submit their own ideas for a project in which BMT could invest and apply its technical expertise to solve a problem in a developing country. More than 100 entries were received from BMT staff across the globe, and after careful consideration and assessment, the BMT Giveback project selected was the design and construction of a Low Cost Drainage and Sewage Treatment System for an Indian Village.

The internally financed BMT Giveback project commenced in November 2010 and is progressing well with an expected completion by March 2012. The village chosen was Khintla in the state of Gujarat. Khintla is a typical, rural Indian village, with a population of about 2,500 people. A new water supply system has been installed recently; however, the village remains without any effective drainage or wastewater. Only a few of the households have a private toilet.

Social, demographic and topographical surveys of the village have been undertaken and analysed to assist in the design. Following detailed analysis, the final design is based on the Decentralised Waste Water Treatment System (DEWATS). This approach combines leading system design with local construction techniques and materials, creating a system that is effective, affordable and easy to maintain. The treated effluent will be used for irrigation in the fields.

Through discussions with the villagers during the design phase of the project, it immediately became apparent that the provision of more private toilets within the programme would have a significant impact on the quality of life for the villagers. This has now been incorporated into the scheme.

In partnership with BMT, the Aga Khan Rural Support Programme India (AKRSPI) will co-ordinate labour and project management assistance during construction with the help of the local community. Technical construction works are being carried out by local companies, keeping all the project funding in that community.

Apoorva Oza, Chief Executive Officer of AKRSPI comments:

‘The population currently has to dispose of its waste water through an outlet from either their kitchen or wash area. This has now resulted in open drains and the possible occurrence of water borne diseases. This programme is set to make a real difference to people’s lives within the village and we are grateful to BMT for their commitment to such a worthy and life changing cause.’

Once this BMT Giveback project has been completed, BMT will donate the IP rights of the sewage system design to the AKRSPI. They will seek to replicate the design and specification so that other villages throughout India can also benefit from this solution.

A further positive consequence of the project will be the upgrading of the water supply to the village. At present, water is pumped into central tanks from which villagers are able draw their supply. The BMT Giveback project has encouraged the local government to invest in upgrading the supply to provide piped connections.



6. Partnership Initiation

6.1 Long-Term Partnerships

Pro bono engineering activities will be a product of the context, community, cultural issues, the services the company will provide, individuals involved and the likely timeline. Therefore, all partnerships are unique; the company and community partner must structure their partnership to reflect the aims of the relationship, as, 'There isn't just one path of this.' While pro bono partnerships will often be for longer periods of time, projects will generally be initiated throughout the duration of the partnership. The findings showed that the way in which respondent companies have engaged in pro bono projects has often been ad-hoc and complex. These projects were often not part of a strategic partnership approach; they were one-off, short term transactional relationships. On the other hand, companies engaged in pro bono partnerships were better able to manage expectations and create mutually beneficial outcomes, as John French, EWB SKM National Partnership Representative, SKM, explained:

'A good pro bono partnership is somewhat analogous to a good client relationship. If a company knows its client well, over a longer period of time, then better solutions can be provided for that client's needs. In like manner the better the pro bono organisation knows the community, the better solutions can be provided for its needs. One off transactional engagements do not lend themselves to the best outcomes for clients, nor for communities.'

Figure 2, presents the Partnering Initiative's⁵ recommended process in initiating, managing and sustaining mutually beneficial cross-sector partnerships.

Figure 2. The Partnering Cycle⁵

- Scoping and Building Partnerships
 - Context mapping – understanding the history, issues and key stakeholders
 - Initiating the idea of partnering
 - Connecting with pre-existing relationships
 - Establishing new relationships
 - Balancing the commercial and technically specialised drivers of engineering companies with the needs and cultural factors in community organisations
 - Resource mapping
 - Managing expectations
- Reaching Agreement
 - Negotiating and co-planning
 - Identifying strategic goals for the partnership
 - Signing partnering agreement
- Managing and Maintaining
 - Build governance arrangements
 - Deepen organisational engagement
 - Develop communications plan
 - Build partnering capacity
 - Problem solve constructively
- Reviewing and Revising
 - Partnership evaluation
 - Assess financial and social impact of partnership
 - Make necessary changes to partnering agreement
 - Sharing lessons learnt
- Sustaining Outcomes
 - Discussions about 'moving on' options
 - Recognition and celebration of partnering agreement
 - Identifying further champions and spheres of influence
 - Management of closure / moving on procedures.

5. The Partnering Initiative, a global programme of the International Business Leaders Forum, drives widespread, effective collaboration for a sustainable future through capacity development, action research and direct support to organisations and partnerships. www.ThePartneringInitiative.org.

'This year we've almost had an oversubscription of our pro bono projects ... there's been phenomenal take-up.'

6.2 Employee Involvement

A significant number of respondent companies told us of the drive for, and number of, pro bono engineering activities initiated by employees who have seen opportunities for their company to become involved with an identified community need. This may be due somewhat to the wider community's lack of awareness of the role of engineers. For example, Rebecca Miller, Senior Consultant, Regional Corporate Sustainability Coordinator, Arup Australasia reported that, 'This year we've almost had an oversubscription of our pro bono projects ... there's been phenomenal take-up.' Miller credited this to a variety of internal promotion mechanisms, ranging from high level support and promotion through to word of mouth, adding, 'People are talking, people are sharing their experiences.'

One of the most significant messages to come through the research was the passion displayed by individuals who are involved in driving these activities. For example, Keith Christiansen, Executive Officer - GHD in the Community, spoke about Dale Young who is part of the MSABI project in Tanzania, 'There's a great example of a highly motivated young guy, and we've got plenty of those really in our organisation, and we find that's where the best success comes from.' Another participant noted, 'We had an engineer take annual leave for the next [event], which is quite funny. He probably could have done that on company time, but that just shows he was really engaged and wanted to keep doing it.'

The inclination of employees to 'give back' and engage with community organisations should not be underestimated. There are many individuals doing incredible work when volunteering their time and engineering expertise. Figure 3. (to the right) provides a snapshot of four individuals passionate about using their engineering to further disaster relief, enhance water supplies, contribute to challenging problems and extend the reach of engineering to future generations.

Figure 3. Individual Contributions

Nicole Hahn – Returned RedR member

RedR Australia supported the United Nations relief effort in Sri Lanka, following conflict in the region in 2009, through the deployment of three emergency water, sanitation and hygiene engineers, a logistician and a humanitarian affairs officer. The deployees worked to provide civilians living in the crowded camps an existence as dignified as possible, in an incredibly challenging environment.

Engineer Nicole Hahn developed spreadsheets and information management tools. These tools aided the decision making processes, through analysis of collected information, gap identification and filling through a fair and transparent method of allocation. Nicole believes: *'Having an effective cluster resulted in some of the best [Water, Sanitation and Hygiene (WASH)] conditions in a camp that I've seen in terms of toilet numbers and level of WASH provision.'*

Justin Modra – Returned EWB Volunteer

'For 12 months I voluntarily worked with one of EWB's partner organisations, Rural Water Supply and Sanitation Program (RWSSP). The program works closely with various government departments, ministries, international and local NGOs to plan for and deliver a nationally sustainable rural water and sanitation capacity in Timor Leste. My role was to work with local Timorese engineers or technicians to improve their capacity to survey, design, construct and manage community water supply systems.'

The experience was so much more than I was expecting. Initially, my motivations were to come along, get my hands dirty and build some water systems for communities and feel happy to be helping out. I quickly realised, there is a much bigger picture involved than just putting in systems ... who is there in the long term to maintain and build new systems? Now I truly believe that the focus needs to be on training and building the capacity of locals that can carry their country into the future and this is one aspect EWB values in all volunteer placements.'

Ben Aldham – Participated in Engineers Australia High School Outreach Programs

For the past four years, Ben has been sharing his engineering experiences, discussing the different career opportunities in engineering and completing small exercises with students.

'I am passionate about engineering and wanted to give these students a greater understanding of the profession and hopefully encourage them to consider it as a career for themselves. I have found participating in the programs very rewarding; when you see students enthusiastic about engineering, the realisation of the broad range of career opportunities available and an understanding of all the aspects of everyday life that engineers are involved in.'

'Professionally I have also gained valuable training in communication and teaching methods (through training run at the VSSEC). The flexible working hours and flexible leave arrangements of my employer CSIRO enabled me to participate in these programs.'

Dianne Boddy FIEAust CPEng (Retired)

A passion for design

After sixty years of successful designs and innovative mechanical solutions providing 2,000 projects and 40 patents spanning various industries, Dianne says she, *'... now wish[es] to work pro bono as I simply have to design and live for the challenge of doing something successfully.'*

She added, *'I will likely work pro bono as I would like to return some of the benefits that I received in what has been the most exciting and interesting career possible.'*

6.3 Engaging Brokers in Pro Bono Engineering Partnerships

Private companies and not-for-profit community organisations have different drivers and operate in complex sectors. While engineering companies may be willing to engage in pro bono engineering activities, there are a myriad of crucial stages involved in ensuring the activities are successful and go beyond the core capabilities of these organisations. In a case study written about lessons learnt from a UN-Business Partnership [20], two conflicting perceptions of the partnership were presented:

1. 'We are completely different. We got on well, but ultimately the cultural gaps between our two organisations made the kind of partnership we wanted impossible.' Business Representative

2. 'We clearly live in different worlds and work in different ways, but I do not feel that our approaches to the partnership were that different.' UN Agency Representative

A partnership broker, whether internal or external to the partnership, may be able to assist in overcoming these challenges in brokering pro bono engineering partnerships between the various sectors by addressing the examples illustrated in Figure 2.

Many of the respondents had conducted pro bono engineering activities through a third party facilitator including the Asian Development Bank, Centre for Appropriate Technology and Engineers without Borders. There are other individuals and organisations brokering partnerships for sustainable development around the world including, Dixon Partnering Solutions (Australia) and The Partnering Initiative (UK).

Andre Grant, Senior Project Management and Technical Officer, from the Centre for Appropriate Technology describes the benefits that third party organisations can offer:

- Invaluable political literacy capabilities to navigate often complex multi-agency and cultural landscapes
- Direct and expedient project development using existing developed community relationships and trust
- Long-term relationships with communities that enable excellent facilitation
- Proximity to the community organisation (important in remote areas with difficult transport options)
- Local knowledge for cost effective logistics and service providers
- An ability to act as a filter between community organisations seeking help and engineering companies providing services
- Controls and systems in place to determine where pro bono effort would be most effective.

Case Study: Team Vista

Wallbridge & Gilbert: Supporting Team Vista

Engineering consulting company Wallbridge & Gilbert has formed a partnership with Team Vista. This decision was based on key criteria that the board was looking for in a partner that could enable them to give back to the community. Personal connections with the company and region of interest confirmed the partnership. A Wallbridge & Gilbert employee is a key driver in Team Vista and the managing directors of Wallbridge & Gilbert each have had experiences in Africa.

Wallbridge & Gilbert offers consulting services in Civil, Structural and Environmental Engineering. They were established in Adelaide in 1979 and now have offices all over Australia. Their fundamental objectives are technical excellence, innovation and professionalism.



Raising Awareness at the Womad Earth Station
Sustainability Festival

Team Vista is a not-for-profit that assists people living in poverty in Moshi, Tanzania. They operate out of Adelaide and Sydney and their key principle is 'Business and the community can work together to achieve social and environmental outcomes.' Their two main projects are Kilimanjaro Kids with Futures School and Upendo Women's Group.

Wallbridge & Gilbert has supported Team Vista as a major sponsor of their annual fundraising dinner and by holding fundraisers within their office. They aim to extend this partnership, starting with offering a working trip to Tanzania to an employee. Most costs of the three-week trip will be covered by the company, as well as leave taken at half pay. This role may involve building consulting, dealing with water issues, finding new land, working with the community to find sustainable solutions and other community work.



‘It takes a lot of effort by that relationship broker or facilitator to bring the different parties together. I don’t think our engineering sector is sufficiently mature that we could do it alone.’

A large proportion of respondents argued that partnership brokering of pro bono engineering activities is crucial and identified the following benefits:

- Merv Lindsay, 2011 President of Engineers Australia, ‘Link[ing] clients with a better definition of what is required, to services [or companies] that more closely align with their work.’
- ‘We need to partner up to make sure that we think about the long term sustainable benefits of that project.’
- ‘EWB is finding those opportunities and taking it to the different corporate partners and that’s what I think works really well ... [It] provides an avenue for [corporate partners] to get involved without having to dig around for those opportunities themselves.’
- ‘It’s projects that can be enduring projects because they’re heavily involved with the community ... so it’s not just a hit and run, go in there and do your job and get out.’

6.3.1 Third Parties in the Legal Sector

The legal profession has numerous organisations that support its pro bono work, for instance, the National Pro Bono Resource Centre states on its website that it is an independent not-for-profit organisation aiming to:

1. ‘Encourage pro bono legal services
2. Support lawyers and law firms to make it easier for them to provide high quality pro bono legal services, and
3. Work with the profession and the community sector to match services with the clients and groups most in need of assistance [21].’

The Public Interest Law Clearing House Vic Inc. (PILCH) states that:

‘Since its inception..., PILCH has become the largest facilitator of pro bono legal services in the Asia-Pacific, providing legal assistance and advocacy to thousands of marginalised and disadvantaged Victorians and community organisations each year. We do this by matching individuals and organisations that are otherwise unable to access legal advice to lawyers willing to act on a pro bono basis. Through our casework we are also able to identify structural and systemic access to justice and public interest issues which inform our law reform and policy activities [22].’

PILCH and its associated state entities, PILCH NSW, QPILCH [23], Justice Net SA [24], ACT Pro Bono Clearing House [25], WA Law Access Pro Bono Scheme [26] provide clearing houses that link those that need legal advice to appropriate lawyers. These organisations are funded in different ways, largely through their members, Federal, State and Territory Attorney-General’s Departments and other interest groups.

The engineering industry does not have analogous supporting infrastructure, with organisations such as ADB, CAT and EWB providing small-scale responses. Just as PILCH has expanded to provide varying services to differing clients, an analogous engineering oriented ‘clearing house’ could also play a role in offering education services, such as training for working with communities, partnership brokering or acting as an initiator, enabler and facilitator of these activities.

'A language that engineering firms understood.'

7. Agreements

Developing and signing a partnership agreement early in a pro bono engineering relationship is essential for all parties involved to ensure their motivations for being involved in the partnership are clearly communicated. There is also a balance to be met in providing certainty for both parties, yet being something that is easily understood and not intimidating to community groups. It is important to ensure that the community is able to seek advice when negotiating or responding to such agreements, as there is likely to be a different level of comprehension of the subtleties when compared to large, corporate clients.

When asked if the company signed a contract, memorandum of understanding or form of agreement with a community partner in preparation for a pro bono engineering activity, there was a wide range of variation in participant responses, including:

- A pro bono engineering tender
- No agreement
- A standard short form contract (i.e. business as usual)
- A simplified, short agreement formulated for ease of understanding
- An agreement with the main aim of outlining the scope of the project to align expectations and create a ceremonial aspect to the start of the relationship.

Pro bono engineering tender - Community organisation driven proposal

Some communities, acting by themselves or through third party organisations such as the Centre for Appropriate Technology and Engineers Without Borders, may formulate a request for pro bono tender detailing the project scope, requirements and responsibilities. Hamish Banks, Structural Engineer, Arup, described this as '... a language that engineering firms understood.'

No agreement

A number of small companies, those with strong personal associations to the community organisation or very short pro bono engineering activities, did not undertake agreements for such activities. In the short term, these companies found this to be an easy and fast way to participate in pro bono engineering activities. However, in the long term, not having an agreement carries additional risk with respondents noting examples of: i) misaligned expectations (as there were no negotiations to understand the community's goals), ii) scope creep (both in type of work and length of project), and iii) a reliance on key individuals to continually manage what might be an evolving relationship.



Short form, business as usual, contract

Companies dealing with short term or small pro bono engineering projects may simply use a short-form, business as usual, contract of works. From a company perspective, this was found to be a time-efficient and comfortable way of participating in pro bono engineering activities. However, for long-term partnering involving sustainable relationships, this was not a preferred option.

Partnering Agreement

Partnering agreements can take many forms, however, they should provide a structure to the partnership, be co-created by all parties, assist with managing expectations and ensure that the partnership is a 'good fit' [27]. Respondents identified advantages of taking adequate time to negotiate partnering agreements including:

- Increased certainty that comes with a well-understood scope and timeline for its achievement
 - It was noted by respondents that such discussions may illuminate areas of the project that require further planning approvals than first thought, or that the community may not have realised would require months to process
- The company is able to pinpoint areas of the project in which they are more knowledgeable
 - For instance, discussions around a multi-party-partnership, led to the formation of a 'roadmap' for a project that included project management, planning, design and construction, with different companies providing input into the sections of the roadmap they were more skilled to participate in

- Discussion of mutual benefits is possible
 - One pro bono engineering activity illustrated consideration on both sides of the agreement, with the company providing engineering skills and the community providing cultural exchange to employees who are inexperienced in community development
- The ability to determine the exit strategy at the project planning stage, the exit strategy being an: 'established enduring legacy.'

For a helpful toolkit on formulating a partnering agreement, see the Australian Government's Department of Families, Housing, Community Services and Indigenous Affairs, 'Partnership Tools,'⁶ which includes seven tools that range from: ensuring an organisation is ready to partner, agreements, communication management techniques, evaluation processes and exit strategies.

Overall, agreements between engineering companies and community organisations will not conform to a one-size-fits all standard. Just as differing engineering disciplines and activities require different contractual formulations; pro bono engineering activities vary on a similar scale and are additionally imbued with different motivations depending on the parties involved and reason for partnering. As with all engineering agreements, in many instances it will be advisable to seek legal advice on the potential liabilities that may arise.

6. Available at http://www.facs.gov.au/sa/communities/pubs/Community/tools_final/Pages/default.aspx.

‘We need steps to understand how we can do that without opening ourselves up to greater risk.’

8. Risk Management

8.1 Forms of Risk

The types of risk identified by respondents as the most concerning in relation to pro bono engineering were:

- Legal
- Commercial
- OH&S
- Reputational
- Moral and ethical.

8.2 Approaching and Minimising Risk

The size of a company and the services it offers were found to be a factor in the management of risk. Risk involved with pro bono engineering activities is an area that many companies responded to with uncertainty. Company approaches are summarised in Table 1.

Table 1: Respondent Perspectives of Risk Management

Respondent Perspectives of Risk Management	Additional factors
Business as usual, just like any other client.	Some respondents utilised a ‘quality management system’ as part of their business as usual approach to risk management in projects.
Partnering with companies more experienced in such work who would bear the risk.	
Limiting activities to those that carried minimal or measured risk.	For instance, technical advice or conceptual design.
Formulating pro bono engineering ‘established rules of engagement.’	Formulating a framework to assess the risk against the costs and benefits. Assess risk on a project by project basis.
Assess risk on an ongoing basis as the relationship around a pro bono engineering activity evolves, and communicate closely with the community partner regarding the management of risks.	One reported a management systems team which is included in the project initiation phase of the pro bono engineering activity and their time is allocated in the project’s pro bono budget.
View pro bono engineering activities as involving additional risks when compared to business as usual.	Further risk management may be required due to remote project locations, security, health risks and measures to protect the community.
Little thought as to risks of the particular pro bono engineering activity.	

A traditional engineering approach to analysing costs against benefits is predicated on the benefit of revenue. An alternative approach is to quantify benefits in the form of:

- Impact to the community
- Project specific outcomes
 - Community organisation determined level of impact on the capacity of the organisation
- Creating a workplace of choice
 - Employee surveys
 - Employee retention and recruitment statistics
- Employee benefits and development
- One company just beginning to develop their pro bono engineering program, stated an intention to track hours in the same way as a commercial project, except to ‘show that there was value achieved socially and environmentally.’

'If an engineering company is going in to a project ... their responsibility from a safety perspective really needs to be clarified from the start.'

Nick Macdonald, Mechanical Engineer, Aurecon

8.3 Insurances for Pro Bono Engineering Activities

Of the companies interviewed, many noted that their existing business insurance covered services utilised in pro bono engineering activities, just: 'like any other client.' Exceptions to this were travelling to remote areas or services that were not a business norm.

It is important for the company and the community organisation to ensure that corporate volunteers are covered under relevant insurances. Examples of those insurances include, but are not limited to:

- Personal accident insurance
- Public liability insurance
- Professional indemnity insurance
- Workers compensation insurance.

Insurance requirements vary from State to State and advice appropriate to your jurisdiction is recommended. Whether an employee is acting 'within the course of employment' and under the company's insurance or as a volunteer of a community organisation and under their insurances is often unclear. In many instances of pro bono engineering-specific projects, it is foreseen that employees will be acting within the course of employment, however, advice regarding the appropriate categorisation should be sought.

For a very good outline of this issue in corporate volunteering programs, see Volunteering Australia's 'Insurance and Risk Management for Corporate Volunteers,'⁷ which identifies applicable risk categories and suggests risk minimisation strategies. For community organisations, 'Our Community' has a broad range of insurance tools.⁸

However, one respondent noted that insurance is the last resort when dealing with risk. They argued that if you require an insurance payout something has already gone wrong.

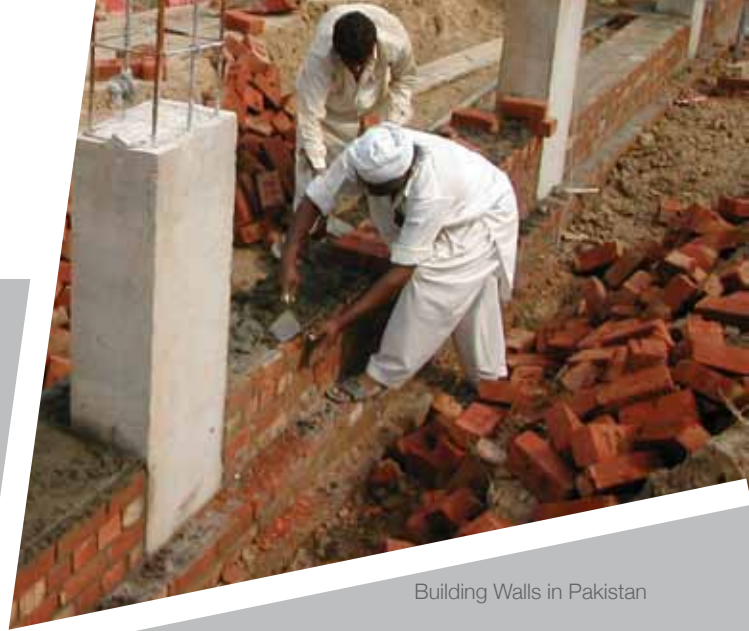
7. Available at <http://www.volunteeringaustralia.org>.

8. Accessible at: <http://www.ourcommunity.com.au/Insurance>.

Risk Management in Practice:

'The community had access to a partly-built and very remote construction site after hours, with a lack of cost effective lock up options. The company, who had taken on site oversight responsibilities were able to make sure the community members understood the dangers that such sites represented and that what occurred after hours would not be the responsibility of the company.'

Case Study: Australian Engineers Working Abroad



Building Walls in Pakistan

Zor Engineers in Pakistan

With two major floods in two years, there have been several million people displaced in Pakistan. In this environment, Zor Engineers have helped aid agencies in training people and assisting in the reconstruction of homes and community buildings.

Zor Engineers is a small/medium engineering company in Pakistan. An Australian Engineer, Peter Thew, is the Technical Director of Zor. The company deals with every stage of the construction process and mostly constructs community buildings, such as schools and hospitals. Since the early days of the company in 1968, they have trained many Pakistani engineers. Zor is now renowned for their technical excellence and integrity.

Zor's recent work has included training contractors to build houses and assisting students from a university that had raised funds to rebuild flood damaged houses. They also designed and constructed emergency toilets for camps for displaced people. They provide on the ground help and local expertise to foreign NGOs and aid agencies.

To cover the contractual parts of the pro-bono work, official MOU agreements are established with their counterparts, setting out responsibilities and the monitoring of money involved. The company insurance covers any work done by their employees, however, any other members of the community that happen to be working on the projects are generally not covered by Zor's insurance, although this is rarely a major issue in Pakistan. Pro bono work is treated like other projects in terms of logging of employee hours and accounting for the costs involved. This engineering input is either charged to the client at a discounted rate, or in some circumstances the office time is performed at no cost and the on-site hours at a reduced rate.

The pro-bono and aid related work has had a positive effect both for the company and the clients. For the company, it has had a major impact in raising staff morale, for both staff directly involved and others in the office, in the face of the recent disasters witnessed in Pakistan. In the community, their pro-bono projects have been beneficial both in providing homes and training local people.

Peter Thew gained his Engineering Degree at the University of Technology, Sydney in 1999. Zor's website is www.zor.com.pk.



'... people have just gone in and built something, but it wasn't what the community needed and they don't use it. It's an understanding that it's really what the community wants and that takes time.'

Trevor Sharrock, Associate, Aurecon

9. Project Management - within Pro Bono Partnerships

9.1 Commercial vs Pro Bono Projects

There are many differences between commercial and pro bono engineering activities, besides the obvious absence of fee. Rather than an approach that focuses primarily on the profitability and satisfaction of clients, pro bono engineering participants are encouraged to address the following questions for each new activity:

- Is the project management team focused on building the capacity of the community partner organisation?
- How people-centred, context orientated and culturally appropriate is the proposed design?
- To what extent is the project environmentally sustainable, socially responsible and economically viable?

Engineers Without Borders Australia (EWB) uses a '4C approach' to its activities in development, which includes, the need to be conscious and concerned, and the ability to comprehend and to be challenged [28]. EWB's work embodies both a strength and rights based approach to community development incorporating the following values: community, sustainability, quality and respect in our governance, operations, relationships and culture [28].

The Australian Council for International Development (ACFID) publishes a code of conduct that may also inform engineering companies as to standards surrounding: 'organisational integrity, governance, communication with the public, finances and personnel and management practice [29].'

The different focus of pro bono engineering work is described by Trevor Sharrock, Associate, Aurecon, who says:

'There is a lot of history of projects all around the world where people have just gone in and built something, but it wasn't what the community needed and they don't use it. It's an understanding that it's really what the community wants and that takes time.'

This can be contrasted to a more traditional engineering approach toward pro bono engineering demonstrated by one respondent:

'Helping the [community organisation] to successfully deliver something which meets their needs ... We'll still be there doing the management and making sure that this thing does stay on track, that the third parties involved do their work on schedule and on budget and basically, get the goods to the [community organisation] when they've promised them to.'

9.2 Managing Expectations

Managing the expectations of all parties involved in pro bono engineering activities was found to be a significant issue. Many reported frustration with community organisations changing scope, timelines or having difficulties communicating in remote areas. Others noted difficulties within their own team management of pro bono engineering activities. For instance, one described a Project Manager's lack of commitment to a project and throwing it back to another manager, requiring a change of key personnel, with a confused reaction from the community organisation who began to question the commitment of the company for the project.

Project Management -

within Pro Bono Partnerships, Continued ...

Managing the expectation of the community was also in the thoughts of those who communicated regularly with the community organisation, with one respondent explaining:

‘Everybody has in their own head what they would like to achieve, but that’s not always verbally communicated ... so part of the challenge of that is just making sure you get expectations at the right level.’

Nick Macdonald, Mechanical Engineer, Aurecon, was a Project Manager for a pro bono project where a commitment to a partnership with a community organisation was made. Upon beginning the project, further local, state and federal approvals were required, adding a considerable amount of scope and time to the project. He noted that if they had prior knowledge of the required planning procedures, then they would have been able to communicate that to the community organisation and both parties would have had a, ‘... better expectation of what is going to be delivered and when.’

The expectations of companies within a multi-party partnership can also be difficult to manage, with one respondent explaining:

‘Scope changing hasn’t really been an issue, it has been more enthusiasm and momentum that is gained and lost and gained and lost and some things I think have taken longer than some of the partners would have expected, or would have liked, and so managing expectations has probably been the biggest challenge, not so much changing scope.’

Delays

When comparing pro bono engineering activities to commercial projects, respondents identified the potential for delays in pro bono engineering as the most significant discriminator. Two respondents explained:

‘Don’t expect things to go quickly. A lot of these projects can drag out for a long time. In fact, don’t expect instant results ... You’ve got to be so committed to it for a reasonable length of time.’

‘Normally it’s a rush to get it finished, the client wants it straight away, whereas these, you have to have a very long term view of the project, or an understanding that it’s going to be a long term thing, a long term engagement, and that it’s not really about any one single project, its more about building a relationship.’

When embarking on a pro bono engineering activity, contingency and flexibility should be built into timeframes, as there are often delays – contributed by the community organisation (who often have limited resources themselves) or company (whose employees may de-prioritise such projects), as well as unforeseen circumstances (such as unexpected weather events).

Experiences recounted in the research demonstrate the importance of: taking the time to build relationships and becoming clear about the expectations of both parties to the pro bono engineering activities.

9.3 Project Team

Many respondents discussed the importance of senior management support in driving pro bono activities:

- ‘It all depends who you’ve got locally at the senior level that’s actually prepared to get engaged with it and if you don’t have that, it doesn’t happen.’
- ‘Some people like to see them and some people don’t ... it depends on the personal viewpoint of where they sit on helping out communities and ... seeing the company dollars spent that way or not.’
- This is then complicated by ‘... a leadership that will generally sign onto the fact that they can do the work, but they won’t sign onto the ownership of the project.’
- However, this can be offset by a, ‘... good core team of people who have a real interest in the project, [encompassing a], personal and professional interest in [both] community development and technical aspects of the project,’ which enables a team to spread the workload and ‘support each other.’

'Our main goal really is to deliver what the community wants or needs ... and if that scope changes then we'll do our best to accommodate it.'

Colin Duggan, Mechanical Engineer, GHD

'If you put your second best into your pro bono, well you're not really fair dinkum are you?'

Bill Lawson, Group Manager, Corporate Social Responsibility, SKM

The importance of passion in such projects was repeatedly mentioned by respondents and seems to be a required ingredient for successful pro bono engineering activities.

A key success reported was the learning and development aspects for the team involved, especially when placing an individual in a more experienced role of Project Manager. One team involved graduates in a conceptual design pro bono engineering activity as it was a, '... good sort of lateral thinking exercise. It's not something you need a lot of experience in, you just need to have a practical bent to propose different solutions, to study them and to rank them and to decide what may be possible.' Other projects may involve only one individual, such as the Twinning program that George Ruta, Manager, Water Quality, City West Water, is involved in, where seniority and experience results in a very knowledgeable mentor.

Senior level support of pro bono engineering activities is a key facet to their success, however, so is the team involved. With the right mix of learning opportunities available to less experienced employees, the benefits of pro bono engineering activities can have a ripple like effect on all involved.

9.4 Employee Time on Pro Bono Engineering Activities

There was variation in the responses relating to whether employee hours were quantified using 'billing systems,' 'project codes' or not tracked at all. Factors influencing this included the size and type of company, as well as whether its pro bono engineering program was structured or ad-hoc.

Structured

A significant number of large consultancies provided project codes for pro bono projects allowing employees to 'bill' time to such codes.

This enables companies to track hours against an allocated 'budget,' so that a rate of 'overspending' on one project can be monitored without impacting on other pro bono engineering activities included in the budget. Respondents' reflections on structured employee time included:

- A number of companies allowed employees to bill only a proportion of their time to such a code, with one respondent manager noting, 'If they are fully funded projects as well, it takes a bit away from what you're trying to encourage, which is about the giving component.'
- The research found a wide range of estimated pro bono to volunteer hours, from 1:0, 1:1, to 1:3 ratio, with some of these set by the company and others a result of an under-budgeted or delayed pro bono engineering activities.
- Some reported that because of a limited number of 'billed' hours, the hours spent on the pro bono engineering activities outside of this weren't accurately recorded; the danger being that a growing proportion of unpaid hours means that the project becomes less 'pro bono' and more an individual volunteering their unpaid time. These volunteer hours were also noted 'to be done outside of working hours,' fitting around external commitments, which contributed to delays encountered by pro bono engineering activities.
- Companies who don't 'bill' employee hours, but still have structured pro bono engineering programs, demonstrated a flexible approach. For instance, Origin Energy, who publicly report their volunteering hours, and support employees to 'take fully paid volunteering leave as convenient and appropriate to the employee and their manager [30].'

Case Study: Narbethong Community Hall



Devastation after Black Saturday

Rebuilding the heart of a community

Saturday, 7 February 2009, was a bleak day as fires destroyed property and lives in Victoria. Referred to as Black Saturday, the fires claimed 173 lives and devastated over 2,000 homes and 3,500 structures. It is a day that has changed the lives of many in our community for ever.

Narbethong in central Victoria was one of the worst hit communities. In 1939, the town was substantially damaged in the Black Friday fires; seventy years later, Black Saturday ravaged the community. At the heart of this timber-industry town was the community hall which was burnt to the ground.

The local community sought assistance to rebuild their hall through Emergency Architects Australia (EAA). EAA rebuilds communities after natural or man-made disasters. The organisation works closely with local communities to understand their needs before construction begins. Its core values and mission are aligned to Arup's commitment to charitable and humanitarian causes.

Working Together For Bush Fire Recovery - Arup and BVN Architecture responded to EAA's call for engineering assistance and offered their design skills pro bono for a new building designed along more sustainable lines.

For Arup, the project presented an opportunity to be directly involved in the bush fire recovery process and make a meaningful contribution to the recovery. In replacing the former weatherboard and timber-framed hall, the aim was to create a simple and transparent structure that reflected the timber industry of the town of Narbethong. More importantly, it had to fulfil its main purpose – a centre for the community's social, sporting and town activities.

Key collaborators: BVN Architecture, BSGM, Rodney Vapp & Associates, Contour Planning, Rodney Aujard & Associates, Douglas Partners Pty Ltd, Fitzgerald Frisbee Landscape Architecture.

The new hall was designed as a multi-purpose space to accommodate a broader range of groups and activities. As part of the recovery process, the community was engaged in the design, consultation and development of the project.

Building Sustainably - Supporting BVN & Arup's focus on sustainability, the construction employed best practice ESD principles providing a building adapted to the climate and environmental conditions of the site. The designers paid particular attention to the provision of effecting heating and cooling systems, water supply and waste services. They also used materials that satisfied best practice ESD objectives.

During the design process Arup provided structural and civil engineering, MEP, fire engineering, acoustic, façade services and project management. During the construction phase Arup continued to provide technical design service, while our project management role expanded to act in a supporting role to the Hall Committee, who had elected to directly manage the construction process.

A Rewarding Rebuild - Arup's Peter Bowtell summed up our philosophy, 'One of the many things that makes Arup shine is our commitment to humanitarian causes and the pro bono work our team are doing at Narbethong is a vivid example of this ethos. Through this commitment, over 30 staff have generously donated many hours of their own time and yet continue to be willing to give even more. Our bond with the local Hall Committee has become incredibly strong and we feel the reward for our efforts returned through friendships that will last for years into the future.'

ARUP

Project Management - within Pro Bono Partnerships, Continued ...

Ad-hoc or small-scale opportunities

Companies yet to implement structured pro bono engineering programs were generally found not to account for hours, with descriptions such as, 'it was always a bit of a guesstimate.' Another company did not monitor hours spent on projects, with an expectation that the employee will fit project involvement into their current workload, even if it meant the employee felt that they had to, '... work extra efficiently.'

9.4.1 Utilised Hours

Companies who categorise billed hours into utilised, or revenue earning, as compared to non-utilised, or non-revenue earning and assess employee performance against these measures should be careful when assigning pro bono engineering activities a 'non-utilised' status. Many respondents claimed that this led to projects becoming 'de-prioritised' and was a, '... barrier to [employees] getting involved,' as they are in effect, '... penalised for working on these pro bono projects.'

Therefore, a high level company directive to conduct pro bono engineering activities may be thwarted, to an extent, by the classification of non-utilised hours. One respondent commented, 'Even though there's support from the company at a high level to do this, at a team or group level there may be less support because ... it affects utilisation.'

9.4.2 De-prioritisation

Respondents from many companies felt that pro bono engineering activities were 'less of a priority' or 'to be completed when the rest of my work is done.' At an employee level, this can be due to the classification of pro bono engineering as non-utilised hours, but even for those projects classed as utilised, respondents still reported feeling tension between balancing pro bono engineering activities and commercial projects.

The de-prioritisation of projects in this way contributes to the perception of pro bono engineering as projects that 'drag on a while,' with employees feeling more immediate pressure to complete commercial projects that have strict, or monetarily tied, deadlines compared to working on pro bono engineering activities 'when they can get to it.'

Another described it as a difficulty to 'deliver on time and treat them exactly as any other client even though we're sort of engaged in a different way.' One respondent noted that a, '... situation where the Project Manager is doing this work in his lunchtimes, which, again, is not indicative of the company really giving this project the priority it should get.'

De-prioritisation of pro bono engineering activities presents a challenge for management to monitor, especially when the effects multiply with the delays often experienced by pro bono engineering activities. For those who consider that pro bono engineering activities should be taken as seriously as commercial projects, consideration should be paid to the internal commitment of employees to the pro bono engineering activities, as well as their managers, that may impede on this time.

9.4.3 Burn-out

Companies and Managers must also be aware of the workload management of employees involved in pro bono engineering activities, especially when employees feel they are responsible to a community for particular outcomes and have a tight company allocated budget. The dangers of 'burnout' or 'volunteer fatigue' were raised by Peter Bowtell, Principal, Buildings Practice Leader - Australasia Leader of Arup's Community Partnering Program - Arup Australasia, who has seen employees, 'feel like they are committed and they're stuck in the process and they don't want to let anyone down.'

10. Evaluation

Like any engineering project, monitoring, review, evaluation and capturing lessons learnt is an integral part of working towards best practice. Pro bono engineering is a relatively new and uncommon occurrence for many companies, so it is especially important that companies reflect on the benefits and challenges experienced.

10.1 Measures for Success

Research respondents were asked: 'what defines completion or success of a conventional commercial project and is this different to a pro bono engineering project or partnership?' Their responses differed widely, and are summarised in Table 2.

A respondent from one of the more structured pro bono engineering programs noted that it was important to:

'... know where you're coming from, know what you're trying to seek to deliver and why, know what outcomes you want and how you will measure success.'

Methods of evaluating projects as explained by respondents included:

- Surveys completed by clients and employees regarding performance and satisfaction
- Identifying clear goals, expectations and a timeline at the outset
- Examining the number of employees that take up pro bono engineering activities.

The methods of evaluation found correlate with existing literature, such as a 2008 study, which showed companies generally measure success with a focus on, 'internal performance benchmarks rather than using external performance measures [31].' Such measures exclude community organisation oriented outcomes and focus on aspects, such as 'employee participation rates and public awareness of the program [31].'

Table 2: Measures for Success of a Commercial or Pro Bono Project

The Same or Different	Commercial Success or Completion	Pro Bono Success or Completion
Same	On time, on budget, right safety and OH&S satisfaction	
Same	Completion: Deliver scope of works commissioned Success: positive client feedback	
Same	Client satisfaction	
Different	Make money – Not lose money Repeat, unbid work	Doing good, putting back into the community
Different	One person trying to earn money One person trying to get an outcome at a reasonable cost	Relationships of strong bonds and friendship Tangible outcomes
Different	Client pays invoice Client happy with result	Have a model by which a set of social, environmental metrics appropriate can be measured
Different	Meet client expectations Good outcome for client Profitability Efficient delivery of the project	Efficient delivery Self-sustainable outcomes Determine 'success criteria around the nature of the project and achieving what is meaningful and...leaving a successful legacy'
Different focus	'Clients, people, performance'	'Service to our clients - community partners. Development of our people. Social or environmental performance or outcomes, rather than commercial.'

The evaluation of pro bono engineering activities should directly tie into the overall CSR strategy of the company. Further, evaluation should be formulated around the mutually agreed strategic aims of the pro bono activity that were incorporated into the partnering agreement. In this way, project performance can be assessed against initial goals, quantified and included in the 'benefit' side of the cost versus benefit comparison often examined when calculating risk.

10.2 Other Evaluation Techniques

Overall, the findings showed that there is a lack of consistent 'measures for success' for company involvement with community focused projects, with respondents quite experienced in working with communities reporting a lack of knowledge of such a framework, or whether this is appropriate. There is a gap for further research, but this remains an area that can be formulated by both parties at the outset of a partnership and in so doing, will be tailored to the relationship.

Some external evaluative techniques and literature that may be considered include:⁹

- The Social Return on Investment – www.thesroinetwork.org
- Indicators for Sustainable Development: Theory, Method, Applications [32]
- UNDP's Handbook on Planning, Monitoring and Evaluating for Development Results [33]
- Reporting in accordance with the Global Reporting Initiative – www.globalreporting.org
- Or simply looking for areas of 'most significant change' and considering the indirect and direct impacts the project has had on the community, employees and the company.

10.3 Lessons Learnt

Companies that carried out pro bono engineering activities on an ad-hoc basis were found to undertake minimal and random sharing of 'lessons learnt' and outcomes from pro bono engineering evaluation when compared to large companies with structured pro bono engineering programs. Despite this, those that reported capturing

information and sharing it internally noted that they were looking for better approaches.

The difficulty of capturing lessons was illustrated by one respondent of a large company without a structured pro bono engineering program, who said, 'You don't know what you don't know' after discovering a number of successful regional giving and community support programs. They further commented, 'It's not exactly transparent to us what's going on.'

A roadmap to guide employees taking on pro bono engineering activities within a company would be helpful. A respondent felt that it would be good to know, 'what the vital points were, [to be] point[ed] in the right direction [and] things to look out for.' The balance between creating roadmaps and not making reporting onerous also needs consideration. Summaries of project history were largely found to disappear, 'They're lost in terms of corporate memory,' so there is a move to continually improve the methods of communicating lessons learnt.

Those companies who have a history of participating in pro bono engineering activities for a number of years mentioned various lessons learnt that are now taken into consideration. Several of these included:

- Taking the time to develop a relationship with a community organisation to ensure expectations are mutually defined and understood including co-creating a partnering agreement early on
- Learning to identify a large goal but aim for achievable outcomes along the way
- Celebrating small wins during the partnership
- Establishing the receptiveness and capacity of different offices within a company to conduct pro bono engineering or varying commitment to suit such offices or community organisations
- Celebration and sharing of success to fellow employees and the industry
- Capturing and sharing best practice through guidelines for others, for instance, the 'Twinning Guidelines' published by the Asian Development Bank [15].

9. Such inclusions are provided for reference only, this report does not recommend or give any warranty to their approach or efficacy.

Case Study: Something Concrete

Building Houses and making Jobs in the East Kimberley.

Through collaboration with local indigenous NGO Wunan Foundation, Beacon Foundation's, 'Something Concrete' aimed to reduce youth unemployment whilst dealing with the housing crisis in indigenous Australia. While the East Kimberley region experiences prosperity from tourism, mining and the Ord River Scheme, many Indigenous families live in overcrowded conditions and are supported by welfare payments. Traditionally, housing has been provided on a turnkey basis by Governments without much opportunity for participation in its design or construction. Using a more sustainable approach based on Beacon's proven 'Real Jobs' template, the 'Something Concrete' project provided 12 month trainee positions to local young Aboriginal people, leading to ongoing positions in the East Kimberley after this period.

The project was supported by the Shire of Wyndham and East Kimberley (SWEK), Holcim, Sinclair Knight Merz, Lotterywest, WA Department Housing and Works, Komatsu, Argyle Diamond Mines, Pilbara Iron and many local small businesses in Kununurra.

The houses were constructed using precast concrete as most of the material and labour can be sourced locally. The simple construction process of precast concrete buildings lends itself to this approach as it can be quickly learnt, whilst also providing satisfying results relatively quickly. Precast concrete is a durable and highly versatile material and is well suited to lowering high maintenance costs, which are frequently incurred in Indigenous housing using conventional building materials. Results of comfortable, durable, attractive, and most importantly affordable homes were achieved quickly.

The project has experienced trainee work/TAFE attendance rates of 95%. This level of motivation is achieved through the presence of: a very special person in the project supervisor or mentor, accommodation and a cash bonus incentive for their attendance. Beacon used its 'Real Jobs' template, which focuses on the social

dividend of providing new jobs. This template involves the establishment of a new enterprise in the community with the help of a project host (Wunan and SWEK). Heavy subsidies are utilised in the first 12 months to remove cost pressures of the training and learning phase.

In Stage 1 of the project, four three-bedroom houses were completed between 2006 and 2008. The client for one house was the Wunan Foundation and for the remaining three, the WA Department of Housing and Works (DHW). In June 2008, a small-scale factory was opened by Beacon and SWEK. In Stage 2 of the project, this factory manufactured precast concrete products for road transport in the region, including two small precast bridges in Kununurra. The factory environment created more employment opportunities and improved the cost and quality of the products over the site casting techniques used in Stage 1.

Eighteen Aboriginal youths participated in the program, breaking away from generational welfare dependence. Such is the success of the project that two new enterprises have emerged: 'Wunan Constructions' and 'Wanna Work'. Wunan Constructions assisted in the fit-out and roofing of the houses built by 'Something Concrete'. 'Wanna Work' was developed as a local labour hire enterprise when the wet season of 07-08 halted the housing construction. This aboriginal owned commercial enterprise utilises various skills sets over a wide area to complete building and maintenance works.

Other Supporters of this project include: Kimberley Group Training, MG Group, TAFE, DHW, FaCSIA, Department of Employment and Workplace Relations, Indigenous Land Corporation, Department of Education, Science and Training, Indigenous Coordination Centre, Office of Indigenous Policy Coordination, Waringarri Aboriginal Corporation, East Kimberley Job Pathways, Argyle Diamonds, Department of Indigenous Affairs, Aboriginal Lands Trust, Department of Industry and Resources, Department of Justice, JSW, Kimberley Industries, Kimberley Green, Ord River Electric, Kimberley Steel, Argyle Motors, East Kimberley Hardware, Tuckerbox Retravision, East Kimberley CDEP, Cockatoo Springs community, Thamarrurr Regional Council.



‘Celebrate your successes, no matter how small, because sometimes something that seems quite small is actually a really significant step forward.’

Claire Dixon, Senior Water Engineer, GHD

11. Celebrating Success

11.1 Internal

A number of respondent companies, who look to employees for input into CSR and pro bono engineering strategies, surveyed their employees in relation to their interest in the company's community involvement. Responses challenged them to improve internal communication. Such companies are exploring options for developing internal and external communication mechanisms through: social media, blog sites and company websites.

Ingraining pro bono engineering in the way in which companies do business through: i) incorporating it into CSR frameworks, ii) providing a budget for pro bono engineering activities, and iii) senior champions vocalising the success of activities, all help to create a culture where pro bono engineering activities are valued, fostered and celebrated.

Company respondents described internal celebration of pro bono engineering in various ways:

- ‘A weekly update about what was happening during the build ... so the staff can see that the company is doing things in that CSR space.’
- ‘We want our staff to know what we’re doing and why we’re doing it.’
- ‘The power of internal secrets.’
- ‘The real engagement of ideas will come from our staff and therefore the champions who ... will rub off on others who then, around the fringes, will want to get involved.’
- ‘Document what you do ... there are actual reports written because engineers like to see real outcomes.’
- ‘Letting news spread organically [rather] than strategically.’
- ‘... we acknowledge the successes and our people who are involved are recognised for that success.’

Employee Presentations

Employee presentations were overwhelmingly seen as a key way of communicating the company's involvement in pro bono engineering activities with high attendance and interest shown from other employees. Inviting the community organisation to attend internal presentations was another method employed by a respondent to celebrate the progress of pro bono engineering activities, ‘... so [other employees] know it's real and they can feel the link.’

11.2 External

When comparing the pro bono activities of engineering companies to other industries, for instance, the widely publicised legal industries commitment to pro bono activity [21], or even a growing movement in the architecture industry [6], it is comparably difficult to find evidence that engineering companies are conducting pro bono engineering activities. Few describe and report on their pro bono engineering activity (although the growth in this space in the last two years is notable) and there is no central collection of statistics surrounding pro bono engineering.

The line between celebrating pro bono engineering activities and taking undue advantage of marketing opportunities that pro bono engineering presents is one that many respondents were aware of:

- ‘We’re not interested in saying what a great mob we are and we’ve let many opportunities go past where we could have, for that reason because we think it's inappropriate ... we only want to inspire and motivate, not brag. We’ve got to pick the line.’
- ‘This is not about building the brand through that sort of thing, it's actually about engagement and giving and being socially aware.’

Case Study: Twinning

City West Water:

Sharing Knowledge with Water Companies Around the World.

Metro Cebu Water District, Philippines

City West Water was invited to take part in a partnership program to help the Philippines improve their water infrastructure.

Funded by the Asian Development Bank, our involvement started in June 2008, with a visit to the Metro Cebu Water District (MCWD), a government-owned water company in the heart of the Philippines.

We work with MCWD in a pilot area of their water supply system to reduce unaccounted-for water from 30% to 15%. We have conducted training and information sessions with MCWD employees.

Members of the MCWD team have also visited City West Water to gain a thorough understanding of our systems and the way we manage our assets.

Zhengzhou Water, China, Twinning Project established in April 2010

City West Water is working with Zhengzhou Water on:

- KPI development
- maintenance data collection
- asset information verification
- leak detection
- preventative maintenance.

Work done to date will assist Zhengzhou Water develop a condition monitoring program for their water pipes and prioritise them for renewal.

EDA RANU Water, Papua New Guinea

Sharing knowledge about water quality with people in Papua New Guinea

In September 2010, City West Water employees attended the third annual Pacific Water and Wastes Association conference and water quality workshop in Port Moresby to talk about:

- 'Managing Water Quality in the Field' and 'Experiences of an Expert Australian Twin'
- 'Managing Water Quality in the Office'

We also conducted a water quality workshop based on City West Water's water quality training course, which addresses: water chemistry, microbiology, biology, limnology, monitoring program design, water treatment, water quality complaints, HACCP, risk management and regulatory issues.

This Twinning project was formalised in November 2010, with our Water Quality Specialist spending a week working with EDA RANU laboratory staff.

In February 2011, EDA RANU staff visited City West Water to continue work on the documentation, equipment needs, and to also observe and take part in water laboratory testing operations in Melbourne.



Celebrating Success, Continued ...

- 'It's an important brand thing that we do that, and without overplaying it ... we don't fund it as a marketing strategy, but we understand the importance of linking it to our brand.'
- 'I mean, we're not getting any revenue out of it, we may as well get some positive benefit.'

In celebrating success externally, it is important to have appropriate approvals from the community organisation. Many respondents noted the communications clauses within their agreements and one told of a journalist's mistake that damaged the relationship with the community organisation. An additional reason to have clear communications expectations is to agree upon the recognition that the company would like to receive from the community organisation itself. One respondent noted, 'We re-did the design three times before withdrawing and received no credit for the work we had done.'

11.2.1 Sharing Stories

Many respondents noted the use of presentations to industry related events in order to share and celebrate the success of pro bono engineering activities. Matthew Giesemann, General Manager of Engineering at City West Water has conducted many presentations and published papers to encourage other water utilities to become involved in the pro bono engineering practice of Twinning. His motivation was described as a, 'Responsibility to contribute to our customers as well as share what we have learned with others who do not have access to the benefits we enjoy.'

A proportion of respondents have pro bono engineering 'stories' exhibited on their website, with an excerpt and associated images from communities involved. Alluvium uses a 'blog site' that is available upon subscription and is publicised to commercial clients.

Arup has created a separate website to celebrate their involvement in community programs with Peter Bowtell, the Australasian Community Partnering Board Representative of Arup stating on the site:

'This site is dedicated to sharing the experiences of our community partnering programme. I hope it will enable others to see that everyone can make a difference in whatever way they choose to contribute, be it through money, time or sharing of their professional experience in a way that benefits others.'

I hope this site helps others to imagine how they too can mobilise their resources and actively engage with the community. If the sharing of our experiences helps others in some small way, then it will have been successful [34].'

11.2.2 Reporting Pro Bono Engineering

Arup is a leader in publicly reporting their pro bono spend, their monitoring and tracking across the company revealing an 'equivalent staff cost' of £715,000 in the year 2008-09 which was reported in the 2010 Corporate Report [35]. Peter Bowtell, Principal, Buildings Practice Leader - Australasia, Leader of Arup's Community Partnering Program – Arup Australasia, sees a commitment to publicly reporting such figures as a way to 'drive behaviours' when reporting such figures to shareholders and stakeholders.

Origin Energy advertised their 4,963 volunteer hours in the 2010 financial year, as reported in their 2010 Sustainability Report [30]. Although at the time they did not split these numbers into skilled and unskilled categories, they have built the capability to do so moving forward. Many others publicly report on the financial sum contributed through CSR activities that may include pro bono engineering but do not single out pro bono as a reporting category. Such delineated reporting would allow further analysis of the contribution that engineering companies are making to the community, such as the reporting undertaken by the Australian Bureau of Statistics or the National Pro Bono Resource Centre [4, 36] regarding law firms.

Case Studies: Dreamfit

Assetivity Helps Realise Dreams

The Dreamfit foundation was the brainchild of Darren Lomman, who back in 2003, was a mechanical engineering student at The University of Western Australia. He was looking for a third-year engineering project when he met Shane, who had become a T6 paraplegic after a terrible motorcycle accident. Shane's dream was to be able to ride a motorcycle once again so Darren spent the next three years developing a hand controlled bike that can be used by people with paraplegia or other leg disabilities.

News of Darren's invention spread and he found that other people with disabilities were contacting him to see if he could realise their dreams. Thus, the Dreamfit Foundation was created as a non-for-profit registered charity with Darren Lomman as the CEO.

Since then, Dreamfit, along with volunteer engineering students from the University of Western Australia and Dreamfit Sponsors, have been able to work together on engineering projects that seek to overcome the challenges and frustrations that people with disabilities have to deal with in everyday life.

When Assetivity heard about the fantastic work that the Dreamfit Foundation was involved with, many of the members of staff offered up their expertise and services. After determining how Assetivity could help, it was decided that we could best be used to manage their assets. A proper store was needed to house stock, bar coding installed to control issues, an asset control system to keep assets maintained and a financial system created to manage budgets and depreciation. Assetivity donated \$15,000 to help install large compactuses in order to create a proper store and with great teamwork, some muscle and some fun, the mess is now starting to look like an engineering workshop.

Assetivity is very proud to be in a position to be able to help such a worthwhile foundation, our relationship with Dreamfit will continue for many years to come.



Darren Lomman presents Sandy Dunn with a certificate of recognition.

WGE Lends A Helping Hand

Wood & Grieve Engineers has a history of offering pro bono services on projects that benefit the community or people less fortunate. When approached by the founder of The Dreamfit Foundation, Darren Lomman, and architectural firm Hames Sharley, for engineering services support to procure and fit out a workshop known as the "Dreamplex" for Dreamfit, we were only too happy to oblige.

Consideration of previous Dreamfit projects, coupled with Darren Lomman's dreams for the future, deemed it a very worthwhile cause. WGE provided services in the disciplines of mechanical, electrical and hydraulic engineering to refurbish an unoccupied workshop building, generously donated by the University of Western Australia through a "peppercorn" lease at their Shenton Park campus. The building required a major refurbishment in order to be suitable for Dreamfit's purposes and to enable Dreamfit to increase the capacity of their community projects. Dreamfit occupies just less than 1,100m² of the 1,916m² facility.

The Dreamplex now includes administration offices, a volunteer computer laboratory, meeting rooms and project bays where the students can develop their project concepts. Space was also allocated for a future metal machining area, metal fabrication and welding area, a wood workshop, a composites area and a painting booth, which may be added when further funding and resources become available.

Extensive site investigations were required by the Wood & Grieve Engineers team to locate existing services, together with meetings with UWA's respective services personnel. Services that were designed included: an upgrade of the building's power and communications reticulation, replacement of roof stormwater systems, new hydraulic services to amenities areas and air conditioning and ventilation to the office areas.

12. Overcoming the Challenges

The findings demonstrated that engaging in pro bono activities has presented several challenges along the way. Several of these challenges are represented in Table 3 along with suggestions for ways in which to overcome these.

Table 3. Overcoming the Challenges.

Challenges	Ways to overcome these challenges
<p>‘Where do we start?’</p> <p>‘How do I find a project that needs our particular engineering assistance?’</p>	<ol style="list-style-type: none"> 1. Make your stance known to employees. Respondents indicated that a large proportion of their pro bono engineering activities were identified by employees. 2. Contact NGO’s or not-for-profits you are interested in partnering with, whether at a community level or a third party facilitator. 3. Advertise your interest on ‘Pro Bono Australia.’
<p>‘Is it worth forming an agreement?’</p>	<p>Yes. Respondents and participants in technical workshops placed great emphasis on the importance of managing expectations by taking the time to examine the aims of the relationship and the responsibilities of both parties.</p> <p>Without such agreements, a proportion of pro bono engineering activities encountered difficulties with aspects such as communications, scope creep, undue delays and unclear responsibilities.</p>
<p>‘Are they ready?’</p> <p>‘How will my employees adequately address the particular needs of the community?’</p> <p>(especially in disaster prone areas, or those with cultural sensitivities)</p>	<p>The skills required for different types of community projects are different to traditional commercial engineering skills. For example, one respondent asked, ‘Engineers wanting to volunteer in the bushfire work; who trains them about dealing with a community in grief?’</p> <p>Many volunteer organisations, such as RedR and EWB, provide mandatory pre-departure training for their volunteers and this may be an option the company could investigate. Otherwise, the training could be facilitated through a third party organisation or organised in-house.</p>
<p>Utilised time & De-prioritisation</p> <p>‘My employees are de-prioritising pro bono engineering activities.’</p> <p>Or</p> <p>‘My employer doesn’t class my participation in pro bono engineering activities as ‘utilised’ time and now my performance has slid.’</p>	<p>It is recommended that companies do not classify pro bono engineering activities as ‘non-utilised’ or ensure work on such projects is not included in assessing employee performance through utilisation. It penalises employees who participate and has a double negative when companies also expect employees to volunteer hours additional to those paid.</p> <p>Companies will have to monitor the internal culture surrounding the priority of pro bono engineering activities and be aware of the impact on schedule if these projects are de-prioritised by employees when compared to commercial projects.</p>
<p>‘How do we overcome the risks involved?’</p>	<p>Formulate a company strategy to examine and plan for pathways to overcome the risks. Ensure there are Partnering Agreements with clear expectations and responsibilities. Plan for and agree on a ‘moving on’ strategy early on that leaves an enduring legacy.</p>
<p>‘How should we internally celebrate participation?’</p>	<p>Create a community of practice within a company to share stories. Within a company, establish a structure to capture knowledge arising from pro bono engineering activities and develop a strategic internal communications process for employees to share lessons learnt with other employees.</p>

13 . A Vision for the Australian Engineering Industry

Participants in the Pro Bono Engineering Technical Workshops were asked to distil their vision for what pro bono engineering would look like in the future, some of the responses included:

- Pro bono engineering becomes part of what engineers 'do'
- There is supporting infrastructure for engaging in pro bono engineering
- The general public perceives engineering as a socially responsible profession
- Pro bono engineering drives a cultural shift and becomes self-sustaining.



14 . Recommendations for the Australian Engineering Industry

For Companies:

1. Move Towards Strategic Pro Bono Engineering

This research is a call to action for engineering companies across the country to develop strategic approaches to corporate social responsibility and to incorporate pro bono engineering activities in these strategies. It is clear that a lack of strategy has led to pro bono engineering activities occurring in an ad-hoc manner sector wide contributing to various challenges throughout the process.

As part of these strategies, companies need to start valuing the wide range of benefits of pro bono engineering activities. Whether it is measuring the impact on the community they are assisting, valuing the professional and personal development opportunities that employees experience or the reputational advantages for the company, companies should leverage value from pro bono engineering.

For example, it is recommended that companies should stop classifying pro bono engineering activities as 'non-utilised' due to not receiving direct revenue from the activity. A 'non-utilised' classification does not recognise the many benefits companies receive in participating in pro bono engineering.

2. Create Pro Bono Engineering Partnerships

A partnership between the community organisation and company is the key to a successful, long-term pro bono engineering relationship. In order to manage expectations, at the outset of the relationship, it is extremely valuable to discuss and form a well understood partnering agreement. When compared to a 'project' style approach,

a partnership involves two parties working together to address an identified need and can create pathways for mutually beneficial outcomes. Participants in Technical Workshops described the difference as looking to build the capacity of the community organisation and work yourself out of a job, rather than a self-sustaining cycle of projects. It is recommended that when initiating pro bono engineering activities, the relationship is approached and managed as a partnership.

For the Industry:

3. Educate the Industry About the Potential of Pro Bono Engineering

There is currently a dearth of understanding of the role, potential and benefits that pro bono engineering can bring to the industry and the wider community, creating a clear gap to be filled through greater education.

Engineers Australia and Engineers Without Borders are beginning to fill this gap, through the commissioning of this report, technical workshops and inclusion in the end of year Humanitarian Engineering Conference. However, this only scratches the surface, there is a need to create a space for stories to be shared, opportunities publicly celebrated (for example, through pro bono engineering awards), and greater statistics regularly compiled. The gains that have come for legal pro bono activity from the collection of detailed statistics through the ABS and National Pro Bono Resource Centre, are significant and have been facilitated by a groundswell of support and competition between firms.

Recommendations, Continued ...

4. Establish a Community of Practise

It is recommended that the engineering industry should establish a community of pro bono engineering practitioners, who are keen to share best practices on pro bono engineering. Topics of interest may include: best practice agreements, how to foster successful partnerships and how to appropriately measure outcomes of pro bono engineering activities.

Such a network could also:

- Provide leadership in the pro bono engineering sphere
- Coordinate celebratory recognition
- Set and regulate aspirational targets such as in the legal industry [37]
- Advocate to Government bodies on behalf of involved participants
- Create a community to share best practice in pro bono engineering activities
- Direct research into forthcoming areas of interest.

5. Engage Partnership Brokers

There is a need for partnership brokers (whether internal to the partnership or external to the partnership) to connect, facilitate and broker pro bono engineering partnerships. This may involve the partnership broker providing assistance throughout the relationship including, matching appropriate partners, supporting the development of the partnership agreement, managing and sustaining the partnership and undertaking monitoring and evaluation. Different partnerships would require different levels of assistance. One approach may include community organisations advertising a need and companies could advertise their interest in providing pro bono engineering assistance, through a registry based process.

6. Train Engineers

Just as RedR trains engineers in disaster-relief related skills, an independent organisation could provide assistance to engineering companies embarking on pro bono engineering activities. Currently there are limited opportunities offered, with an apparent niche for access to these opportunities.

7. Deepen Understanding of the Community Perspective

Further research is needed to address the needs of the community sector in relation to pro bono engineering. Little is known about the perceptions community organisations have about the engineering sector and their understanding of the skills and services engineers can offer. It is recommended that the engineering sector invests into future research on the community perspective to gain an all-encompassing, balanced and informed approach to pro bono engineering.

15. Implications

Engineer a Better World

The impact engineers have on our everyday life should not be understated. Engineering underpins much of what has satisfied an individual's basic needs (and community wants) and engineers have the potential to assist, empower and provide those skills to communities around the world. Some communities do not have access to safe drinking water, appropriate sanitation facilities or adequate shelter. The projects showcased in this report are examples of the way the engineering industry, engineering companies and engineers themselves can engineer a better world through the provision of pro bono engineering.

Foster a Culture of Socially Aware Engineers

Pro bono engineering fosters a sense of community between engineers and the communities they work in and provides community engagement experiences likely to challenge their understanding of working with communities. The professional development opportunities experienced by employees, while participating in pro bono engineering activities, have great impact on their personal wellbeing and, additionally, their commercial work, with socially-aware engineers creating better outcomes for communities across all areas of work.

Increase the Number of Women in Engineering

The engineering profession, traditionally and contemporarily, faces a gender disparity. In 2010, of all Engineers Australia memberships, 10.6% were female [38]. This statistic includes the proportionally higher category of students, at 15.9% [39]. In a major review of engineering

carried out by the Commonwealth Tertiary Education Commission, it was cited that, 'The engineering profession is impoverished by this failure to attract females [40].'

Literature also highlights the higher rates of women volunteering, as well as the high rate of women's involvement in the not-for-profit sector [41]. A career in engineering may become more appealing to women due to greater volunteering opportunities within engineering companies and support of not-for-profit or community organisations.

Improve the Public Perception of Engineering

The general public's knowledge of 'what an engineer does' is quite limited. A 2008 Australian Council of Engineering Deans report states, 'Engineering academics and contributors from industry and the profession all referred to the profession of engineering and the work of engineers as being invisible to the public [42].' Multiple respondents discussed the public perception of engineering. Merv Lindsay, 2011 Engineers Australia President, noted that: 'Everybody knows lawyers do pro bono, but no-one knows engineers do.'

This lack of public knowledge, combined with shortages of engineers [43], and declining university enrolments [42], presents a problem for the industry; with a clear need for further public awareness of engineering including what it is, how it can help and how an individual can become involved.

Pro bono engineering will undoubtedly provide 'good news stories' for the engineering media cycle, helping to demystify the public perception of engineering and create a positive perception of the sector.

16. Closing Statement

For many large companies, it is difficult to pinpoint when an involvement in pro bono engineering activities began. For example, a request from an employee to help a community organisation seeking drainage advice would constitute pro bono engineering, or an engineering firm that makes a choice to provide design work for a school at little or only cost price would also constitute pro bono engineering. In the past, this sort of activity has generally been isolated, irregular and ad hoc, however, there is evidence to suggest that companies are now developing more structured CSR programs, featuring pro bono engineering activities.

This report is an affirmation to those who see wins in participating in pro bono projects; wins for the individual communities assisted by pro bono engineering as well as the community at large; wins for companies in fostering a workplace of choice; wins for their employees who will grow through the myriad of experiences that pro bono engineering activities offer; even wins in terms of increasing the pool of talent that engineering attracts. By examining different approaches to structuring pro bono engineering within companies, this report is a call to action for those who are yet to become involved.

With increased awareness of pro bono engineering and greater infrastructure to identify, facilitate and support pro bono engineering activities, together, we can make it so engineers are known for pro bono work ...

Pictures in this report:

Page 4: Image courtesy of Ecoteam

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Page 12: Image courtesy of the Bana Yarralji Indigenous Ranger Base Partnership Team

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Dr. Sunny Oliver-Bennetts completed her PhD in Corporate Social Responsibility (CSR) and Branding in 2009. Her background is in cross sector partnership management between the not-for-profit, education, community and private sectors. This has involved Sunny working for one of Australia’s leading social enterprises that improves the lives of homeless and disadvantaged Australians. Currently, she is the Corporate Partnership Manager at Engineers Without Borders Australia managing eleven corporate partnerships that focus on humanitarian engineering. Sunny is an Accredited Partnership Broker through the PBAS Scheme. She is also a Co-founder and Director of not-for-profit organisation Desert2Surf that empowers indigenous youth through outdoor activities with a focus on surfing. Her research interests include: pro bono engineering, CSR, branding, cross-sector partnerships, and organisational change.

Sarah Purcell - LLB(Hons)/BE(Hons) (Chemical)

An interest in the future of pro bono engineering activities led Sarah to complete a paper in her final year of her degree, comparing the development and current state of pro bono activities within the legal and engineering industries. This report was a chance to further pursue this passion before she takes a position with a law firm in Melbourne.

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'We are well off compared to many others around the world ... we have a responsibility to contribute to the industry as a whole.'

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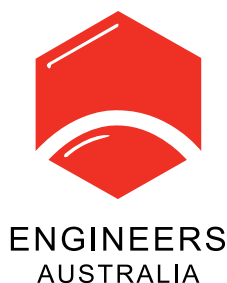
Together, we can make it so the engineering industry is known for pro bono work.

'Our organisation is trying to grow a community of contribution.'

'If the community at large do not understand what engineers do, how the heck can we expect them to realise that the potential of the engineering profession to overcome the intransigent core problems that beset the developing world, or that underpin social need.'

'Engineering is only just coming to grips with what this might be.'

'Organisations that undertake pro bono engineering are highly attractive for professional engineers to join, as a pro bono engineering program highlights a progressive, forward thinking organisation that is likely to think outside the box not only in their pro bono engineering work, but in their day-to-day engineering.'



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