# Cross-Cultural Construction Engineering with Aboriginal Communities

Kutay, Cat; Gunay, Baruk; Tobin, Chris

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# Cross-Cultural Construction Engineering with Aboriginal Communities

Cat Kutay, Burak Gunay[1], and Chris Tobin[2].
*[1]University of Technology Sydney, [2]Artistic Consultant Rude Council*
*Cat.Kutay@uts.edu.au*

## STRUCTURED ABSTRACT

### CONTEXT
Construction is an area where Aboriginal consultation have been carried out in a comprehensive process and with benefit to the community in terms of innovative designs, cultural experiences and improving sustainability in construction. We are engaging members of Aboriginal communities and engineers on their experiences with community consultations relating to sites, artefacts and construction in Sydney to support our students in understanding the complexity of these projects.

### PURPOSE
We base our research on work by Rigney (2006) who discusses Indigenist Research; Kennedy *et al.* (2016) who work in appropriate Engineering processes; Cox (2014) who analyses health, wellbeing and IT projects; and other researchers. This has provided protocols for managing engagement with Aboriginal communities, but practitioners still find it difficult to envisage what is the process or protocols to be followed in a specific practice and how they can be implemented in a real context. Also, the benefits of productive consultations are not always promoted, yet these provide a positive perspective on cross-cultural work.

### APPROACH
We are looking at case studies of how some construction projects in Sydney were managed when they impinged on Aboriginal cultural heritage. From this we extract common themes and link to this previous research. This will provide both practical examples and pragmatic steps for engagement with community. This will be expanded with an understanding of why these different protocols exist and why they are significant to the Aboriginal communities.

### RESULTS
While the projects and the communities involved in consultation are very different, we find that the issues that are important for managing consultations and collaborative projects are consistent. They relate to the fundamental cultural values of the Aboriginal peoples involved and how these are reflected in construction projects. The resulting case examples are presented in a format suitable for practical examples in teaching Aboriginal knowledge to engineering students.

### CONCLUSIONS
Expanded guidelines are developed to provide a more process-based approach to the area of Indigenous consultation and engagement in Engineering Management.

**KEYWORDS** Indigenous Engineering, Protocols of cultural engagement

# Introduction

Australia is a dynamic and multicultural population of many races and different nationalities that have come from all over the world to settle on Aboriginal land. This is reflected in the foundations of the construction industry. Aboriginal constructions were based on sustainable practice with minimal damage to the environment. When accommodating the mobility of the population, we should look to incorporate this sustainability in our practice.

As part of Environment Heritage Preservation in Australia, the State and Federal Governments have various responsibility to monitor and maintain Aboriginal Heritage sties. However, this relies on sites being listed on a database, which may not match community wishes for privacy, and monitoring of construction or other activities in their vicinity. When a construction may contravene the Aboriginal Heritage Act, it can take many months for a case to be heard so an injunction may not be achieved before damage is done to the site. Even the Aboriginal people asked for advice on the significance of a site may find it difficult to determine if the site is of significant value to warrant delaying works.

This paper investigates case studies focusing on Aboriginal Culture and Heritage in Engineering Tender and Project Implementation in the area of construction, where there is no well-known practice or guidelines for ensuring preservation of Aboriginal culture and heritage. We gathered information from sources as involved community members end engineers. We used project documents and reviewed these case studies around past experience and completed works. Two authors worked for Ryde council, providing them access to the planning process and documents not available to the general public, thus giving us insights on methodologies that can be used when constraints due to Aboriginal culture and heritage are present on-site.

This material is designed to be presented to students in the construction area as examples of the situations and issues they will face in many of their projects. The issues raised by Aboriginal communities around engineering projects is usually not dealt with by technical solutions, but by communication and problem solving. The complexity as well as known benefits of the engagement with such communities is illustrated by these examples provided in the context of NSW regulations and the Aboriginal organisations available for consultation.

# Background

There are various regulations for the perseveration of Aboriginal sites which we present here for NSW. Significant projects require the engagement of an archaeologist to monitor the construction area as material is disturbed and possible new findings uncovered. Sites or artefacts that are inappropriately treated incur financial penalties up to $275,000 and one-year's imprisonment for individuals and $1.1 million for corporations (NP&W 1974, Section 84). However, these involve court injunctions or later orders to prevent further work and can thus be too late to prevent damage. The purpose of this paper is to consider how to prevent damage being done to our heritage through actions by the engineers in design and on site.

State and Territory legislation for preservation of Aboriginal heritage places can be overridden for major significant infrastructure projects. A construction will then fall under Federal law via the Environment Protection and Biodiversity Conservation Act 1999 (EPBC, 1999). We summaries the major regulations relating to the case studies below, which were all projects in Sydney, NSW and regulations, there needs to be a set of practices and habits that can be adapted to different projects. This requires an ideological and ethical approach. We look at existing protocols in Engineering for cross-cultural work, particularly for use in educating Engineers of the future.

However, beyond rules and regulations there needs to be a set of practices and habits that can be adapted to different projects. This is where an ideological and ethical approach is needed, hence in the next section we look at existing protocols in Engineering for cross-cultural work, particularly for use in educating Engineers of the future. Also work by the Australian Heritage Commission (Ask First, n.d.) promoted through the WA Natural Resource Program provides an excellent outline of guidelines for negotiations around construction.

### Environment Protection and Biodiversity Conservation Act

The Environment Protection and Biodiversity Conservation Act 1999 manages the National Heritage List, which monitors places that have been listed, including “natural, Indigenous and historic places that are of outstanding heritage value to the nation” (EPBC 1999). Under the Act there are penalties for actions that impact or will impact on the Indigenous heritage values of a place but only if already recognised on this National Heritage List. The list is reviewed every five years and added to by Commonwealth legislation. Engineers Australia has been involved in the registering of sites such as Budj Bim in Victoria on such a list, an extensive submission process. The Minister is not obliged to act on any matter referred by a member of public and most applications arise from the person proposing the construction or activity.

### Aboriginal and Torres Strait Islander Heritage Protection Act

Aboriginal and Torres Strait Islander Heritage Protection Act 1984 Is designed to protect areas and objects and ‘allows the Environment Minister, on the application of an Aboriginal person or group of persons, to make a declaration to protect an area, object or class of objects from a threat of injury or desecration’ (ATSIHP, 2018). It is often difficult for Aboriginal people to negotiate these declaration procedures based in a non-Aboriginal legal framework, not only because of the legal format, but also the risk of exposing sensitive cultural information in the process. The documentation required is significant (Checklist, n.d.).

### National Parks and Wildlife and Environmental Planning and Assessment Act (NSW)

The NSW National Parks and Wildlife Act 1974 No 80 consolidates and amends the law on establishing, preserving and managing national parks, historic sites and certain other areas and the protection of certain fauna, native plants and Aboriginal objects. The Act is complemented by the National Parks and Wildlife Regulation (NP&W 1974), which provides for managing Aboriginal land and objects and administration by various Committees. This Act includes a public listing of significant sites. The Environmental Planning and Assessment Act covers approval for development.

## The Five Rights

The area of legal protections and penalties is complicated and frequently altered by parliament. Engineers on a works program have little contact with these matters and any intervention usually comes too late for the community. This paper looks at educating engineers to take responsibility in their work and safeguarding what is the heritage for us all it a way that can provide both financial and wellbeing benefit from construction.

The perspective by Kennedy *et al* (2016) of ‘Integrating Aboriginal Perspectives into Engineering Education’ considers Aboriginal protocols and provides criteria to address the sensitive constraints of Indigenous stakeholders, who are often affected by construction projects, giving the industry criteria and objectives as a guideline for professionals.

The ‘5 Rights’ is the concept to guide people interested in dealing with the Indigenous significance in projects They are described by Kennedy *et al*. as People, Place, Timing, Language and the Way. We explain these in the context of three case studies as a way to provide a framework to students for them to evaluate the management of any such project. These rights will be aligned with the stages of a generic engineering project in a later section of this paper.

### The Right People

This right relates to the knowledge sharing process in the community. In an oral culture there are ways to ensure that knowledge is both preserved and maintained pure, uncluttered by supposition and gossip. This protocol in Aboriginal communities relates mainly to the relationship between people and who can be told what story, and by whom.

This was highlighted in the Hindmarsh Island bridge construction saga (Bell, 1998) where many local Aboriginal women were not privy to the knowledge about the island in women's initiation and hence considered the stories to be false. The non-Aboriginal people investigating may not have understood the different relation of each group to the land and hence their different knowledges of this area. In one of the projects discussed below Chris Tobin was engaged early in the project for design work and he has connections with the land around the construction, hence has been an invaluable resource for Ryde Council.

When discussing this with students we link this to the aspect of stakeholders but highlight the increased cultural and communication difficulties in this consultation, including the cost of respectful engagement and how and engineers perspective can be very different to those in the community. This will be due to different values and understanding the limits and options within technology.

## The Right Place

There is the issue of finding a location that is not contentious for a construction, which can include redirecting paths and reducing the expanse of building. The following two case studies show how this can be managed, reducing the cost at the same time as reducing impact. The particular process of negotiation and consultation must also be considered as to its suitability for the specific context in which a construction is being done.

It is often assumed that a project that is successful in one community will work well in another. The many different languages used across Australia these reflect the different environments people lived in and their cultures, as well as the different history of occupation. Therefore, a project that works with one group will not automatically transfer to another, and the aspects we think made the project successful may not be the significant feature (Cox, 2014).

Transferal of technology between communities should allow members of the community with previous experience to meet with members of another community interested in taking up the technology. They will be most able to discuss the adoption process and the relevant issues involved. This model is used in Canada with Aki Energy (Wood, 2018). For students who have been involved in different organisations, we can draw out the differences in these environments and how they organise to help them to be aware of this issue.

## The Right Timing

The Aboriginal viewpoint incorporates a continuum or spiritual aspect, which will not fit well into any design by a materialist researcher. It is expressed as the way of knowing things from pattern matching through many past events; for example, the sight of a willie wagtail is the sign of news. This means the environment is acknowledging the individual and providing signs, forecasts and warnings, NS that there is significance in the world. We cannot ignore or belittle this perspective simply because it does not fit our knowledge system,

Timelessness as used in the Aboriginal dreaming stories is part of the method for verifying knowledge on a large-scale level, it is not experimental or world changing, but world observing and world understanding. It is a knowledge system that links more closely to the specific environmental location or system on which we depend for living, than does western scientific processes, and it holds a much greater value for human wellbeing as part of a community than our economic approach to governance. Similarly, the process of designing construction that engages Aboriginal people allows them to learn the western concepts of design and the options of any construction that are open to innovation and change. The paper by Downing (1974) provides excellent examples of different perspectives on town planning when more information on construction options is provided.

## The Right Language

The process of sharing technology also involves training in the use and creation of this technology. This means the language and the knowledge travelled with the artefact as it was traded (Pascoe, 2014). Aboriginal people talk about a story or piece of knowledge being 'in' an artefact and that a piece of the person creating a tool or story remains in that artefact.

In Australia, designers work in a language of a very foreign culture, that derived from England. Any technology developed within this framework will necessarily be more appropriate to the original culture. While cultural protocols provide cohesion in governance across different peoples who are sharing technology and knowledge, Aboriginal people are still often divided through language and cultural difference which adds to the difficulty in communication as we are not dealing with community as some unified viewpoint. We acknowledge that as designers we are entering that conflicted domain (Nakata, 2010) when we seek to develop mutual understanding.

Work in appropriate technology, for example by Healthhabitat (Pholeros, 2013; Healthhabitat, n.d.) provides an excellent example of how technology in Australia has been adapted to Aboriginal communities, and the reason for these adaptions.

### The Right Way

Finding the right mix for each project is a matter of experience. To deal with all cross-cultural work, we need to start to engage our students in this from early in their career. This requires being sensitive to new issues and changed circumstances and being able to listen to community concerns. We also need to have some idea of the protocols of engagement with a new culture, who to speak to and how to understand what is said. This can include an introduction to Aboriginal kinship system and relationship protocols which can be provided by community speakers invited to class.

## Case Studies

### Case study 1

The Ryde River Walk is a recreational walkway along the Parramatta River linking nearby foreshore parkland in the City of Ryde. The new trail fits the context of the existing foreshore parkland with existing trails, facilities, natural environments and public transport hubs. The Ryde River walk is in environmentally sensitive areas that contain Aboriginal heritage and protected species of vegetation such as saltmarsh and mangroves, particularly within the Glades Bay Park area.

We focus on the connection of Ross Street Road Reserve and Glades Bay Park where an elevated boardwalk was constructed as an alternative to the original design. The change of design and use of the boardwalk reduced the impact the previous path networks had on the archaeological artefacts and vegetation. This project is an example of how the Ryde council partnered with other Government agencies to develop and improve public welfare and enjoyment of a unique location and attractions alone the Parramatta River.

The concept design of the project was challenging because of the significant opposition from nearby residents and landowners as well as particular interest groups who was against the project. Therefore, the design went through multiple iterations to provide a politically acceptable solution. The community engagements of this project were managed with external consultants and the location and design of paths via an external contractor to design around the potential impact on the site and develop multiple options to take when constructing the board walks.

Option one, which was to keep the initial design, would have allowed the project to be completed but would have caused issues with people. The council opted for the second option, which involved upgrading and providing a link within the two parks along the foreshore with a mix of raised boardwalks and tracks. The key aspect for this option was using elevated boardwalks in the intertidal zones and Ross Street, which avoided the sensitive seawall and mangrove stands, reduced the environmental impact and provided an upgraded dingy launch area near the Ross Street Reserve.

The other three options considered included similar concepts but would either have blown the budget (e.g. involved building a jetty structure that could possibly impact the environment), or building fewer links (to protect the environment) and so not complete the project according to the masterplan.

## Case Study 2

The Wallumai Wind Sculpture and meeting place is located near the Parramatta River at the Bennelong Park in Putney, NSW. This location has unique local sculptures erected to promote the local history and significance for all people to appreciate. This was not considered a regular design process but an artwork and civil plan/design. The project involved an Aboriginal artist from its inception to create an artwork that incorporated the site, community and provide longevity.

The design followed the council's requirements of material, scale and maintaining project to standards as well as the requirements for completion. The Artist was engaged to develop a design to fit into a conceptual framework and to support the consultative process within the project development/design phase. The project also needed to be looked at from different aspects that an artist may have not understood and so incorporate these into their design such as the engineering, maintenance and OH&S aspects to the project.

Before the design is signed off, parameters such as site, safety, scale, audience, and budget all need to be assessed and incorporated within the design. Things such as the budget can be the biggest factor affecting the scale and material of the project. This phase of the project also needed to include visual presentation and documentation so it would communicate the concept and situation of the design. The preliminary budget estimation provided an indication to selection of design materials and scale of the project.

This particular case study consists of two projects; the landscape meeting place and the Wallumai wind sculptures, which had been constructed earlier but complemented and interconnected with the Meeting place project. The Project expresses a meeting place within the natural environment if the location. The core of the circular meeting place (Figure 1) symbolises the collective warmth of the sun and fire, with concentric curves facing within. Its geometric design emphasises the people and their meeting place rather than the view of the Parramatta River.  The geometry also used the existing footpath crossing through the centre of the "campfire".

**Figure 1 Walkway Existing Layout**

The project was a social benefit project to give greater importance to the Aboriginal heritage of the Parramatta River and the clan that lived there. It also enhanced amenities and wayfinding with cohesive interface with the landscape and river. A key factor is that it celebrates history and cultural diversity and gives this location and river a visual signature.

The engagement of Chris Tobin as an Aboriginal Artist from the initial planning stage enabled greater creative rein to his work and ensured he was not providing free advice on how to avoid habitat destruction. The results of this project were considered of benefit to all parties involved as well as the

other stakeholders such nearby residents, the community, the local indigenous people and others who had a relation to the location

### Case Study 3

A preliminary assessment had identified the likelihood of Aboriginal artefacts being present for the Randwick light rail construction so the Planning Department put a condition of consent for the project that an archaeologist was hired to be on site.

The stabling yards beside the racecourse, which it is a marshy area with natural spring from the Centennial Park sand hills, was said to be a place of Aboriginal gatherings. Often such knowledge is known only by word of mouth in the Aboriginal community and may not have filtered out to other organisations. However, we are improving our understanding of Aboriginal settlement and the areas that are most likely to be significant through archaeology.

This was a State significant infrastructure project so the State Heritage protection were turned off and only observational requirement remained. This became an issue where a large group of artefacts was uncovered, including one artefact that appeared to come from a site in the Hunter Valley due to the rock used. This evidence indicated trade links between Bidjigal and Gadigal and the Wannarua of the Hunter Valley.

The site Project Manager decided a few more digs would be made and anything uncovered would be sent to the La Perouse Lands Council for safe keeping. Then a concrete sarcophagus would be laid over the area and construction continued. The Bidjigal people approached the Heritage Archaeologists and the matter was taken to the State Heritage Minister, who rejected any stay of works as this was state significant infrastructure. The matter was finally heard in the Federal court after the works had been completed.

To further complicate matters, the La Perouse Lands Council in consultation with the State Government agreed with the compromise of just a few more exploratory digs, any artefacts found to be kept in safe keeping by the Lands Council, then the construction could continue. The Lands Councils, at least in urban areas where many people have been moved in or out of their original country, are not set up to represent the traditional owners In Sydney they more represent the people and have been established to manage their wellbeing at a service level, given the complexity of working across the many different Aboriginal cultures now living in Sydney.

## Project Management Design

The aim is to provide a framework for students venturing into construction design to assist them in negotiating and understanding the issues to consider. The project management process will vary slightly with different projects and their specific background, but the main steps are listed below along with additional aspects to these steps for considering Aboriginal Heritage:

### Perceived Need

People: Construction needs come from the community or business, but this rarely involves the local Aboriginal community as major stakeholders. The Aboriginal people need to be consulted at this stage to enable time for the right people to be located and for the community to discuss what can be revealed publicly. While Lands Councils may not be the route to access traditional owners especially in urban areas, often another source is the Reconciliation Councils who will be able to assist with this local knowledge.

### Concept Plan and Feasibility Study

Place: The feasibility study will include Environmental and Heritage impact studies. At this stage the local knowledge of Aboriginal people would be invaluable to ensure a good understanding of long-term environmental conditions are included. While Aboriginal people are often not trained in the legal and process requirements of an impact statement, involving local owners in the process as consultants would be invaluable for the future environmental and social benefit of the project.

### Design

Timing: The artistic design of any project as part of the local landscape can be enhanced by a deeper understanding of the local environment. This involves Aboriginal people with this expertise being engaged early in the process to ensure their concepts are included in the design in a cost-effective manner. This can save iterations in design and the Aboriginal person will have the opportunity to develop a good understanding of budget constraint and be able to assist in creative solutions.

### Engineering Master Plan

Language: The engineering language can be quite foreign to others, but we are used to working across disciplines. Material presented to community should be in the spirit of partnership and the need to communicate the aspirations of all parties. The visual language of engineering is highly transparent to a culture with an ability to see 'over' their land, so respect should be shown in including community in the final planning feedback stages around master plans.

### Procurement

The Way: Using a significant percentage of Aboriginal labour and skills on site enables the community to oversee the operation without providing free labour to observe during excavation and construction. The right way would include employing Aboriginal people on community projects, or projects that have a significant impact on their land.

## Conclusion

It is important for the preservation of our land and environment that we include the longest surviving culture in the world in our construction plans for the future. In some case this has been seen to provide both financial and wellbeing benefit in projects that integrate local knowledge from an early stage. Aboriginal people maintained a culture and way of life for at least 80,000 years in this country and lived in distinct regions of Australia for at least 40,000 years (Tobler et al, 2017) in relative wellbeing. In terms of sustainable practices, we have a lot to learn from this holistic view of the environment and of human relations. It can only be of advantage to train our students and our future engineers in this approach to our land and how we live on it.

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