# Australian Indigenous Culture and Heritage in Engineering Project Planning and the Implications for Engineering Education

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## BACKGROUND
Consideration of Aboriginal Culture and Heritage in the planning of construction, infrastructure development and mining projects is becoming increasingly critical to the financial viability of these projects. Examples exist of long and costly delays caused by community opposition as a result of poorly managed indigenous community consultation and engagement. Government legislation surrounding protocols for managing and preserving culturally significant sites continues to be clarified and strengthened (NSW Government, 2013). It is now essential that engineering students graduating from Australian universities have some appreciation of the history, politics and sensitivities surrounding Australian Indigenous Culture and Heritage.

## PURPOSE
This paper considers how risks associated with Aboriginal Culture and Heritage is currently being considered in industry in the context of government, private and mining sector engineering project planning and implementation, and the implications for engineering education.

## DESIGN/METHOD
A group of five final year undergraduate engineering students undertook research into current and past approaches to considering Aboriginal Culture and Heritage in engineering project planning. The students used publicly available documentation including project reports and news articles and reported on various approaches taken and evidence of their success.

## RESULTS
The research highlighted numerous examples of progressive industry practices in the identification and protection of significant cultural sites through Aboriginal community partnerships and positive collaboration, particularly within the mining sector. Also identified were several unsuccessful interactions between government and private sector developers and Aboriginal communities. It was apparent that successful outcomes largely involved the outsourcing of Aboriginal Culture and Heritage considerations to specialist contractors who develop detailed site studies and protocols for managing sites and engaging with Community.

## CONCLUSIONS
The mix of successful and unsuccessful interactions between engineering projects and Australian Aboriginal Community groups, together with the emerging practice of outsourcing community engagement suggests that there is a lack of capacity within the engineering profession to effectively consider Aboriginal Culture and Heritage. This research supports the recommendation that opportunities for engineering students to engage with local Aboriginal Community groups and members should be facilitated through Universities to help students develop some connection with Aboriginal Culture and Heritage. Further research involving industry and Aboriginal community groups is also needed to better understand the preparation graduates may need to engage with Community in future.

## KEYWORDS
Aboriginal culture and heritage, cultural issues, consultation, community engagement.

# Introduction

Competitive tendering is a common process within the engineering industry. Competitive tendering is used in both the private and government sectors as a means of awarding work to contractors with a degree of transparency and fairness. Success in the tendering process is most commonly based upon price, but other non-price factors such risk management, capacity and reputation are also considered. Once awarded a project, issues can arise in the design, construction and commissioning phases leading to delays and cost overruns. A tenderers ability to identify, assess and cost risks and develop appropriate mitigation and management strategies is a key factor in their ability to deliver projects on time and on budget.

Risks such as inclement weather, contractual changes, supply delays and technical challenges are well recognised in engineering project management curricula. However, complex issues like community opposition receive less attention. In particular, the potential for engineering projects to impact negatively on sites of significance to Aboriginal communities is not well covered at the undergraduate level. Engineers Australia's Reconciliation Action Plan highlights the significance of Aboriginal and Torres Strait Islander culture and heritage to the profession. The plan includes goals and actions for strengthening ties between Aboriginal and Torres Strait Islander peoples and the engineering profession, and improving awareness and understanding of Indigenous cultures and heritage within the profession (Engineers Australia, 2011a). At government level, state planning legislation in Australia mandates various approaches to the consideration and protection of significant sites, with moves underway in NSW to strengthen protections through stand alone legislation (NSW Government, 2013c). Current legislation in all states imposes substantial penalties for failing to adequately protect significant sites and artefacts, with various legal frameworks and protocols in place for managing cooperation between Engineering firms and developers and Aboriginal community groups.

Despite the legislation and professional targets, examples exist of both positive and negative outcomes for both engineering companies and Aboriginal communities. It is apparent that different strategies are being used to asses and manage risks associated with Aboriginal Culture and Heritage. For universities to adequately prepare students for this challenge, more needs to be understood about the engineer's role in protecting and respecting Aboriginal Culture and Heritage and how engineering companies are managing risks at the project planning and implementation stages.

## Defining Aboriginal Culture and Heritage (ACH)

Before understanding the engineer's role in protecting Aboriginal Culture and Heritage (ACH), it is critical to understand what this phrase encompasses. Firstly, pre-colonisation, the Australian Continent was a land of many nations, language and cultural groupings (Horton, 1996). While culture and language was impacted heavily post 1788 (and to varying degrees around the continent), Australian Aboriginal cultures have continued to change and adapt to the times, informed by stories that continue to be passed on, often never written or shared with wider society (Sveiby & Skuthorpe, 2006). It is crucial, then, to acknowledge the currency and legitimacy of such alternative worldviews. In this work, the Authors are informed by a broad, locally developed definition (Dharawal Country) of Aboriginal culture that has parallels and similarities to other published definitions (Kennedy & Hoynes, 2010; Kennedy, Hoynes, & Pratt, 2010):

- Country – refers to one's nature and natural surroundings. It includes: lands and waters; trees and plant-life; animals, birds, fish and reptiles.
- Kinship – reflects the system by which people are related to each other. It defines one's roles and responsibilities, and obligations and commitments to the relationship.

- Culture – is said by the Dharawal to be present in your everyday being. It is represented in: art; song and dance; language, stories and oral histories.
- Journey – refers to the lived experiences that occur and have occurred 'on Country'. This is presented through one's story and one's families stories, one's history, past, present and future.
- Connectedness – speaks of the interrelationship of everything and distinguishes how nothing can be considered in isolation.

Another Important aspect which characterises Australian Indigenous cultures is the limited importance placed on material wealth (Sveiby & Skuthorpe, 2006). This means that sites regarded as significant in terms of both culture and Heritage are often marked by stories rather than objects identifiable to outsiders. Aboriginal Heritage concerns that may arise in a construction project are not solely limited to places that may hold archaeological artefacts. Aboriginal Heritage can include (NSW Government, 2013a):

- places associated with Dreaming stories depicting the laws of the land and how people should behave;
- places that are associated with their spirituality;
- places where other cultures came into contact with Indigenous people;
- places that are significant for more contemporary uses.

These places may not hold artefacts or physical objects but this does not necessarily decrease their significance to Aboriginal communities. This can be challenging to engineers who may be unknowingly more focused on the impact of a proposed development on artefacts contained within a site than on the site itself.

## Legislation a driving force

State based legislation has been a key driver of considerations of ACH in the development and implementation of engineering projects. This work focused primarily on the relevant state based legislation in New South Wales, Australia. In NSW, ACH is currently protected under part 6 of the *National Parks and Wildlife Act 1974.* This act also includes requirements for consultation with registered aboriginal parties of the surrounding areas as part of the cultural heritage assessment. The *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (NSW Government, 2010) aim to add opportunities for Aboriginal Community organisations and individuals who hold cultural knowledge that is significant to the proposed area to help with determination of important Aboriginal objects and places.

The requirements recommend that efforts to identify and develop protections for ACH should:

- Involve consultation with the local Aboriginal community in the early planning stages of the project.
- Create a sense of equal understanding to promote the use of Aboriginal knowledge in project planning and decision making processes.
- Consider time and formality of feedback between parties an important factor.
- Adhere to any cultural regulations and practises.
- Be aware of, and avoid inappropriate times for consultation and consider location and transportation wisely.

Recognising the limitations of this approach, for proponents and Aboriginal Community, a process for reforming Aboriginal Heritage Laws in NSW began in September 2011. The process, aims to implement a new "Aboriginal Cultural Heritage Act" to replace the current provisions for ACH contained within the *National Parks and Wildlife Act 1974* (Government, 2013c). The Aboriginal Culture and Heritage Reform Working Party were established to provide the NSW Government with "options for the protection and management of Aboriginal

culture and heritage in NSW". The reform process is described as a series of six phases and as of April 2014, the reform process was in the third phase (Phase 3 – Options provided to Government for consideration) with submissions for community feedback or suggestions closing March 2014. One of the four major concerns shared by the aboriginal people in submissions for phase 1 of the process was a desire to "increase the opportunities available for Aboriginal People to have earlier input into the planning process to ensure ACH values can be considered and impacts can be avoided, minimised and appropriately managed" (NSW Government, 2013b). In response, the Minister for the Environment and Minister for Heritage, Hon. Robyn Parker MP released a statement outlining the proposed reforms; "… these proposed reforms will ensure cultural heritage considerations will occur at the start of any development process, giving greater certainty to both aboriginal communities and project developers, and also generating time and cost savings." (Parker, 2013).

This move towards earlier, more complete consideration of ACH will increase pressure on the construction industry in NSW to make comprehensive Aboriginal Cultural Heritage considerations during the tendering process itself. Identifying critical risks, and managing these through the effective consultation and engagement strategies will be in tenderers' best interests to give the client confidence that these considerations have been made prior to awarding the project.

# Industry Practice

In Autumn Semester, 2014, a group of final year Civil and Mechanical engineering students at the University of Wollongong undertook a project to identify different practices currently being used by engineering companies to manage ACH issues in their projects. The students were enrolled in a single semester research subject *ENGG456 Engineering Project*. The students explored public and private sector construction projects, and mining development projects. The students were seeking examples of approaches which appeared to deliver successful outcomes for both Industry and Community. Throughout the project, students were supported by the alternative perspective of a politically active member of the Illawarra Aboriginal Community. Projects considered by the students were:

- Vickery Coal Mine, Whitehaven Coal Ltd, Gunnedah basin NSW
- Jabiluka uranium mine project, NT
- Hunter Expressway, Newcastle, NSW
- Brighton Bypass, TAS
- Pacific Highway Bulahdelah Bypass, NSW
- Hill 60, Port Kembla, NSW
- Barangaroo South, Sydney, NSW
- Charbon Colliery, Centennial Coal, Kandos, NSW
- Bengalla Mining Company Pty. Ltd., Hunter Valley, NSW
- Sandon Point Development, Bulli, NSW

Each of these cases was investigated using publically available information from consultancy reports, project progress and final reports, news articles and public statements from government, community groups and development proponents. The students identified approaches to planning around or managing ACH in major construction and infrastructure projects. In the 10 cases identified, approaches used by the proponents of the development fell into three broad themes themes based on the available information:

1. Relationship building, handled in-house - Hunter expressway (McNab, 2014; RMS, 2013; Vernon, 2014);
2. outsourced consultation and protocol development - Charbon Colliery (RPS, 2012), Barangaroo (TKD Architects, 2014), Vickery Coal Mine (Landskape, 2012), Bengalla (AECOM, 2013);

3. and, engagement by obligation, or engagement with a predetermined outcome - Hill 60 (NSW Government, 2002), Jabiluka (Commonwealth of Australia, 1999), Sandon Point (Wollongong City Council, 2013), Bulahdelah Bypass (AAP, 2009; Navin Officer heritage consultants Pty Ltd, 2004), Brighton Bypass (Raabus & Cox, 2009).

In the cases where significant community opposition was apparent (both Aboriginal and non-aboriginal), the available evidence suggested that community liaison was limited, and that initial consideration of ACH may have been driven mainly by legal obligation. In some cases, resolution of Community opposition and protection of significant sites relied on legal proceedings. In the case of Hill 60, Sandon Point, and Jabiluka, the strength and persistence of community opposition was clearly underestimated. Development of these sites was halted, curtailed and even reversed despite significant legal challenges by the proponents of development. In these three cases a legacy of suspicion and distrust may still exist in regards to any further development of the sites.

Other examples where planning around ACH was clear and detailed were handled by outsourcing of this planning to specialised consultants, and appeared to have more positive outcomes. At the very least no evidence of sustained Community opposition was identified by the students. In these examples, detailed reports of Community consultation, identified sites and artefacts of significance, and protocols for dealing with unexpected finds and variations to agreed works have been made accessible to the public. These are examples of the transparent processes currently being considered in the NSW ACH legislation reform (NSW Government, 2013b).

Unfortunately, due to the sensitivity of information, no cases were identified of consideration of ACH in the pre-award phase of the tendering process. It was also unclear the engineers role in consideration of ACH aside from adhering to predetermined processes and protocols. Nonetheless, cases where minimum guidelines and legal obligations were the key driver suggests that following predetermined processes and protocols successfully requires some appreciation and understanding of Aboriginal cultural values and heritage. Importantly, skills for effective management of consultation and trust relationships between contractors and traditional land owners or Community groups are key to management of project risks associated with ACH.

# Discussion

At present, this work is limited by the availability of sensitive operational information within the engineering industry. In particular, details on the consideration of ACH issues in tendering processes and the experiences of engineers involved in developing and/or following Community engagement protocols are scarce. This could be explored in more detail through interviews with engineers conducted with assurances of anonymity and formal confidentiality agreements. Another group of students are now continuing the research, identifying and exploring further case studies and new information in those already identified. This additional research is currently underway for completion in November 2014 and will explore in greater depth approaches to investigation and protection of ACH, outcomes for the construction industry and Aboriginal Communities, and drivers for valuing ACH.

Other questions critical to understanding the engineers' role in considering ACH and managing associated risks include:

- How do we judge success or failure of an engineering project where ACH considerations are a factor?
- What is the extent of an engineer's individual responsibility in considering ACH issues?
- What are the motivations for engineers to develop an appreciation of ACH beyond legal responsibility/liability?

- Are current practices for sharing experiences within organisations facilitating organisational learning on issues of ACH?

These questions will be considered in ongoing engineering student research projects. For now though, this initial review of publically available information has highlighted some critical issues with implications for Engineering Education. Firstly, revisions to legislation mandating the consideration of ACH issues in construction projects is shifting responsibility onto proponents of development. This creates an imperative for engineers to be aware of their responsibilities and to consider ACH in the earliest stages of project planning, including competitive tendering. Where planning and legislative issues are addressed in the curriculum, ACH legislation should be addressed as an integral part of the project planning process.

Secondly, due to the history and complexity of Indigenous issues in Australia, engineering graduates must have some understanding of how these can come to impact their practice as engineers beyond legislative requirements. To adhere to legislation and produce a successful project outcome, the case studies have shown that Community opposition is less apparent where there is a commitment from the proponent of development to protect ACH throughout project implementation. Engineers Australia's Stage 1 competency standards do highlight social and community responsibilities such as "1.6 Understanding of the scope, norms, accountabilities and bounds of contemporary engineering practice in the engineering discipline" and "3.1 Ethical conduct and professional accountability" (Engineers Australia, 2011b). There is a clear need to ensure that engineering graduates have an adequate awareness of their responsibilities to protect ACH through risk management in engineering projects, and that they have some appreciation of the value of doing so. In the future, specific reference to Aboriginal and Torres Strait Islander peoples within indicators of attainment for these competencies may be more consistent with the goals set out in EA's Reconciliation Action Plan (Engineers Australia, 2011a), and highlight the relevance of ACH in engineering.

## Supporting learning

Meeting the need to developing students' awareness and appreciation of Aboriginal Culture and Heritage presents significant challenges from an educational perspective. Engaging students in discussions around Australian historical, political and cultural issues relating to Aboriginal Culture and Heritage raises legitimate questions of relevance. The lead author and colleagues at the University of Wollongong have confronted these questions in the context of final year research project students (as described in this paper) and early year design project students (Goldfinch & Kennedy, 2013; Goldfinch, Layton, & McCarthy, 2010). In the case of final year students, the focus on legal obligations and examples of cases in industry has largely addressed students concerns of relevance. It is useful to note at this point that none of the research project students were aware of the focus of their project beyond 'engineering tendering' before commencement, and so were not self selecting as a result of their interest in Aboriginal Cultures or history. Encouraging students to engage with the research in the interests of preparing themselves for potential challenges in years to come and establishing a point of differentiation in the employment market appeared to spark a level of enthusiasm.

For both final year research students and early year design students, facilitating direct engagement between students and politically active members of the local aboriginal community also appears to have encouraged more enthusiastic student buy in (Goldfinch & Kennedy, 2013). These representatives are well briefed on questions they may face from students. Aboriginal Community members, teaching staff, and students are encouraged to approach conversations with open-mindedness and respect. The lead author and colleagues have experienced on many occasions reluctance among students to ask questions they believe may be considered controversial, ignorant, or even racist. Creating a learning environment of open-mindedness and respect has allowed students to ask difficult questions

and even discuss deep seated beliefs and understandings to the benefit of academic staff and the students themselves. While not wanting to preach a certain way of thinking, there is a need to ensure that students' views on ACH issues are not based on incomplete information. These insights are based on experience an personal learning, and while they provide a useful starting point, an objective assessment of the processes used is still needed. A more comprehensive evaluation of how students engage with ACH in their projects in now underway to develop a greater understanding of enablers and barriers to valuing ACH in relation to engineering design and practice.

# Conclusion and ways forward

Aboriginal Culture and Heritage (ACH) is a complex area and one of growing relevance to engineering practice. Current state based legislation in Australia, plus legislative reforms currently underway in NSW are driving the consideration of ACH related risks earlier in engineering project planning. Examples exist of a variety of approaches taken within the industry, from minimalist approaches of adhering to legal requirements to quite comprehensive and ongoing engagement with Aboriginal Stakeholders. Due to the limited information available, more needs to be understood about the engineers' role, present and future, in the consideration of ACH. The Authors argue that engineers responsibilities for protecting ACH through engineering need to be addressed within undergraduate engineering education. The challenges associated with encouraging student engagement with discussions of ACH issues can potentially be overcome with a focus on legislation, direct engagement with Aboriginal Communities, and educational policies which encourage open-mindedness and discussions unhindered by concerns about racism. While these approaches have been trialled, and preliminary outcomes reported, a more in-depth study of how engineering students engage with ACH issues is needed.

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