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Project Alliance: The Collaborative Process to Design and Build the Australian National Museum (2009)

Australia was the last continent to be inhabited by humans. About 45,000 years ago groups of hunter-gatherers came across land bridges and short sea crossings from Southeast Asia. As of 1788, when the British established the New South Wales penal colony for transported convicts, the total aboriginal population has been estimated at 350,000. Over the following two centuries this population would be decimated by the seizure of its lands, the introduction of new diseases, and open warfare between settlers and aborigines.

In recent decades Australian society has been roiled by a vigorous and often bitter debate, known as the "history wars," over the meaning of European settlement and its impacts on the aboriginal peoples. Some even used the highly charged term "genocide" to characterize past government policies. A focus of the debate was the suggestion that the Australian national government should apologize for past injustices. During the period from 1996 to 2007, when a conservative coalition headed by Prime Minister John Howard held power, Howard consistently refused to issue such an apology.

Unlike the United States, Australia had a peaceful political secession from Great Britain. In 1901 the Commonwealth of Australian was created as a largely self-governing federation of six existing British colonies, with an elected national parliament and a prime minister chosen by the majority party. The creation of the federation prompted a rivalry between Sydney and Melbourne, Australia's two largest cities, which were competing to become the national capital. As with Washington, DC, the decision was taken to create a new capital city, Canberra, that would be distant from existing centers of population and industry.

In April 1911, the Australian government announced an international design competition for the master plan for the new capital. Two young Chicago architects, Walter Burley Griffin and Marion Mahony Griffin, had just gotten married when they heard about the competition in July, during their honeymoon. They worked feverishly to prepare a set of drawings that were submitted under Griffin's name. On May 23, 1912, Griffin was announced as the winner of the competition.

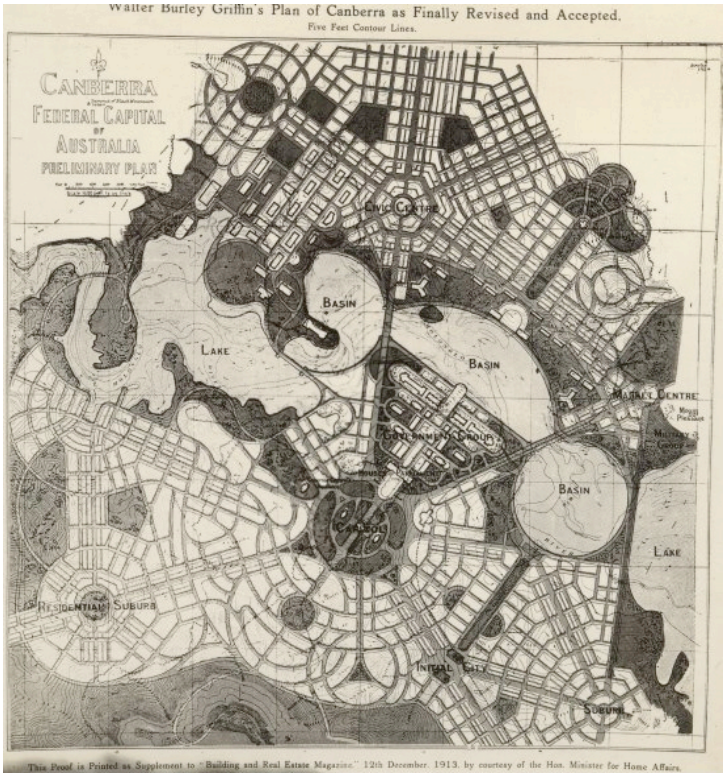
Mahony, an MIT architecture graduate, had worked for Frank Lloyd Wright from 1895 to 1910, as a designer and renderer – architectural historian Reyner Banham calls her the "greatest architectural delineator of her generation." The famous 1909 Wasmuth portfolio of Wright's work, which did so much to establish his reputation in Europe, largely comprises Mahony's drawings. Griffin started to work for Wright in 1901, two years after graduating with an architecture degree from the University of Illinois. In the following years he oversaw construction of some of the office's most important projects, including the Ward Willits House and the Larkin Company Administration Building in Buffalo, NY. He left Wright to start his own firm in 1906, when it became clear that Wright would never make him a partner. Mahony joined him in 1911, following their marriage, although she rarely received the recognition she was due as his design

partner. Both Griffin and Mahony were licensed to practice architecture by the State of Illinois, which had passed the first governmental registration law anywhere in the world in 1897.

The Griffin-Mahony master plan for Canberra combined a rich overlay of elements. Like City Beautiful plans of the era, the governmental complex was organized around a series of radial axes, both visual and circulation, focused on the central Parliament Hill. But unlike most City Beautiful plans, Griffin and Mahony were highly sensitive to the landscape features of the site, including surrounding mountains and a proposed new lake. Outlying residential districts of Canberra were planned along more informal "garden suburb" principles.

In 1913, in order to see that their competition-winning design was carried out, Griffin and Mahony moved permanently to Australia. Griffin was appointed the government's Federal Capital Director of Design and Construction, a post he held until 1920. Although Griffin was ultimately forced out of his directorship, he and Mahony continued to design projects across Australia and in India. Griffin died in 1937, following an operation in an Indian hospital; Mahony left the Australian practice in the hands of a partner and returned to Chicago, where she died in 1961.

Wright never spoke to Griffin or Mahony again after they won the Canberra competition; in later years he referred to Griffin as a "draughtsman." In Australia, Griffin has received belated recognition. The competition master plan continues to guide development of the capital, and in 1964, when a river was dammed to create the artificial central lake that the original plan had envisioned, it was named Lake Burley Griffin.



The Griffin-Mahony master plan for Canberra

Marking the Federation's Centenary

As 2001, the centenary of the founding of the Australian federation, approached, there was increasing public discussion of an appropriate symbol to mark the event. The most prominent new structure in Canberra was the new Parliament House, which had been constructed between 1981 and 1988 to the competition-winning design of the American architect Romaldo Giurgola, on the location shown in the Griffin-Mahony plan. Now it was decided to construct a new building for the Australian National Museum.

The Australian National Museum had been founded by the government only in 1980, and had never possessed a permanent home. The Museum owned a broad and eclectic collection of 170,000 artifacts. Among them were the preserved heart of Phar Lap, a famous racehorse; rare examples of convict clothing from the founding era; and the world's largest collection of aboriginal bark paintings.

Early in 1997 the national government decided to proceed with the national museum project. The budget was established at $152 million (Australian); the completion date would be March 11, 2001 – the date of the centennial. The program included three distinct elements: the museum itself, which would be the primary destination for public visitors; the Australian Institute of Aboriginal and Torres Strait Islander Studies (the Institute), whose extensive collection was primarily intended for the use of scholars; and a cultural center to be funded and operated by the regional government for the Australian Capital Territory (ACT).

The selected site was the Acton Peninsula, projecting out from the shore of Lake Burley Griffin, and currently occupied by the empty buildings of the former Royal Canberra Hospital. From the peninsula one could look west to Black Mountain and the Brindebellas range, south to the Parliament House and the capital complex, and north to the city center of Canberra.

A design competition was announced in June 1997, and in October the jury selected the winning team: the Melbourne firm of Ashton Raggatt McDougall (ARM), in association with another Australian firm, Robert Peck von Hartel Trethowan. The design created by Howard Raggatt, the design principal for the project, was deliberately anti-monumental, unlike the prevailing aesthetic of government buildings in Canberra: it broke down the program into several simple, decorated shed structures set at odd angles to one another. The design located the museum at the tip of the peninsula, to draw visitors all the way into the site. The Cultural Center was located closest to the entrance of the site, and the Institute was off to one side, in a more secluded setting. Cars would park along the central spine of the site. ARM's chief addition to the program, and one which seems to have caught the imagination of the jury, was a central open space framed by the elements of the museum, called the Garden of Australian Dreams.

As required by the competition brief, the design took into account Griffin's axes in the Canberra master plan. But in addition to these visual axes, the ARM design also incorporated the concept of a curving "Uluru line." As the architects explained, in one's actual experience of Canberra a wandering line is often the only way to move between two spots linked by a visual axis. The Uluru line would also evoke aboriginal traditions of wandering in the wilderness as a rite of passage. The facades of the building would also contain cultural references, including fragments of the word "Eternity" – evoking the story of Arthur Stace, an illiterate former criminal who for thirty years after his conversion to Christianity walked around Sydney at night, chalking

this single word on the city's walls and pavements. As the architects later described their design in 2002:

> "We liked to think that the story of Australia was not one, but many tangled together. Not an authorized version but a puzzling confluence; not merely the resolution of difference but its wholehearted embrace. We hoped to make a place vividly local, rooted in Walter Burley Griffin's garden city, rooted in the local country, but also we hoped to make something projective, to make a sign to mark our longing."

Meanwhile, the challenges of the project schedule were becoming increasingly daunting. By the time Parliament had officially approved ARM's design, on July 1, 1998, less than three years remained until the date of the centennial. How would it be possible to complete the design and the construction of so large and complex a project – including the installation of all its exhibits – within less than three years?

Images of the completed museum: Above, aerial view showing site on Acton Peninsula; below, Garden of Australian Dreams

Choice of the Alliancing System

The decision made by the client group, the governmental Construction Coordination Committee (CCC), was to design and construct the museum using the concept of a project alliance. Alliancing comprised an innovative set of legal and business relationships, which over the past decade had begun to be used in Australia for such complex infrastructure projects as the Sydney Water Northside Storage Tunnel (see *Engineering News Report,* June 7, 1999) and private projects in the oil and gas industry. But before the museum project, alliancing had never been used on a major building anywhere in the world.

The system of alliancing was initially developed by British Petroleum (BP) for the construction of oil drilling platforms in the North Sea. In the early 1990s, the high development costs of exploiting the relatively small oil fields that remained in the North Sea was making these projects less profitable, compared with sites elsewhere in the world. New technologies were not delivering enough cost savings. Meanwhile, BP's management had come to view traditional legal and business arrangements as counterproductive. The standard system of seeking competitive bids from multiple contractors, followed by long contract negotiations in which each party tried to shift as much risk as possible to the other side, had engendered a climate of mistrust and conflict that led to increased costs and delays. So BP decided to experiment with a new form of contracting for a particularly challenging site, the Andrews Field. According to James Martin, BP's project manager: "The adversarial relationships between oil companies, contractors and suppliers had to be confined to the history books – we believed that only by working in close alignment with our contractors could we hope to make Andrews a success." (Sakal, p. 3)

The way BP tried to align the interests of the parties was through a new set of financial incentives in its contracts. The seven contractors who made up the project team would all have to agree upon the total budgeted project cost. Each participant would have to open its financial books to the other parties, and would only be reimbursed for its actual costs to perform the work. Profits or losses would be shared through a system of "gainshare / painshare." If the total project cost came in below the budget, provided that the project had also met specified performance targets for schedule, safety, and quality, the contractors would split the "gainshare"; if costs exceeded the budget, they would collectively cover the loss as their "painshare." Since the ability to produce high-quality work in a cooperative environment was so critical to the success of the project, the contractors were selected based on their qualifications, rather than by the lowest bid.

The success of the Andrews Field project exceeded BP's expectations. The original cost estimates for construction had been £450 million. Once the project team had been selected, it agreed to work to a contractual budget of £373 million. The actual results were better still. The final construction cost was only £290 million – a reduction of 35% from the original estimate – and the field began producing oil six months ahead of schedule. Said BP's Martin: "To achieve this degree of cost reduction and produce oil six months ahead of schedule was never in my wildest dreams at the time." (Id.)

Following the success of the Andrews Field project, BP continued to use alliancing on other projects. Use of the new system spread to other companies and regions around the world. Project alliancing has found the most widespread acceptance in Australia, a country where the

construction industry was marked by frequently adversarial relations between clients, contractors, and labor unions. Starting in 1994, the first Australian projects to employ alliancing were the construction of new oil and gas fields. The system then spread to the public sector as well, for use in constructing highways, water and sewer systems, and other engineering public works projects. As of 2009, several Australian government agencies have published detailed manuals on the use of project alliancing. But before the National Museum project, the system had never been used on a major building project anywhere in the world, let alone Australia.

Forging the Alliance

A key step in an alliancing project is the process of selecting the major participants: the lead design firms, the lead contractor, and the subcontractors for the major building trades. To assist them in this process, the CCC turned to Steve Knisely, managing director of the Asia Pacific office for the Texas-based management consulting firm JMJ Associates. Knisely and JMJ were serving as the alliance facilitators for the Sydney Water project, Australia's first public sector alliance, which was perhaps six months ahead of the Museum in progress. Knisely would act in a variety of roles over the course of the project: from educating the CCC client team in the concept of alliancing, to helping CCC structure the alliance, to selecting the members of the team, to acting as a facilitator, informal mediator, and all-around team "coach" as the alliance members proceeded to design and construct the project.

For the Sydney project, Knisely and Graham Thomson, a lawyer from the firm of Malleson Stephen Jacques, had created an innovative and rigorous alliance participant selection process that had passed the highest levels of government scrutiny. CCC adopted the same selection process for the Museum. To select the lead construction firm, the short-listed candidates were not allowed to make canned presentations; instead, each of them had to participate in a frank four-hour discussion about the alliance and how they would fit into this novel structure. At the end of the meeting, the candidate firm was given time to develop its top-10 list of the strengths and weaknesses they saw in the CCC team and its alliance approach; meanwhile, the CCC team did the same for the construction candidate. The mutual presentation of these assessments of strengths and weaknesses proved to be very telling, as evidence of just how open and honest the candidate firms were willing to be.

Then the final three short-listed construction firm candidates each had to participate in a separate two-day workshop, termed an "alignment workshop," in which it met with CCC and ARM to try to establish the key alliance principles, goals, and functional working relationships that would characterize its approach to the project. This workshop was more than just part of the selection process; the intention was to draw upon the results of the workshop for the winning bidder in structuring the Alliance itself. The selection criteria focused on each firm's technical capacity, and on its ability to operate within an alliance environment – in short, which firm would offer the "best fit" for the alliance. Following the last workshop, CCC selected Bovis Lend Lease, a large global firm, as the lead construction contractor, teamed with Honeywell, Ltd. The entire selection process had taken approximately eight weeks, versus the nine months that a conventional competitive bid process would likely have taken on a project of this size and complexity.

The selection process, which took place during August and September of 1998, segued immediately into the incorporation of the selected candidates into the alliance. As each new

alliance member was chosen (first the lead construction firm, followed by the exhibit design firm), the leaders of the newly chosen firm would participate with the previously selected alliance members in an intensive Risk-Reward Workshop, facilitated by Knisely and focused on business and financial issues. The successful candidate firm was also invited to become a signatory to the single, all-encompassing Project Alliance Agreement. The goal of this two-step process was to make these activities – interviews and team member selection, followed by the risk-reward workshop contract negotiation – integral to the forging of a team that could collaborate successfully over the course of the project. During the course of the risk-reward workshop, the alliance members negotiated and agreed upon any adjustments in the Agreement necessary to accommodate the interests of the new signatory. Knisely structured these workshops to create a collaborative environment, in which team members could learn how to listen to one another, and how to communicate in an open yet productive manner. For example, he encouraged the participants to begin each risk-reward workshop by distinguishing the process in which they were engaged from a conventional negotiation over the business and legal terms of a contract. The participants would then regularly refer back to this distinction as the workshop progressed, to ensure that they were always operating in an alliance approach, while still resolving the critical issues that would mean professional and business success or failure for their firms. In this as in other respects, Knisely successfully served as a coach, both for individuals and for the entire team.

The head of the selected exhibit designer, the American firm Anway & Company, had an unusual background that well suited him to work well in this collaborative setting. Anway did not hold a professional design degree; after graduating from Boston College with a degree in history, he went into the construction field. He ultimately rose to become the Vice President of Design and Construction at Fidelity Investments, the large Boston-based mutual fund company. During his tenure, he led Fidelity's Design and Construction division through the renovation and new construction of more than two million square feet of office, retail, and investment space, and computer facilities.

In 1993 Anway started his own construction management company, Anway & Company, intending to focus on museums and other high-end visitor attractions. Soon after he started, his firm joint-ventured with a New York exhibit designer, DMCD, to win the commission to design the Petrosains Museum, a $65 million highly interactive, science museum that would occupy the bottom five floors of the Cesar Pelli-designed Petronas Towers in Kuala Lumpur, Malaysia. Early on in that project, it became clear that getting the exhibits fabricated and installed on time and on budget would pose a major challenge. Anway-DMCD agreed to take on the construction as well as the design of the project, acting as a design/build firm. Petrosains was nearing completion at the time that Anway & Company was selected for the Australian National Museum; it would open in March 1999 to wide praise, with visitor levels twice as high as the projections. For the Australian project, Anway subcontracted with DMCD for the concept design of the exhibits; his own newly formed design subsidiary, Amaze, carried out most of the design detailing and nearly all of the graphic design.

Within the selection process there was, however, one anomaly: the lead architecture firm, ARM, had already been chosen through the design competition, without regard for its ability to work within an alliance framework. This had some lingering effects throughout the life of the project. The principals of ARM at first were somewhat resistant to the alliancing concept. Then one of the firm’s principals, Robert Peck, agreed to serve as an observer for the selection process in

the only other public sector alliance project taking place in Australia at the time. Once he saw how transparent and collaborative the process was, ARM and its affiliated firm agreed to participate fully in the alliance. However, there would be a continuing tension throughout the project between the collaborative goals of the alliance and the style and personality of ARM's design principal, Howard Raggatt.

Images of the completed interiors. Above: the entrance hall; below, part of the Anway exhibit design.

Contract Terms of the Project Alliance Agreement

The Project Alliance contract for the museum was drafted by Thomson, who ultimately had to testify to Parliament to reassure skeptical lawmakers of the value of this novel legal structure. The contract began with an aspirational "Charter," or a series of goals, not unlike those that are often agreed upon in a "partnering" charter:

> "This Alliance will create an exceptional Australian cultural precinct on Acton Peninsula, Canberra. The Project is the flagship for the Century of Federation and will be a source of pride for all Australians. The way we go about it will lead the way for construction projects in the future. We are therefore committed to the following principles.
>
> **"We are committed to:**
> - to continually strive for innovations and breakthroughs
> - honest, open and ethical communications and actions
> - timely and forthright resolution of all issues
> - equitable risk and reward
> - public accountability and good governance
> - a culture of responsibility
> - listening with intensity and speaking with responsibility
> - supporting all team members
> - collective ownership of decisions
> - trust, integrity and respect
> - achieving a Balanced Quality of Life"

But unlike a partnering project, in an alliance these aspirational goals are then given legal teeth within the alliance contract. There are three key elements of a project alliance contract that differ from standard construction industry contracts for design and construction: the collaborative governance structure; the sharing of financial incentives and risks (Gainshare and Painshare) among the parties; and the agreement of the parties to share legal risks and not to sue one another, except under exceptional circumstances.

Team Governance. Traditional construction projects involve a variety of separate contracts between the client (owner) and the lead design and construction firms. Those firms, in turn, will subcontract with many second-tier consultants or trade contractors. In an alliance, by contrast, all members of project team – owner, contractor, architect, and the primary subcontractors and design consultants – are parties to one contract. (In Canberra nine of the project's key construction subcontractors entered into Suballiance Agreements, so that the alliance concept was carried through to these members of the project team as well. The rest of the subcontractors were hired through conventional subcontracts.)

An alliance contract needs to contain a team governance structure that reinforces its collaborative nature. On the Museum project, the contract called for monthly meetings of the Alliance Leadership Team (ALT), comprising one senior representative from each Alliance member. All of the team representatives needed to be present at an ALT meeting for a quorum to exist, and all ALT decisions had to be unanimous. Obviously, this is a radical departure from standard contractual structures; it potentially gives the design firms a veto power over decisions

that would affect the construction process, and the builders a veto power over decisions that would affect the design. Day to day operations of the Alliance were carried out by a Project Management Team that reported to the ALT.

Knisely, or another of the other JMJ consultants supporting the alliance, was present at each ALT meeting as a facilitator to aid in the decision-making process. While he did not play the formal role of a standing neutral in resolving disputes among the team members, informally he saw his job as "staying in tune with the team's culture, mood and commitment to the Alliance principles and goals. We would encourage the leadership to acknowledge what was going well and to tackle the tough issues. The JMJ role at times was to maintain the possibility of a solution being found when many people saw no possibility." The JMJ consultants also supported CCC's project management team in a similar fashion.

Financial Incentives. The business terms of the alliance contract provided that the client, CCC, would pay each other alliance member, on an audited, open book basis, for the actual cost of its work or services on the project. This cost reimbursement would include a pre-established amount to cover a normal level of overhead and profit for each alliance member. The contract set a not-to-exceed cap on the total costs that the client was obligated to reimburse to all the alliance members. (Many private alliance contracts do not contain this overall cap; under Australian law, though, the CCC could not legally enter into a contract for a government project in which the final cost could be higher than the budget.) However, the contract did not set any limits on how much or how little each individual alliance member might receive: that was for the alliance members to work out among themselves. Thus, rather than predefining the scope of work for each alliance member, the contract encouraged them to reallocate tasks, and the associated compensation, on a "best for the project" basis.

Beyond this base cost reimbursement, further distributions of profits or losses were allocated in the contract through the concepts of Gainshare and Painshare, each of which applied jointly to all alliance members. The Gainshare was a bonus pool of money, to be distributed to the alliance members based on the project's success in meeting a series of defined project goals:

- meeting the schedule
- bringing in the total project cost at or below the agreed-upon budget
- meeting or exceeding construction quality standards
- meeting or exceeding design quality standards

Conversely, failure to meet these goals could cause the alliance members to pay a penalty, or Painshare. Within the alliance, the payments of Gainshare or Painshare would generally be distributed on a proportional basis, relative to each party's share of the overall costs of design and construction.

Regarding schedule, because the March 11, 2001 completion date was so critical to the project's success, the contract called for a Painshare penalty of over $1 million if completion of the museum was even one day late, with the amount increasing for each subsequent day; there was no reward for early completion, since this was not an important goal for the CCC. There were smaller penalties if the institute or the cultural center were late.

Regarding costs, there were two steps to the Gainshare incentive. First, if the team was able to agree upon a revised cost estimate that was less than the original project budget, the team would split the savings on a 50/50 basis with the government. However, the revised cost

estimate would then become the new baseline, against which team performance would be measured.

Upon the completion of construction, when all project costs had been totaled, if there had been a further cost savings against the revised estimate, the alliance members would receive 30% of those savings as their Gainshare. If, however, the project were to go over budget, the alliance members would bear the risk of covering 70% of that additional cost, or Painshare. Each alliance member's exposure for cost overruns was capped at that portion of the compensation that had been calculated as their normal overhead and profit. Thus, in the worst case, if the project costs could not be controlled, the alliance members risked completing the entire job at cost without making any profit, while any additional costs beyond the cap would have to be paid by the client.

The concept of incentive and penalty payments is not unusual in traditional construction contracts. Quite often an owner and contractor will agree to a clause that provides for a penalty if the project is completed late – sometimes coupled with a bonus if completion occurs early. In open-book contracts for construction management-at-risk, there are often "shared cost savings" clauses, in which the CM is entitled to a portion of any savings if it is successful in completing the project for less than the guaranteed maximum price. But it is rare for design contracts to include comparable performance incentives, and unprecedented for all members of the project team to depend upon one another for their success or failure in meeting project-wide financial performance goals.

No Blame Among Alliance Members. The third radical departure from traditional contracts in an alliance agreement is the "no blame" concept. In effect, the Alliance members agree in the contract not to bring a lawsuit or other claim by any other Alliance member, except in the case of a "Willful Default." Willful Defaults are narrowly defined, to include only a "wanton or reckless act or omission." To try to limit the use of payment holdbacks to influence behavior, the contract does expressly state that a failure to pay money due under the contract from one party to another within 30 days of demand will be considered a Willful Default.

But otherwise, the alliance contract for the museum tries to do away with the traditional framework of blame and cross claims to redress problems that would otherwise exist among the owner, the designers, and the contractors. The contract specifically states that a mistake made by an Alliance member, even if it would be considered negligent by a court (and therefore would give rise to the payment of damages to the party who was harmed), shall not be the grounds for a lawsuit or claims so long as it was "made in good faith."

According to lawyer Chris Noble, who represented Anway & Company in the contract negotiations, and who has written extensively on the legal implications of project alliances:

> "By its nature, a project alliance agreement creates a fundamentally different contracting environment from that encountered in other delivery systems. Whether traditional, construction management, or design/build, all of the other delivery systems rely on the enforceability of contractual obligations, and provide for the payment of damages by any party who does not meet these obligations. . . . All of these permutations share the threat of an involuntary, fault-based asset transfer as their primary contract compliance strategy.

> "The project alliance system, on the other hand, relies upon a culture of positive reinforcement to motivate the project participants. It focuses on incentives for success rather than consequences of failure. The upside of such a system is self-evident. What may concern those who would otherwise consider utilizing the system, however, is the potential downside. An American construction industry that is obsessed with risk aversion and risk transfer will provide fertile ground for growth of the project alliance system only if the downside can be contained (or, at least understood and managed)."

Measuring Performance and Quality

To implement the Gainshare / Painshare incentives contained in the alliance contract, there must be a reliable method for measuring the success or failure of the project team. As described above, the cost and schedule goals were easy to quantify. But in order to make sure that the team did not sacrifice quality, in its desire to complete the project on time and on budget, there was a particular need to measure both design and construction quality through a system of outside peer review.

To constitute the team's Gainshare for quality, the client agreed to set aside an additional bonus pool of $3 million. If the normally expected ("Business As Usual" or "BAU") result was achieved for a certain quality goal, then no bonus or penalty would be payable for that goal. If BAU results were exceeded (as defined by mutual agreement of all alliance members), then Gainshare would be payable to some or all alliance members in specified amounts or ranges. However, if the project costs had exceeded the cost estimate, the government would first be allowed to apply the Gainshare pool against its part of the cost overrun, before distributing any quality bonus to the team. If BAU results are not achieved, there were similarly established Painshare penalties payable by some or all alliance members.

The most difficult quality goal to measure was that of achieving a high quality design and maintaining the project's design integrity. To judge the alliance's performance against this goal, an independent design integrity evaluation panel was appointed to review the design of the buildings, landscapes, and interior exhibits. The independent panelists were Michael Keniger, head of the architecture school at the University of Queensland, and Leon Paroissien, editor of *Visual Arts and Culture* magazine and the founding director of the Museum of Contemporary Art in Sydney. Keniger and Paroissien met regularly throughout the course of the project (during the design phases the panel met nearly every month), with the museum director, Dawn Casey, and principals of the lead design firms, ARM and Anway, along with members of the firms and their consultants.

The panelists rejected the idea that the appearance of ARM's original competition-winning design must be retained in every respect, as too restrictive. Instead, they allowed more flexibility as the design was developed. Early on, a number of site constraints emerged, including the need to save existing trees on the site, that required some rethinking of the overall scheme. In response to these constraints, the design integrity panel allowed the alliance to shift the locations of the institute, the main parking area, and an exterior amphitheater, and to reverse the floor plan of the institute as part of this change.

An even greater challenge was the decision by ALT, the territorial government, to pull out of the project and withdraw its funds for the cultural center, which was ultimately built on another site. Fortunately, within ARM's original scheme the major project elements were independent enough that this did not require a redesign of the other elements. But it did pose the question: what should become of the former cultural center site? Through the discussions with the design integrity panel, it was agreed that this space should be left open for future use. The panel was involved in bringing in an aboriginal artist, who developed site sculptures made of large concrete and fiberglass moths.

As the design progressed, the design integrity panel continued to play an important role. ARM's competition-winning design had called for a dramatic sculptural entrance canopy with multiple curves. When the cost estimates for this element proved to be unaffordable within the budget, the panel pushed to retain the canopy as an important design element, while ultimately allowing the curves to be fabricated as a series of flat segments, thus reducing costs to a manageable level. Within the museum interior, the panel served as design critics for architectural elements that had not been addressed in the competition design, such as the retail shop, food service spaces, and interior finishes and signage.

The completed entrance canopy, part of the Uluru line that runs through the site.

The panel acknowledged, in its final report, that the landscape design fared less well than the architecture during the design-to-budget process. The panel and the alliance members agreed jointly to accept the loss of certain landscape design elements around the periphery of the site, in order to protect the integrity of the spaces and landscapes at the project's core: notably, the Garden of Australian Dreams.

The role of the design integrity panel for the design of the museum exhibits was somewhat different. The architectural design for the museum's exhibit spaces was essentially an empty box; it had been left to the exhibit designer, an integral member of the alliance, to design those spaces. Yet in this case the design was being developed as part of the alliance process. As an initial step, the panel agreed that their role was to assess the fit of the exhibition spaces within the building, in terms of circulation flow and visitor experience. The panel would not assess the content of the exhibits (as it turned out, this was a fortunate decision).

The Anway firm had presented its initial design concepts, in January 1999, followed by a presentation of the schematic design in May 1999. At least five subsequent meetings of the design integrity panel were devoted to critiquing and refining the design of the exhibit spaces. In general, Anway felt that this process went quite smoothly, and the panel worked well with the exhibit designers and the architects.

Building the Project

All team members, including the design firms and the construction contractors, shared common office space at the project site. The office had two floors, and early on an upstairs / downstairs divide impeded easy communication. Team leaders then agreed to shuffle the seating and mix up the staff of the different firms between the two floors, and from then on the interaction among the alliance members was constant. (One participant also comments that the Aussie culture of sitting back and having a beer (or several) together on Friday afternoons also helped the process of teambuilding.)

The Museum project took place before the emergence of Building Information Modeling (BIM) technology. However, the alliance did take advantage of the best information technologies then available. Most notably, the team used a "ProjectWeb" system designed by the contractor that consolidated all emails, calendars, memos, drawings, specifications, and other project-based documents into a single database available to all alliance members.

As the project progressed, the team faced the inevitable changes and unanticipated problems that arise in every construction project, testing the strength of the alliance concept. An early test was an escalation in steel costs, causing the bids to come in approximately $1 million above the estimate. All members of the alliance came together in creative discussions on the full range of potential cuts and value engineering changes. In the end, the alliance was able to maintain the budget through a combination of limited redesign, changes in the construction methods used to install the skylights, and other small changes throughout the project.

The alliance then weathered a public controversy over the architectural design in 2000, when Daniel Libeskind charged that the project's floor plan showed that ARM had plagiarized the broken Star of David shape or "lightening bolt' that he had used in the Berlin Holocaust Museum. Raggatt defended his design, calling it a quotation rather than a copy. Museum director Dawn Casey claimed in the press that she was not aware of this symbolism when the ARM design was approved. But Libeskind did not bring legal charges, and the design was left unchanged.

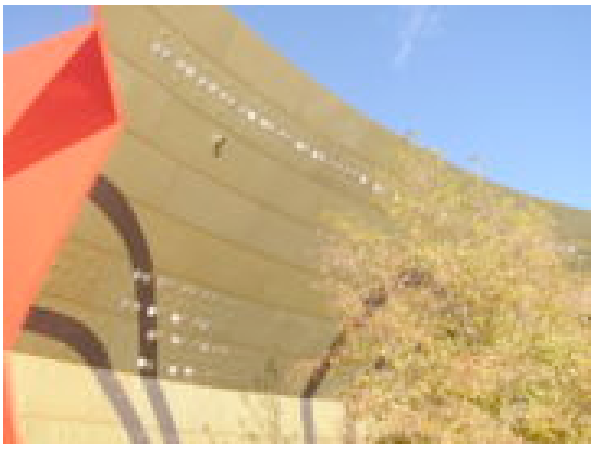
View of museum under construction, showing the Libeskind-inspired "lightening bolt.'

In early 2001, just a few weeks before the museum was scheduled to open, a new problem arose. The alliance members were told that the exterior skin of the building, a system of anodized aluminum panels marked by an irregular pattern of large projecting bumps, was more communicative than anyone had realized. It seemed that Raggatt had deliberately encoded a series of Braille messages into the façade: "God knows," "Mate," "Love is blind," "Who is my neighbor?," "Time will tell," "Sorry," and "Forgive us our genocide."

All the team members were furious at being surprised in this way; but none of them had spoken directly to Raggatt. When Anway heard this, he called the architect directly and asked him if the story was true. Raggatt said that it was. He admitted having failed to disclose this knowledge to the team earlier, but he told Anway that he felt it was his duty as the architect of a public building to address the public issues of the day. He also said that in a few years' time, no one would see these statements as controversial.

But how could the political embarrassment to the government, and to the alliance itself, be resolved? Anway pressed Ragatt to work with the other team members and come up with a compromise solution that would allow the project to open on time. Raggatt agreed. The solution in some places involved placing large metal discs in strategic locations over the panels, rendering the messages illegible. In other places panels were moved around, so that the Braille phrases became nonsensical. Some of the less controversial messages were left unaltered. The changes were carried out with the approval of Craddock Morton, the government official in charge of construction, and the controversy was not made public until several years after the project had been completed. The payment of Gainshare bonuses to the alliance members was not affected.

The hidden messages: left, discs added to façade panels to obscure words; right, "Mate" in Braille.



Conclusion

The Australian National Museum opened on time and on budget on March 11, 2001. Prime Minister Howard presided at the opening ceremonies. According to Jim Service, chairman of the CCC, the total cost of $152 million was $20 – 30 million less than the project would have cost in a conventional process. (quoted in Hauck)

In 2003 the Conservative government commissioned a review of the museum's exhibits. The investigating panel found that many of the historical narratives contained within the exhibits were "unbalanced." While the report concluded that there was no systemic bias, it recommended that the exhibits should give better recognition to European achievements. Craddock Morton, after being appointed director of the museum in 2004, soon began to modify the exhibits in line with the panel's recommendations.

In 2007, the Conservatives were defeated by the Labor Party in national elections. The first official act of the new Prime Minister, Kevin Rudd, was to read a public statement of apology in the Australian Parliament for the past mistreatment of indigenous peoples. The statement was then adopted unanimously by both houses of Parliament. John Howard was the only former prime minister who did not attend Rudd's speech.

Project alliancing has found increasingly wide use for public and private infrastructure projects throughout Australia. Anway calls the museum project "a transformative experience that changed the life of everyone who participated in it." However, as of April 2009 the Australian National Museum remains the only significant building anywhere in the world to have been designed and constructed through an alliancing process.

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