

SCOPE FOR IMPROVEMENT

A survey of pressure points
in Australian construction
and infrastructure projects



AUSTRALIAN CONSTRUCTORS ASSOCIATION

BLAKE DAWSON WALDRON
LAWYERS



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Foreword from Blake Dawson Waldron

Our survey of major construction and infrastructure projects reveals an array of stakeholders caught in a series of dilemmas, torn between self-interest and collaborative performance. Projects are complex ventures in which participants integrate a daunting range of services and skills to construct an asset that none would be capable of delivering on their own. How can projects be delivered successfully, with better outcomes for all stakeholders?

Blake Dawson Waldron has partnered with the Australian Constructors Association to research the root causes of project pressure points. This complements previous industry studies which examine the macro policy issues that establish a framework for infrastructure investment. Our research addresses the micro challenges associated with project performance.

This report contains insights into the nature and causes of project pressure points and proposes recommendations for future action that should assist the industry as a whole. We hope it will shed further light on how project participants can work together to avoid pressure points and improve the delivery of Australia's future construction and infrastructure projects.

John Atkin
Managing Partner
Blake Dawson Waldron

BLAKE DAWSON WALDRON
L A W Y E R S

Foreword from The Australian Constructors Association

The Australian Constructors Association (ACA) was formed in 1994 to advance the interests of major construction contractors. Its mission is “to make the construction industry safer, more efficient, more competitive and better able to contribute to the development of Australia” through positive leadership.

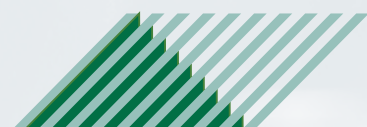
The success of our industry lies in its ability to manage risk, coupled with the delivery of exceptional outcomes for our clients. Clearly there is a partnership of interest with our clients, consultants, subcontractors and suppliers.

We believe that *Scope for Improvement - a survey of pressure points in Australian construction and infrastructure projects* will play a positive role by creating awareness and promoting a debate on the important issues confronting our industry. Many of the findings of this report will come as no surprise to those of us involved with building the nation’s infrastructure. But it is what we do with the findings that is important.

From time to time we need to stop and think about the issues facing the industry. We need to ask how things can be done better and work together to improve them. *Scope for Improvement* fulfils that role because it has surveyed the parties responsible for delivering large projects to identify the major pressure points. This is an important work.

The ACA has had a long and beneficial relationship with Blake Dawson Waldron. It has a respected construction practice that serves the industry’s leading clients and contractors and we are delighted to collaborate with BDW in the publication of *Scope for Improvement - a survey of pressure points in Australian construction and infrastructure projects*.

Wal King AO
President
Australian Constructors Association



AUSTRALIAN CONSTRUCTORS ASSOCIATION

Introduction

Over the past decade, demand for construction and infrastructure projects in Australia has grown at an unprecedented rate as the economy has surged. Indeed, infrastructure spending over the next decade could almost double to \$400 billion.¹

However, participants in the industry often encounter a number of pressure points which hold back their progress. These urgently need to be addressed so that the industry can prosper and continue playing a vital role in underpinning the country's future development.

This study, which has received widespread backing from industry participants and organisations, aims to:

- Promote a deeper understanding of the main pressure points in construction and infrastructure projects
- Assess their impact from multiple stakeholder perspectives
- Encourage broader participation in the debate about how industry participants can work together to improve the outcomes of major projects.

In order to obtain a balanced view, we invited participation from all project stakeholders in the industry and from both the private and public sectors. Target participants included constructors, developers, government (federal and state), financiers, private sector principals and consultants who had been involved in Australian construction or infrastructure projects worth \$20 million or more in the past three years.

The survey opened on 10 October 2005 and closed on 25 January 2006. It was divided into two sections – the first focused on project pressure points in general and the second required participants to answer questions based on their experience in one project only. The questions were structured around the different aspects which arise during the lifecycle of a project, namely project definition, market request, risk allocation, contract negotiation, project execution and dispute resolution. The survey did not cover the operation or maintenance phases of projects.



No incentive was offered to encourage participants to respond. Nonetheless, we received an enthusiastic response from across Australia. Of the 190 responses received, 183 were in-depth and comprehensive responses and have been used for the basis of this report. These responses represent over \$20 billion worth of expenditure. A detailed breakdown of respondents is available in Appendix 1.

Responses were analysed by a team of lawyers, using both qualitative and quantitative research methodologies. To test views expressed in the survey, we conducted follow up interviews with selected survey respondents and with key industry players, including Infrastructure Partnerships Australia, AusCID, directors of the ACA and board members of both public and private sector principals. In order to encourage frank and open discussion, we have undertaken not to reveal the names behind specific industry views cited in this report.

The chapters in this report follow the phases of a project through its lifecycle. This mirrors the approach taken in the survey itself. In each chapter we outline the findings* for that phase and then put forward recommendations for improvement based upon the responses received and our own experience.

** In some instances percentages cited add up to more than 100% as respondents could select more than one option to a question.*

Overview

Pressure points are obstacles which stand in the way of the delivery of a project and the incidents which create stress to the project or its participants.

KEY FINDINGS

Our survey finds five main issues that hamper Australian construction and infrastructure projects, leading to major pressure points at all stages of their life cycle. These five issues are:

- A shortage of skilled resources
- Inadequate scoping
- Use of inappropriate delivery methods
- Poor risk allocation
- Unrealistic time and cost objectives.

These factors create major pressure points across the lifetime of a project, from start to finish. They are also strong contributors to adverse outcomes such as:

- Cost overruns
- Delays
- Disputes.

SKILLS SHORTAGE

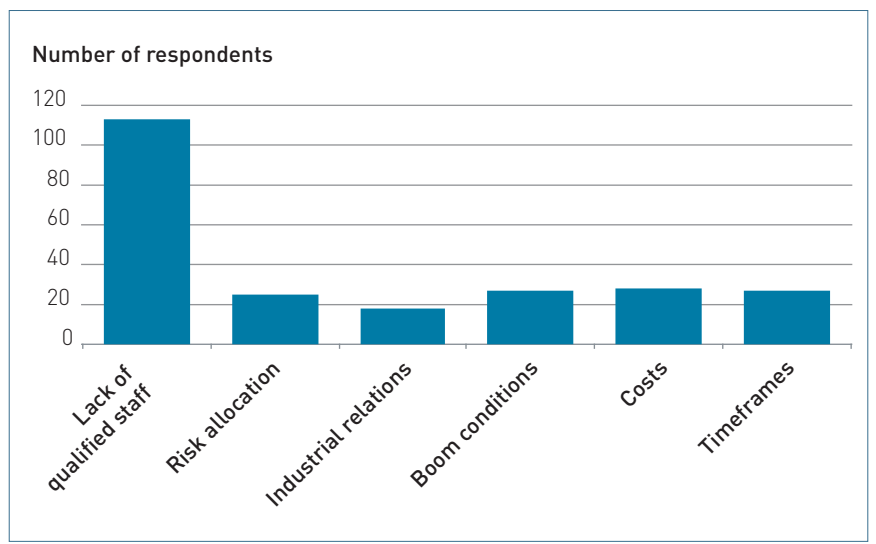
Our survey respondents confirm that the skills shortage is by far the most significant challenge they face today. The scarcity of qualified personnel impacts construction and infrastructure projects in every sector and at every stage of the project life cycle, from the initial scoping to completion.

In fact, over half of all respondents, regardless of sector, seniority or job type, identified the skills shortage as *the* critical industry challenge. The shortage is experienced across the board and affects not only constructors, but also principals, designers and other consultants, at every level and

across the range of occupations and professions.

Lack of expertise is commonly cited as a key factor leading to insufficiently scoped projects, problems during project negotiation and hiccups during project execution. Ultimately, this skills crisis is viewed as being a cause, either directly or indirectly, of time delays, cost overruns and other pressure points that lead to disputes in the industry. The respondents overwhelmingly acknowledge that their projects will ultimately suffer without a well functioning, motivated and experienced team composed of high quality people who relate well to each other.

What are the industry challenges that give rise to project pressure points?



Survey respondents provide various reasons for the shortage. Most believe a deficit in training initiatives for young people has led to a diminishing number of engineering graduates and trade apprentices entering the industry. Many also express disquiet about the traditional apprenticeship scheme which they consider too long and unattractive to potential participants.

The other difficulty identified is the inability to retain the talent which has already entered the industry. One reason ventured for this is that instead of working to create a more stable workforce, the industry has resorted to the short-term solution of hiring contract labour on a regular basis. Another view put forward is that the cyclical nature of the industry has entrenched a project approach to resourcing, again leading to a transient workforce. The main reason proffered for this was that without a visible pipeline of work, there is little incentive for any industry participants to build and maintain a solid core of expertise.

FUTURE OPTIONS

Suggestions for future options fall into three broad categories:

- Attracting people into the industry
- Retaining people presently in the industry
- Efficiently using resources.

ATTRACTING PEOPLE

A significant number of respondents consider that more should be done to encourage the present generation of school leavers into their industry. There was almost universal acceptance that the industry needs to offer an occupation and a lifestyle which is more attractive than those offered by the apprenticeships, cadetships and graduate employment opportunities which are presently available. One specific suggestion was to develop entry level pathways to the professions and trades from schools and colleges. A smaller number suggest that skilled labour ought to be brought to Australia through a skilled immigrant intake.

RETAINING PEOPLE

Others suggest looking after the industry's existing resources better and paying more attention to retaining staff. Examples given include:

- Introducing more flexible working options to achieve a better work life balance
- Encouraging a more stable work force instead of hiring short-term contract labour
- Implementing policies and practices to encourage and retain mature age workers.

EFFICIENT USE OF PEOPLE

A third category of respondents accepted that in the short-term, the pool of skilled resources was a constraint the industry needs to acknowledge and work within. They suggested that governments and their agencies should coordinate the timing of their projects to enable the industry to make the most efficient use of its limited resources. The current backlog of infrastructure projects makes this a viable possibility.

INDUSTRY VIEW

"The industry is structured to live from project to project, and not to carry staff or labour between projects. There is a false assumption that labour and staff can be engaged once a project is won, and that there will always be a pool of suitably skilled people to draw from. The reality is that the pool is shrinking fast, particularly in the skilled trades area, and the structure of the industry does little to encourage individuals to build a career with a particular firm. Companies are very unwilling to spend money on intangibles like training and staff development, particularly when the people they do have are flat out on the current project."

SCOPING AND PROJECT DELIVERY

Our survey reveals that, in many cases, respondents encounter fundamental flaws at the earliest stage of projects. The two flaws that emerged as most significant are:

- Inadequate scoping of projects
- Not using the best contractual delivery method for the project.

Getting off on the wrong foot

Survey respondents say inadequate scoping is encountered at several different points during the procurement process. However, they add that this problem really manifests itself as a pressure point when a project is released to the market for pricing. Constructors and designers alike express frustration at often receiving thin design or inadequate site information at this stage. This finding is consistent with the desire expressed by a number of constructors and consultants that principals should involve designers more at the early stages of projects.

A further source of frustration among the constructors is the reluctance of principals to take responsibility for the accuracy of the information which they provide. Indeed, constructors are often asked to accept responsibility for the quality of the information provided by principals, sometimes in situations where there is no way in which the constructor is able to assess properly the quality of that information.

Moving the goal posts

Another commonly cited cause of pressure points is principals changing the scope of their project during the market request phase.

One reason for this is that principals set unrealistic timeframes for their developments, allowing

insufficient time for proper documentation to be assembled before projects are released to the market. This not only affects the design, but also the site information used by the market to conduct proper risk assessments and to make accurate estimates for the completed project.

Another reason given was principals changing their minds as to their desired project outcomes after the project was released into the marketplace.

Inappropriate project delivery methods

A fundamental error experienced at the outset of projects is the inappropriate choice of contractual delivery method. Choosing the right

delivery method is essential to the ultimate success of the project. It defines the risk profile and is the touchstone for the participants' relationship for the duration of the project.

INDUSTRY VIEW

"Too often these days the documents produced for tendering are subject to ongoing revision which is disruptive and costly and places considerable strains on relationships. This is generally a result of the pressure placed on designers and managers to get the project underway in unrealistic timeframes."

FUTURE OPTIONS

Many solutions to the problem of inadequate scoping and inappropriate delivery methods were proposed by survey participants. Constructors, in particular, want to see a greater investment of time, effort and money in the scoping stage, a commitment to the full disclosure of information, as well as clarity and certainty of project goals and specifications. They recognise that they should spend more time up-front pinning the client down on what they want and in understanding project deliverables.

Most of the reform in this area requires action by principals. This is because at this stage of projects, principals are the only participants that can effect change. Some of the practical suggestions for improvement include:

- Principals should produce design documents and functional performance specifications which comply with industry best practice to ensure that projects are adequately scoped prior to going to market.
- Principals should carefully consider and seek specific advice on the most appropriate project delivery method during the feasibility and planning stage for each project.
- Principals should establish a market request process that allows for the selection of a preferred bidder before a contract is fully negotiated.

RISK ALLOCATION

Our survey results indicate that the issue of risk allocation is at the heart of what many respondents refer to as a “them and us” culture within the industry. Many constructors note that because of the entrenched culture of competitive tendering, negotiations are, more often than not, adversarial and principals seek to impose on constructors whatever risk they can. Often, constructors are asked to accept risks which are outside their control. What’s more, they commonly accept such risks.

Although principals acknowledge that they impose risk on constructors, most do not recognise this to be a problem.

One view dominated all others suggested by survey respondents: there needs to be acceptance

throughout the industry that risk should be appropriately allocated to the party best equipped to manage it. However, all parties will need to work together to understand the actual risks involved, requiring a thorough risk appraisal at the

outset. And all parties will need to realise that passing on an unmanageable risk does not always provide certainty; it often makes a dispute inevitable and places the successful delivery of the project in jeopardy.

FUTURE OPTIONS

Many survey respondents would prefer to see greater emphasis on inclusive approaches to risk allocation, rather than a predetermined risk matrix which is imposed with little or no consultation. This would require principals to be prepared to act more openly and devote more time to planning: as one respondent put it, “measure twice to only cut once”.

To achieve this, there needs to be an attitudinal change to the preparation of contract documents. Accordingly, for each project, there needs to be a critical examination of risks that may arise, and these risks must be allocated fairly.

DELAYS AND DISPUTES

Time is money and this is particularly true in the construction and infrastructure sectors. Our survey identifies insufficient and unrealistic timeframes and cost overruns as major project pressure points in the industry. It also pinpoints both of these as key challenges for the future.

Time and cost overruns are revealed as the two biggest causes of disputes in construction and infrastructure projects. A key reason is that every project is unique.

Many of the factors contributing to time and cost overruns are connected with the skills, scoping and risk issues identified earlier. Specifically, survey respondents cite:

- Lack of up-front planning, incomplete design and incorrect

or uncoordinated documentation

- Poor project management
- Changes to scope
- Authority approvals.

Disputes are seen as both a significant cause and damaging consequence of time and cost overruns. They are a factor in all major projects. Prevention is undoubtedly better than cure and it is vital that project participants agree in advance clear dispute avoidance and resolution mechanisms.

INDUSTRY VIEWS

“Too many projects are behind programme. Too many constructors promise programmes that cannot be met. Too many clients believe them!”

“Time is directly linked to cost so that any delays immediately impact budget.”

FUTURE OPTIONS

Traditionally, the construction and infrastructure industry in Australia has been at the vanguard of alternative dispute resolution methods. To maintain this position, the industry should consider more proactive approaches to dispute resolution, such as the joint appointment of a neutral and independent specialist to act as a sounding board for the benefit of the project, rather than the individual participants. Alternatively, a system of internal peer review could be introduced to assist the participants avoid or settle disputes.

Project Definition

The phase in the project works when the preferred project option is developed from a basic project brief to a defined project so that the principal can consider whether the project should proceed. This phase includes the undertaking of feasibility studies and scoping.

SUMMARY

Our survey reveals that project participants, other than principals, believe there are substantial deficiencies in the definition and scoping of major construction and infrastructure projects in Australia which are creating significant pressure points throughout the project life cycle. The reasons cited for this include:

- A compressed budget and timeframe in which designers and other consultants are permitted to operate by their clients.
- The skills shortage in the industry.
- The use of inappropriate contract delivery methods.

KEY FINDINGS

Major Australian projects are inadequately scoped

The survey reveals that 42% of projects are inadequately scoped prior to going to the market. This is a worrying figure because it means that principals are likely to receive tenders from constructors that fail to address critical issues and contain sub-optimal pricing structures.

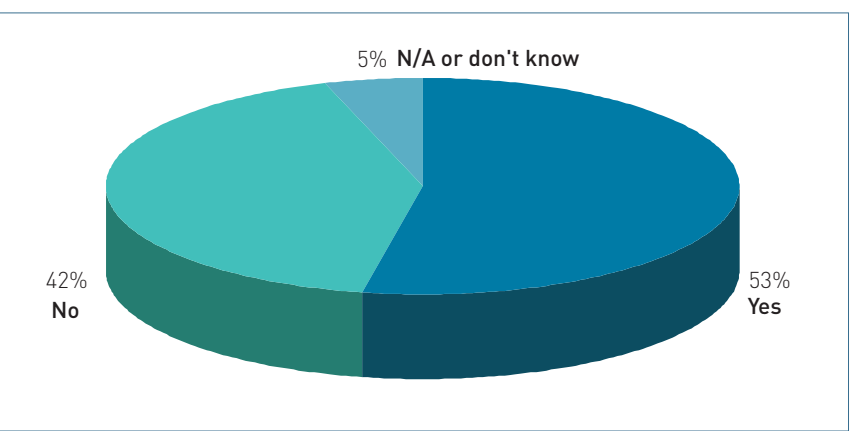
Of the projects that are identified as inadequately scoped, 39% are not completed on time while 55% are completed over budget.

The survey also highlights a critical need for industry participants to reduce their tolerance of industry practices or approaches that fall well short of best practice particularly in the

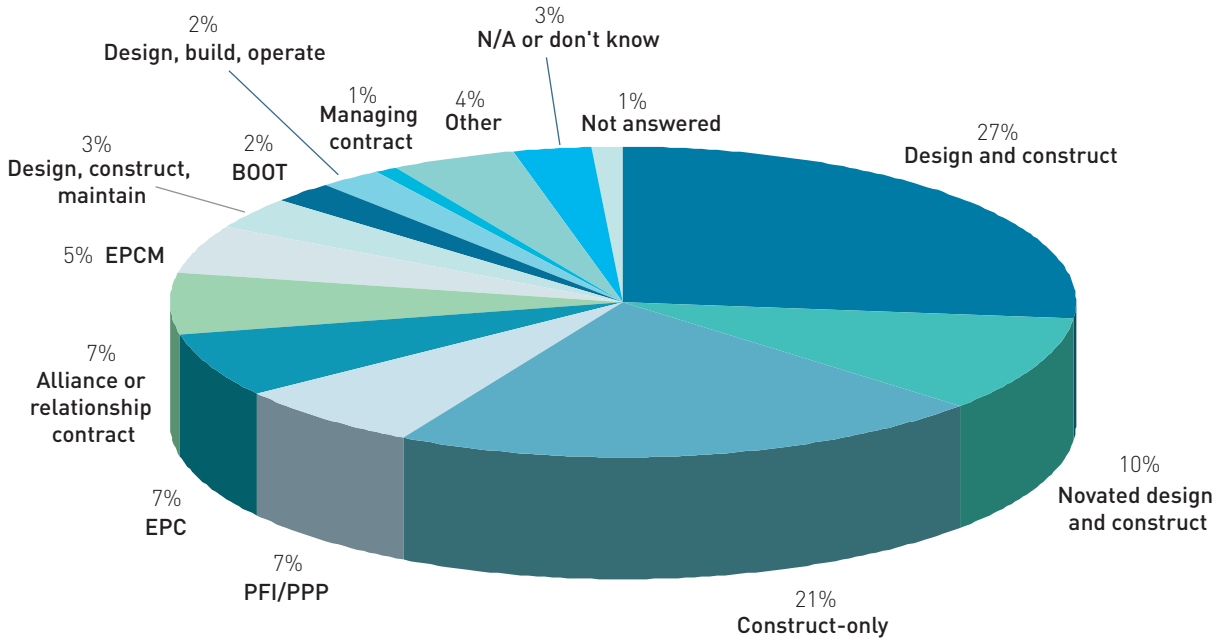
early stages of a project. Significant time and cost benefits are available if the rush to get an inadequately scoped project to the market can be resisted.

Inadequate scoping is a problem which cuts across all industry sectors, but is identified in the survey responses as most pronounced in the rail (55%), mining (54%), energy (50%) and industrial (47%) sectors. These statistics suggest that the industry, and in particular the sponsors of major projects in Australia, are not adopting best practice in risk management during procurement. The survey responses indicate that it is not uncommon in these industries for projects which are not ready to be brought to the market. In terms of delivery method, the data indicates that

Was the project sufficiently and accurately scoped prior to going to market?



What was the project delivery method?



just over two thirds of engineer, procure, construct (EPC) contracts are inadequately scoped, while 50% or more of novated design and construct (D&C) alliance and public-private partnership (PPP) contracts don't make the grade when it comes to scoping.

The survey reveals that some respondents believe that principals are not spending enough time or money on design consultants at the outset of projects. A common lament is that the quality of design documentation presented to the market is often poor and that the problem is only getting worse. Interestingly, constructors do not blame the consultants for this. Instead, they attribute the poor quality of the documentation to the compressed budget and time frame in which the designers are permitted to operate by their clients and the difficulty in finding and retaining skilled and experienced

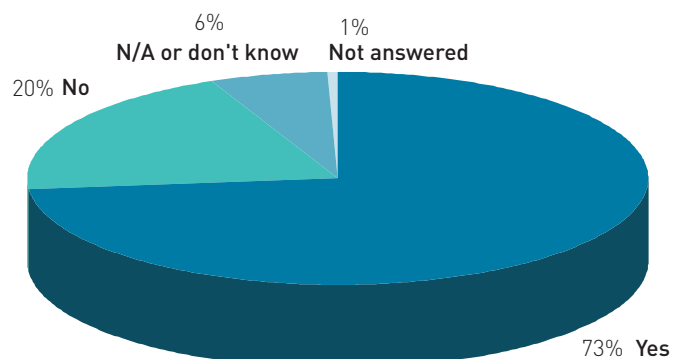
designers. They also describe the present trend where principals "fee cut" their designers at the early stages of projects as "a false economy" and "counter-productive".

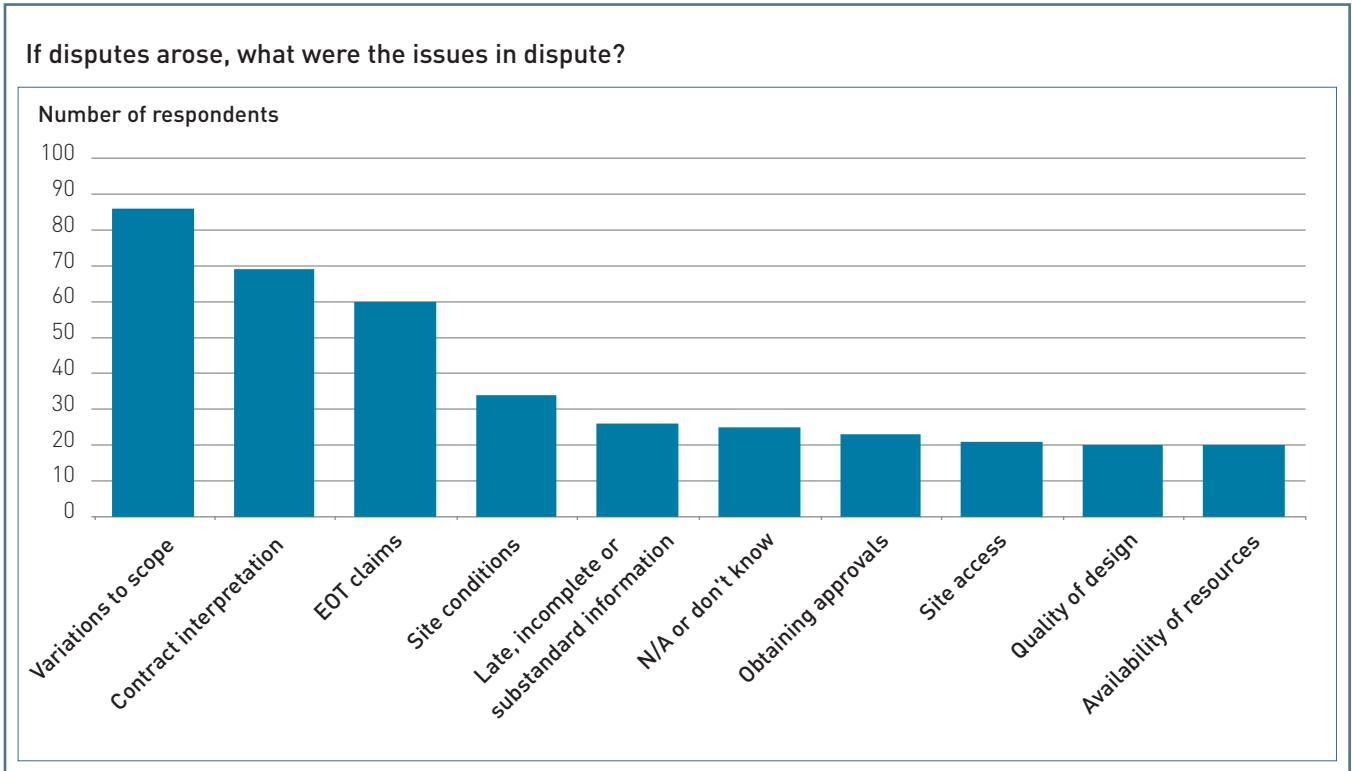
Our findings also show a firm link between those projects which are inadequately scoped and the existence of scope-related disputes. The most commonly cited causes of disputes are variations to the

scope and interpretation of what is included in the scope of works.

Principals and financiers of projects are naturally keen to have their newest asset constructed and operating as soon as possible. Minimising costs and bringing the asset into operation so that it can generate revenue are their main priorities. As a result, projects which spend years in the planning,

Was it the most appropriate delivery method?





funding and feasibility stages are sometimes afforded only weeks at the scoping and design stages.

However, the message from survey respondents is that if a short-term view is taken, which places low, up-front design costs and early commencement above all else, project sponsors are more likely to face claims. A focus on better defining the scope of projects at the outset, through the thoughtful use of design consultants, is likely to relieve this pressure point.

Design and construct contracting leads the field

Well over half of the survey respondents say their projects involve either design and construct (including novated design and construct (D&C)) or construct-only. In fact, over a third of respondents are involved in a D&C project, with a quarter of these involving novated consultants.

Of the projects surveyed, PPPs have largely been confined to rail and social infrastructure

sectors. While the relatively new PPPs accounted for more than a third of projects in each of these two sectors, they only accounted for 7% of projects overall. In our view, this reflects government procurement policy, rather than being an accurate guide as to which sectors are best suited to PPPs. It also indicates the market’s natural wariness with a (relatively) new procurement method.

In the energy sector, EPC contracting (44%) dominates while D&C contracting is especially strong in the rail and road sectors where it is commonly used in 55% and 40% of surveyed projects respectively.

Less commonly used forms of project delivery are alliance contracting (7%) and engineering, procurement, construction management (EPCM) contracting (5%).

Survey responses indicate that the water industry is the biggest user in Australia of alliance contracting, with almost 25% of respondents in this sector citing it as the method of

procurement used in their project. A reasonable proportion of mining (15%) and ports/airports (15%) projects are also procured using an alliance. The survey indicates that EPCM is prevalent as a delivery method in two sectors: industrial (27%) and mining (15%).

Inappropriate contract procurement and delivery methods are still being used

Overall, these findings reveal that the survey respondents adopt a conservative approach when selecting a project delivery method, relying too heavily on previous experience in a sector, rather than the particular characteristics of the project in question. Whilst prior experience is an important consideration, project participants should be cautious of choosing a delivery method out of habit, rather than as a result of critical analysis in the context of the project.

In fact, 20% of respondents say the procurement method adopted is not the most appropriate choice

for the project in question. The proportion is even higher in the road and rail projects surveyed, where more than a third state that an inappropriate contract delivery method is being used.

It is disquieting that the principals and constructors in our survey hold different views on how best to procure major infrastructure projects. This suggests a lack of understanding between the two parties which does not auger well for the smooth delivery of high profile projects in what is always a sensitive political climate.

However, there are two industry sectors where the use of inappropriate contract delivery methods appears to be considerably less prevalent. The clear leader is the water industry. Survey respondents from this industry say adequate consideration is given to the choice of delivery method, with the most appropriate method being used in 90% of their projects. The results from the social infrastructure sector are also encouraging, but, with 14% of respondents in this sector stating that their project did not use the most appropriate delivery method, there is still some scope for improvement.

INDUSTRY VIEWS

“Fee cutting of designers has to stop. These people have to be paid appropriately. It is counter-productive. Not only does it stifle creativity, but it inevitably leads to variations later down the track.”

“Project delivery would be improved if there was better documentation from the outset. There would be fewer discrepancies and variations. The quality of documentation which we receive is not great and the quality is getting worse. The problem is caused by clients who need to pay their consultants more. Not doing so is a false economy.”

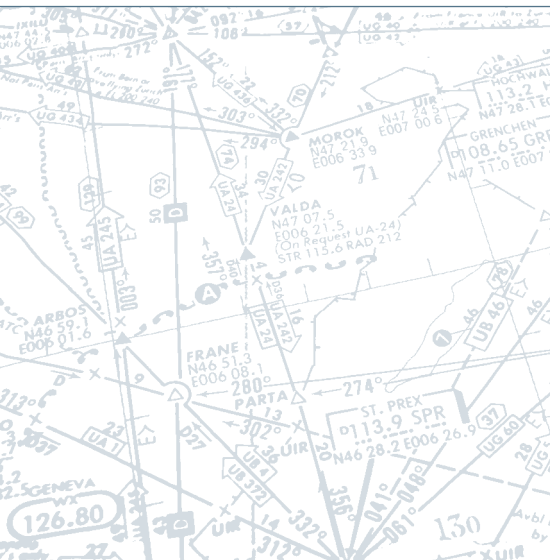
“What happens is that the scope is not fully prepared when the project is started and then they have to keep expanding the scope and the project gets bigger and bigger (but with the same timeframes) and then you are under more and more pressure. The timeframes on these projects are too tight and we don't have the staff to do it.”

“Too often these days the documents produced for tendering are subject to ongoing revision which is disruptive and costly and which places considerable strains on relationships. This is generally a result of the pressure placed on designers and managers to get the project underway in unrealistic timeframes.”

“Many of the disputes are the result of poor documentation. Every project that you bid these days has incomplete documentation. The principal puts the project out to tender before the documentation is complete and then keeps re-issuing the documentation throughout the process. An alliance contract structure is one way to get around that difficulty as the design manager is part of the team and that process can be managed. But also in the normal process you have several months for the design process and you need to make use of that time to do the design.”

FUTURE OPTIONS

- Principals should identify all stakeholders so that appropriate issues and key risks can be surfaced and addressed prior to going to market.
- Principals should carefully consider and seek specific advice on the most appropriate project delivery method during the feasibility and planning stage for each project.
- Principals should make better use of all available resources to ensure that projects are adequately scoped prior to going to market.



Market Request

This is the phase in the project when the principal goes out to the market to invite bidders to tender for the project and evaluates bids received.

SUMMARY

The key messages to emerge from our survey regarding the market request phase of projects are that:

- Constructors tell us that they are dissatisfied because the information released to the market by principals is often unsatisfactory, and from a legal perspective they are not able to rely upon it anyway.
- Despite this, constructors are often not proactive in obtaining further information from principals during the market request phase.

This state of affairs is not beneficial to either constructors or principals because the survey found that in the majority of cases further information would have improved the price or quality of the bid.

KEY FINDINGS

Many respondents are dissatisfied with the information available during the market request phase.

The survey shows that 32% of respondents are dissatisfied with the information which is released to the market to price projects. It also uncovers a wide disparity between how principals and constructors perceive the quality of information made available during the market request phase.

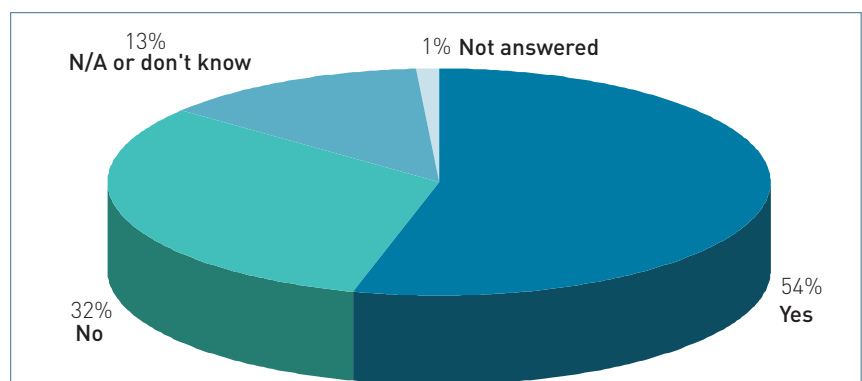
While around two thirds of principals believe they provide adequate information, almost half of the constructors are not satisfied with either the quality or volume of information received. Given these differences in perception, it is perhaps not unexpected that 23% of respondents believe that the

market request phase gives rise to pressure points.

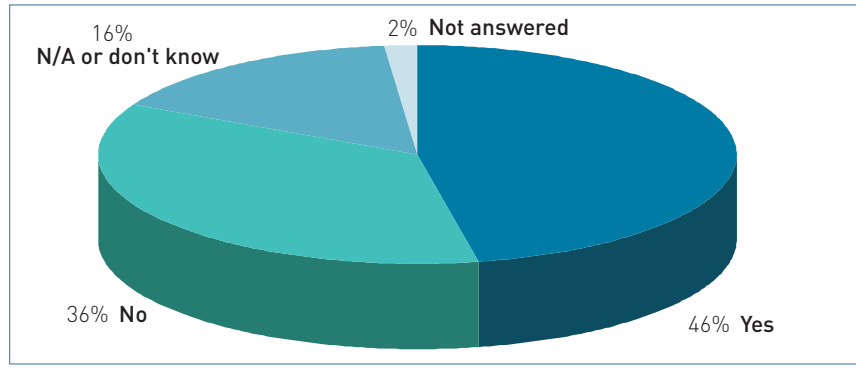
In addition to inadequate tender documents, a number of constructors view the delivery time for bid prices as too short. The dissatisfaction in the projects surveyed is highest in the rail (55%), road (36%), residential/commercial (36%) and industrial (33%) sectors.

As we have seen in the previous section, some constructors complain about receiving tender information which they regard as significantly under-prepared. This, they say, makes them feel like they are being asked to finalise and check the principal's work. This is unfortunate because almost half of all respondents indicate that more information would have improved the quality or pricing of bids on surveyed projects. Importantly, 65% of the constructors express this view, noting that it would have

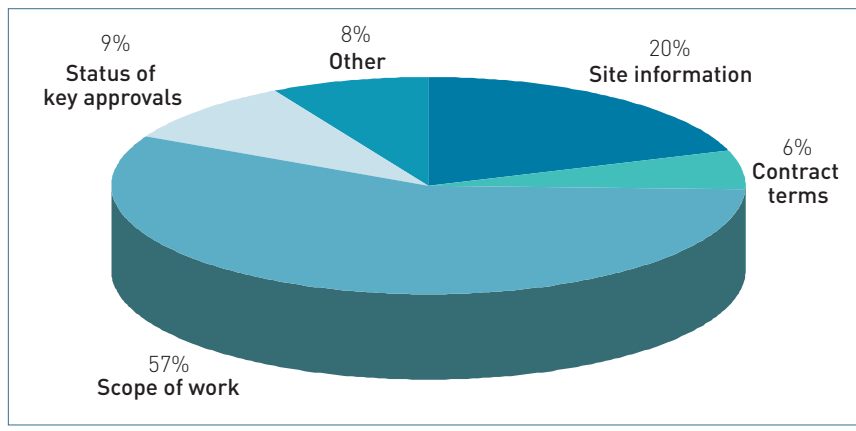
Were you satisfied with the quality and volume of information released during the market request phase?



Would further information have improved the quality or pricing of the bid(s)?



What further information would have improved the quality and pricing of the bid(s)?



better enabled them to estimate the project time line and costs. Put another way, the industry recognises that these two key pressure points could be avoided.

Of all the respondents claiming that further information would have assisted, 57% say they would have liked more information about the scope of the work, with over a fifth of constructors adding that more details on the site conditions would have improved their bid.

The potential drawbacks of inadequate market request information are also highlighted. Of those respondents who are dissatisfied with the information made available, 50% list the scope of work and site information made available during the market request phase as issues in dispute. When compared with the figures for which

information was lacking in the market request phase, the similarity is unmistakable. It is almost inevitable that if the market request information is inadequate, disputes will arise.

Bid costs

The survey paints a picture in which bid costs are becoming comparable with profit margins, leaving constructors and subcontractors with little room for error. This is also identified by many constructors and subcontractors as the cause of significant pressure points.

Overall, one third of respondents note that their bid costs are less than 1% of the project value. However, 10% of respondents estimate their bid costs at between 3% to 5% of the overall project works. Of considerable concern,

INDUSTRY VIEWS

“The constructors put a price down. They are looking to cut corners all over the place. In the process, the timeframe for producing documents for tender has been dramatically reduced. There is a new understanding that it is now only a three month process for tendering, whereas properly, it probably requires six months.”

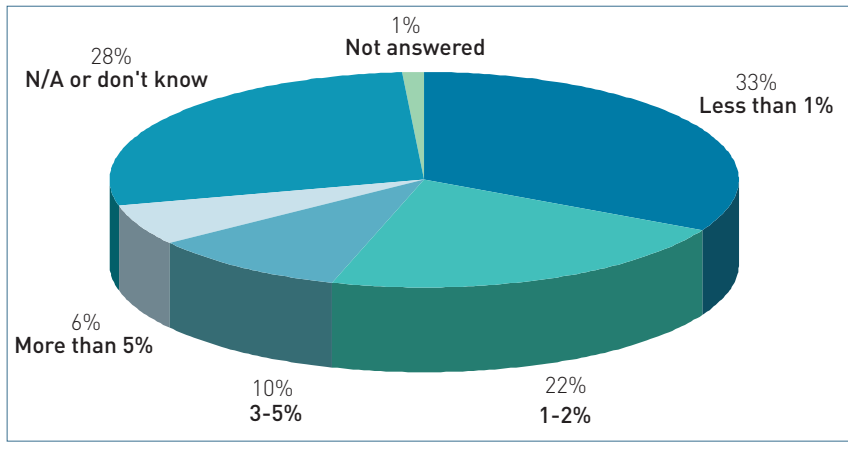
“Poor quality tender documentation results in cost and time claims.”

“Principals choose to accept the cheapest price knowing that the tenderer is significantly cheaper than his competitors and ignore the real probability that the cheapest tenderer will realise his errors and make claims to recoup his losses.”

“With competitive tenders as the basic business model for construction, the desire to win creates the problem. Ways to help overcome the problem include allocating risk to those who can best control it, clearly defining scope and expectations, setting realistic targets and dividing the project into manageable packages or contracts that are better scoped.”

“Negotiating strength has a major impact on projects. The owner has a strong negotiating position pre-appointment of a single preferred bidder. The contractor usually has the superior position thereafter, including during the delivery phase.”

What was the bid cost for the project as a percentage of the overall project works?



18% of those involved in projects valued at over \$500 million place their bid costs at between 3% to 5% of the project value. In terms of hard currency, this represents a significant cash investment by each bidder, in the order of between \$15 to \$25 million, simply for the chance of winning a project.

Industry reports suggest that some of Australia's larger constructors are accepting net profit margins as low as 1%, thereby increasing the pressure on smaller builders to price similarly. It has been estimated that margins are now less than 5% with some constructors estimating the figure as low as 2.7%.²

In summary, the survey reveals that the costs of bidding on a project are onerous for constructors, who are forced to incur large expenses in an overly competitive tendering market and narrow profit margins, and who have only a chance of recouping these costs if successful. The desire to win the bid also leads directly to bidders promising more than they can realistically deliver or bidding at a price that is lower than can be achieved. One respondent recounts the enormous pressure he experienced to accept uncontrollable risk. He invested over

\$5 million in bid costs which meant that not winning was not an option.

INDUSTRY VIEW

"Bid costs are in the range of 3% - 5% and this is a pressure point. However, the current PPP projects are "pathfinder" projects and will naturally incur more transaction and bid costs for both the public and the private sector. In time, when the market is more experienced in this type of procurement, bid costs should be reduced. However, the pipeline for PPP projects in Australia may not be sufficient to justify private sector involvement where the costs are high and the private sector is unsuccessful. The standardisation of contracts in this area will assist in this regard."

FUTURE OPTIONS

- **Principals should establish a market request process that allows for the selection of a preferred bidder before the contract is fully negotiated. This would have several benefits for the project and the industry in general:**
 - **The project would receive the constructor's early input on scope and buildability.**
 - **It would free up the limited resources of the unsuccessful bidders much earlier.**
 - **It would have the potential to reduce bid costs significantly.**
- **Principals should thoroughly review the bid documentation, especially the scope of work and site conditions, before it is released to the market so that bidders have sufficient information to price the project. Specifically, principals should be encouraged to produce design documents and functional performance specifications which comply with industry best practice.**
- **Principals should ensure that constructors are given adequate tender preparation time to allow them to produce optimal quality bids.**
- **Constructors should ask for further information where this would improve their understanding of the project so that they can price their bid with more certainty.**

Risk Allocation

The process of allocating the adverse effects of risks to the parties which are exposed.

SUMMARY

Risk allocation is ranked by industry participants as a major pressure point in present day construction and infrastructure projects. The reasons cited for this include:

- The imposition of risk by principals during tendering and contract development is endemic.
- The tendering process in a highly competitive market forces some constructors to accept inappropriate risk profiles to obtain work.

KEY FINDINGS

Risk allocation is weighted in favour of principals

A principle of long standing is: “The person best able to manage a risk should take that risk”. Our survey, however, reveals that, in many cases, this is no longer followed in Australia.

Our survey uncovers considerable dissatisfaction among constructors as to how risk is allocated in a construction contract, with 61% identifying risk allocation as a pressure point. Forty per cent of public principals and 29% of private principals also acknowledge that risk allocation is a pressure point.

The survey indicates that 74% of constructors believe that project risk is wholly or predominantly imposed on them by principals. While clearly not the majority, 41% of private principals and 35% of public principals also acknowledge this.

In terms of procurement methods, novated design and construct contracts are considered the most likely to have risks allocated wholly or substantially by the principal (77% of all respondents), followed closely by design and construct contracts (62% of all respondents). Conversely, alliance contracts are identified as those most likely to involve a more equitable allocation of risk. However, less than 10% of projects are procured in this way.

Inappropriate risk allocation

With principals enjoying the advantage of establishing the risk allocation they wish constructors to accept in the competitive tender process, constructors are often exposed to some risks over which they have little or no control. Indeed, 69% of constructors admit that some risks have been inappropriately allocated to them, but say they continue to participate in these projects, albeit reluctantly. In this regard, it is not only up to the principals, but also the constructors to drive a more appropriate risk allocation. If over two thirds of constructors accept risks which they identify as inappropriate to secure work, albeit unwillingly, principals may see that there is little incentive to proffer a more equitable method of risk allocation during the market request phase. Constructors need to recognise they are able to drive this change. However to do so, they will need to adopt a more conservative attitude to accepting risk, and be prepared to decline to participate in or continue in a market request process in the knowledge that they are likely to see a competitor awarded that project. This matter is solely in the constructors’ domain.

The three most common risks which constructors responding to the survey believe they should not be compelled to carry are:

- delay events (44%)

- site conditions (35%)
- approvals (30%)

The survey finds that constructors are much less inclined to engage external consultants to assist with identifying project risks (12% compared to private principals 53%). Instead, constructors appear to rely almost exclusively on internal review (86%).

Several principals express apprehension about constructors taking on risk without adequate contingency or margin. One notes: “Constructors appear to be willing to continue the trend of taking all project risks, without due diligence or evaluation of the downside.”

Consequences of inappropriate risk allocation

The imposition of risk with limited or no negotiation resulting in mis-allocation of risks can set the tone for the relationship throughout a project, as the following comments show.

“The current practice is to simply transfer risk without any assessment of who is best to manage the risk. It is an adversarial environment and not a cooperative environment. This practice needs to change.”

“Putting undue risk [onto]

constructors leads simply to adversarial relationships throughout project structures.”

When faced with imposed or inappropriately allocated risks, constructors appear to back these risks down onto their subcontractors, some of whom have no idea of the consequences.

Several principals also identify this as a significant cause for concern.

One principal says: “One of the biggest pressure points today is constructors who shift risk to the bottom of the food chain where it cannot be controlled.”

In contrast, as one constructor notes: “One of the most positive impacts on a project is an informed client or clients who do not have unrealistic expectations and who do not try and offload all the contractual risk to the builder.”

One solution put forward by a respondent is to “Look for the ‘fourth option’: one that is not the client’s demand; nor the contractor’s demand; nor the obvious compromise, but one which deals with the risk and issue in a considered manner for the benefit of the project.”

INDUSTRY VIEWS

“In relation to risk transfer, there are unrealistic client and client advisor (read solicitor!) expectations about a contractor’s ability to control a risk. This is especially so in relation to design errors, ambiguities and discrepancies.”

“Despite the rhetoric...that risks should be apportioned to the person who can best manage them, clients produce contracts that pass all risk onto the contractor – for example, wet weather – how can a contractor control this and why should liquidated damages apply for time lost due to this.”

“Sometimes clients have the wrong expectation of banks when it comes to risk allocation. They see us as a dumping ground for risk. Projects are more successful where risks are parked with those parties who can best handle the risk.”

FUTURE OPTIONS

- All participants need to recognise that wholesale transfer of all risk to another party does not necessarily lead to the delivery of a successful project. There needs to be an attitudinal change to the preparation of contract documents. Accordingly, for each project, there needs to be a critical examination of risks that may arise, and these risks must be allocated fairly.
- Principals should arrange a workshop for key stakeholders to identify the likely risks and then establish a fair risk matrix before going to market.

Contract Negotiation

The phase when the terms and conditions of the contract - including its risks, scope, price and remedies - are negotiated and agreed on by all parties.

SUMMARY

The contract negotiation period *should* be the phase where issues are discussed and agreed by the parties. However, the survey reveals that too often:

- Negotiation meetings are ineffective.
- The negotiation period is not the right length of time.
- Negotiations are adversarial.

KEY FINDINGS

Quality not quantity

Less than half the survey's respondents (46%) say the right amount of time is spent on negotiating the terms of the contract. The remainder are split in their views. Almost twice as many believe the time spent is too long than believe it is too short.

The disparity in these responses shows that the meeting participants often get it wrong, for varying reasons.

The contract negotiation phase is vital. It is when the risks, scope, price and remedies are settled. Yet, respondents say too little time was spent on it in 13% of projects. Some note that if too little time is spent on this phase, problems can arise at later stages of the project.

Of equal concern, and perhaps more annoying for meeting attendees, is that a quarter of respondents believe that the negotiation process takes too long. This may come as little surprise to many industry participants who have endured a series of endless, fruitless meetings. The survey tends to support the view that the number of meetings is not the correct benchmark for gauging whether or not a negotiation will proceed smoothly. Instead, focused and efficient meetings, that are fewer in number, will drive the parties to

spend time wisely and move them more readily towards agreement.

What drives this inefficiency? Survey responses and our own experience point to a number of common factors which act as blockers to effective negotiation:

- Ambit or unrealistic positions being taken by the parties
- Parties being unprepared for meetings
- Parties sending people to meetings who don't have the relevant skills, experience or authority to make decisions
- Poor management of the negotiation process.

Some respondents note that if the parties are unable to stick to meeting timeframes themselves, a designated facilitator or negotiation manager who is independent of the parties may be able to set deadlines, keep agendas and generally ensure the consistency of the process and understanding of the key issues.

Top negotiation concerns

The key issues identified by respondents which arose during the negotiation process in many ways reflect overall pressure points.

The top concerns in negotiations are:

- Price (34%)
- Delay events (32%)
- Limitation of liability (32%)
- Scope of work (26%)

- Site conditions (26%)
- Indemnities or warranties (25%)
- Liquidated damages (24%).

Although responses are relatively consistent some notable trends are that:

- Limitation of the constructor's liability is more often cited as a key issue for both private sector principals (47%) and public sector principals (40%) than for constructors (27%).
- Constructors are much more likely to consider delay events and scope of work as key issues, often based on the risk which has been allocated to or imposed upon them.

These findings reveal that although principals, constructors and consultants may all attend the same negotiation meetings, each group will, understandably, be driven by their own priorities causing them to view the same issues very differently. A cooperative, best for project approach, one of the commonly

cited project enablers, will not be achieved in negotiations if the parties cannot communicate effectively or understand each other's viewpoints in the context of the overall project.

Ineffective meetings

The survey shows that respondents know that things are often not working in the negotiation process. For example:

- 20% believe negotiation meetings are ineffective
- 14% do not know whether the length of time spent on negotiations is appropriate
- 27% believe the right people are not involved in the negotiations.

Yet the study reveals a high degree of confusion as to why the negotiation process is not working effectively. Firstly, 19% of those who say negotiation meetings are ineffective cannot, or will not, say why. The rest provide a wide range of reasons, including failure to set realistic timeframes or

communicate effectively, and an inability to stick to timelines if they can be agreed.

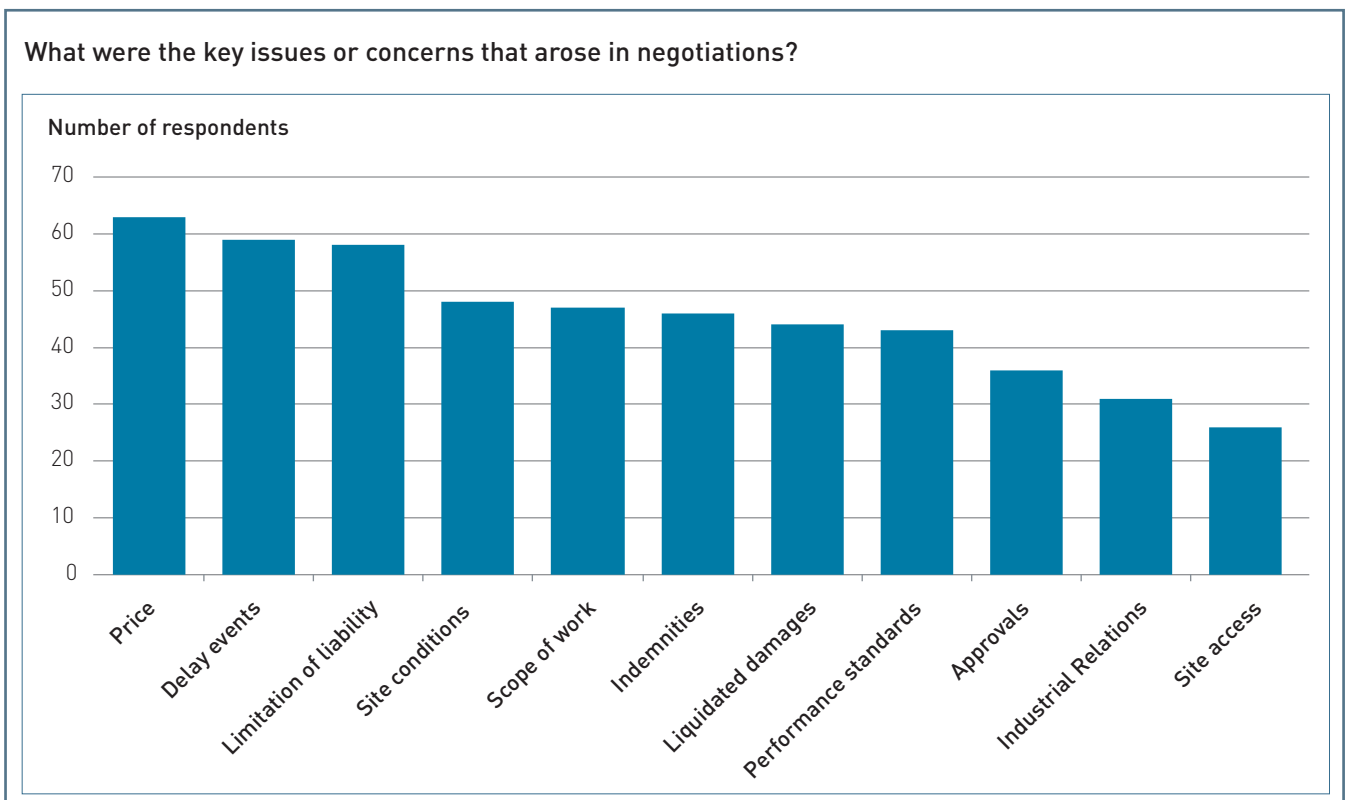
The right people

The survey shows the responses of people who thought that meetings were ineffective. Of those, 14% believe that there are too many people present, 27% think that the wrong people are at the meetings and 3% note the inexperience of attendees as a negative factor. These responses reveal that getting the right people involved in negotiation meetings is one of the keys to a successful negotiation process. This includes:

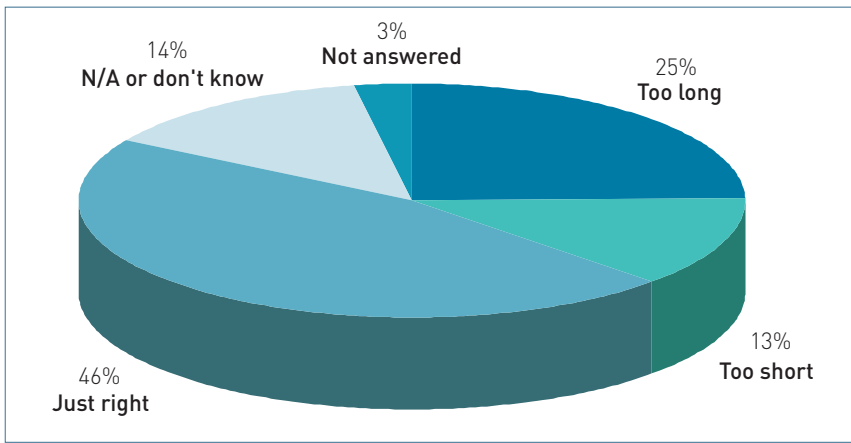
- Key stakeholders
- Only people who have value to add
- People with an understanding of the issues and experience in similar projects.

A more cooperative approach

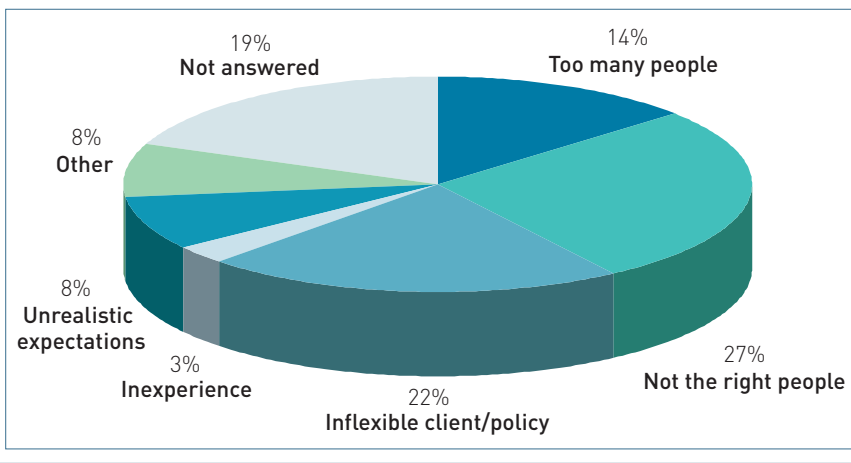
Many of the respondents believe a less adversarial approach to the contract structure and the



Was the contract negotiation period too long or too short?



If the contract meetings were not effective, why was this?



negotiation process will foster better negotiations and, ultimately, better relationships between industry participants. This view is supported by the survey's finding that 83% of the respondents who identify being involved with an alliance or relationship contract in their last project say negotiations were effective. On the other hand, only 55% say the design and construct meetings were effective, with around half of those respondents involved in a build, own, operate, transfer (BOOT) or PPP project saying the same.

INDUSTRY VIEWS

"Clients were being obnoxious, had a take it or leave it approach – there was no negotiation."

"I think the styles of contract that people are using are changing for two reasons. One, there are less constructors so they have the upper hand and clients are trying to make it more attractive for them to do the job. Secondly, there is a move to try to limit the amount of adversarial conduct by using other styles of contracting."

FUTURE OPTIONS

All participants should:

- **Get the right people involved: key stakeholders with an understanding of the issues and authority to make decisions.**
- **Ensure agreements reached at each stage of the negotiation process are accurately reflected in the documents.**
- **Adopt a negotiation protocol with a clear and realistic timeframe, focused and effective meetings, and a streamlined approach to minimise the number of draft documents issued.**

Project Execution

This phase involves the carrying out of the work under the contract.

SUMMARY

Nearly half of all projects are not completed on time. Among the factors hampering project execution are:

- A lack of skilled resources on both the constructor's and principal's teams, leading to poor management and inefficiency.
- Unexpected risks that materialise.
- Uncertainty with the scope of works.

KEY FINDINGS

Nearly half of all projects are not completed on time

Our survey finds that only 56% of projects surveyed are completed on time. It also reveals that of projects surveyed which run late, 58% run more than three months late. This is a disturbing statistic, particularly given that the resulting costs will need to be absorbed by one or more of the contracting parties. It is unlikely that an allowance will have been made for an overrun of this magnitude by any project participant. It is important to note that this result takes into account extensions of time granted under the respective contracts.

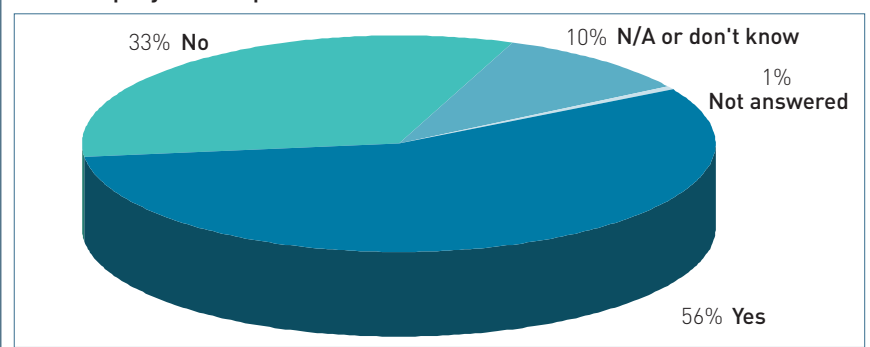
The survey also reveals that the greater the project value, the less likely it is that the project will finish on time. For instance, 66% of projects valued between \$20 million and \$50 million were completed on time, compared with only 50% of

projects valued at over \$500 million.

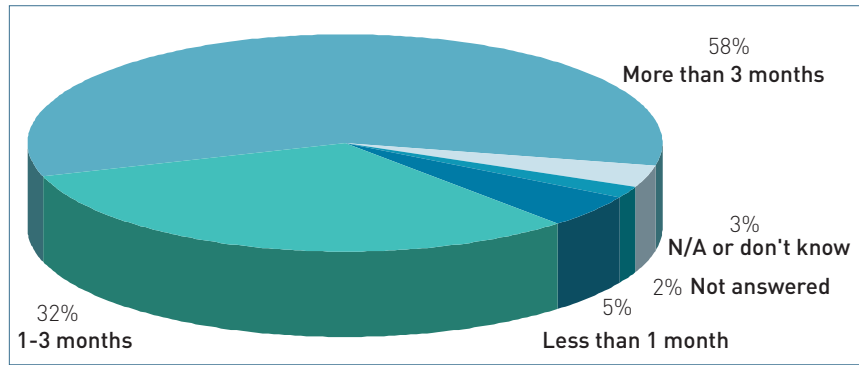
Another survey finding is that the most used form of project delivery method, D&C contracting, is most likely to achieve a project completed on time. Indeed, about 63% of the D&C projects surveyed were finished on time. Not far behind, though, was the more traditional delivery method of construct-only, where 56% of projects were completed on time.

The building and road sectors seemed, according to our survey sample, to be the better performing sectors when it comes to completing projects within the contractual timeframe. In these sectors 66% and 64% of projects respectively were completed on time. In contrast, only 42% of mining and resources sector projects surveyed made it across the line on time. This is not surprising given recent reports³ that the resources boom has resulted in soaring construction and labour costs, a tight supply of skilled resources and a market in which

Was the project completed on time?



If the project was not completed on time, by what period was it late?



several large projects have been placed on hold until prices return to more competitive levels.

Significant pressure points are not adequately addressed in advance

Survey respondents say the key pressure points affecting project execution include:

- Availability of subcontractors, labour or materials
- Poor management and inefficiency by constructors and principals
- Unexpected risks materialised
- Variations to, and interpretation of, the scope of works.

Similarly, the survey reveals that most of the different project delivery methods are affected by the same four pressure points in the execution phase. However, variations to scope are experienced as a much greater pressure point in projects which have adopted the construct-only project delivery method than in projects using other delivery methods.

All sectors are also fairly consistent in terms of identified pressure points. However, the survey finds that the availability of subcontractors, labour or materials are a much greater problem in the mining and resources sector than in other sectors.

Many respondents also state that pressure points are being caused by "unrealistic" programmes for the completion of projects. Principals

are criticised for having unrealistic expectations about the time needed and a lack of understanding of the requirements of the project, while constructors are criticised for agreeing to meet deadlines that are clearly unachievable. This is an issue which needs to be resolved when deciding upon the allocation of risk during contract negotiation.

Availability of subcontractors, labour and materials

As noted earlier, a clear theme that emerges from our survey is that a lack of resources is a major pressure point in the Australian construction and infrastructure industry. It affects projects not only during the negotiation phase, but right through to project completion. For instance, 28% of respondents say a change in personnel after the negotiation phase hinders project execution.

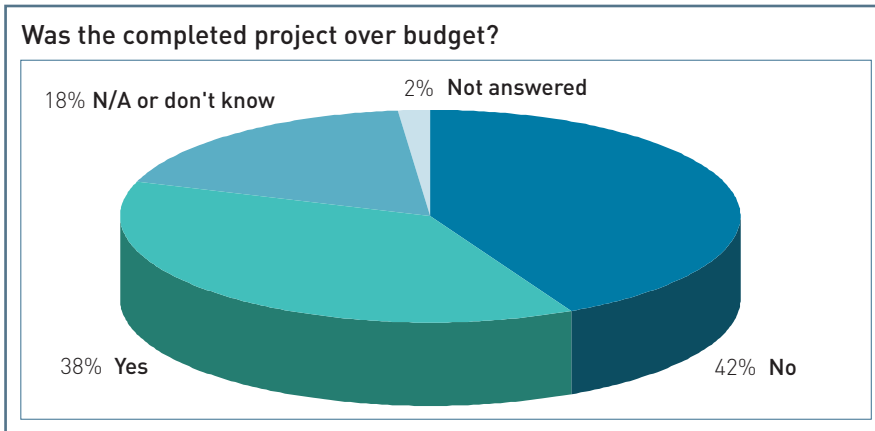
The clear message is that teams should be carefully selected and adequately resourced from the start of the project and once selected, they should only be changed as a last resort. It is preferable to retain the team members who negotiated the project, or at least have them available, throughout the execution phase because they will know the finer details of any agreed risk allocation. This approach will not only benefit contract interpretation and administration, but will also

INDUSTRY VIEWS

"People make it happen! It is therefore vitally important to be able to recruit the people with the necessary skills to ensure you achieve the project outcomes."

"Authorities approval: the long lead time in getting the DA [development approval]. Subsequently the inevitable changes required by the design process and the need for client changes necessitate further authority approval. There is a need for a more streamlined approval and change process."

"Usually you submit a DA and the relevant authority imposes a whole bunch of conditions. When you get into the real design and development stage, it's often simply not possible to fully comply with both the design and the DA conditions. But by that stage, you've signed the contract and you're stuffed."



assist in reducing the potential for disputes.

Poor management or inefficiency

From the principal’s point of view, one of the three main issues creating pressure points is the contractor’s poor management or inefficiency. In contrast, constructors view poor management by the principal or the principal’s representative as a key pressure point. Put simply, fingers are pointed both ways. The clear inference is that a lack of communication between parties in an adversarial environment during the execution phase is a major cause of pressure in projects.

Unexpected risks materialised

Survey respondents highlighted several unanticipated risks which materialise during the execution of their projects. The most common were:

- Latent conditions such as ground conditions
 - Delays caused by inadequate design and changes in scope
 - The shortage of skilled personnel and increased costs of resources
 - Site access issues
 - Delays with the approval process.
- Site access issues are one type of risk which appears to be underestimated by contracting parties during the negotiation phase.

This is a by-product of inadequate scoping and design, a constant theme throughout this survey.

Respondents also identify delays in the approval process as an unexpected risk which was realised during projects. Compounding this is the extent of delays which are not within the direct control of either contracting party; they are in the hands of the consent authorities.

Consequences of pressure points in project execution

The survey reveals that more than a third of projects are completed over their forecast budget. Respondents provide various reasons for cost overruns. In particular, the quality of the definition of the scope of the project is considered a major factor

which affects the ability to finish the project within budget. Incomplete or inadequate design work is a key contributor to this. The recurring themes of insufficient skilled resources and the increased costs of labour and materials are other key factors, particularly in the resources sector.

However, it is not only the resources sector in Western Australia that has been severely affected by the higher costs of labour and materials and the labour shortage. Queensland has also been hard hit. There are reports of the Gold Coast experiencing increases in costs of 1% every month since around the beginning of 2004,⁴ and of the Brisbane CBD not producing a major project where the builder made a profit in the previous two years.⁵

The two most popular forms of project delivery method, the D&C and the construct-only delivery methods, display interesting results when it comes to cost overruns. D&C contracting performs better with around 33% of projects completed over budget, by on average 15%. On the other hand, 46% of construct-only projects exceeded their budgets, in this case by 19%.

FUTURE OPTIONS

- As far as possible, all participants should ensure the stability of the project team.
- All participants should establish practical processes to facilitate communication and teamwork at all levels.
- All participants should establish procedures for identifying, reviewing and escalating issues at the earliest possible stage to avoid protracted disputes.
- All participants should agree upon realistic project goals and milestones in the negotiation process. To facilitate this, a more diligent examination of design and construction programmes is needed.

Dispute Resolution

SUMMARY

In relation to disputes the survey reveals that:

- **Disputes are widespread in Australian construction and infrastructure projects.**
- **Negotiation is by far the preferred method to resolve disputes.**
- **A majority of respondents are not satisfied with the time, cost, process and outcome of the dispute resolution methods used.**

KEY FINDINGS

Disputes are widespread

The overwhelming majority of respondents said they had invoked a dispute resolution process in their projects. The most common issues in dispute are variations to scope (47%), contract interpretation (38%), extension of time claims (33%) and site conditions (19%). The survey reveals that these issues are common across all projects regardless of the size or the delivery method used and the industry sector.

Negotiation is preferred

Overwhelmingly, the survey shows that project level negotiation (72%) and executive negotiation (59%) are the two most commonly used dispute resolution methods. This, in part, is a reflection of the prescriptive nature of the multi-tier dispute resolution clauses in project contracts. It also reflects the desire of parties to negotiate and agree on an outcome to disputes, rather than having a third party impose a decision with considerable time and cost implications to both parties. Indeed, the cost of resolving a dispute when it is decided by a third party is often seen as outweighing the benefits.

Consistent with the preference for negotiated dispute resolution is the survey finding that principals in the

public sector tend to avoid litigation, instead preferring negotiation and mediation to resolve disputes.

Responses to the survey indicate that principals in the public sector are more than twice as likely to use mediation than their private sector counterparts to resolve disputes. In contrast, while private sector principals and constructors prefer forms of facilitated negotiation, they will resort to litigation where necessary.

A question of time and value

Less than half of the survey respondents are satisfied that the dispute resolution methods used are effective in terms of cost, outcome, time and process.

In the projects surveyed, 41% of disputes took up to three months to resolve. Of the most common methods of dispute resolution, 72% of disputes settled by project level negotiation and 59% of disputes settled by executive negotiation are resolved in less than three months. Of the disputes not settled in less than three months, 16% took over 12 months to resolve.

One reason often cited for a delay of over 12 months is the time needed to complete prescribed dispute resolution procedures which involve a third party to either facilitate a negotiated outcome or to impose a decision that resolves the dispute, for example through

litigation or arbitration.

The survey also finds that 42% of disputes had a value of less than 5% of the overall contract value. However, 9% of disputes had a value, relative to the contract, of more than 30%. The impact of such disputes speaks for itself.

Satisfaction in dispute resolution

Across all project values and organisations, only 33% of respondents were happy with dispute resolution procedures in terms of time, 39% in terms of the cost, 22% in terms of the process and 42% in terms of the outcome.

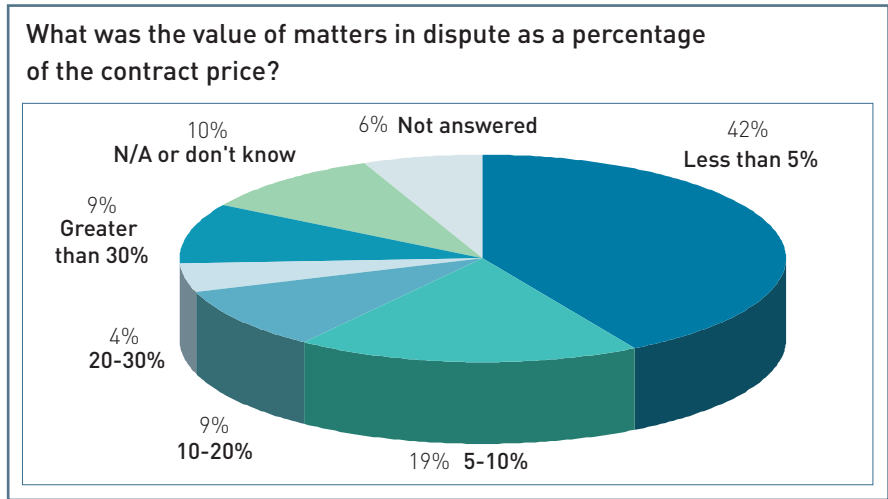
The survey also shows that in general, satisfaction with the effectiveness of a dispute resolution method used decreases as the project value increased, although there was an upward spike in satisfaction in a number of (but not most) projects worth more than \$500 million.

In projects worth \$200-\$500 million, only 9% of respondents are satisfied that the resolution process used is effective, a figure which contrasts with those who are satisfied in the \$20-\$50 million (25%) and \$50-\$200 million (24%) ranges. The larger the project, the bigger the dispute tends to be and as a result, the greater the risk, time and costs involved in seeking to resolve it.

The common thread

There is a clear connection between the pressure points experienced by industry participants in the early phases of a project and the issues that continue to arise throughout its life and which become the subject of disputes.

The previous chapters of this report detail the significant problems that arise as a result of



insufficient or inaccurate scoping. The statistics speak for themselves: of the projects surveyed which were not sufficiently scoped, 39% were not completed on time and 55% were over budget.

Constructor respondents indicate that over a project's lifespan, late, incomplete or substandard information is a significant issue in disputes. Interestingly, not many public sector principals (5%) or private sector principals (12%) indicate that these pressure points have been key issues of worry for them in the disputes they have encountered. Responses suggest that the disparity relates to the party which ultimately bears the risk, time and cost consequences of these issues.

As noted previously, many of the project delivery methods prescribe the dispute resolution regime to be used in the event of disputes or differences between the parties. However, as the survey reveals, when disputes do arise, parties are often dissatisfied with the resolution procedures stipulated by the contract. This may be the result of the parties not giving sufficient attention to dispute resolution clauses at the time of contract preparation and negotiation. Time taken at the early stages of a project, in this case prior to contract execution, can avoid costly, time consuming, as well as distracting and ineffective dispute resolution processes later.

FUTURE OPTIONS

- Traditionally, insufficient attention has been given to dispute resolution clauses prior to contract signing. All participants should discuss, agree and document an appropriate dispute resolution regime for each project. It is important to recognise that a dispute resolution regime which is appropriate for one project may not necessarily be suitable for another.
- Consider alternative approaches to dispute resolution which are proactive, such as appointing a neutral and independent specialist from the industry to act as a sounding board for the benefit of the project as a whole. Alternatively, a system of internal peer review could be introduced to assist the participants to avoid or settle disputes.

Scope for Improvement

SUMMARY

Our analysis of the survey findings points to four broad areas where there is scope for improvement:

- **Attracting and retaining highly skilled industry personnel.**
- **Investing more time, effort and resources collaboratively at the start of projects to set off on the right foot.**
- **Setting realistic timeframes and budgets.**
- **Developing an industry-wide culture of teamwork to address the "them and us" mentality.**

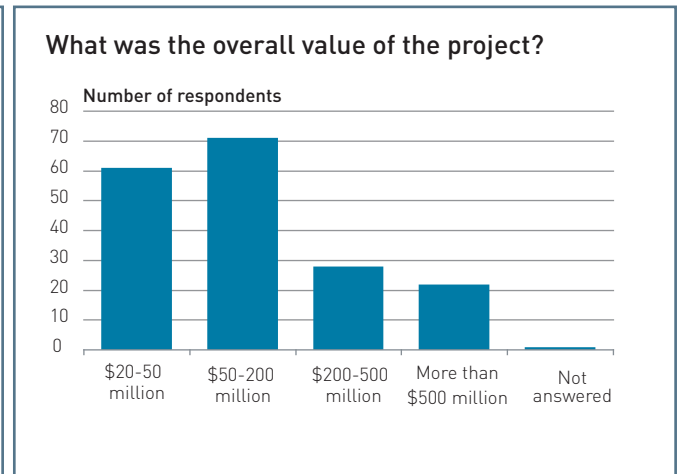
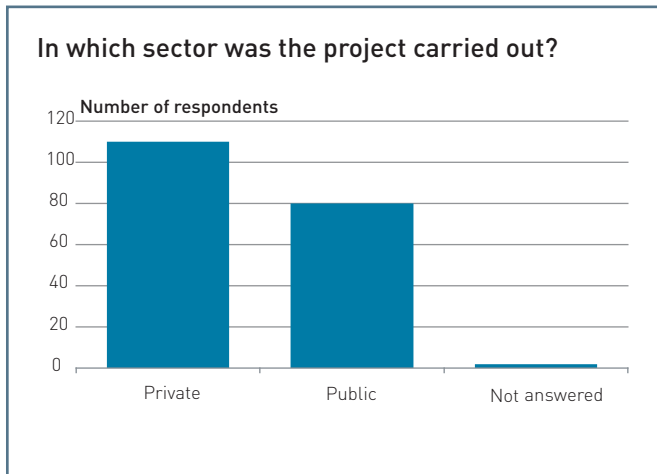
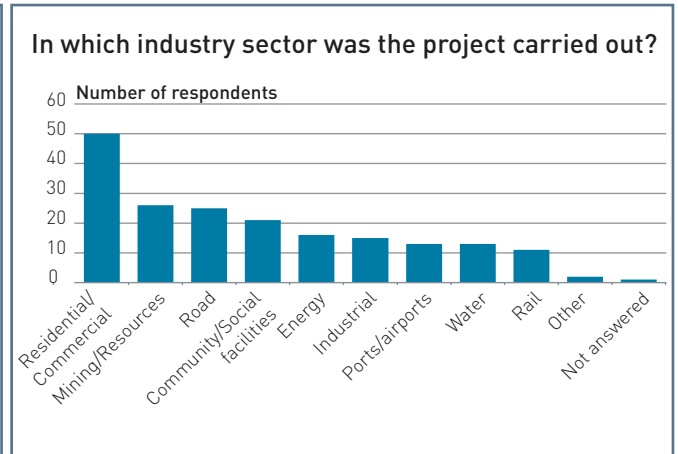
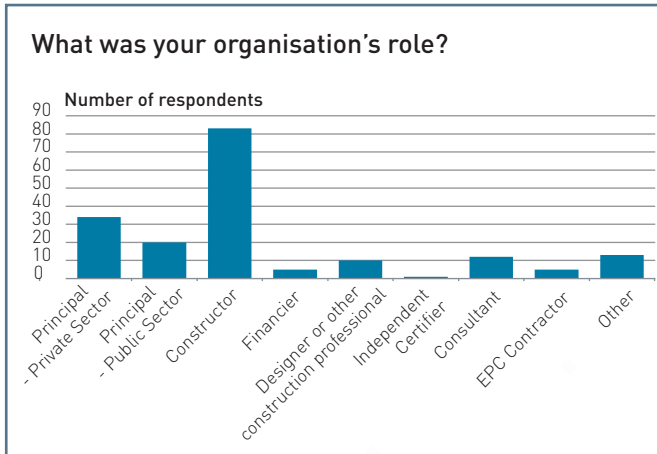
It is a mark of confidence in the Australian construction and infrastructure sector that despite this scope for improvement, new projects are being identified on a daily basis. As increasing numbers of these progress from drawing board to construction site, the competition for skilled and experienced personnel will become ever more intense. A collaborative, industry-wide effort to attract and retain young Australians and develop their skills is fundamental to the successful delivery of all these projects, with positive outcomes for all stakeholders.

Getting off on the right foot is critical – that means adequate scoping, as well as adopting the procurement model best suited to the project, with an appropriate allocation of risk between the project participants. Investing time and money to get it right up front will produce positive returns for everyone.

The Australian construction and infrastructure industry is booming as a growing economy sustains unprecedented development. There will never be a better time to address these challenges and implement change for the benefit of all participants in the industry.

APPENDIX 1: BREAKDOWN OF SURVEY RESPONDENTS

In order to obtain a balanced view, we invited participation from all project stakeholders in the industry, including both the private and public sectors. We received 190 responses to the survey questionnaire. Of these, 183 in-depth and comprehensive responses were used in our study. The tables below show the split of respondents by role, industry sector and value of their project.



APPENDIX 2: REFERENCES

1. Ian Porter, "Infrastructure costs to double", *Sydney Morning Herald*, November 8 2005.
2. James McCullough and Melissa Maugeri, "Bleeding to death", *Courier Mail*, 19 March 2005.
3. Tim Treadgold, "Work on Ice", *Business Review Weekly*, November 24-30 2005.
4. Fiona Tyndall, "Subcontractors hold the whip hand", *The Financial Review*, 5 April 2005.
5. James McCullough and Melissa Maugeri, "Bleeding to death", *Courier Mail*, 19 March 2005.

APPENDIX 3: ACKNOWLEDGMENTS

Blake Dawson Waldron and the Australian Constructors Association would like to thank all the respondents who participated in the research. We would also like to acknowledge the support of Infrastructure Partnerships Australia and The Australian Council for Infrastructure Development in relation to this report.



INFRASTRUCTURE PARTNERSHIPS AUSTRALIA is the only industry organisation that brings together both the public and private sectors to promote partnerships in infrastructure.

Drawing on the expertise and leadership of our members, it is actively strengthening the dialogue and relationships between businesses and governments.

Infrastructure Partnerships Australia has a robust work program of Policy Forums, research and analysis of best practice, media advocacy, and engagement with government through submissions and consultation.

Our agenda reflects the broad range of infrastructure – services, transport, social infrastructure, utilities and projects – needed to meet the economic and social demands of our nation.

We draw on 15 years experience in providing a forum for pursuing policy interests through our close association with TTF Australia (Tourism and Transport Forum).



AusCID is the principal industry association representing the interests of organisations owning, operating, building, financing, maintaining and otherwise providing advisory services to private investment in Australian public infrastructure.

The Council was formed in 1993 and its members are drawn comprehensively from all economic infrastructure sectors, including roads, rail, ports and airports, electricity generation, transmission and distribution, gas transmission and distribution and water. As a result of its membership base, AusCID is in a unique position to articulate the views of infrastructure owners, equity investors and debt financiers and combine them with the views of infrastructure operators.

This publication is intended only to provide a summary of the subject matter covered. It does not purport to be comprehensive or to render legal advice. No reader should act on the basis of information contained in this publication without first obtaining specific professional advice.

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