

UNIVERSITY OF SOUTHERN QUEENSLAND  
FACULTY OF ENGINEERING AND SURVEYING

Project Performance Measures for Civil Construction  
Projects associated with Different Procurement Strategies

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A dissertation submitted by

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Courses ENG4111/4112 Research Project

towards the degree of

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## **Abstract**

The Australian construction industry, operating in both the public and private sectors, ‘is the fourth largest contributor to Gross Domestic Product in the Australian economy’ (Nitschke, 2010, para. 2). Given the significance of this industry to the Australian economy, it is critical that the way in which contractors are procured for projects, and the way in which their performance is monitored, is undertaken with a ‘best practice’ focus with the aim of delivering excellent project outcomes for clients.

This dissertation investigated current procurement strategies and performance measures used on civil construction projects. Specifically, this dissertation was undertaken with the aim of determining the most common procurement strategies and performance measures used on civil construction projects, the relevance of these performance measures to the current industry, the opportunity to introduce new performance measures with a focus on driving innovation, establishing current industry thinking on procurement strategies and performance measures, and to determine industry thoughts on future approaches to procurement.

Using a single round Delphi study, semi-structured interviews using a feed forward methodology were undertaken with 20 industry experts. These experts were selected based on their employment history and knowledge regarding procurement and performance measurement, with participants selected from private, local and state government works agencies, engineering consultancies as well as contracting companies.

Using the Framework Approach, the qualitative data gathered in the Delphi study was assessed for trends and consensus of opinion amongst participants regarding the areas of investigation. It was identified that the industry continues to heavily utilise the construct only approach to procurement, with some use of the design and construct approach. Recession away from alternate approaches, such as alliancing, has been evident over the past five years.

Investigations identified that the industry has come to accept performance measurement as an embedded element of project delivery, and that the influence this has creates positive impacts during the delivery of projects. Participants expressed that the current areas of

performance measurement are reflective of the industry, and that there is not a need for new areas to be introduced.

The concept of driving innovation through performance measurement was dismissed, and it was found that this should be done through the adoption of a suitable procurement strategy. Specifically, the industry nominated a preference of moving towards greater utilisation of the design and construct approach, with the belief that this could help to bring innovation into the industry. In addition to this, it was identified that this would also require a change of mindset from procuring agencies who currently stifle innovation through prescriptive specifications and standards, as well as a risk averse approach to project delivery.

The study presents a number of additional findings regarding issues associated with current approaches to procurement and performance measurement, as well as discussing the limitations associated with this research, and potential future studies that can build upon this study.

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I further certify that the work is original and has not been previously submitted for assessment in any other course or institution, except where specifically stated.

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0050070348

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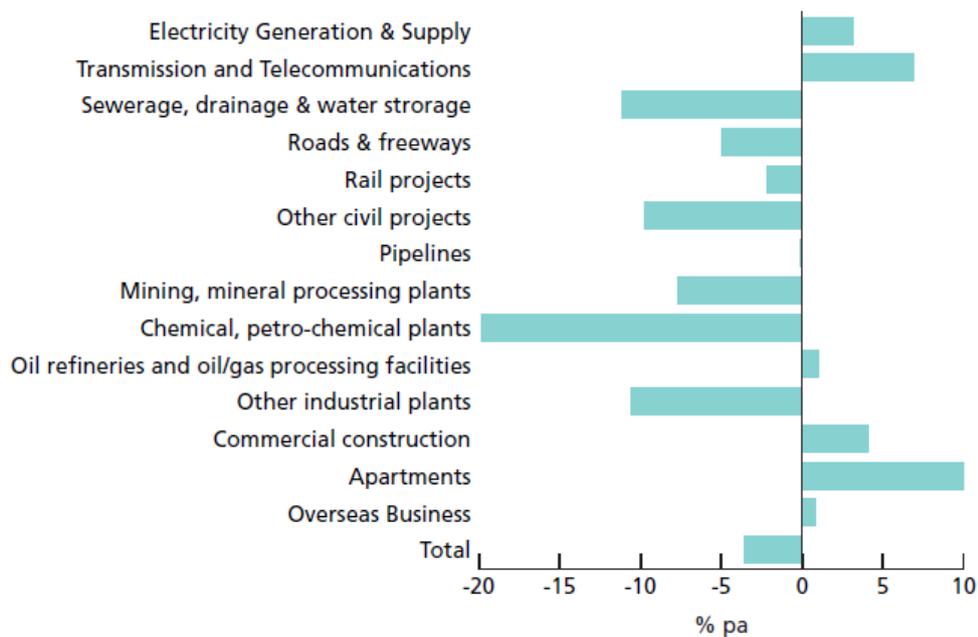
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# 1. Introduction

## 1.1. Background

The Australian construction industry, operating in both the public and private sectors, ‘is the fourth largest contributor to Gross Domestic Product (GDP) in the Australian economy’ (Nitschke, 2010, para. 2). Nitschke (2010) explains that the construction industry primarily engages in the areas of residential building, non-residential building and engineering construction.

After experiencing several years of growth, the Australian Constructors Association (ACA) (2014) states that a number of Australia’s leading construction companies are predicting a decline in non-residential construction across the majority of sectors throughout 2014 and 2015, with an overall reduction of approximately 4.6% per annum (**Figure 1.1**). The ACA (2014) further forecasts that naturally, the downturn in the construction industry, particularly the resources sector along with the reduction in total infrastructure projects, will create a decline in the employment sector which the Australian Bureau of Statistics (2010) indicates, employs 70,000 people within the heavy and civil engineering construction areas alone.



**Figure 1.1 2014 forecast annual percentage change**

Source: Australian Contractors Association (2014)

This downturn will create an environment in which competition for projects will increase, and could force engineering companies to look into other areas of engineering outside that of their traditional focus. Piccioli (1988) expresses that changes in the engineering industry in Australia over time, has meant that engineering companies have had to also change to be successful and survive in the industry. These changes have included looking beyond the traditional areas of a company's engineering focus and modernising, rationalising resources, and being prepared to be innovative and entrepreneurial.

It is important that while the industry is potentially changing, the strategies under which the procurement of services is undertaken, as well as the way that performance is measured is also reflective of the changing industry. From the traditional areas of time, quality and cost, the procurement strategies and performance measures employed under the adopted strategy should be reflective of significant innovations, technology and strategies employed by contractors in the delivery of services. If the performance measures are not reflective of the modern practices, for example innovative construction techniques or the adoption of new technology, then why would a contractor invest time, money and resources to investigate these areas which could potentially deliver time and cost savings, while increasing the quality of the overall project outcome? This could deliver benefits to not only the contractor and the client, but also the entity who utilises the delivered project, typically, the general public in regards to civil construction projects.

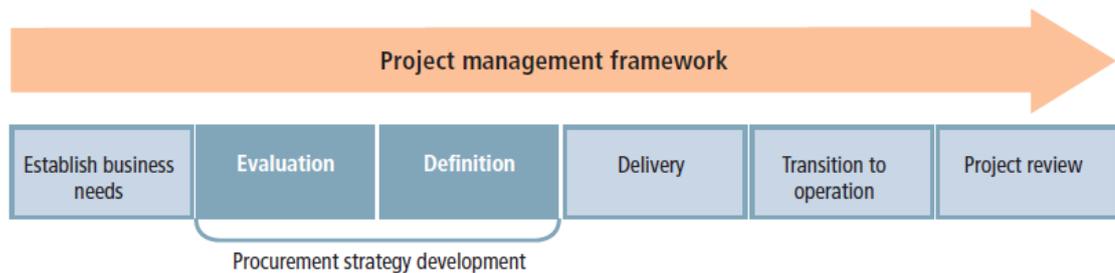
## **1.2. Procurement Strategies**

The Building and Construction Procurement Guide (BCPG) developed by Casey and Bamford (2014), explains that a procurement strategy is a core project element that takes into account the characteristics, risks and circumstances of a project or group of projects, and through analysis of various options, determines the delivery model and procurement method to be used to deliver the project.

The development of the procurement strategy occurs throughout the evaluation and definition phase as part of the project management framework (**Figure 1.2**) and, as explained by Casey and Bamford (2014), is critical to successful project outcomes. Put simply, a procurement strategy is an assessment of what it is that is to be delivered, this

being a project, understanding the elements surrounding the project, and then identifying the most effective, value for money, risk mitigating strategy to deliver the project.

Commencement in the development of the procurement strategy as early in the project lifecycle as possible, helps to ensure that the strategy developed is as fully informed as possible.



**Figure 1.2 Procurement strategy development**

Source: Casey and Bamford (2014)

### 1.3. Delivery Models

Casey and Bamford (2014, p. 21) state that typical delivery models used in the delivery of civil construction projects include:

- Construct only;
- Design and construct (D&C);
- Managing contractor;
- Construction management;
- Direct managed;
- Early contractor involvement (ECI);
- Alliance; and
- Public private partnership (PPP).

Further to this, Casey and Bamford (2014) explain that of these models, the construct only and the design and construct models are the most commonly used delivery methods.

Depending on the delivery model adopted in the procurement strategy, the performance measures will vary.

#### **1.4. Performance Measures**

The measurement of project performance is ultimately defined by the overall outcome achieved at the completion of the project (Chan & Chan, 2004). That is, has the contractor delivered what was intended or visualised when the project was initiated and is the outcome achieving the desired goals and objectives of the project? Although the answer may be yes, have the underlying performance measures related to project success been satisfactorily achieved, ensuring that not only the ultimate project outcome has been achieved, but that the ‘optimal’ project outcome has been achieved?

Ward, Curtis and Chapman (1991) explain that typical measures of contractor performance are related to the traditional areas of time, quality and cost. Kagioglou et al (2001, p. 88) states that ‘although these three measures provide an indication of project outcome, in isolation they do not provide a balanced view of project performance’. Furthermore, Ward, Curtis and Chapman (1991) explain that typically, it is not so much the financial or time outcomes of the project that remain after the project is complete, but the memories of the people, and the relationships and the harmony achieved between the client and the contractor that influences the client’s future decision to pursue a particular procurement strategy. On this basis, Kagioglou et al (2001) argues that these traditional measures are not sufficient to provide a full and true view of project performance.

This view opens up the area of investigation into what aspects of performance measurement will provide a full and true view of project performance and what aspects of performance measures are reflective of the current civil construction industry, and whether there are new performance measures that can be adopted to reflect current industry practice and procedures.

## **1.5. Project Aim**

The aim of this research project is to investigate performance measures for civil construction projects associated with different procurement strategies used in the current civil construction industry.

In undertaking this project, the key areas of focus will be on gaining an understanding on industry thinking in regards to procurement and performance measurement, future approaches to procurement, whether performance measures used on projects are reflective of current industry practices and techniques, whether there is an opportunity for the development of new performance measures that could provide a clearer view on project performance, and whether innovation could be driven through the industry using performance measurement.

## **1.6. Project Objectives**

The research investigation will focus on key objectives related to procurement strategies and performance measures and will include:

- Research current procurement strategies used in the procurement of contractors for civil construction projects;
- Research performance measures used in the various procurement strategies to assess contractor performance;
- Ascertain the relevance of these procurement strategies and performance measures to current industry;
- Gauge an understanding of current industry thinking on procurement and performance measures;
- Evaluate the level of importance and value placed on performance measures and the relativity of these levels to ultimate project outcome;
- Identification of potential new performance measures particularly those related to innovation; and
- Ascertain if performance measurement can be used to drive innovation through the civil construction industry.

In undertaking and achieving these project objectives, the study will attempt to answer the following research questions:

- Are performance measures used in civil construction projects reflective of current industry practices?
- Do current procurement strategies and thinking provide sufficient scope to adopt the necessary performance measures?
- Is sufficient value placed on performance measures and the results of these measures?
- What is current industry thinking on procurement and performance measurement?
- Is there potential for the development of new performance measures that are reflective of current industry practice?
- Could innovation be driven through the industry via performance measurement?

## **1.7. Overview of Dissertation**

This research project is assembled with six chapters presenting the work. The remainder of this dissertation is structured as follows:

CHAPTER 2: This chapter presents the literature review of the information related to procurement strategies and performance measures and is the foundation from which this study is built.

CHAPTER 3: This chapter describes the methodology utilised in conducting this research and provides justification regarding the adopted approach. It explains the use of the Delphi technique, the assembly of the research panel, interview process and the data assessment technique.

CHAPTER 4: This chapter presents the findings of the qualitative data assessment using the Framework Approach, identifies the links from these findings to the research

presented in the literature review and presents some initial discussion related to the findings.

CHAPTER 5: This chapter discusses the findings of the analysis and identifies the core areas and issues to arise from the data assessment. This chapter also provides a number of recommendations based on the research findings.

CHAPTER 6: This chapters presents the final conclusions drawn from the research, relates these to the project objectives and aims, before finally identifying potential further areas of work.

## 2. Literature Review

### 2.1. Introduction

In preparation of this research paper, review of relevant literature to the topic under investigation has been conducted. This process assists in providing an initial insight into the research area, presenting both supportive and objective literature. This review will introduce the topic areas and provide a foundation from which the research will be built. The review will cover the following areas of relevance to the project topic:

- Procurement
- Procurement strategies;
- Procurement strategy selection;
- Procurement strategies and performance measures;
- Performance measures;
- New areas of performance measurement;

### 2.2. Procurement

Before delving into the subjective and what seems to be, dark depths of procurement strategies and performance measures, it is important to understand what it is that is meant by procurement to help focus the areas of study and explain the context of procurement to this investigation.

To elaborate on this, and the need to gain an understanding of the term procurement in regards to this investigation, reference is made to the definition of procurement firstly by a number of dictionaries. The Oxford Dictionary (2015) defines procurement in two instances. The first explains that procurement is the action of obtaining or procuring something, while the second definition states that it is the action of acquiring military equipment and supplies. Looking now at the definition provided by the Cambridge Dictionary (2015), it also states that it is the obtainment of military supplies while again, the Merriam-Webster Dictionary (2015) states that it is the process of obtaining something with a specific focus on military supplies obtained by a government.

While procurement of military supplies would indeed be an interesting area of investigation, reference to the Queensland Procurement Policy (2013, p.10) specifically defines procurement as:

...the entire process by which all classes of resources (human, material, facilities and services) are obtained. This can include the functions of planning, design, standards determination, specification writing, selection of suppliers, financing, contract administration, disposals and other related functions.

With this focus, and reference to Casey and Bamford (2014), procurement in the context of this research is the obtainment of goods and services to be supplied in the delivery of civil construction projects.

In procuring these goods and services, given the significant investment of time, cost and resources required, it is typical to develop a procurement strategy to conduct the engagement, and develop a planned approach to provide increased opportunity of achieving the desired project objectives and outcomes.

### **2.3. Procurement Strategies**

Casey and Bamford (2014) provide guidance on the development and implementation of procurement strategies for building and construction projects. They state that the procurement strategy is a fundamental document that considers the project characteristics, risks and circumstances and is the outcome of a robust analysis to identify the recommended delivery model and procurement method. In developing an effective procurement strategy, Casey and Bamford (2014, p. 10) explain that it is important to:

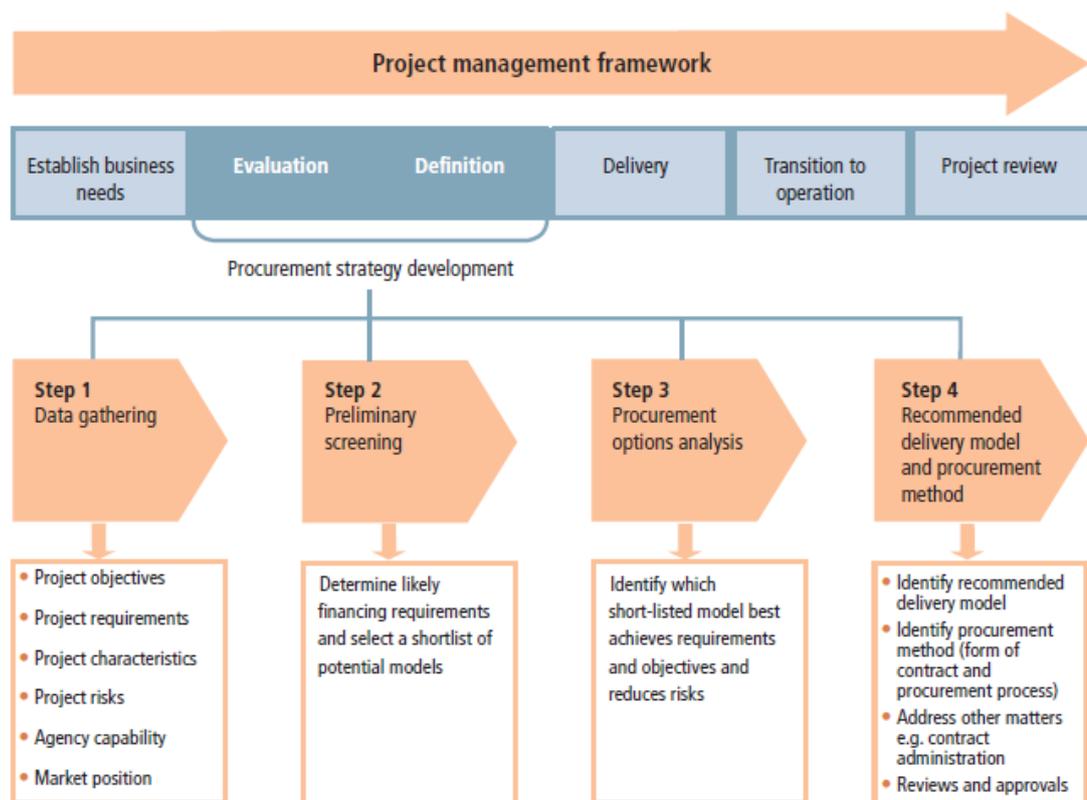
- Fully understand the project including key drivers, constraints and risks;
- Assess agency and market capabilities and capacity;
- Rigorously evaluate potential delivery models and procurement methods for suitability;
- Involve key stakeholders and experts as early as possible in the planning and development process;
- Challenge assumptions in order to better achieve desired outcomes; and

- Use practical analytical techniques in the decision making process.

The literature reveals that there is no common template for a procurement strategy, but each strategy typically involves key elements such as (Casey and Bamford, 2014, p. 11):

- Statement of objectives;
- Summary and analysis of project objectives, requirements, characteristics, and risks;
- A review of agency and market capabilities;
- An analysis of delivery model options and identification of a recommended delivery model; and
- An analysis of applicable procurement methods and identification of a recommended method.

This development process is illustrated in **Figure 2.1**.



**Figure 2.1 Key steps in procurement strategy development**

Source: Casey and Bamford (2014)

In addition to this explanation of a procurement system, Love, Skitmore and Earl (1998, p.222) explain that a procurement system is ‘an organisational system that assigns specific responsibilities and authorities to people and organisations, and defines the relationships of the various elements in the construction of a project’.

They expand on this and explain that there are three typical types of procurement systems or strategies categorised as follows (1998, p. 222):

- Traditional (design – tender – construct);
- Design and construct methods; and
- Management methods.

They continue with the view that from these three categories, there are many sub-classifications in use in the Australian industry that stem from these three main categories.

In support of this view, Gan (2010) explains that, when undertaking procurement and determining a procurement method, a decision between a separated, integrated or management strategy is required. The study explains that in modern construction practices, there are three typical procurement strategies being:

- Sequential traditional (design – bid – build) or separated;
- Design and build or integrated; and
- Management orientated including both the contracting and construction management.

As can be seen, the three strategies identified in the study are consistent with those identified by Love, Skitmore and Earl (1998), with Gan (2010) also going on to explain that a number of procurement strategies exist outside of these three distinctive areas, but are typically just variations of these with the addition of other functions.

In retrospect of this, Rooney (2006) looked into the development of Project Alliancing and Relationship Contracting procurement approaches. These approaches are non-priced approaches that primarily focus on the relationships, personnel and collaborative working environments that drive teams to perform at levels beyond the norm. Rooney (2006, p. 9)

stated that he believed ‘Project Alliancing and Relationship Contracting is evidence of a major cultural shift towards seeking teamwork as more important than competitive behaviours’.

Walker, Harley and Mills (2015, p. 1) also looked into alliancing and stated that this approach ‘often provides best value and superior value for money when compared to traditional approaches such as Design and Construct’. They cite Wood and Duffield (2009) explaining that in Australia, the estimated value of projects delivered using this procurement approach was ‘\$32 billion’ (2015, p. 2) for the period 2004-09 but that this method of procurement has since reduced although there is still ‘continued willingness to embrace this type of system in Australia’. In light of this, they explain that if a significant move towards this approach were to be made in Australia, there ‘would be a major shortage of requisite knowledge, skills, attributes and experience within the industry for all alliance parties’ (2015, p. 16).

With this in mind and reflecting on the literature covered to this point, it is apparent that while procurement is the process of obtaining the desired goods and/or services, this is typically coordinated through the selection, development and implementation of a specific procurement strategy. This selection process is critical given that there appears to be many strategies and approaches that can be used.

## **2.4. Procurement Strategy Selection**

Love, Skitmore and Earl (1998) state that procurement is a key factor in contributing to not only client satisfaction but to the success of the project, indicating that the selection of the appropriate procurement methodology is a critical element in the development and outcome of a project. In support of this, Alhazmi and McCaffer (2000) argued that for the project to be successful, the procurement strategy needs to address the individual characteristics and requirements of each project, while also taking into consideration the technical features of the project as well as the client and contractor. Similarly, the selection of the appropriate procurement strategy is a key factor in project success, as it is ‘the framework that encompasses the structure of responsibilities and authorities for participants within the building process’ (Cheung et al., 2001, p. 427).

This leads to the premise that a direct relationship can be drawn between the performance under the procurement strategy, the ultimate success of the project and the particular procurement strategy selected to deliver the project, i.e. a poor procurement process adopted during project development results in poor performance and a poor project outcome, while a thorough and relative process considerate of the project objectives, outcomes and client considerations results in better project performance and delivers a satisfactory outcome.

Ireland (1982) and Barclay (1994) (cited in Love, Skitmore & Earl 1998, p. 222) identify that within the Australian industry, the most commonly selected procurement strategies implemented in building projects are:

- Single lump sum contracts and full documentation;
- Provisional or partial quantities;
- Cost reimbursement;
- Package deals/turnkeys;
- Construction management; and
- Management contracting.

Love, Skitmore and Earl (1998, p.222) state that ‘project management is excluded as it is considered that a project manager could be applied to any procurement method’ while also providing further insight into the common strategies and indicating that in addition to those above, there is also:

- Novation;
- Design and manage; and
- Contractors design and build.

This is further supported by Casey and Bamford (2014) which nominate the above strategies as common place in the current industry while also specifying early contractor involvement, alliance and public private partnerships as additional strategies.

With an array of procurement strategies, and what seems to be an endless number of iterations adapted from these, it poses the question of which strategy is the right strategy for a project and how can this be determined?

Alhazmi and McCaffer (2000) explain that there have been numerous investigations in the past to try and provide some clarity and solidify a process around selecting a procurement strategy. This has included the development of multi attribute techniques, strengths and weaknesses analysis, software packages and knowledge based expert systems to name a few. In most instances, the main difficulties common to the studies undertaken in this area includes (Alhazmi & McCaffer 2000, p. 176):

- The models seem to ignore some important factors in the selection of the most appropriate procurement systems;
- Available options in the database of a number of existing models are limited;
- Some of the models are conditional and cannot be used by any client;
- Some of the models require the use of advance mathematics and are particularly time consuming; and
- A number of the models adopt a primitive approach to the selection process and limit the number of options to be considered.

It appears that there is not a single definitive tool that can be used to select an appropriate procurement strategy and, that in the first instance, the environment in which the project will be undertaken needs to be considered.

Referring to Casey and Bamford (2014) identifies that the initial parameters that should be considered when selecting a procurement strategy should firstly consider:

- Does the procurement strategy comply with government and agency requirements such as the Australian Industry Participation National Framework?
- Does the procurement strategy suit the prescribed forms of contract relative to the delivery of this project?

- Is there a mandated procurement process already in place to deliver this project, i.e. tender must go to the open market due to the project value?
- Is the procurement process complimentary to the intended delivery model?

Dependent on the above outcomes, the process of determining a procurement strategy can then be developed further.

Watermeyer (2012, p. 223) explained that selection of a procurement strategy can be considered as ‘skilful planning and managing of the delivery process’ that carefully devises a plan of action and making appropriate decisions in consideration of procurement options and circumstances to achieve optimal outcomes. Kershaw and Hutchinson, (cited in Watermeyer 2012, p. 223) suggested that when selecting a procurement strategy, it should:

- Include the basis for seeking tenders;
- The number of contracts and work breakdown between contracts;
- Publicity to attract the desired level of market interest;
- Process for bidder prequalification and short listing;
- Bid and evaluation process;
- Process for accepting winning bids;
- Terms of engagement; and
- Breakdown of roles and responsibilities.

In addition to this, Watermeyer (2012, p. 233) states that a procurement strategy does not only need to be for a single project but can be developed to deliver a programme of projects that considers ‘the best way of achieving project objectives and value for money, while taking into account risks and constraints’. He states that the ‘procurement strategy is the combination of the delivery management strategy, contracting arrangements and procurement arrangement for a particular procurement’.

Research undertaken by Sidwell and Kennedy (2004, p. 7) refined a decisional matrix targeted at selecting ‘best practice project delivery strategies’. This research identified a matrix consisting of an axis based on construction process and a second axis based on ‘generic actions which need to be taken to achieve project success’ (2004, p. 18). In

constructing this matrix, the construction processes that need to be considered in developing the procurement strategy are quoted as (2004, p. 18):

- Ideas and feasibility;
- Planning and design;
- Construction;
- Commissioning; and
- Operation (including maintenance).

In consideration of the generic elements, it is necessary to consider:

- Project objectives, values and excelling above normal industry standards;
- Value based personnel selection;
- Alignment of the team;
- Sufficient funding to support teamwork;
- Decisional and operational agreement;
- Engagement of satisfactory feedback systems;
- Accounting for life cycle costs through aligned design strategies; and
- Aligned construction strategies.

It was argued that the use of this decisional matrix would provide a ‘robust foundation for the development of a best practice guide to project delivery’ (2004, p.18).

This somewhat aligns with work undertaken by the Cooperative Research Centre (CRC) for Construction Innovation (2001) which developed a paper-based workbook as well as an electronic database to try and provide decisional tools to support agencies in selecting project delivery systems. It was evident that these support tools were needed as it was clear that poor decision making at this point in the project was leading to less than optimal outcomes for projects.

In a similar context to this, further work undertaken by CRC for Construction Innovation (2006) explored procurement strategies and the use of an appropriate strategy to achieve best practice delivery. This study found that, often, agencies would not utilise the most appropriate strategy during delivery. In an attempt to assist in the selection of a suitable

strategy, a support toolkit was developed to aid agencies in the decision making process when selecting a procurement strategy.

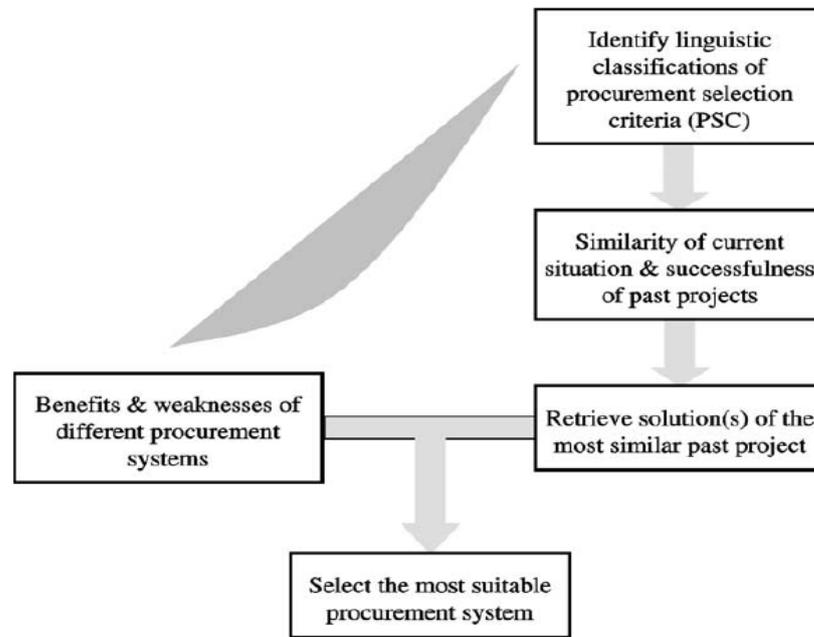
Studies conducted by Love, Davis and Baccarini (2008) exploring similar issues was undertaken and considered quantitative and qualitative characteristics in the evaluation of selecting a suitable procurement strategy. This study identified six steps which included (2008, pp. 191-5):

- Step 1 – Identification of project objectives and constraints;
- Step 2 – Identify procurement assessment criteria;
- Step 3 – Weighting of client criteria and procurement methods;
- Step 4 – Procurement appropriateness charts;
- Step 5 – Procurement review session; and
- Step 6 – Procurement option (s)

This evaluation methodology was developed with the aim of providing organisations with a step by step process to assist in determining a suitable procurement strategy that could provide value for money, and move away from the default position of using traditional approaches to procurement.

Cheung (2001), who undertook research into the area of multi attribute technology as a selection tool, stated that typical selection of procurement strategies has been judgmental, and subject to bias from the decision - maker, driving the need for an objective and systematic selection model.

Contrary to this, Luu, Ng and Chen (2003) investigated case-based procurement selection techniques in which the emphasis was placed on the experience, knowledge and previous learnings of those involved to guide the procurement selection process and determine the appropriate strategy (**Figure 2.2**). The critical element in the use of this approach is the ability to reflect on previous projects and strategies implemented, which can act as a guide to the likely outcome of the project, a current feature that is not included in analytical approaches.



**Figure 2.2 Case-Based Procurement Selection Process**

Source: Luu, Ng and Chen (2003)

Providing a third view on this, Cheung et al. (2001, p. 132) investigated the use of a selection process that utilised both an objective approach using multi attribute technology, as well as a subjective component whereby the procurement officer is ‘free to assign importance weightings against a set of selection criteria’. The study found that the ‘multiplicity of criteria made selection difficult’ and that the subjective component introduces personal preference and perception of a project characteristics impacting on the decisions made by those involved in the process.

In consideration of the above, it is evident that there is no single tool that can be used to select the actual procurement strategy that should be implemented. Each project is unique and although similarities with previous projects as well as past experience can be used as a guide to investigating a particular procurement strategy, it is evident that the strategy needs to be suited to the specific project and its objectives. Given that the outcome of the project appears to be directly linked to the procurement strategy, and that project outcome is a function of the project performance, it is critical that the procurement strategy considers the project performance measures to be implemented.

## **2.5. Procurement Strategies and Performance Measures**

In establishing the relationship between procurement strategy, project performance and project outcome, it is important to understand how procurement methods relate and impact on project performance.

Early studies conducted by Molenaar, Songer and Barash (1999) indicated that traditional delivery techniques in the 1980's focused on low-bid, price only procurement strategies which would often result in increased claims during construction. The focus of the procurement strategy on price only excluded many performance variables which, in this instance, appeared to impact on the quality of the design and documentation resulting in increased claims. This was supported by DeFraités (cited in Tilley 1998, p. 3) who stated that 'the level and quality of the services provided is likely to be limited' in reference to a selection process purely focussed on price, and that 'this translates into additional project costs for both the contractors and the owner'. From this, it could be implied that the procurement strategy selected, resulted in poor project performance.

In support of this, Wardani, Messner and Horman (2006) argued that the decisions made regarding procurement strategy greatly impacts the performance of any project and that this can be exacerbated by the delivery method, i.e. design-build where the selection of a poor team can impact on both the design and construction.

Casey and Bamford (2014) reveal that the link between the procurement strategy and the performance measures comes through the adoption of either a price, non-price (qualification based) or a combination of the two (value-based procurement) based procurement strategy.

Price based procurement strategies focus only on the price element of the project and do not take into account non-price criteria. The process involves the assessment of offers and selection of the lowest conforming tender regardless of elements such as experience, delivery approach and team member skills, all of which are elements that can impact on the project performance. Ruparathna and Hewage (2015, p. 6) explained that this approach to procurement 'is the main cause of the major issues in the current procurement systems'.

A non-price or qualification based procurement system does not consider the price component when determining the successful contractor but focuses on things such as experience, past performance, team member skills, and delivery approach. This is typically a performance based approach as the key criteria in the assessment are performance driven measures which will be discussed shortly.

The third approach is the adoption of a value-based approach which considers both price and non-price components. Dimitri (2013) explains that a gradual change and transition towards the adoption of this approach has occurred in both the public and private sectors in recent years. Deemed the best value for money (BVM) approach, this strategy allows both price and non-price components to be assessed allowing a balance to be achieved in obtaining a quality service at a reasonable cost hence delivering “best value for money”.

Dependent upon which approach is adopted, the strategy directly influences the performance measures established in delivering the project. A study conducted by Sebastian, Claesson-Jonsson and Di Giulio (2013, p. 395) looked into performance based procurement for low-disturbance bridge construction projects. They explained that by adopting the ‘most economically advantageous tender (MEAT)’ or value for money strategy as opposed to the lowest price tender (LPT) approach, additional performance measurement avenues are opened up including the ability to measure technical and sustainable aspects as well as taking into account innovation and innovative solutions.

Two case studies were undertaken in which two bridge projects were assessed on a project outcome level. One project was procured using the LPT strategy while the second project was procured under MEAT arrangements. It was found that there was no significant benefit in adopting one strategy over the other and that both delivered desirable project outcomes. In some instances, it was actually more expensive for the client undertaking the MEAT process as it required greater involvement from the client in the delivery of the project, resulting in greater costs.

It was noted that although the LPT strategy delivered a desirable project outcome, the focus on price based procurement omitted elements such as long-term project lifecycle aspects, which would have been assessed under the MEAT procurement strategy and ultimately lead to a better outcome in the longer term for the project. This highlights the

deficiencies in the price based strategy when compared to the value based approach, which could have achieved a more desirable outcome in the longer term.

Research into the impact of procurement systems on performance measurement was undertaken by Rashid et al. (2006) in which an analysis was undertaken to determine the impact on time, cost and quality related to construct only, design and construct and managing contractor procurement approaches.

This study found that, of the three approaches, the construct only strategy was the slowest of the three approaches. The approach allowed a greater amount of time to prepare and review the design documentation and could provide greater confidence in regards to cost. This was due to the definition provided by having a fully documented project when entering the tendering phase. They stated that this approach allowed for greater quality however it could be argued that this is not always the case, as this is a function of the time and resources available during design development and documentation.

In their review of the design and construct approach, it was identified that the combination of the design element with the construction element, allowed for a quicker delivery timeline. This was also assisted by the involvement of the contractor in the design phase allowing for input into the design, translating to efficiency in the construction of the project.

The downside of this approach is increased costs when compared to the construct only approach as a result of the risk inherited by the contractor due to the limited detail available during the tendering phase. Despite this, often the input from the contractor during the design stage in conjunction with the reduced costs associated with this procurement strategy, ensures that whole of project costs are within reason.

Rashid et al. (2006, p. 10) stated that ‘it is more often found that the quality of work under this contracting system tends to be questionable’. It was explained that this is primarily attributed to the contractor being able to control the design and construction phase, while the client is largely left in the dark as to what is actually occurring throughout these two phases.

Their review of the managing contractor approach identified similar time advantages to that mentioned in the design and construct approach. It was stated that ‘the cost of the project procured using this system tends to be lower than those using other procurement approaches’ (Rashid et al. 2006, p. 11) and that increased quality can be achieved as the managing contractor is typically highly experienced, and is also responsible for the outcome that is delivered.

Contrary to this, a study conducted by Zillante et al. (2014, p.1) stated that ‘it is perceived to be a common occurrence that finalised documentation for managing contract projects are of poor quality’. Zillante et al. (2014) undertook a series of semi-structured interviews with 8 industry representatives of whom the majority indicated that, for varying reasons, this procurement approach did tend to lend itself to the production of poor quality documentation. As part of the research, a case study was undertaken on a managing contract project in which it was found that poorly prepared documentation led to ‘238 variations’, ‘340 requests for information’ and ‘just under \$1 million dollars worth of changes’ (Zillante et al. 2014, p.6). This is a clear example of the implications associated with poor quality design and documentation.

A study conducted by Tilley (1998) further highlighted the link between the procurement strategy and performance measures, where design and documentation deficiencies and the associated impact on steel construction were examined. It was evident that poor design and documentation quality was leading to significant rework and rectification, resulting in added costs to projects which were primarily absorbed by the Contractor.

The study found that the focus on quick profits was prioritised over greater upfront costs in relation to planning and design, which would reduce rectification and rework costs. The paper states that the adoption of a system which is performance based, such as the non-price or value for money based approach, rather than a price focused strategy, could be utilised as a way to minimise quality based issues, improving the efficiency of the construction process. By adopting a procurement strategy that assesses experience and expertise as opposed to cost, a greater level of confidence can be assured regarding project performance, and that the project outcome is of a high quality and standard while minimising rectification and rework.

It is evident that the procurement strategy influences the project performance measures, and that the project performance measures impact the level of project success and the project outcome, but this poses the following questions which will be examined as part of this investigation:

- What measures are reflective of project performance?
- To what degree and what level of value are placed on these performance measures and their relativity to project outcome?
- Are these performance measures reflective of current industry practice?
- Is there an opportunity to introduce new performance measures that are reflective of current industry practices and technology to improve the validity and measurement of performance?

## **2.6. Performance Measures**

Construction Queensland (2001, p. 13) states that the Australian construction industry has, for a number of years, ‘sought to improve performance under construction contracts’. This is in regards to time and quality aspects of project delivery in addition to ‘minimising disputes between the parties to construction contracts’. The study summarises a number of performance measures that can be grouped into six categories that provide for fair project delivery (2001, p. 21):

- Customer focus;
- Optimum use of information;
- People involvement;
- Process improvement;
- Leadership; and
- Strong supplier relations.

A study conducted by Bassiono, Price and Hassan (2004) into performance measurement in construction found that, since approximately 1994, research into performance measurement has been significant as industry has become increasingly competitive and measurement of performance has become critical to business success. This determination introduces the idea that significant value *is* placed on performance measurement and that,

as competitors try and gain the upper hand, the development of new approaches and technology could occur and should potentially be measured.

Further to this, it was found that financial based performance measures often provide information that is lagging in that it reflects actions and decisions that may have occurred by a minimum of one reporting period. Managers and the project dictate up-to-date and mostly nonfinancial information to guide project decisions and actions.

Kagioiglou et al. (1999), Lee et al. (2000) and Smith (2001) (cited in Bassiono, Price and Hassan 2004, p. 5) explain further that ‘the construction industry in the U.K. and many other developed countries has a long track record of less than optimal performance’. Investigations dating back to as far as 1944 indicate the need for change and improvement. Latham (1994) identified that improvements to project performance could be made by increasing the focus on design process, quality management, productivity, training, and education while Egan (1998) highlighted areas of productivity, profits, quality, and safety while emphasising the importance of performance measurement as key in delivering improvement in performance of the construction industry.

A study undertaken by Crow and Barda (2001) looked at 28 projects that had been delivered and deemed as ‘excellent projects’. It was revealed that there were several attributes that were responsible for excellence achievement. They stated that approximately 10% of projects achieve this excellence rating, and that the utilisation of the identified attributes could raise this statistic. Crow and Barda (2001, p. 8) specifically state that the following drivers were responsible for achieving excellent project outcomes:

- Client leadership;
- Trusting relationships;
- Project initiation;
- Team establishment;
- Team pride;
- Value management;
- Stakeholder involvement;
- Communication;

- Understanding the client's business; and
- Adequate budget.

Research undertaken by Sidwell and Kennedy (2004) looked at 56 elements that can play a role in project performance. They found that four of these were crucial, specifically (2004, p. 6):

- Co-operative project teams;
- Client's competency and commitment;
- Continuity of key personnel;
- Equitable risk allocation.

Many of those elements identified by Crow and Barda (2001) could be categorised under those areas identified by Sidwell and Kennedy (2004) demonstrating consistency in the findings.

A study conducted by Dainty, Cheng and Moore (2003), although focussed on the performance of construction project managers, argued that in the current construction industry, simply looking at the areas of cost, time and quality are no longer sufficient when assessing the construction manager's performance. It was noted that these areas are only a few of the criteria that are used to assess project performance, however this highlights the fact that it is important to consider an array of elements that all contribute together to ascertain a measure of project performance.

It was argued that there are many variables outside of the managers control that can impact on performance as well as greater demands when compared to the past. It was argued that definition of more appropriate performance measures was required 'to consider the knowledge, skills and behavioural inputs' (Dainty, Cheng and More 2003, p. 209) that could lead to improved project outcomes.

Similar to this, Robinson et al. (2005, p. 13) found that 'clients, investors and other stakeholders are demanding continuous improvement' and that 'increased reliance on industry-specific key performance indicators' (KPIs) demonstrates the 'growing importance of performance measurement'. The paper explains that traditional

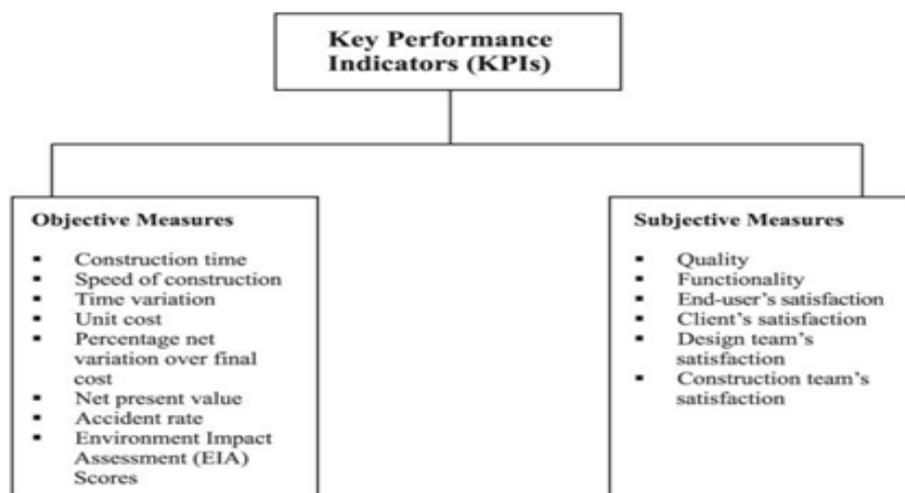
performance measurement techniques, which are dominated by financial information, ‘is no longer sufficient for understanding the dynamic business environment’ in which civil construction projects are undertaken.

It was argued that measurement brings attention and that improvement upon desired areas could be achieved through sufficient measurement. Specifically, it was stated by Kagioglou et al. (2001) (cited in Robinson et al. 2005, p.14) ‘that measurement is an integral part of business improvement, as it is often seen as the information system at the heart of the performance management process’.

Further studies into performance measurement conducted by Chan and Chan (2004) also investigated the areas of project success. They identified that project performance measurement has typically been restricted to the common elements of time, cost and quality but that measuring success may be more complex.

The investigation developed a set of KPIs (**Figure 2.3**) that could be used to measure performance, and explained that the construction industry has changed dramatically, and that the adoption of a wider approach to performance measurement is important in measuring project success in the current environment.

Through undertaking three case studies and assessing these against the KPIs, it was demonstrated that the KPIs were good indicators of the performance of construction projects over and above that of the traditional performance measures.



**Figure 2.3 Key performance indicators for performance measurement**

Source: Chan and Chan (2004)

Despite the findings of these studies, research undertaken by Idrus, Sodangi and Husin (2011) looked at the importance placed on the various areas of performance that are typically measured on construction projects. This study found that, despite expansion into other areas of performance measurement away from time, cost and quality, these three areas were still ranked as the most important. It was identified that the quality of the completed project took top priority, followed by cost and then time. In addition to these three areas, the study determined that the most commonly used alternative areas of performance measures, ranked in order of priority, are as follows (Idrus, Sodangi and Husin 2011, p. 1150):

- Occupational health and safety;
- Labour dependency;
- Contractor’s project management;
- Quality of coordination by construction team;
- Contractor’s capacity of manpower;
- Construction flexibility;
- Environment friendliness; and
- Level of technology.

Further to this, research undertaken by Construction Excellence (2006) (cited by Furneaux et al.2010, p. 5) identified a number of performance measures currently used in the United Kingdom (UK) as shown in **Table 2.1**.

**Table 2.1 UK performance measures**

<b>Economic KPIs</b>	<b>Social KPIs</b>	<b>Environment KPIs</b>
Client satisfaction – product	Employee satisfaction	Environmental impact
Client satisfaction – service	Staff turnover	Energy use – product
Defects	Sickness absence	Energy use – process
Predictability – Cost	Safety	Water use - product
Predictability – Time	Working hours	Water use – process
Safety	Qualifications and skills	Waste removed from site
Productivity	Equality and diversity	Commercial vehicle movements
Profitability	Training	Impact on biodiversity
Construction Cost	Pay	Area of habitat created / retained
Construction Time	Investors in people	Whole of life performance – product

They go on to explain that there are a number of issues in measuring performance with these summarised as follows (Furieux et al. 2010, p. 6):

- Subjective assessment;
- Crude/questionable measures;
- Lack of coordinating agencies;
- Large number of schemes – fragmentation;
- Data overload; and
- Large (cash and in-kind) investment required.

It is evident in the literature above, that a greater emphasis is being placed on performance measurement than ever before in the construction industry, as organisations strive for improved capacity, efficiency and greater outcomes, while remaining focussed on increasing profits. This opens up the possibility of potentially new performance measurement areas and the investigation into current industry thinking of the status of performance measurement. This again raises similar questions to those highlighted in section 2.5, further reinforcing the purposes of this study in regards to:

- What degree and what level of value are placed on these performance measures and their relativity to project outcome?
- Are these performance measures reflective of current industry practice?
- Is there an opportunity to introduce new performance measures that are reflective of current industry practices and technologies to improve the validity and measurement of performance?

## **2.7. New areas of Performance Measurement**

Having identified that the civil construction industry could potentially address new areas of performance measurement, review of the results from the previously discussed study by Dainty, Cheng and Moore (2003, p. 212) identified nine factors that could be considered when defining performance measures for the assessment of a project as follows:

- Team building;

- Leadership;
- Decision making;
- Mutuality and approachability;
- Honesty and integrity;
- Communication;
- Learning, understanding and application;
- Self - efficacy; and
- External relations.

Although the study identified and refined areas of project performance that could be used in the assessment of a project, it was noted that ‘there is a lack of consensus among previous studies that have attempted to address this issue’ (Dainty, Cheng and Moore 2003, p. 216) regarding adoption of new performance measures as opposed to traditional time, cost and quality metrics.

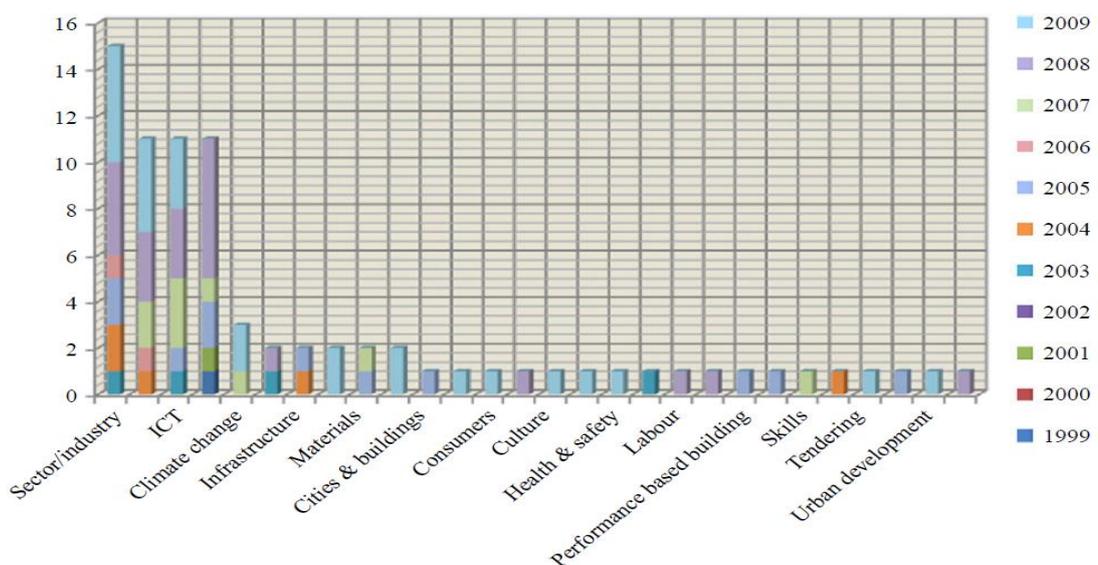
Looking back again at the study by Robinson et al. (2005, p. 14), the investigation into new approaches to performance measurement has found that interest has been generated around using Egan key performance indicators, the Balanced Scorecard and the Excellence Model. These techniques explore more than the typical time, cost and quality areas and provide a method of measurement that considers:

- Innovation and learning;
- Processes;
- People;
- Leadership;
- Partnership and resources;
- Products;
- Society; and
- Learning and innovation.

A key finding is that although some of these techniques had been around for over 10 years at the time of the study, movement away from typical performance measurement techniques and the take-up of newer methods within construction organisations was slow.

Examining the potential of new areas related to innovation and technology improvements within the industry, Slaughter (1998, p. 226) explains that there is a ‘generally accepted perception’ that innovation within the construction industry is uncommon, however in actuality, it consistently occurs in various segments of the industry. Aouad, Ozorhon and Abbot (2010) somewhat support this view in stating that, given the significance of the construction industry to the economy, it is critical that the industry continues to develop and adapt to the opportunities and problems that will be presented in the future.

Research conducted by Boddy and Abbot (2010) shows an increase in various segments of the construction industry regarding reporting on innovation. This increase becomes particularly apparent from 2004 – 2009 (**Figure 2.4**). This indicates a willingness by the industry to invest into the area of innovation and that this is in fact occurring within the industry.



**Figure 2.4 Innovation reporting**  
Source: Boddy and Abbott (2010)

With the perception that innovation in the construction industry is actually being undertaken, or at least reported on, this poses the question of how is innovation being measured within the industry and is any value being placed on innovation to continually encourage investment in this area?

Aouad, Ozorhon and Abbot (2010) state that there is typical interest in the promotion of innovation but it is unclear as to whether these policies have been successful. They

explain that the measurement of innovation has typically revolved around scientific and technological innovation however the construction industry does not typically innovate in this way and is more focussed on the process and organisation based level. With this being the case, it again puts question to two of the areas being investigated in this study:

- Are performance measures reflective of current industry practice?
- Is there an opportunity to introduce new performance measures that are reflective of current industry practices and technologies to improve the validity and measurement of performance?
- Can innovation be driven through the industry via performance measurement?

### 3. Methodology

This project has been undertaken to establish current industry thinking on procurement strategies and performance measures used in civil construction projects. In addition to this, the project sets out to determine industry thinking on future approaches to procurement and performance measurement, and whether innovation can be driven through the industry via performance measurement. The first step in conducting this study was to increase the understanding of current procurement strategies and performance measures.

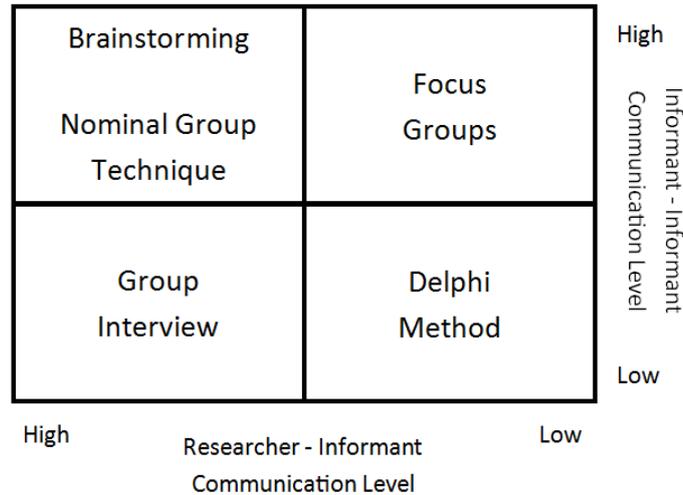
#### 3.1. Theoretical Analysis

Initially, theoretical analysis of procurement strategies and performance measures was undertaken to gain an understanding of current industry practice and how procurement strategies and performance measures are utilised within the civil construction industry. To do this, a literature review was undertaken as presented in the previous chapter, providing the basis for an understanding of the research area. In deriving this understanding, it was evident that industry experts would need to be consulted to obtain their opinions and judgments, from which answers to the research questions could be generated.

#### 3.2. Information Gathering

To obtain this information from the industry, it was necessary to identify a suitable approach which could be used to extract the required information from industry experts.

A figure prepared by Day and Bobeva (2005) and reproduced as **Figure 3.1**, provides a summary of typical consensus seeking research methods. For this study, it was desirable to have a low level of researcher to informant communication as well as a low level of informant to informant communication. This was due to the limited availability of industry experts and to ensure that the research being undertaken caused minimal disruptions to the expert's day to day employment. As a consequence of this, **Figure 3.1** indicates that the most suitable approach is to utilise the Delphi method.



**Figure 3.1 Consensus seeking research techniques**

Source: Day and Bobeva (2005)

### 3.3. Delphi Method

The Delphi method is a flexible research technique that has been used for a number of years. The studies origins date back to the 1950s when the technique was employed by the Rand Corporation on defence research (Helmer and Rescher, 1959). Skulmoski, Hartman and Krahn (2007) explained that the use of the Delphi method is common in undertaking PhD and masters research and is an iterative process that can be used to gather the judgement of experts in regards to the desired topic area.

Typically, the technique involves assembling a panel of experts with knowledge relevant to the research area, and then through the use of questionnaires or interviews, opinions and judgements are gathered from the participants. Skulmoski, Hartman and Krahn (2007) indicate that a typical Delphi study consists of three rounds. That is, a first round of questions or interviews are conducted from which initial opinions are drawn. From this, the researcher prepares and conducts a second round of questions or interviews. These second round questions or interviews are shaped from the findings extracted in the first round, with the goal of refining the questions to iterate towards a general consensus or outcome from the panel of experts. Similarly, this process is repeated a third time of which final conclusions can be drawn.

While it is understood that a three round Delphi is commonly used, it has been identified that this can be adjusted to suit the requirements of the project. This is supported by

Skulmoski, Hartman and Krahn (2007, p. 5) who stated that ‘there is no “typical” Delphi; rather that the method is modified to suit the circumstances and research question’. In addition to this, Skulmoski, Hartman and Krahn (2007, p.10) explain that ‘for master theses, often a single Delphi study will suffice’. Further to this, the panel of experts that have been assembled for this study are industry professionals involved in the civil construction industry who offered their time free of charge to participate in the Delphi study. Given the constraints around the availability of these individuals, in addition to the time constraints associated with delivering this project, a single round Delphi study was undertaken.

It was determined that in undertaking the study, a qualitative approach would be used to gather the opinions and judgments of experts and that from these responses, common themes and trends would be determined and a general consensus reached regarding the research questions. Glenn and Gordon (2009) explain that modern approaches in the use of the Delphi method have utilised interviews as an information gathering tool as opposed to questionnaires. With this in mind, it was determined that semi-structured interviews would be used.

Using semi-structured interviews would allow the development of an interview questionnaire targeted at the research questions, while providing the freedom to explore and probe the responses from industry experts as they arise throughout the interviews. This approach compliments the single round Delphi method as it allows “feed-forward” to be introduced to the interviews. Glenn and Gordon (2009) explain that this introduces emerging consensus from prior interviews which allows for the iteration towards a general consensus while still employing only a single round Delphi study. While it is acknowledged that this creates differences as the interview process progresses, Glenn and Gordon (2009) support this process by explaining that this research approach is not seeking statistically significant results but to extract the ideas, opinions and judgments of experts for analysis.

### **3.4. Semi-Structured Interviews**

The single round Delphi study utilised semi-structured interviews as the tool to engage the industry experts and gather the opinions and judgments in regards to the research areas. The use of semi-structured interviews has previously been adopted in research areas of this focus. An example of this was a study undertaken by Dainty, Cheng and Moore (2003) who used semi-structured interviews when investigating performance measurement related to construction project managers, and determining whether these performance measures were representative and relative to the current industry in which they operate.

Ayres (2008) explains that semi-structured interviews are a qualitative data collection strategy, demonstrating its suitability to this study, given the requirement to obtain qualitative data from the industry experts. Ayres (2008) also indicates that this type of interview technique is useful for research questions where the concepts and relationships between them are relatively well understood. This is the case in this instance as a product of the literature review.

Ayres (2008) explains further that this interview technique allows the researcher to freely move back and forth through the topic questions based on the interviewee's responses while also using probing statements if necessary to extract further information. This again highlights the suitability of semi-structured interviews to this study and compliments the "feed-forward" approach discussed previously.

Provided in **Appendix B** are the questions that were used throughout the semi-structured interview process. These questions were primarily open ended questions specifically developed with the research objectives in mind, while trying to avoid leading the interviewee in any particular direction (Ayres, 2008).

The interviews were typically conducted face-to-face at the interviewee's place of employment. This approach removed the need for the interviewee to travel and hence reduced the time required for the interviewee to participate in the study. Where it was not possible to meet with the interviewee due to locality and availability issues, the interview was conducted via the telephone. Although telephone interviews somewhat lose the

personal and expressional aspects of a face to face interview, Millward (2011) argued that semi-structured interviews via telephone provided good quality textual data on a similar level to that obtained using face to face interviews.

Millward (2011) further explained that comparisons were drawn between semi-structured interviews to that of basically taking the form of a managed conversation in that a set of questions are prepared prior to the interview, but the semi-structured style allows the interviewer to ask additional questions and extract additional information based on the interviewee's responses. Similarly, telephone conversations are focussed on the callers' agenda but that the flexibility in the choice of the order of the questions and the development of the conversation with the respondent parallels that of semi-structured interviews.

Millward (2011) concluded that when conducting qualitative research, textual transcripts obtained from telephone interviews provided a rich data source for analysis. It was stated that through experience in telephone interviewing, the process proved to be a valid and effective research methodology.

In light of this, it is shown that the validity of the data gathered via interviews conducted using the telephone, is equivalent to the data gathered via face-to-face interviews.

### **3.5. Panel of Experts**

To undertake the Delphi study and conduct the semi-structured interviews, it was necessary to select a number of members from the industry who were familiar with the areas of research, practiced in the areas of research or engaged in the areas of research through their employment. Day and Bobeva (2005, p. 108) state that a Delphi panel 'should consist of individuals with knowledge about the substantive area of research'. Termed as 'industry experts' a number of elements were considered in determining the suitability of a potential study participant, the first of these being the number of participants required.

### **3.5.1. Panel Size**

Research conducted into what constitutes a suitable panel size for a Delphi study uncovered inconclusive results. Research undertaken by Skulmoski, Hartman and Krahn (2007) identified a number of Delphi studies that had been undertaken between the period of 1973 to 2005. The panels in these studies varied from as little as four participants, up to 171 participants. Delbecq et al. (1975) implied that, for a homogenous group, a panel size of 10 to 15 was suitable, while Yong et al. (1989) stated that a minimum of 15 to 20 participants is necessary for a Delphi study. Green and Hunter (1992) argued that to obtain sufficient data a panel size of 40 is more suitable.

A further consideration in selection of a suitable panel size was the need to allow for any panellist attrition. In this case, this was not considered, as the study was consisting of only a single round, therefore the possibility of a panellist ‘dropping out’ during further rounds was not applicable.

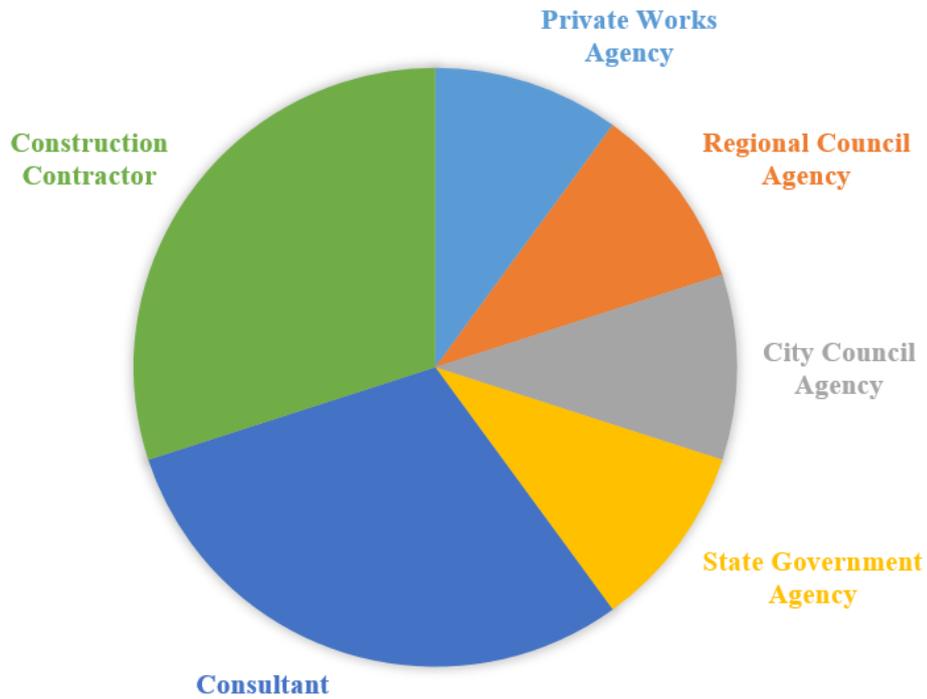
Given that the study was to consider the opinions and judgments of construction contractors, engineering consultancies, private works agencies as well as state and local government works agencies, selection of a panel consisting of four members was deemed not suitable, as this would not provide sufficient representation of these sectors. In consideration of the above information, as well as the time and resource constraints for this project, a panel size of 20 members was selected.

### **3.5.2. Participant Background**

Interview participants were selected from throughout the construction industry with various backgrounds. This approach was adopted to try and establish a greater perspective of the industry as opposed to targeting a select industry group. Participant backgrounds included state, local and private works agencies, construction contractors from tier 1, 2 and 3 categories, and various consultants with backgrounds in contract administration, design, and environmental.

A breakdown of the industry representatives is shown in **Figure 3.2**. This demonstrates a relatively even split amongst the various backgrounds with 38% of participants from

state, local and private works agencies, 33% from construction contracting backgrounds and 29% from various engineering consultancies.



**Figure 3.2 Interview participant breakdown**

### **3.5.3. Participant Selection**

Upon identifying the various participant backgrounds to be targeted, a process was undertaken to identify the particular experts that should be interviewed. This process is summarised below:

- Consult with current industry contacts regarding potential participants and gain recommendations;
- Determine recommended participants suitability based on number of years of experience, qualifications, current employment status and current employment role;
- Initiate contact with the potential participant, explain the nature and objectives of the study and determine their desire to participate or not participate;

- Send selected participants a copy of the interview questions to allow them to determine if they have sufficient knowledge, experience and familiarity with the research areas to participate in the study;
- Arrange a suitable time to meet with the participant and undertake the interview.

A key consideration in the selection of participants was to ensure that they had a minimum of 10 years of experience. This would allow them to consider factors such as how the industry may have changed relative to the last decade, and to provide judgment on how the industry should evolve in the future. Participants selected for the study are provided in **Table 3.1** with further details provided in **Appendix D**.

### **3.6. Data Analysis**

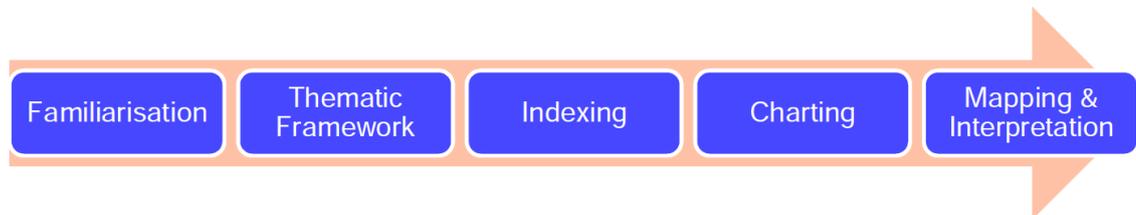
The Delphi study generated a large amount of qualitative data obtained through the semi-structured interviews. In light of this, it was necessary to establish a method that could be used to analyse this data and obtain meaningful output to address the research questions. Exploration into techniques used in analysing qualitative data, identified an approach termed the 'Framework Approach' that had been used in analysing qualitative data since the 1980's (Smith and Firth, 2011). This approach has been refined over time and is a proven technique across studies of varying types (Jane and Liz, 2002).

**Table 3.1 Selected participants**

<b>ID</b>	<b>Company</b>	<b>Experience (years)</b>	<b>Qualification</b>
IP01	Private Works Agency	17	Bach. Architectural Design
IP02	Tier 2 Contractor	15	Bach. of Engineering (Civil), CPEng, RPEQ
IP03	Multi National Consultancy	14	Bach. of Engineering (Civil) CPEng, RPEQ
IP04	State Government Agency	27	Bach. of Engineering (Civil) CPEng, RPEQ
IP05	City Council Agency	14	Masters of Infrastructure Engineering and Management
IP06	State Government Agency	30	Associate Degree Civil Engineering
IP07	Regional Council Agency	31	Bach. of Engineering (Civil) Masters of Business Administration RPEQ, Emeritus IPWEAQ Member
IP08	Multi National Consultancy	30	Bach. of Eng. Tech. (Civil)
IP09	Tier 2 Construction Contractor	35	Bach. of Engineering (Civil)
IP10	Regional Council Agency	15	Bach. of Engineering (Civil)
IP11	City Council Agency	47	No formal qualification
IP12	Multi National Consultancy	23	Associate Degree Civil Engineering
IP13	Tier 3 Contractor	24	Trade – Carpenter with an open builders licence
IP14	Local Design Consultancy	20	Masters in Urban Planning Bach. of Science (Environmental)
IP15	Local Design Consultancy	30	Bach. of Engineering (Civil)
IP16	Tier 2 Contractor	10	Bach. of Engineering (Civil)
IP17	Multi National Consultancy	10	Bach. of Engineering (Civil) CPEng, RPEQ
IP18	Multi National Private Works Agency	21	Diploma Project Management, Clerk of Works, Open Builders Licence
IP19	Tier 2 Contractor	10	Bach. of Engineering (Civil)
IP20	Tier 1 Contractor	14	Bach. of Engineering (Civil)

### 3.7. Framework Approach

The framework approach is a five step process that has resemblance to that of thematic analysis in that it identifies recurring and significant themes (Smith and Firth, 2011). The five step process is shown below in **Figure 3.3**.



**Figure 3.3 Framework approach**

These five steps are discussed in greater detail below, outlining the methodology adopted in analysing the qualitative data.

#### 3.7.1. Familiarisation

The first step in the analytical approach of the qualitative data is ‘Familiarisation’. During this stage, the key is becoming familiar with the range and diversity of the data gathered (Jane and Liz, 2002). This was achieved through:

- Undertaking all interviews - In some case it is understood many interviewers are used in studies of this type, especially those with a large sample size, making it difficult to be familiar with all data. In this instance, all interviews were conducted by the sole researcher, therefore avoiding this issue;
- Development of the interview transcripts – Upon completion of the interviews, a transcript was developed summarising the opinions and judgments made by the interviewee against each of the interview questions. Through this process, further familiarisation of the data was obtained; and
- On completion of the production of the interview transcripts, all transcripts were further reviewed to increase familiarisation with the data.

### 3.7.2. Thematic Framework

The second stage of the framework approach involves the development of a thematic framework used to sift and sort the data (Jane and Liz, 2002). These themes will be an outcome of those identified in the familiarisation stage but will also be shaped by the research questions and aims. The research questions and aims have been used to shape the interview questions which is where the connection to the thematic framework lies.

During the creation of the thematic framework, an index was developed that is applied to the data in step three of the framework approach. The index categories largely relate to the areas of questioning but also related to the research questions. The index categories are shown in **Table 3.2**.

**Table 3.2** Index categories

Index No.	Index Item
<i>Interviewee Background</i>	
1.1	Years of experience
1.2	Qualification
1.3	Typical employment role
1.4	Private industry experience
1.5	Public industry experience
<i>Procurement Strategies</i>	
2.1	Procurement experience
2.2	Common strategies
2.3	Scope for performance measurement
2.4	Project outcomes related to price strategies
2.5	Project outcomes related to non-price strategies
2.6	Project impacts price based
2.7	Project impacts non-price based
2.8	Procurement approach that the industry should transition towards
2.9	Perception
<i>Performance Measurement</i>	
3.1	Performance measurement experience
3.2	Typically adopted performance measures
3.3	Relevance to industry
3.4	Perception
3.5	Project outcomes
3.6	Opportunities for new areas of measurement
3.7	Innovation

### **3.7.3. Indexing**

During this stage of the analysis, the index categories identified above are applied to the interview transcripts. This extracts the key information out of the transcripts related to the specific research goals and any areas that may have developed in the interviews. In undertaking this process, the transcripts were physically noted with the index code that applied to each element of relevant data (**Appendix C**).

### **3.7.4. Charting**

Upon completion of the indexing process, the data was extracted from the transcripts and charted. These charts were thematic based, not individual case based and included the information from all respondents applicable to the relevant theme/data index. These charts will be examined in later chapters when conducting the analysis process.

### **3.7.5. Mapping and Interpretation**

Following the charting process, the data was interrogated further, searching for themes and elements that have developed from the interview process and relating these back to the research questions and objectives. During this process, figures and tables were produced based on the charted data and discussion areas generated, looking at what has been found in undertaking the research. During this phase, the data was assessed for, amongst other things, the following:

- Defining concepts,
- Mapping range and nature of phenomena,
- Creating typologies,
- Finding associations,
- Providing explanations,
- Developing strategies

## 4. Analysis

The analysis performed in undertaking this study follows that prescribed in Chapter 3. This process yielded a great amount of qualitative data relative to the research objectives and questions. This chapter will present the analysis of this data before discussions and recommendations are provided in Chapter 5.

### 4.1. Interview Participants

#### 4.1.1. Participant Anonymity

In undertaking this study, the methodology adopted required participants to provide responses to a series of questions via a semi-structured interview. It is important to note that while it is intended to try and develop a perspective of the industry in regards to procurement and performance measurement, the responses are solely those of the individual and not necessarily that of the company they are employed by. At the same time, these responses can be of a sensitive nature and therefore it has been chosen to allow participants to remain anonymous. To facilitate this, participants have been prescribed an identification number only (**Appendix D**), with their name and company remaining anonymous.

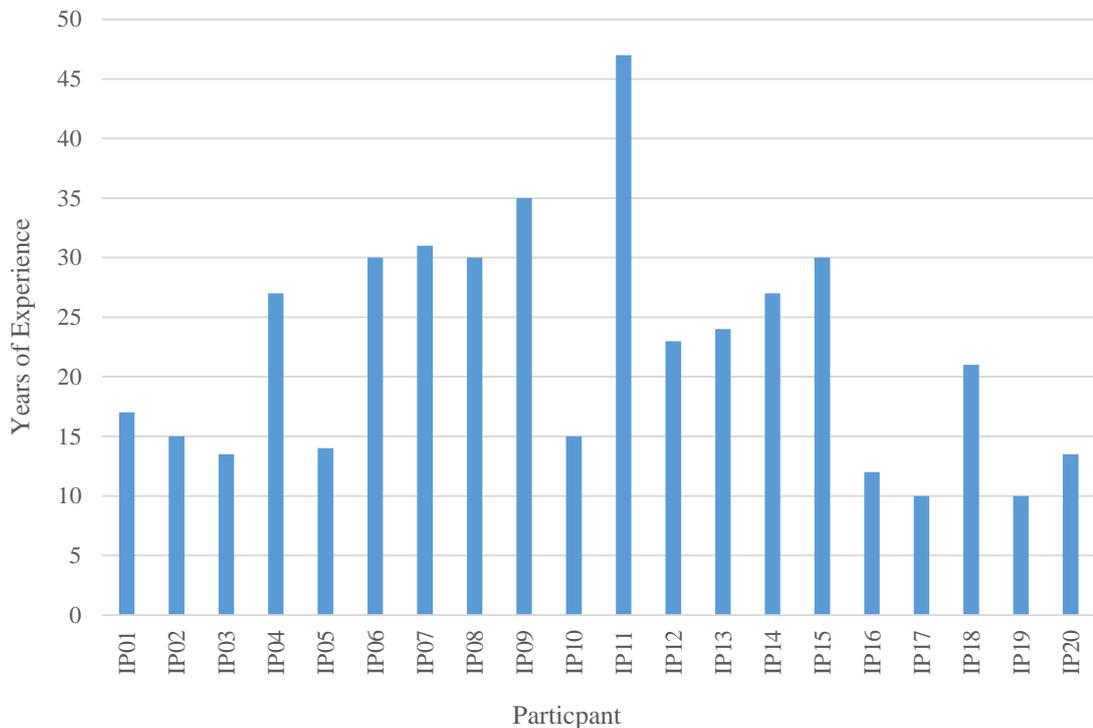
#### 4.1.2. Participant Background

As mentioned previously in Chapter 3, interview participants were selected from throughout the construction industry with various backgrounds. This approach was adopted to try and establish a greater perspective of the industry as opposed to targeting a select industry group. Participant backgrounds included state, local and private works agencies, construction contractors from tier 1, 2 and 3 categories, and various consultants with backgrounds in contract administration, design, and environmental. This breakdown of industry representatives was shown previous in **Figure 3.1** and did not vary from that proposed in the original methodology.

### 4.1.3. Participant Experience

In addition to the participant’s employment background being considered when selecting potential interviewees, significant consideration was given to the participants experience within the industry.

Each participant’s years of experience are shown in **Figure 4.1**. The average number of years’ experience of the participants was 22.25 years while the median number of years’ experience was 22 years. Given that the average is almost identical to the median, this indicates that the years of experience across all members are spread evenly around the median value indicating that the data is not skewed significantly in either direction.



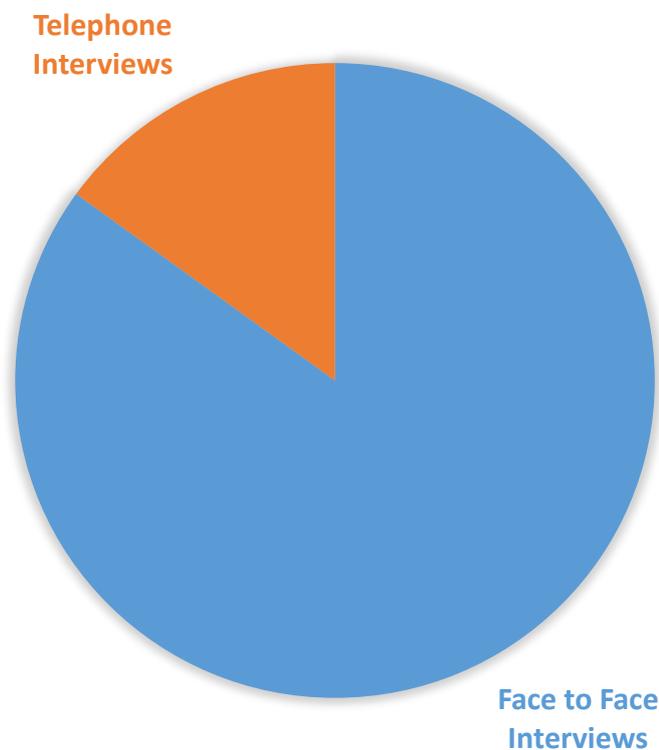
**Figure 4.1 Interview participants experience**

### 4.1.4. Participant Responses

Semi-structured interviews were conducted with 20 representatives selected from differing areas of the construction industry. This approach allowed for a greater representation of the industry as a whole, as opposed to focussing solely on one particularly group of the industry, such as construction contractors. Interviews were

typically conducted face to face at the participant’s office, however in three instances, due to locality issues, the interview was conducted via telephone (**Figure 4.2**). This equated to 85% of the interviews conduct face to face, and 15% conducted via the telephone.

Upon completion of the interviews, a transcript was developed documenting each participant’s responses to the interview questions. These transcripts are provided in **Appendix C**.



**Figure 4.2 Interview mode**

## **4.2. Procurement**

### **4.2.1. Procurement Experience**

Typically, all participants interviewed had been involved with procurement to varying degrees. In the simplest of cases, participants had been involved purely from a tendering perspective and acted simply in response to a procurement approach used for a project, while other participants had been directly involved in the development of procurement strategies. For instance, IP05 is responsible for providing corporate wide leadership and

expertise in best practice procurement and contract management for capital works projects. Interview participants IP01, IP04, IP07, IP10, IP11, IP12, IP14 and IP15 all had experience in utilising procurement strategies that had been determined at a strategic level and then administered by them in the letting of works.

Participants IP02 and IP13 were from smaller construction firms and had also been involved in the development of procurement strategies and purchasing policies from the perspective of procuring sub-contractors for use in delivering projects.

The remainder of participants had primarily been involved from the perspective of responding to a procurement strategy in a tendering role.

Across the board, the participants demonstrated a good level of familiarisation with procurement strategies and processes. A summary of this experience is provided in **Appendix E**.

#### **4.2.2. Commonly Used Procurement Strategies**

Upon establishing each participant's familiarisation and experience with procurement strategies, participants were asked for their opinion on what procurement strategies they find are most commonly used in the procuring of services, and whether these strategies provide sufficient scope for performance measurement. A summary of their responses is provided in **Appendix F**.

In the majority of responses, it was identified that the industry is primarily using construct only or design and construct delivery methods. This agrees with Casey and Bamford (2014) who indicated that these models are still the most commonly used delivery models. These two methods were also mentioned by Love, Skitmore and Earl (1998) and Gan (2010) as two of the three typical procurement strategies. This also highlights that, despite the works of CRC for Construction Innovation, as well as others, the tendency to utilise traditional approaches to procurement is still the default arrangement.

Participants indicated that there was a tendency to use design and construct methods on larger projects, especially those that were high risk, as the Principal could offload some of this risk onto the contractor through using this procurement strategy.

Participants also mentioned that, to a lesser extent, Early Contractor Involvement and also Construction Management methods are sometimes utilised.

From a consultancy perspective, it was identified that it is common for consultancies to be procured through a mix of price and non-price criteria in an attempt to ensure that not only a good price was being achieved, but that a suitable consultant, with the right experience, team and resources was being procured. This is seen as a positive shift in the industry, as Tilley (1998) highlighted that the use of this approach can help to minimise quality based issues in regards to design and documentation.

In all instances, participants indicated that the procurement strategies typically provide sufficient scope for performance measurement with some strategies involving overarching performance measures, while all strategies allow for the adoption of project specific performance measurement. This indicates that the strategy does not prohibit the utilisation of performance measurement.

It was mentioned previously that Casey and Bamford (2014) identified that the procurement strategy and the link to performance measurement comes through the adoption of either a price, non-price or value based procurement approach. Further to this, it was evident through understanding the research of Cheung et al. (2001), Luu, Ng and Chen (2003) and Watermeyer (2012) that the outcome of a project appears to be directly linked to the procurement strategy and that this outcome is a function of project performance measures. Given this, participants were asked a series of questions to establish their opinions on how the selection of a price or non-price approach impacts on the project and how the outcome can differ depending on the approach.

### 4.2.3. Price Focussed Procurement

Questions asked of participants in regards to price focussed procurement yielded interesting results. A summation of the key issues raised and the areas that participants thought this strategy detracts from is provided in **Appendix G**.

The majority of participants believed that by adopting a price focussed procurement strategy it could lead to detrimental impacts. These are shown in **Table 4.1**.

**Table 4.1 Impact Areas**

Procurement Approach	Impact Area
Price Based Strategy	Cost
	Time
	Quality
	Omissions and Rework
	Disruptions
	Safety
	Experience of Personnel
	Relationships
	Corner Cutting
	Fit for Purpose Solution

It was found that the most prominent issue participants believed is associated with a price based procurement strategy, is that it will often lead to a greater number of variations as contractors try to recover costs due to the submission of a low price. This viewpoint is supported by early research conducted by Molenaar, Songer and Barash (1999) who found that price only strategies often resulted in increased claims during construction.

A secondary impact associated with this, was that it led to conflict and detrimental impacts on relationships between the principal and the contractor due to the claims. This is of significant concern as it negatively impacts on trusting relationships, team pride, as well as the communication elements of the project, which were all key drivers identified by Crow and Barda (2001) in achieving excellent project outcomes. It is important to note however, that greater negativity towards price based procurement was shown by the participants from design consultancies and state, local and private works authorities.

The majority of contractors felt that, just because a strategy is price based, it will not necessarily lead to a lesser outcome had a non-price approach been adopted. This was also supported by IP05 who is employed by a large city council. IP05 believed that much of this has to do with the culture of the contractor and their approach to delivery. IP05 indicated that, in his experience, if a contractor is a ‘hard nut’ contractor, they will always try and gouge you on variations regardless of procurement approach and regardless of how little or how great the dollars are that are involved in the project. IP05 also mentioned that a price driven strategy may simply mean that the smartest, most efficient contractor comes out with the lowest price and genuinely does a good job.

This view was supported by IP13 who stated that price driven strategies made them approach tendering with a view of thinking harder and smarter about how the project can be delivered, while still maximising the outcome and minimising the cost. IP13 acknowledged that there will always be companies who have very low margins and that, at the moment, there are even companies adopting negative margins to win work as the market is very saturated at present. IP13 explains that this is being seen more and more as consultants are also in a saturated market that is price driven with documentation being produced to a lesser quality than usual. IP13 identified that poor quality documentation provided in tender packages is leading to opportunities for significant variations throughout the delivery of the project and that hundreds of thousands of dollars are being won on single line items in specifications that are not correct. IP13 explains that it comes back to the drive and culture of the company though and that ‘our company will often try to clear up any issues during the tendering phase to allow us to provide a good price to the client that delivers the outcome they are chasing without gouging them on variations’.

IP13’s opinion was also supported along similar lines by IP09 who stated that, for 18 out of 35 years of experience, ‘procurement had been solely based on price’. ‘Our typical view is that if a contractor thinks he can deliver it for ‘x’ amount of dollars then go for it’.

It is evident that it depends on the project in that if a project has high risks and there is the potential for a lot of changes, a price based approach will be not necessarily be the best approach to use. IP09 states that ‘if the project is well defined, with good quality documentation then I can’t see why it is not purely just on price’. This is emphasised by

the fact that many works authorities use a pre-qualified panel of contractors to go out to tender to. IP09 argues that ‘if you are on the panel, you obviously meet the requirements so why should anything else, but, price be considered’? IP09 explains that this is made worse by organisations like the Department of Transport and Main Roads (TMR) who can utilise an unusually low bid rule if a bid is lower than the mean bid by a certain margin, which can result in the tenderer either being removed from the tender assessment or being asked to justify their bid.

In opposition to this, it is important to consider the view point of works agencies, especially those who are of a smaller nature such as local regional councils who are heavily scrutinised on spending given the political environment in which they operate.

IP07 stated that previously, they had always had a heavy focus on price and that there had been incidences where this had ended disastrously. In one instance, a contractor had been engaged on the basis of lowest price to construct a new bridge. During the delivery of the project it became evident that there were significant capability and experience issues with the contractor. This resulted in contract management costs doubling to manage the contractor and get the project completed.

Similarly, IP01 voiced that in the past, there had been price driven strategies within their organisation with little focus on performance measurement and non-price criteria. This philosophy had led to increases in project costs due to poor quality documentation, corner cutting, a lack of resourcing, time delays, and large variations all of which contributed to increasing project costs. IP01 believed that had the focus and approach been different from purely price, this could have been avoided. This viewpoint is supported by DeFraités (cited in Tilley 1998, p.3) who stated that ‘the level and quality of the services provided is likely to be limited’ in reference to a selection process purely focussed on price and that ‘this translates into additional project costs for both the contractor and the client’ as was the case in the experience of IP01.

In consideration of the points above, it would appear that the adoption of a price based approach is not necessarily the best strategy from the client’s perspective and that adoption of this approach can leave them exposed to being taken advantage of if the

contractor does not act with client focussed intentions. In saying this, participants were also queried on their thoughts regarding non-price or value based procurement.

#### **4.2.4. Issues Associated with Price Based Procurement**

In general, it appears from the responses that price based procurement can leave the client exposed to potential shortfalls in contractor experience and capability. Further to this, there was a common theme that price based procurement results in contractors seeking variations to a greater extent than they would had the procurement strategy adopted a non-price or value based approach. Whether this is in fact the case is outside the scope of this study, however in consideration of responses from participants IP09, IP10, IP11 and IP13, if a project is well documented, with a tight project scope and the client is clear in regards to what they want, then there should be no reason for significant variations or increases in construction costs. This was stated well by IP09 who stated that ‘if there are a large number of unknowns, with significant risk of changes then a price approach will not work and an alternative approach should be sought’.

#### **4.2.5. Non-Price Focussed Procurement**

In an attempt to gain an understanding of participant’s thoughts on non-price procurement, questions were asked of participants in regards to non-price strategies. In part, this was a deliberate act to solidify their thoughts regarding the differences that a price or non-price approach can make to a project.

In a perfect world, responses would have been opposite to those discussed in the previous section whereby participants often expressed the opinion that a price based strategy was detrimental to the delivery of the project and detracted from areas such as cost, quality, safety and time. Review of the responses in regards to non-price procurement, which have been provided in **Appendix H**, identified mixed responses from the participants and there was not a clear distinction on whether non-price approaches would or would not deliver a better project outcome.

While many participants did believe that a better outcome could be achieved, as non-price approaches gives consideration to elements such as past performance, experience,

resources and capability, participants equally expressed the view that adoption of a non-price approach does not guarantee a better outcome and that it is very much dependent upon the contractor themselves.

IP01 expressed the opinion that it is fundamentally the personality meshing of the team that is going to result in the best outcome as ‘they understand each other, they communicate with each other, and they work together to come up with the best result’. Regardless of the procurement approach used, generally if all parties are satisfied with the project budget, the consultant will be happy, the contractor will be happy and the client will be happy. IP01’s belief was that ‘happy projects are typically successful projects’.

Similarly, IP08 indicated that a non-price approach will not necessarily yield a better project outcome but more so there needs to be a good balance between both price and non-price criteria to ensure value for money. This allows for the right team to be dedicated to the job with sufficient resources, time and cost to deliver the project while still ensuring that costs do not get out of hand.

It is interesting to note that this participant expressed the opinion that non-price strategies require the tenderer to think harder about how they are going to deliver the project and have a sound methodology, process and systems in place to demonstrate to the client that they can effectively deliver the product. This is a similar response to IP13 in the previous section who stated that a price approach made them think harder and smarter about how they can deliver the project to minimise costs. From this, it is instigated that both strategies generate this thought process, but that a non-price approach creates greater transparency as the tenderer can be required to document their delivery approach as part of their submission.

Interview participants IP2, IP4, IP6, IP7 and IP12 all believed that adopting a non-price approach will yield a better project outcome when compared to a price driven strategy and that this is primarily due to factors such as the ability for a non-price approach to service a project to a greater level, the quality will improve, timeframes will be more realistic and that relationships between the contractor and principal will be greater which is important for future projects.

#### **4.2.6. Issues Associated with Non-Price Based Procurement**

From the participant responses, it was identified that some issues were associated with adopting a non-price approach. IP06 indicated that non-price approaches can inflate costs compared to price only tenders, which was supported by the view of IP08 who stated that it is always important to maintain an element of price to ensure that costs remain in check with the project budget.

A common issue identified by participants was that non-price approaches are made difficult by the subjective nature of the assessment criteria. IP02, IP04 and IP05 all voiced concerns that non-price criteria make it difficult to justify decisions due to the subjectivity with assigning a score to categories such as experience, local presence and team. Areas such as these are very difficult to quantify as opposed to price, where one dollar is going to always be less than three dollars.

Some participants expressed the opinion that a non-price approach can create additional costs to a project, primarily upfront costs associated with tendering, however the general consensus was that, in regards to whole of project costs, there does not generally appear to be additional costs associated with adopting a non-price approach.

#### **4.2.7. Procurement Processes**

Participants were asked questions relating to procurement processes to establish whether participants thought improvements could be made to how construction contractors are procured for civil construction projects. **Appendix I** contains the responses from the participants which demonstrates that there are some differences of opinion between the views of the procuring agencies and the construction contractors.

Participants IP01, IP04, IP05, IP06, IP07, IP10, IP11, and IP18 are all from agencies who procure construction contractors to deliver projects. These participants all expressed the typical view that procurement is usually a straight forward process due to the organisations having clear procurement processes and policies in place. While in some instances it can be a time consuming task, it is not so much a difficult process. IP10 did indicate though, that in smaller agencies, a lack of training and understanding of

government legislation can sometimes make it difficult for procurement officers to determine what is required regarding the correct procurement approaches and how to go about procuring the required services.

Providing an insight from a different perspective, IP18 indicated that while the process of undertaking procurement is not difficult, procuring good quality service providers with the correct skills and experience for the job can be difficult. IP18 attributed this to the fact that, despite a slowdown in recent times, many highly skilled trades people and engineers are still lost to the mining and gas sector.

In light of the views expressed above, opinions from participants from both the consulting and contracting sectors expressed differing opinions on procurement processes to those discussed above. While there was general agreement that many agencies do have well-structured procurement procedures and policies, there are a number of factors that contribute to making procurement difficult, specifically:

- Subjectivity associated with non-price criteria;
- Manipulation of non-price criteria assessment to select the desired contractor;
- The requirement of government agencies to be particularly transparent in their procurement processes increasing the documentation requirements;
- Lack of understanding from government agencies regarding their own strategies, procedures and policies;
- Influx of foreign workers employed by procuring agencies who do not have an understanding of the organisations procurement policies and procedures;
- Poorly scoped briefs making it difficult to understand the desires of the client and to prepare a correct, well scoped and well priced bid;
- Poor quality documentation;
- Outdated specifications stipulating products that have not been made for a number of years;
- Short time frames;

- Approaches such as ‘*Expression of Interest*’ that do not require the same justification or level of scrutiny as full tender processes, allowing procuring agencies to easily eliminate tenderers and choose a desired select few; and
- Having to deal with client nominated suppliers;

Of the points mentioned above, there was a recurring theme from respondents that the combination of short tendering response time frames, a lack of quality documentation and scope definition, in addition to a lack of client understanding of the project requirements, are all contributing factors creating difficulties with current procurement practices for civil construction projects. Issues surrounding subjectivity and manipulation of non-price criteria appeared to be more of a frustration to the industry as opposed to an actual difficulty with procurement.

#### **4.2.8. Future Approaches to Procurement**

Given the importance of the construction industry to the Australian economy, a critical element was establishing the industries thoughts on future approaches to procurement and trying to establish whether there was an industry preference in regards to procurement strategies. Participants were queried regarding their thoughts on future approaches to procurement, with these responses charted and provided in **Appendix J**.

It is evident that responses were of a similar nature across the majority of participants with clear trends identified. These trends included:

- A preference towards a combination of price and non-price criteria used in the tendering phase and assessment;
- A preference towards the use of pre-qualification panels for consultants and contractors for the delivery of civil construction projects;
- A transition towards the use of performance driven specifications as opposed to prescriptive specifications that are typically utilised on current civil construction projects;
- In situations where the project is small in size and dollar value, has low risk and is of a relatively simple nature, a construct only approach is preferred;

- In situations where the project is of a medium to larger size and dollar value, has medium to high risk and is of medium to high complexity, a preference was shown towards the design and construct procurement approach; and
- The preference of alliance and collaborative type approaches to procurement has receded over the last five years.

It is interesting to note this last point and the trend away from alliance approaches in that Rooney (2006, p.9) looked into the development of Project Alliancing and stated that this approach ‘is evidence of a major cultural shift towards seeking teamwork as more important than competitive behaviours’. From the data, it would appear that this trend is somewhat being reversed as approaches move back towards more traditional construct only and design and construct approaches. IP20 believes that the trend away from alliance approaches is a reflection of the current economic environment of the civil construction industry and that the reduction in work has ‘made contractors hungrier and clients have probably worked out they can get better value using competitive price procurement approaches’.

This was also supported by IC16 who stated that the industry has gone away from alliance approaches and is unlikely to go back this way. IC16 stated that this approach ‘creates laziness in engineers’ as the alliance approach does not require the same attention and focus on quantities and the work being performed as hard dollar contracts do.

This recession away from alliancing was also observed by Walker, Harley and Mills (2015, p.2) who cited Wood and Duffield (2009) in stating that the ‘level of alliancing has reduced’ although they did explain that there is still a significant ‘willingness to embrace this type of system’.

Of the points mentioned above, it is particularly important to focus on the responses and tendency of participants to nominate the design and construct procurement approach on projects, other than those of a simple and low cost nature, as the preferred procurement approach.

It is evident from the responses that this approach is preferred due to the opportunity it provides for the contractor to become involved in the project at an early stage and have

input into the design. This involvement allows for input from different aspects which are sometimes not given due consideration in a typical design only approach. These aspects include the consideration of construction methodologies, future maintenance of the asset, as well as a vast amount of construction knowledge that can help to optimise the design solution.

From the responses, it is evident that participants believe that this approach to procurement can provide sufficient benefits in regards to cost savings for projects. Specifically, IP20 expressed the belief that this approach could allow the delivery of more infrastructure at the same cost, as the contractor is 'motivated to identify the optimum design solution that meets the functional outcome of the project but does not necessarily gold plate the design'. This was supported by IP19 who expressed the opinion that once the contractor is on site, it is 'difficult to change the design even if there is a better way to do something or a better design solution'. This can create unnecessary costs to the project that could have been avoided had a design and construct approach been adopted. Emphasising this point, IP13 stated that in regards to consultants 'a lot of firms are backwards when it comes to understanding construction and methodologies'.

Adding further support to utilising this approach in future approaches to procurement, IP18 believed that this approach helped to reduce issues associated with design and documentation typically experienced in design only approaches. IP18 indicated that in approximately 15 years, he was 'yet to deliver a project that had good quality, complete and accurate documentation'. He expressed the belief that this was due to a lack of required skill sets and experience in engineering consultancies and that by using a design and construct approach, some of these shortfalls can be mitigated through the involvement of the contractor.

While there was a clear consensus amongst the group regarding a move towards design and construct procurement approaches, it is important to understand that, as explained by Rashid et al. (2006, p.10), 'it is more often found that the quality of work under this contracting systems tends to be questionable'. Rashid et al. (2006) explained that this was primarily attributed to the contractor being able to control the design and construction phase, while the client is largely left in the dark as to what is actually occurring throughout these two phases. This exact issue was voiced by IP15 who has been heavily involved in procurement from a state government perspective. IP15 mentioned that the issue with the

design and construct approach is that ‘you loosely get what you want, but not specifically because the control around the design has been lost by the client’.

### **4.3. Performance Measurement**

#### **4.3.1. Performance Measurement Experience**

In all cases, interview participants displayed at least some experience in regards to performance measurement of civil construction projects. IP01 and IP08 explained that they had minimal experience, however were aware of the concepts, requirements and reasoning behind performance measurement. All other participants expressed this same understanding and in addition to this, had been involved with performance measurement through the preparation of performance reports, participating in performance workshops, monitoring performance, having their performance monitored and through the ranking and scoring of performance.

In consideration of the responses from participants regarding their experience with performance measurement, it was evident that the group demonstrated a good level of familiarisation and experience with performance measurement. A summary of this experience is provided in **Appendix K**.

#### **4.3.2. Commonly Adopted Performance Measures**

Upon establishing each participant’s familiarisation and experience with performance measurement, participants were asked for their opinion on what performance measures they find are the most commonly used in the measurement of performance for civil construction projects. A summary of their responses is charted in **Appendix L**.

The majority of participants indicated that the traditional areas of cost, time and quality are always measured, but that often, a number of other areas are also typically measured these days as shown in **Table 4.2**.

**Table 4.2 Common Areas of Performance Measurement**

Environment	Reliability
Traffic Management	Organisational Structure
Safety	Experience
Community	Past Performance
Relationship Management	Communication

This demonstrates that the measurement of performance has evolved from the traditional areas of time, cost and quality and also indicates that agencies are understanding the importance of performance measurement, as investment has been made in developing this field. This was also mentioned by Bassiono, Price and Hassan (2004) who mentioned that research into performance measurement has been significant since 1994 as it had become critical to business success.

In studies conducted by Latham (1994), Egan (1998), Crow and Barda (2001), Construction Queensland (2001), Dainty, Cheng and Moore (2003), Chan and Chan (2004), Sidwell and Kennedy (2004), Robinson et al. (2005), and Idrus, Sodangi and Husin (2011) many of the performance measures mentioned about by the participants were identified in these studies as being key measurables in delivering great outcomes for projects. This indicates recognition of performance measurement from the industry in the delivery of civil construction projects, and demonstrates investment in performance measurement to potentially improve projects outcomes.

**4.3.3. Scope for Performance Measurement**

To assist in establishing the relationship between procurement and performance measurement, participants were queried regarding whether they thought procurement provided sufficient scope to allow for performance measurement and whether the procurement approach prohibited performance measurement in any way. Participants responses have been charted and provided in **Appendix M**.

From the responses, it was clear that the selected procurement approach does not typically prohibit performance measurement, it more so encourages it by often providing overarching project performance measures and then allowing the adoption of project specific performance measures as seen necessary by the procuring agency.

It was evident that some performance measures, typically related to cost and quality are dictated through state and local government legislation in regards to the procurement strategy. Study participants indicated that, in addition to these measures, it is common place to include performance measures specific to the project and its characteristics.

#### **4.3.4. Relativity of Current Performance Measures to Industry**

A key area of this study was to establish whether it was thought that current performance measures are relative and reflective in the delivery of civil construction projects undertaken by contractors. Study participants were queried in regards to their opinions on this area which are charted and provided in **Appendix N**.

The study revealed that there is a general consensus of opinion amongst the participants that current performance measures that are monitored on projects are reflective of the way the industry operates. The common areas were mentioned previously in section 4.3.2, with participants indicating that these areas are a fair representation of the key performance areas that a contractor should be measured against.

It was mentioned that while these areas are reflective of the industry operations and practices, there are a number of issues associated with measuring these areas. The issues are discussed later in section 4.3.8.

#### **4.3.5. New Area of Performance Measurement**

Upon establishing whether performance measures are reflective of the industry, a secondary element to this was whether new areas of performance could or should be monitored. Responses in regards to this have been charted and provided in **Appendix O**.

As expected, given the findings from section 4.3.5 indicating that current performance measures are reflective of the way the industry operates, there was a general consensus that current areas are typically sufficient in regards to monitoring the performance of contractors and that there are not necessarily any specific new areas that should be monitored. There was some mention of potential links to innovation through performance

measurement and cost incentives as well opinions that rather than measuring new areas, agencies should focus on perfecting the measurement of current areas. These findings will be further addressed in sections 4.3.8 and 4.3.9.

#### **4.3.6. Impact of Performance Measurement on Civil Construction Projects**

With evidence that investment into, as well as a greater focus from agencies on performance measurement has been observed in the construction industry, participants were queried as to what impact they thought performance measurement had on a civil construction project. Participant responses are provided in **Appendix P**.

It is evident that there is a resounding consensus that performance measurement has a positive impact on a civil construction project when it is implemented. Participants indicated that while performance measurement may not change the end product that is delivered, as the contractor is required contractually to deliver this product at project completion, the most noticeable impact of performance measurement is in the delivery of the project. This was expressed well by IP15 who stated that ‘performance measurement more so changes how the project is delivered, not so much what is delivered’.

It is evident that in undertaking performance measurement, it provides the contractor with a set of measurable targets that they can set out to achieve. IP04 elaborated on this point stating that ‘it concentrates the contractors mind on what the client really desires’. This was supported by IP20 who stated that ‘it aligns the contractor and client a bit closer and opens up discussion around the measures’.

By implementing performance measurement on projects, it allows for key areas to be monitored and through monitoring these areas, the contractor and client can respond accordingly, dependent upon what the measure is indicating. This is exemplified in the opinion of IP12 who stated that performance measurement ‘gives direction’ and that ‘you can’t underestimate the early warnings about how you are travelling, I follow this religiously as it gives you a good heads-up about how you are travelling’. In addition to this, it was evident that performance measurement assists in project learnings which are transferable to future projects.

It is important to note though, that there was a general consensus that for performance measurement to have a positive impact on a project, it must be implemented and utilised well and there must be an element of ‘buy-in’ from all stakeholders.

#### **4.3.7. Perception of Performance Measurement**

With evidence suggesting that performance measurement has a positive impact on a civil construction project as discussed in section 4.3.6, the study delved further to gain an understanding of the general perception of performance measurement across the industry. Participant responses in this regard are provided in **Appendix Q**.

There was a consensus amongst study participants that performance measurement is widely accepted across the industry and that it has become embedded as part of project delivery. It was evident that many agencies have well developed systems in place to support performance measurement and this ensures that the tasks associated with undertaking measurement are relatively simple for all involved.

It was interesting to note the differences in perception amongst contractors compared to those of private agency, as well as local and state government agency members. There was a belief from some contractors that performance measurement could lead to a competitive advantage if they received high ratings in regards to performance measurement on a project. They believed that this could lead to the award of more work in recognition of high performance on previous projects. This was countered by a general consensus from procurement agencies that performance measures helped them to ensure that contractors were performing satisfactorily and that just because one contractor performed satisfactorily and another performed above satisfactory, this would not directly lead to one contractor being awarded more work than the other. The focus here was simply to ensure that the contractors were performing satisfactorily and meeting the minimum performance requirements. The attention is more so on those contractors who are falling below the minimum standard as opposed to those that are excelling far beyond this. This highlights a discrepancy in the alignment of the industry on the aims of performance measurement.

#### **4.3.8. Issues with Performance Measurement**

With performance measurement becoming increasingly important on civil construction projects, opinions and judgements were sought regarding issues with performance measurement currently experienced by the industry. Participant responses have been charted against this area of focus and are provided in **Appendix R**.

Of the issues raised, the most consistent of these across the participants was the issues performance measurement causes in regards to the relationship between the contractor and the client when performance is being measured as poor or unsatisfactory. It was clear that the issue of poor performance creates conflict between the contractor and the client and can often create tension in the delivery of the project. This was expressed well by IP06 who stated that ‘it can be emotionally draining due to difficult conversations with contractors in environments that can already be high pressure and high stress’. This can become amplified given that many of the measurement areas are subjective, leading to further disagreement. This was highlighted by IP05 who explained that although records may indicate a high number of Requests for Information from the contractor, is this the result of ‘an incompetent contractor, a poor design with poor documentation, or a difficult superintendent?’.

The subjectivity of the measurement areas, was consistently identified by the participants as a significant issue in the measurement of contractor performance, with this being amplified in a civil construction environment, as many of the activities themselves are difficult to quantify. An example was provided by IP04 with reference made to the manufacturing industry in which the measurement of defective products is simple. If it is defective, it is defective. IP04 went on further to explain that the civil construction industry is not like this and even on objective areas such as a completion date, there are so many variables that can impact on this, that subjectivity is brought back into it.

Although advances have been made by some organisations to try and remove some of the subjectivity through the introduction of matrices explicitly stating how a subjective area is measured, the systems themselves are somewhat subjective as they rely on the opinions and judgements of those carrying out the monitoring. This was expressed by IP15 who stated that ‘the issue with many systems is that they are a consensus system, where the

client scores the contractor and the contractor scores themselves and then you meet in the middle'. This highlights the subjectivity of the system itself, and also indicates that the actual measurement of performance is not entirely a true reflection of the client's perception of the contractor.

It was expressed that there are generally sufficient systems and processes in place to support the measurement of performance in the larger organisations, while smaller councils have difficulty in justifying the investment in these systems and as a result, often do not have appropriate tools for performance measurement. Despite the systems and processes of the larger organisations, there was a general consensus that there is a lack of resources and training of these resources to satisfactorily capture, assess and take action from the data. It was apparent that once the data is captured, it is typically discussed in monthly performance meetings but little is done with the data beyond this point. This leads to few outcomes being generated from the captured data.

#### **4.3.9. Innovation through Performance Measurement**

In an attempt to determine whether innovation could be driven through the construction industry via performance measurement, participants were queried on their opinions and judgements as to whether performance measurement could actually drive this. These responses have been charted in **Appendix S**. In addition to this, participants were queried as to whether they thought the construction industry is slow to change, develop, and adopt new processes or techniques, as this is also an indicator on the ability of the industry to innovate. These responses have been charted in **Appendix T**.

It was evident from the data that trying to drive innovation through performance measurement was not generally seen as an approach that could encourage this. This was primarily due to the fact that performance measurement is undertaken during the construction phase of a project at which point, there is often little option or time available to make any significant changes or pursue innovation. Despite this, there was a general consensus amongst study participants that they would like to see a greater push from procuring agencies in regards to innovation.

It was determined from the data, that rather than try and drive innovation through performance measurement, this should more so be pursued through the procurement strategy. There was clear consensus amongst the group that not only does the procurement strategy need to drive innovation, there needs to be incentives tied to this to encourage the pursuit of innovation through strategies such as the sharing of cost savings.

Participants indicated that there is significant opportunity to be innovative in the current construction industry in Queensland on civil construction projects. This was highlighted in a response by IP03 in which their organisation utilises many techniques throughout other states in Australia, but trying to bring these approaches to Queensland has been met by tough resistance. This was further highlighted by IP09 who indicated that Queensland sees itself as a leader in regards to the use of foam bitumen pavement, despite this being used overseas for decades. It was clear that the general theme was towards the use of tried and true techniques, as opposed to looking into alternatives, and that the emphasis was on minimising risk as much as possible.

It was extremely evident in the data that there is a general shift required in the thinking of procuring agencies in regards to innovation and that the industry will continue to be stifled on the innovation front unless this shift occurs. This is highlighted by a response from IP04 who stated that the approach to innovation ‘is especially bad here in Queensland and is the worst I have seen throughout my career in the United Kingdom and Australia’. This is further highlighted by a response from IP03 who stated that ‘when I come up to a project in Queensland, I take a step back in time to some extent’.

The data indicates that this approach to innovation, or lack thereof, is being driven by prescriptive specifications and the use of standards being applied as if they are cast in stone. This prescriptiveness is being driven by risk averse state and local government agencies looking to minimise their exposure to risk as much as possible. IP04 states that the government ‘have taken conservative to a new level in regards to innovation’. This approach to risk mitigation can be somewhat understood from a local government perspective, especially in smaller regional areas, as the cost to pursue innovation can be high, especially if the outcome is undesirable, but from a state and federal government perspective, the industry is calling for change.

This change needs to be driven through all levels of the procuring agencies and not just talked about at the top. Aouad, Ozorhon and Abbott (2010) explained that there had been typical interest in the promotion of innovation but it is not clear as to whether these policies had been successful. In response to this, the participants indicated that in the past, there has been much talk at the top levels about innovation and pursuing alternatives, but that is as far as it gets. The message is not delivered to the ground levels who are more focussed on delivering the project right now, at the right cost and with the least amount of headaches. From this, it can be assumed that these policies have not been successful.

Review of the responses from the participants identified that a change towards more performance driven specifications and a move away from the prescriptive environment the industry currently operates in is needed. This will help to bring innovation back into the industry and allow contractors the freedom to pursue alternatives to the current approaches as emphasised by Molenaar, Songer and Barash (1999, p.56) who stated that ‘performance specifications are used in the design and construct context to encourage innovation from the offerors’. This again ties back to the procurement strategy and the consensus from the participants about a move towards design and construction strategies, as Molenaar, Songer and Barash (1999) explains that a design and construct approach is a performance-oriented approach as opposed to a prescriptive approach. Whilst true, it is important to highlight the fact that in some instances, even using a design and construct approach, a design can be largely developed before going to design and construct, and that to breed innovation, the contractor needs to become involved prior to significant design development.

By exploring these alternate techniques, it can help to deliver more efficient and effective processes that can reduce the delivery costs of infrastructure. This was highlighted by IP09 who stated that from experience in delivering infrastructure in the United Kingdom and comparing that to Australia, ‘the country is paying way too much for its infrastructure’.

## 5. Discussion and Recommendations

### 5.1. Procurement

It is evident from the analysis undertaken of the data obtained in this study, that despite the use of alliancing type approaches to procurement on larger scale projects, the industry is transitioning away from this approach and that the traditional approaches of construct only and design and construct are utilised in the delivery of most civil construction projects.

It is evident from the study that there is no single or 'one size fits all' approach to procurement and that the strategy is not only a reflection of the project characteristics, but also the economic environment in which the industry is operating in at the time.

The study identified that the industry attributes a number of issues associated with the use of price only approaches, despite participants in the study from contracting backgrounds attesting that a good, honest contractor will always deliver the project with the same intent regardless of whether a price only or non-price procurement strategy is used.

The major issues associated with the use of a price only approach tended to lean towards cost and quality issues which led to transmitted impacts on relationships, disruptions to the project, safety impacts, corners cutting and omissions and rework.

It was identified that in determining whether a non-price approach or a price approach should be used, it is critical to consider the current economic environment, as a market that has limited supply and excessive demand, as is the current contracting environment, can lead to contractors 'buying jobs' and, in some instances, contractors submitting bids to the market with negative margins with the intention that costs can be recovered through variations.

It was clear in the study that private, local and state government agencies had, in the past, used procurement strategies that had been price focussed but have since tended to transition away from this approach due to unsatisfactory project outcomes and performance from construction contractors. This was particularly evident in a local

government context as the political environment in which they operate in, as well as the constrained budgets, particularly in regional councils, creates the need for every dollar spent to be significantly justified. Through the use of non-price criteria, this allows for the decisions to not simply go with the lowest price to be somewhat justified, despite issues related to subjectivity around the non-price criteria.

Clear consensus could not be drawn from the participants as to whether or not a non-price approach would in fact deliver a better outcome for the project. It was generally perceived that this approach allows for greater serviceability of the project, as the contractor is not constrained as much by what is potentially an extremely low budget to undertake the works, as is sometimes the case in price only approaches.

Participants did indicate though, that non-price approaches can inflate costs compared to price only tenders, however the general consensus was that, in consideration of whole of project costs, a non-price approach did not typically have a large impact on cost when compared to a price only approach.

Of concern, is the fact that non-price approaches are still being made difficult by the subjective nature of the assessment criteria. This indicates that little progress has been made in trying to remove some of the subjectivity around these non-price elements and that there is the need for studies to be undertaken, and outcomes sought to assist agencies in reducing the subjectivity of these criteria. Despite this, it would appear from the study that most agencies typically have well-structured policies and procedures around their procurement processes.

It was found that the participants who were from private, local and state government agencies who were involved in the procurement of contractors thought that it was a relatively simple process due to the structured procedures and policies that are in place in these organisations. Of concern though, was the influx of foreign workers employed by procuring agencies that have a poor understanding of the procedures and policies due to being unfamiliar with local and state government legislation. This indicates a lack of training within these organisations and it is recommended that these agencies are made aware of this short coming when considering the employment of foreign workers.

In retrospect to the views expressed by procuring agencies, many consultants and contractors explained that they found procurement a difficult process due to short time frames to respond to tenders, poor quality documentation, a lack of understanding from clients regarding the desired project outcome, and poorly scoped briefs.

In this light, it is recommended that procuring agencies should be made aware of these shortfalls especially regarding the lack of project understanding and scoping that is impacting on the ability of suppliers to accurately cost the required works, as well as the fact that often, there is simply not enough time for the contractors to assess the requirements and go into the detail required to provide an accurate cost. There is the potential that these factors could be contributing to increased project costs that could easily be removed with a little more attention and time given during the pre-tender phase. This could somewhat be addressed in the type of procurement approach that is adopted by the agency.

The research identified that the industry would like to see the continued use of both price and non-price criteria used in tendering assessment and that they were in favour of the use of pre-qualified supplier panels to ensure a minimum standard is maintained.

There was a clear preference from the industry to move towards the use of performance driven specifications and to increase the use of design and construct approaches when procuring contractors for projects. This approach was seen as the key to being able to decrease the cost of civil construction projects, open the industry up and provide greater freedom to contractors to be innovative and implement new technology and techniques and most importantly, reduce the current issues associated with the production of poor quality designs and documentation. On this basis, it is recommended that procuring agencies be made aware of the call from the industry to move towards a design and construct procurement approach.

## **5.2. Performance Measurement**

It is evident from the study undertaken that there has been significant development in the area of performance measurement. This was identified in the research in that, while traditional areas of time, cost and quality are still monitored, there are several further areas that are now continually monitored on almost all construction projects.

Many of these areas have been identified in previous research as key areas to leading to greater project performance and project outcomes. This indicates that the industry is striving to increase the performance and project outcomes by increasing their scope of performance measurement, and including these measures across civil construction projects.

The study revealed that commonly, projects now also typically measure performance related to traffic management, safety, community, relationships, environment and communication. These are typical to the construction phase while in the pre-construction phase, there is a focus on assessing contractor's organisational structure, experience and past performance.

The research revealed that the industry is of the opinion that these measures of performance are reflective of the way the industry operates and that there are not necessarily new areas of performance measurement that could be or should be introduced.

It was identified that, rather than investigate or introduce new measures of performance, the industry should focus on perfecting the current measures of performance and investing the time and resources to get this right.

It was found that the industry has come to accept that performance measurement is widely used across the industry and has become embedded as part of the project delivery process. It was found that there appears to be a difference in perception amongst the industry as to the objectives of performance measurement and it is recommended that both procuring agencies and contractors work closer together to try and achieve alignment across this element of project delivery. This will help to improve the process as it will ensure that all parties are on the same page.

It was evident that there are issues related to the lack of training, resources and, from smaller agencies, a lack of suitable support tools in the undertaking of performance measurement. It was determined that often, little is done with performance data beyond the extent of the current project and that greater utilisation of this data is required to ensure that the process can continue to improve the performance of contractors and the outcomes of future projects.

On this basis, it is recommended that organisations commit greater resources to the areas of performance measurement and that training should be increased to ensure that the people involved in the measurement of performance are aware of the objectives of performance measurement, how it is to be undertaken and what to do with the data that is gathered.

It is also recommended that organisations increase their focus on the data that is captured and the transfer of the outcomes generated from this data across future projects and the organisation as a whole. The data is of little use if it is siloed on a project by project basis. This is particularly important as there was a resounding consensus that performance measurement can have a positive impact on civil construction projects when it is implemented well.

It was indicated that, although performance measurement will not typically change the end product that is delivered, it is critical to the delivery of the project as it helps to align the contractor and the client, provide a set of measurable goals for those involved in the project, and provides direction and early warning of potential issues on a project.

To assist in this, and to strive for potentially greater results related to performance measurement, it is recommended that further work be done around helping to define the targets and to help reduce the subjectivity of some of the areas. It was indicated that some agencies have attempted to do this through the development of matrices defining targets, however further work should be done in this area as there was a consensus amongst the participants that the greatest issue with performance measurement is the subjectivity.

It was clear from the study participants that they did not feel that current approaches to procurement prohibit the ability of a contractor's performance to be monitored, and that

the strategy more so provides general guidance and overarching areas that are to be monitored while allowing the freedom to adopt project specific measurement areas. From this perspective, it is evident that changes are not required to the procurement approaches regarding the ability to allow for performance measurement.

### **5.3. Innovation**

In consideration of all findings from this study, of the most importance are those related to the potential to drive innovation through the industry via performance measurement and the issues that this has uncovered.

It was found that the industry does not believe innovation can be driven through performance measurement, as measurement is typically done during the project delivery phase and that, at this point of the project, the opportunity to innovate, make changes and provide potential cost savings for a project is very limited. The ability to make changes at this point of a project is also exacerbated by risk averse governments who are particularly unreceptive to any proposed changes that may deviate outside the specifications and standards.

The study identified that the industry is being stifled by client's who are handcuffing consultants and contractors through the use of overly prescriptive specifications and the application of standards as if they are cast in stone as opposed to using these as guides.

The industry feels that there is great opportunity being lost on all projects that are being delivered in regards to innovation and the benefits that contractors can bring to a project, especially in Queensland.

It was discovered that Queensland's approach to innovation is particularly bad and in some instances, the worst that some study participants had seen. It was found that innovation is often talked about but rarely driven at the project level and that the 'red tape' associated with pursuing innovation, even if it can bring significant benefit to a project, makes it overly complicated, time consuming and often prevents the pursuit of innovation all together.

It was found that, rather than try and drive innovation through performance measurement, this should be done through the procurement strategy. This comes back to earlier discussion in that the industry would like to see a trend towards design and construct procurement approaches.

The industry feels that by adopting this approach to a greater extent on projects, it will allow innovation to be brought back into the industry, as the contractor can be involved before many of the design decisions are made, signed off and given no further thought.

In addition to this, there needs to be monetary benefits associated to the pursuit of innovation as this will further drive consultant's and contractor's to pursue innovation. This could lead to significant cost savings across projects for all parties involved.

It was identified that infrastructure costs on current civil construction projects are believed to be excessive by study participants and that this could be reduced through the methods mentioned above. It is clear that the industry is calling for change in this regard and that the findings of this study in relation to prescriptive specifications and standards, and the current approach to innovation from risk averse governments needs to be taken further.

It is evident that the current environment allows for little engineering input, particularly when it comes to pursuing alternatives outside the norm, and that it has become more of a step by step process, following standards and guidelines, and simply preparing the documentation.

## 6. Conclusions and Further Work

### 6.1. Conclusion

This research project was undertaken to assess current industry thinking in regards to procurement strategies and performance measurement for civil construction projects, and to assess the relevance of performance measurement to the current industry, whether new areas of performance measurement could be introduced, and to ascertain whether performance measurement could be used to drive innovation through the civil construction industry.

Through the use of the Delphi technique, a panel of industry experts were assembled from which a single round study, using a feed forward methodology was used to extract the opinion and judgements of these experts using semi-structured interviews. This process resulted in a large amount of qualitative data that was assessed using the Framework Approach.

While this study has identified a number of key findings in regards to the areas of procurement and performance measurement, and provided a number of recommendations, it is necessary to acknowledge the limitations associated with this study and the impact this may have on the findings.

It is accepted that, despite the best intentions of the researcher, the research findings are based on the outcomes of the Delphi study and that this approach does not yield statistically significant results. This approach provides findings based on the opinions of select industry experts who may not necessarily represent the opinions of the industry as a whole. Despite this, it should be acknowledged that this research technique is used widely around the globe in many studies and that by engaging with industry experts, it is assumed that these experts have an excellent understanding of the subject matter and can provide quality information in regards to the research areas.

Limitations primarily related to time, and the willingness of industry experts to participate in this study resulted in the panel being limited to a size of 20 participants. This was seen as suitable given the aims of the project although it is acknowledged that a larger panel

could change the results. Nonetheless, Delphi studies have been performed several times with panel sizes smaller than this.

The project set out with the aim to investigate performance measures for civil construction projects associated with procurement strategies used in the current civil construction industry.

With this in mind, the study focus was on a number of key objectives. These are listed below with comments made regarding their outcomes:

**Objective 1** Research current procurement strategies used in the procurement of contractors for civil construction projects.

This was achieved through undertaking a literature review, which identified that the industry currently uses a number of procurement strategies for civil construction projects. This is covered in Chapter 2, but briefly, the literature identified that the most typical of these are the construct only, and the design and construct approach. This was also confirmed in the Delphi study in which the participants nominated these two approaches as most common.

**Objective 2** Research performance measures used in the various procurement strategies to assess contractor performance;

This was achieved through undertaking a literature review which identified that there are a number of performance measures utilised on civil construction projects. This is covered in Chapter 2, but briefly, the literature identified that performance measures used in procurement strategies include the traditional areas of time, cost and quality but has moved on to include several other areas of measurement in the hope of achieving greater performance and project outcomes. This was also confirmed in the Delphi study in which participants nominated the traditional areas of time, cost and quality but also several other areas that included traffic management, safety, community, environment, communication, and relationship management.

**Objective 3** Ascertain the relevance of these procurement strategies and performance measures to current industry;

This was achieved through undertaking the Delphi study in which it was found that the common approaches to procurement are relevant to the way the industry currently operates and that the general consensus is that procurement is typically done well due to structured policies and processes within the procuring organisations.

There were difficulties experienced in procurement for consultants and contractors due to time, scope and client issues with this covered in greater detail in Chapters 4 and 5.

It was found that the industry thought current performance measures are relevant to the way the industry operates and that this has become embedded as part of project delivery.

The key recommendations to come out of this objective is that the procuring agencies need to increase training of staff, especially those who have come to Australia from other countries, to ensure that employees understand procurement processes and implement them correctly.

**Objective 4** Gauge an understanding of current industry thinking on procurement and performance measures;

This was achieved through undertaking the Delphi study in which it was found that the industry is open to performance measurement and that it has become embedded as part of project delivery. It was determined that the industry feels that performance measurement has a positive impact on project performance and the outcome of the project. This is covered in greater detail in Chapters 4 and 5.

The key recommendations to come out of this objective is that the industry should continue with performance measurement and that investment into this area can yield significant benefits for all parties involved in the delivery of the project.

**Objective 5** Evaluate the level of importance and value placed on performance measures and the relativity of these levels to ultimate project outcome;

This was achieved in undertaking the Delphi study in which it was found that there were differing values placed on performance measurement. From the perspective of the procuring agencies, it was typically seen as a tool to help ensure that consultants and contractors are meeting the minimum performance requirements, while consultants and contractors saw it as a way of achieving a competitive advantage over other contractors if they were ranked highly regarding performance.

Despite this, the industry expressed that performance measurement is a valuable tool in the delivery of projects as it helps to align all parties involved, provides measurable goals and targets for the project, and helps to identify issues and mitigate these before they become serious. The findings in relation to this task are covered in greater detail in Chapters 4 and 5.

**Objective 6** Identification of potential new performance measures, particularly those related to innovation; and

**Objective 7** Ascertain if performance measurement can be used to drive innovation through the civil construction industry.

This was achieved in undertaking the Delphi study in which it was found that the industry did not feel there were new areas of performance measurement that should be introduced but that the industry should work on perfecting the measurement of the current areas.

It was identified that the industry did not feel that performance measurement could be used to encourage innovation but that this should be done through the use of procurement strategies that allow the freedom to innovate. It was found that the preferred industry approach to procurement is the design and construct approach as this allows for greater involvement of the contractor at earlier stages of the project. This is covered in greater detail in Chapters 4 and 5.

The key recommendations to come out of this objective is that the industry should focus on the current measurement areas and that there should be increased training in regards

to undertaking performance measurement and the utilisation of this data. There should also be increased investment into performance measurement systems and greater resourcing dedicated to these areas of project delivery.

In achieving these project objectives, the study successfully answered the following research questions:

- Are performance measures used in civil construction projects reflective of current industry practices?
- Do current procurement strategies and thinking provide sufficient scope to adopt the necessary performance measures?
- Is sufficient value placed on performance measures and the results of these measures?
- What is current industry thinking on procurement and performance measurement?
- Is there potential for the development of new performance measures that are reflective of current industry practice?
- Could innovation can be driven through the industry via performance measurement?

## **6.2. Further Work**

It is felt that the findings of this study, particularly those related to innovation and the industry being stifled through prescriptive specifications and standards, as well as the call from the industry to utilise design and construct approaches to a greater extent should not be ignored. There should be further research undertaken to solidify these findings as set out below, and this used to initiate change in the industry:

- Undertake further industry research in the areas investigated in this study involving participants from the construction industry throughout Australia to determine if the same relationships and trends are identified;
- Undertake research into the design and construct procurement approach to determine if there is a tendency for this approach to drive innovation;

- Undertake research into the use of performance driven specifications and the potential impact that these have on project outcomes; and
- Present the findings of this study to Local and State Government agencies highlighting current issues regarding innovation in the industry;

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## **Appendix A Project Specification**

University of Southern Queensland

FACULTY OF ENGINEERING AND SURVEYING

ENG4111/4112 Research Project

**PROJECT SPECIFICATION**

FOR: **LUKE SEENEY**

TOPIC: PROJECT PERFORMANCE MEASURES FOR CIVIL  
CONSTRUCTION PROJECTS ASSOCIATED WITH DIFFERENT  
PROCUREMENT STRATEGIES

SUPERVISOR: Mr Paul Tilley

PROJECT AIM: This research project seeks to investigate performance measures for civil construction projects associated with different procurement strategies. The key objectives are to investigate current performance measures and the relevance of these to current industry, gauge an understanding of current industry thinking on performance measures, evaluate the value placed on performance measures, and identify new performance measures reflective of current industry practices and improvements in technology.

PROGRAMME: Revision 2, 19 October 2015

1. Research current procurement strategies used in the procurement of contractors for civil construction projects;
2. Research performance measures used in various procurement strategies to assess contractor performance;
3. Liaise with industry members regarding procurement strategies through interviews, to gain an understanding of industry perspectives on performance measures;
4. Evaluate the level of importance and value placed on various performance measures and their relativity to ultimate project outcomes;
5. Investigate opportunities to introduce new performance measures reflective of current industry practices and technology, to improve the validity and measurement of performance;
6. Ascertain if performance measurement can be used to drive innovation through the civil construction industry; and
7. Submit an academic dissertation on the research.

## **Appendix B Interview Questions**

Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies  
Luke Seeney

<b>Name</b>		<b>Date</b>	
<b>Organisation</b>			
<b>Location</b>			
<b>Time Start</b>		<b>Time End</b>	
<b>INTERVIEWEE BACKGROUND INFORMATION (BI)</b>			
<i>BI-1 What is your current role within your organisation?</i>			
<i>BI-2 How long have you been involved in the construction industry?</i>			
<i>BI-3 Throughout this time, what has been your typical role?</i>			
<i>BI-4 Have you primarily been involved in public or private industry?</i>			
<b>PROCUREMENT (P)</b>			
<i>P-1 Have you been involved in the development of procurement strategies?</i>			
<i>P-2 If so, what do you find are the most commonly developed procurement strategies?</i>			
<i>P-3 Do you think that these strategies provide sufficient scope in relation to performance measurement?</i>			
<i>P-4 In what way do you think the project outcome differs if a procurement strategy is price based as opposed to value or non-price based strategies?</i>			
<i>P-5 By adopting a price based procurement strategy, what areas of a project does this detract from, if any?</i>			
<i>P-6 Do you think a non-price approach delivers a greater project outcome when compared to a price-based approach, why or why not?</i>			
<i>P-7 Do you think a non-price approach increases or creates additional project costs, why or why not?</i>			
<i>P-8 Which procurement approach do you think the industry should try and move towards in an attempt to achieve greater project outcomes and why?</i>			
<i>P-9 Do you find that procurement is a difficult, vague and ambiguous process, why or why not?</i>			

<b>PERFORMANCE MEASURES (PM)</b>
<i>PM-1 How have you been involved in performance measurement for civil construction projects?</i>
<i>PM-2 What measures do you find are typically adopted in performance measurement?</i>
<i>PM-3 Do common procurement strategies allow the adoption of sufficient performance measures and are they utilised in projects?</i>
<i>PM-4 Are typically adopted performance measures reflective of current practices in the civil construction industry, why or why not?</i>
<i>PM-5 How is performance measurement in the construction industry perceived?</i>
<i>PM-6 If a project has an emphasis on performance measurement and is implemented well, how do you believe this affects the project outcome?</i>
<i>PM-7 Is performance measurement an arduous element in project delivery, why or why not?</i>
<i>PM-8 Do you think new areas of performance measurement aside from those typically used could be introduced that better reflect current practice in the civil construction industry?</i>
<i>PM-9 What areas or if not, why do you think it is not necessary?</i>
<i>PM-10 Do you think that current performance measurement adopted under procurement strategies encourages Contractors to be innovative at the benefit of the Client?</i>
<i>PM-11 If not, what types of performance measurement could be introduced to encourage this?</i>
<i>PM-12 Have you found that the construction industry is typically slow to change, develop and adopt new process or techniques that could improve performance?</i>
<i>Are you aware of the KPI's developed for the Australian Construction Industry by the Australian Construction Industry Forum and the Australian Procurement and Construction Council?</i>

## **Appendix C Interview Transcripts**

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**  
Luke Seeney

<b>Name</b>	IP01	<b>Date</b>	21/07/2015
<b>Organisation</b>	Private Company Works Authority		
<b>Location</b>	Gelly Consulting Office, Emerald Lakes		
<b>Time Start</b>	10:30am	<b>Time End</b>	11:30am
<b>INTERVIEWEE BACKGROUND INFORMATION (BI)</b>			
<b><i>BI-1 What is your current role within your organisation?</i></b>			
<p>GC Health and Knowledge Precinct Coordinator as well as Project Manager and Principal's Representative for the organisation.</p> <p>Coordinating the organisations role in the Gold Coast Health and Knowledge Precinct (30% of role). Remainder of role is acting as the Project Manager for the organisation delivering the construction program across all organisational localities – acts on behalf of the Principal (Principal's Representative).</p>			
<b><i>BI-2 How long have you been involved in the construction industry?</i></b>			
<p>17 years of experience in the construction industry. <span style="border: 1px solid black; padding: 2px;">1.1</span></p>			
<b><i>BI-3 Throughout this time, what has been your typical role?</i></b>			
<p>Design, Contract Administration and Project Management <span style="border: 1px solid black; padding: 2px;">1.3</span></p>			
<b><i>BI-4 Have you primarily been involved in public or private industry?</i></b>			
<p>Mixture of public and private but primarily private sector.</p> <p>Started with an Architect in a design and contract management role. Project Management role at the Department of Public Works, then four years with current organisation in Contract Administration and Principal's Representative, moved to London for three years working with Turner and Townsend again in Contract Administration and acting as the Principal's Representative before returning to current organisation to again fulfil previous role which he has now occupied for 5 years. <span style="border: 1px solid black; padding: 2px;">1.4 and 1.5</span></p>			

***PROCUREMENT (P)***

***P-1 Have you been involved in the development of procurement strategies?***

2.1

Typically used off the shelf approach to procurement predominately two stage design and construct, construction management format, and traditional lump sum.

Regarding the development of strategies, yes, every project that the organisation undertakes, the team establishes which procurement approach best suits the project and develop an appropriate strategy. This can be a simple process for relatively small projects or a longer, more robust process for large projects.

Unwritten law at the organisation that for projects under \$1M a traditional lump sum format is typically used – this is because other approaches such as design and construct become too onerous for such a small project and the front end costs start to outweigh the benefits of using this approach.

2.2

In the \$2 - \$3M bracket the process becomes a bit more blurred where more consideration is given to project issues, risk and constraints. Dependent on these factors as well as others consideration is then given to moving to a design and construct contract especially where there is high risk as this approach allows us to offload some of this risk onto the Contractor. This is primarily focussed on cost as with great risk, there can come significant financial impact, by using a design and construct approach, this can somewhat be passed onto the Contractor and provide greater confidence for us given limited budget. A further consideration for us is time as many of the projects need to be coordinated with semester breaks etc. to minimise operational impacts of the our organisation.

Our organisation also has a spreadsheet that can be used if there is uncertainty around the strategy which, through a number of in depth questions, can help to establish which approach could be best suited for a specific project. The spreadsheet primarily focusses on risk and who is best place to take on this risk, i.e. a program risk should be offloaded to the Contractor as the Contractor is driving the program.

2.1

***P-2 If so, what do you find are the most commonly used procurement strategies?***

Design and Construct and traditional lump sum. Third used strategy but not often is the construction management format but this is only used when extremely time poor regarding the delivery of a project.

2.2

Clear split between the two strategies – minor refurbishment works are traditional lump sum, major capital works are design and construct.

***What is your typical annual works program budget?***

Fluctuates between \$10M - \$100M but currently in the order of \$30 million dollar with \$25 - \$30M being the typical average figure.

***P-3 Do you think that these strategies provide sufficient scope in relation to performance measurement?***

No although the strategy does not really dictate what can and can't be included in regards to performance measurement, it is rather another layer that is part of the overall approach that can be included in delivering the project. 2.3

The organisation is currently looking at increasing its focus on performance measurement to try and encourage good quality work from all suppliers but in doing this it also accepts that there should be some remuneration in this process.

The organisation has had a number of previous experiences in which this has not been the focus and this has led to increases in project costs due to poor quality documentation, corner cutting, lack of appropriate resourcing, time delays, large variations which ultimately causes the project costs to be greater than what they could have been had the focus and approach been different.

***P-4 Do you think price based procurement strategies deliver poor quality outcomes when compared to value based, or non-price based procurement?***

Yes, but typically it depends. An alternative strategy that is not priced based does not guarantee a greater project outcome. Measuring a project outcome is difficult because it is a complex mix of cost, personalities, resourcing, communication, abilities of team to mesh. All of these lead to a successful or non-successful project. 2.4

You can get someone that will seriously cut their price because they are so keen to do the project and will do a good job no matter what. Others will just be desperate to win work and not give the project any resourcing.

Typically however, if you are choosing the right people, the right experience, the right methodologies rather than just focussing on price, this should generally yield a greater project outcome.

***P-5 Do you think price based procurement creates too much focus on the price element of the project at the detriment of others measures such as quality?***

Yes, price is always a problem as it typically leads to difficult relationships as the Contractor is trying every which way to make some money out of the project. This leads to reduction in quality, under-resourcing and corner cutting. 2.6

***P-6 Do you think a non-price approach delivers a better project outcome when compared to a price-based approach?***

2.5

Generally yes however this links back to P-4 in that it is a complex mesh that should typically yield a greater outcome. For me it is fundamentally the personality meshing of the team that is going to result in the best outcome as they understand each other, they talk to each other, they

work together to come up with the best result, not necessarily the best and easiest. Generally if everyone has the right fee, i.e. the consultant is happy, the contractor is happy, the client is happy, you get a greater outcome.

Happy projects, are typically successful projects. 2.5

***P-7 Do you think a non-price approach increases or creates additional project costs, why or why not?***

It can create additional upfront costs as typically the assessment process can take longer, require greater resourcing as well as the fact that the cheapest price may not be the price that is accepted but from experience, cheapest price can often result in additional costs during the project through variations for example that may not have come up otherwise. Overall it's difficult to gauge one against the other however, no not generally when looking at the overall cost of a project. 2.7

***P-8 Which procurement approach do you think the industry should try and move towards in an attempt to achieve greater project outcomes and why?***

I think there has been a general industry shift towards non-price approaches, but still need fair value for money. Possibly choosing mean fee instead of lowest fee. Don't want high or low fee, want mean fee. 2.8

***P-9 Do you find that procurement is a difficult, vague and ambiguous process?***

Not at our organisation as it has fairly defined views on what sort of project should be procured in what manner. This is unique to our organisation and typically government sector due to similar projects, similar risk profile, how much it is going to cost and how long it will take.

However in commercial environments where minimising cost is an issue, it can become vague because you are trying to minimise cost, as well as time, not necessarily looking to offload risk, so choosing the right option could be more complicated and also disastrous if the wrong approach is adopted. 2.9

**PERFORMANCE MEASURES (PM)**

***PM-1 How have you been involved in performance measurement for civil construction projects?***

3.1

No because in regards to civil works what we build is typically light weight – car parks, buildings and roads. We see little benefit in going into detailed performance measurement because it would yield little benefit.

The organisation does however have a prequalified tender list from which Contractor's must be selected. To get on this list the necessary paper work must be completed and relevant experience in projects to that undertaken by our organisation must be shown. Through continual

use of these Contractor's a typically benchmark is established and this alone can be used when determining what to expect from appointed Contractor's.

***PM-2 What measures do you find are typically adopted in performance measurement?***

In the organisations structural works as opposed to civil works – which some could be transferred to civil if required:

- Square metre rates as a first benchmark;
- Trade package analysis of rates (not normally done however);
- Time to deliver the project;
- Variation types, causes, number of. 3.2

The organisation is trying to get more sophisticated regarding measurement of quality both through their procurement process i.e. who they procure as well as in measurement of quality of what is being delivered. Would rather spend an additional \$100K to ensure quality of deliverables upfront as opposed to \$500K through poor design and documentation that results in a large number of variations at a significantly increased cost. This is a result of past experience where we have been burnt but also a shift in the industry. If this approach was tried 10 years ago when building and designing was flat out, no one would listen as everyone had plenty of work and would just move on to the next job, however the industry is not currently in that phase. We have a lot of current Consultants and Contractors who are more than happy to increase their quality of work to try and achieve greater results, particularly as the environment is currently highly competitive.

10 years ago you got what you got, whereas now the lack of work, increased competition as a result is opening doors regarding quality.

***PM-3 Do common procurement strategies allow the adoption of sufficient performance measures?***

Yes, but we haven't taken advantage of performance measurement previously. We are currently trying to increase the way it captures, records and processes data. 2.3

***PM-4 Are typically adopted performance measures reflective of current practices in the civil construction industry, why or why not?***

The key is the resources that are available and the ability of these resources to provide what is needed. Time, Cost and Quality will always come into it, however it is about the measurement of the people, who does a good job and has the result given us what we wanted. Time, Cost and Quality are always the benchmark, however there is more depth that could be given to the measurement of people and relationships.

3.3

***PM-5 How is performance measurement in the construction industry perceived?***

Not undervalued, it is extremely highly value but the problem has been with how do we gather it, understand it and use it. This is still our problem now – how do we draw out the meaningful data of the project, put it in a format that is sensible to use and how do we feed this back into the process. This is not well done by us and there needs to be enhancement in this. It's the feedback part and the ability of the Contractors and Consultancies to take this, process this and then use it in their way.

It's hard to measure, for instance, a person could be really behind in what they are doing but what caused this? Rating them poorly against time management has measured the performance but it doesn't necessarily lead to a fix for the problem. They could typically be excellent however due to a lack of supporting resources, project budget allocations, over committed etc. this led to the time issue. It is this that is the difficult part – taking the performance measurement, understanding what it means and making changes to enhance performance.

This comes back to the organisation receiving the feedback, understanding it, analysing it and responding. 3.4

***PM-6 If a project has an emphasis on performance measurement and is implemented well, how do you believe this affects the project outcome?***

Unsure. Performance measurement that is undertaken concurrently with a project may not change the result of this project as it is lag data, however it does provide an opportunity to makes changes to the current project to increase the performance or taking learnings and use them in future projects. This comes back to one of the difficulties of analysing the data and then implementing and using this data in an appropriate manner to yield a benefit.

Performance measurement from one project starts to inform the next. It's more of a cumulative process as opposed to an individual project thing although the knowledge that a project is going to be using performance measurement could increase yield a greater outcome from the project as the team understands that it is being monitored and measured.

If you take lessons learnt from previous projects then yes it should deliver a better result on similar projects in the future. 3.5

***PM-7 Is performance measurement an arduous element in project delivery?***

It's not typically arduous but the difficulty lies in the analysis and response. Many layers can impact on a particular element of performance which is why it is such a subjective process. 3.4

***PM-8 Do you think new areas of performance measurement aside from those typically used could be introduced that better reflect current practice in the civil construction industry?***

Yes, everything needs to be looked at more so than just time, cost and quality. People and inter-relationships are the key to making or breaking a project which I believe is more important 3.6

<p>than time, cost and quality as these are dependent on the people and resources involved in the project.</p> <p>Inter-relationships being personalities, communication, responsiveness etc. <span style="border: 1px solid black; padding: 2px;">3.6</span></p>
<p><b><i>PM-9 What areas or if not, why do you think it is not necessary?</i></b></p>
<p>Covered above.</p>
<p><b><i>PM-10 Do you think that current performance measurement adopted under procurement strategies encourages Contractors to be innovative at the benefit of the Client?</i></b></p>
<p>No – a Contractor is going to be looking to make money. Innovation and drive comes out of financial desires for themselves not driven by performance measurement. A project could be setup through the procurement to state that the Contractor needs to come up with innovative ways and ideas to deliver the project. This could be driven by financial benefits, i.e. savings resulting from the innovation will be split equally between contractor and client. <span style="border: 1px solid black; padding: 2px;">3.7</span></p>
<p><b><i>PM-11 If not, what types of performance measurement could be introduced to encourage this?</i></b></p>
<p>Yes, because without them how can innovation be measured and comparisons and learnings been made from previous projects. <span style="border: 1px solid black; padding: 2px;">3.7</span></p>
<p><b><i>PM-12 Have you found that the construction industry is typically slow to change, develop and adopt new process or techniques that could improve performance?</i></b></p>
<p>Yes, there's always a continual drive to do things faster and cheaper and anything that can be trialled to try and achieve savings in these areas is usually done. In saying this, the industry is typically conservative and cautious when it comes to new processes and techniques but typically once these become relatively proven they are rapid to adopt these – it always comes back to cost. Conservative and cautious to outlay costs to try new techniques and processes due to the potential for it to fail, but once proven, rapid to adopt. <span style="border: 1px solid black; padding: 2px;">3.4</span></p>
<p><b><i>Are you aware of the KPI's developed for the Australian Construction Industry by the Australian Construction Industry Forum and the Australian Procurement and Construction Council?</i></b></p>
<p>No. Has not heard of these let alone familiar with them.</p>

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**  
Luke Seeney

<b>Name</b>	IP02	<b>Date</b>	22/07/15
<b>Organisation</b>	Tier 2 Construction Contractor		
<b>Location</b>	Interviewee's Offices		
<b>Time Start</b>	3:00pm	<b>Time End</b>	3:45pm
<b>INTERVIEWEE BACKGROUND INFORMATION (BI)</b>			
<i><b>BI-1 What is your current role within your organisation?</b></i>			
Current role is as the Manager of Business Development and Relations			
<i><b>BI-2 How long have you been involved in the construction industry?</b></i>			
15 years <span style="border: 1px solid black; padding: 2px;">1.1</span>			
<i><b>BI-3 Throughout this time, what has been your typical role?</b></i>			
Over the last 5 years, business development manager and relations however previous to that, 10 years as project engineer/project management/project delivery for civil construction projects. <span style="border: 1px solid black; padding: 2px;">1.3</span>			
<i><b>BI-4 Have you primarily been involved in public or private industry?</b></i>			
All experience has been gained in the private industry. <span style="border: 1px solid black; padding: 2px; display: block; margin-left: auto;">1.4 and 1.5</span>			

<b>PROCUREMENT (P)</b>
<p><b><i>P-1 Have you been involved in the development of procurement strategies?</i></b></p>
<p>Yes for current company have developed procurement policies and procedures that form part of the management system. Sit on both sides i.e. we tender and try and get procured for works but at the same time we procure a number of Sub-contractors to assist in the delivery of works that we win. <span style="border: 1px solid black; padding: 2px;">2.1</span></p>
<p><b><i>P-2 If so, what do you find are the most commonly developed procurement strategies?</i></b></p>
<p>From the perspective of trying to bid and win work the majority of work is through a closed or open tender process. Typically with State Government work we either tender on projects offered to the open market or through an invitation only process. This is our preferred engagement type.</p> <p>In procuring Sub-contractors, we have a database of Contractors that we use. We don't have a pre-qualification process however we have a database that we go out to for pricing. We typically have a cost focus in our procurement approach but we do consider other elements such as safety, time, previous performance however we do have a significant focus on cost. We do keep records of such data to ensure that the procurement team is well informed and it is part of our quality system requirements. <span style="border: 1px solid black; padding: 2px;">2.2</span></p>
<p><b><i>P-3 Do you think that these strategies provide sufficient scope in relation to performance measurement?</i></b></p>
<p>When doing works there are typically structured performance measures. Initially there is the pre-qualification process to enable you to tender on works as a contractor. When constructing the works for say TMR, there is monthly performance reporting that is undertaken with the Contractor's PM and team as well as TMR's Superintendent and team and score each other's performance for the month. This information is circulated in TMR particularly to TMR prequalification branch to monitor Contractor performance. <span style="border: 1px solid black; padding: 2px;">2.3</span></p> <p>This system is in place however it doesn't get used as well as it should. There is a number of Contractor's who are not performing exceptionally well however this does not appear to have much influence on the attitude to shortlist them for future contracts.</p>
<p><b><i>P-4 In what way do you think the project outcome differs if a procurement strategy is price based as opposed to value or non-price based strategies?</i></b></p>
<p>Typically when adopting the lowest price this ends up in a lot of variations, delay and disruption to the project ultimately impacting on the project outcome. <span style="border: 1px solid black; padding: 2px;">2.4</span></p>

<p><b><i>P-5 By adopting a price based procurement strategy, what areas of a project does this detract from, if any?</i></b></p>
<p>Price due to increased variations, omissions and re-work. Time due to delays associated with variations and disruption claims. Safety issues associated with under resourcing, corner cutting and poor workmanship. Quality. <span style="border: 1px solid black; padding: 2px;">2.6</span></p> <p>We strongly believe in non-price criteria and shortlisting processes due to a competitive advantage based on our past experience etc.</p>
<p><b><i>P-6 Do you think a non-price approach delivers a greater project outcome when compared to a price-based approach, why or why not?</i></b></p>
<p>Far better outcome for a value or non-price approach. At the end of the day, the price you start with, isn't the price you end with. Typically when adopting the lowest price this ends up in a lot of variations, delay and disruption to the project ultimately impacting on the project outcome. <span style="border: 1px solid black; padding: 2px;">2.5</span></p>
<p><b><i>P-7 Do you think a non-price approach increases or creates additional project costs, why or why not?</i></b></p>
<p>In the procurement phase yes there is additional cost for both the Contractor and the Principal due to increases in the preparation of the documentation, the submission requirements and the assessment process. However ultimately, it leads to better outcomes overall and reduced hidden costs. <span style="border: 1px solid black; padding: 2px;">2.7</span></p>
<p><b><i>P-8 Which procurement approach do you think the industry should try and move towards in an attempt to achieve greater project outcomes and why?</i></b></p>
<p>A balance of price and non-price approach as opposed to a price only procurement technique which results in Contractors cutting margins, conflicts and difficulties in delivering the project. <span style="border: 1px solid black; padding: 2px;">2.8</span></p>
<p><b><i>P-9 Do you find that procurement is a difficult, vague and ambiguous process, why or why not?</i></b></p>
<p>Not typically, it is fairly structured in our area as most of our works are government projects. We know exactly what the criteria is, we know how the assessment is done. There is always some subjectivity in non-price criteria but is needed. <span style="border: 1px solid black; padding: 2px;">2.9</span></p>
<p><b>PERFORMANCE MEASURES (PM)</b></p>
<p><b><i>PM-1 How have you been involved in performance measurement for civil construction projects?</i></b></p>
<p style="text-align: center;"><span style="border: 1px solid black; padding: 2px;">3.1</span></p> <p>Been involved in performance measurement for the majority of experience, preparing reports, reviewing reports, assessing outcomes of performance measurement.</p>

***PM-2 What measures do you find are typically adopted in performance measurement?***

It depends on the project but typically as a Contractor, measurement focusses on safety, environment, timing, cost, traffic, community, quality. There is a lot of quality data that is looked at in the measurement of our performance. Problem being with all of this data is that it is lag data and always a minimum of a month behind.

This lag can, in some instance, be somewhat mitigated by using lead indicators for things such as safety where the number of work hours can be a lead indicator for fatigue. This isn't possible though on cost and program. 3.2

***PM-3 Do common procurement strategies allow the adoption of sufficient performance measures and are they utilised in projects?***

Yes however the utilisation is often the issue. As mentioned in P-3 the data is gathered however this does not typically lead to results as the same Contractors are still being invited to tender on projects despite poor performance. 2.3

***PM-4 Are typically adopted performance measures reflective of current practices in the civil construction industry, why or why not?***

Yes pretty well, the industry has come a long way in regards to technology however it still comes back to time, cost, quality, safety, environment, community, stakeholder relationships. There are still the main performance areas. 3.3

***PM-5 How is performance measurement in the construction industry perceived?***

Contractors are typically open to performance measurement and those that aren't, typically have performance issues. From our perspective, definitely open to performance measurement because we know we perform well and this gives us a competitive advantage over our competitors and assist with our pre-qualification. For a long time, performance measurement wasn't taken seriously and in some cases still doesn't as the data doesn't get used as well as it should, but if it's done properly, the data is used well, it can be a powerful tool. 3.4

***PM-6 If a project has an emphasis on performance measurement and is implemented well, how do you believe this affects the project outcome?***

If it's implemented well it improves outcomes, if you have KPIs there and they are monitored it should generally lead to a greater outcome. Again, however, this comes back to the utilisation of the data, how it is used and whether it is implemented. 3.5

<p><b><i>PM-7 Is performance measurement an arduous element in project delivery, why or why not?</i></b></p> <p>No, not generally. If the right systems are in place it can be easily done. On most of our projects it is just an hour at the monthly meeting and going through and scoring each other's performance. Often also a good way to bring out and resolve any issues and build relationships. On the flipside it can create tension and conflict if someone's performance is not satisfactory. <span style="float: right; border: 1px solid black; padding: 2px;">3.4</span></p>
<p><b><i>PM-8 Do you think new areas of performance measurement aside from those typically used could be introduced that better reflect current practice in the civil construction industry?</i></b></p> <p>No not really needed. <span style="border: 1px solid black; padding: 2px;">3.6</span></p>
<p><b><i>PM-9 What areas or if not, why do you think it is not necessary?</i></b></p> <p>There is always someone using a different measure of safety performance etc. but the overarching performance areas are typically good for the way things are done. Would prefer if more lead indicators could be identified to assist in the prediction and mitigation before things even become an issue. <span style="border: 1px solid black; padding: 2px;">3.6</span></p>
<p><b><i>PM-10 Do you think that current performance measurement encourages Contractors to be innovative at the benefit of the Client?</i></b></p> <p>Probably not, unfortunately. TMR has been grappling with this for a number of years to provide incentive for Contractors to come up with innovation but the issue is Contractors want to know that their intellectual property is being protected and that they get benefit out of it as well. If there is no tangible benefit for the Contractor, they will not pursue it.</p> <p>TMR starting to talk about new clauses and conditions of tender around innovative proposals where you put forward an alternative and if it is accepted there is a 50/50 share of cost savings. The problem is, TMR has a culture of doing things the way they have always done it and trying to get innovative and new ways of doing things over the line is a real challenge and Contractors end up throwing their hands in the air and give up. Unfortunate as there is a lot of efficiencies, cost savings and other tangibles that could be gained but it's a very hard process to try and prove and get things done differently. <span style="border: 1px solid black; padding: 2px;">3.7</span></p>
<p><b><i>PM-11 If not, what types of performance measurement could be introduced to encourage this?</i></b></p> <p>There is incentives that can be used, recognition of innovation in their procurement strategies through non-price criteria around innovation and looking at demonstrated project with innovation and alternative. Although it is a buzz word for the department, it is not really embraced. I'd like to see it embraced as we see it as one of our key differentiators as a business – we have some really clever guys that come up with good solutions but we often don't get to show and implement this. <span style="border: 1px solid black; padding: 2px;">3.7</span></p>

***PM-12 Have you found that the construction industry is typically slow to change, develop and adopt new process or techniques that could improve performance?***

It varies, the industry is rather good at adopting new technology, but new processes and techniques not so good. A lot of people in the construction industry have been doing it a long time and are set in their ways. Difficult to get them to change the way they do things. MCE faced a real challenge moving from private clients to government clients which placed a whole compliance burden on MCE resources. Trying to get them to embrace a compliance type culture that team require is a difficult challenge. For the industry, change is difficult, technology is not. 3.4

***What is the typical value range of projects undertaken by MCE?***

\$1 - \$50M

***Are you aware of the KPI's developed for the Australian Construction Industry by the Australian Construction Industry Forum and the Australian Procurement and Construction Council?***

No has not heard of the KPI's and did not know they existed or were under development.

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**  
Luke Seeney

<b>ID Number</b>	IP03	<b>Date</b>	23/07/15
<b>Organisation</b>	Multi National Consultancy		
<b>Location</b>	Gelly Consulting Office, Emerald Lakes		
<b>Time Start</b>	2:30pm	<b>Time End</b>	2:45pm
<b>INTERVIEWEE BACKGROUND INFORMATION (BI)</b>			
<b><i>BI-1 What is your current role within your organisation?</i></b>			
<p>Current role is Senior Contracts Manager. Acts primarily for the organisation in the Superintendent / Project Verifier role through the construction process.</p>			
<b><i>BI-2 How long have you been involved in the construction industry?</i></b>			
<p>13.5 years of experience in the construction industry. <span style="border: 1px solid black; padding: 2px;">1.1</span></p>			
<b><i>BI-3 Throughout this time, what has been your typical role?</i></b>			
<p>Started with RTA as a graduate engineer doing various placements with them through project management, laboratory and road safety. After two years took a role as a Site Engineer with the RTA before leaving and joining current organisation working as a project engineer, project manager through to current position as Superintendent's Representative or Project Verifier.</p> <p style="text-align: right;"><span style="border: 1px solid black; padding: 2px;">1.3</span></p>			
<b><i>BI-4 Have you primarily been involved in public or private industry?</i></b>			
<p>Spent 4.5 years in the public sector with the RTA and has now be in private industry with current company for 9 years.</p> <p style="text-align: center;"><span style="border: 1px solid black; padding: 2px;">1.4 and 1.5</span></p>			

<b>PROCUREMENT (P)</b>
<p><b><i>P-1 Have you been involved in the development of procurement strategies?</i></b></p>
<p>Not overly, generally the procurement strategy has been selected for a project before involvement begins. However is familiar with a large array of procurement strategies and contracts being a Senior Contracts Manager. This includes straight road construction contracts through to early contractor involvement and alliance arrangements. <span style="border: 1px solid black; padding: 2px;">2.1</span></p>
<p><b><i>P-2 If so, what do you find are the most commonly developed procurement strategies?</i></b></p>
<p>Typically the most common is still construct only approach. Design is already completed and has been procured previously by the Client and has been completed by a design consultant or the like. On the bigger projects there is a shift occurring especially with TMR towards early contractor involvement and design &amp; construct arrangements, this approach helps to take away some of the risk from the client and the design consultant. <span style="border: 1px solid black; padding: 2px;">2.2</span></p>
<p><b><i>P-3 Do you think that these strategies provide sufficient scope in relation to performance measurement?</i></b></p>
<p style="text-align: center;"><span style="border: 1px solid black; padding: 2px;">2.3</span></p> <p>Yes, there is always sufficient scope to allow for the measurement of performance, however this can be difficult under a design &amp; construct arrangement as there is limited initial project scope for the Contractor as opposed to a construct only where the design has been done and it is clear what the Contractor is required to construct. In a design and construct or alliance arrangement there is more freedom and opportunity to maximise your performance.</p>
<p><b><i>P-4 In what way do you think the project outcome differs if a procurement strategy is price based as opposed to value or non-price based strategies?</i></b></p>
<p>You get what you pay for. On the construction side of things, often you end up paying the same amount whether it's a price or non-price strategy, the difference is just in how you pay for that. From experience, Contractors that come in substantially lower than other Contractors typically end up seeking significant variations costing the Client the money that they through they were saving by going with the lower price. Definitely feel that a price driven strategy delivers a poorer outcome when compared to value or non-price driven strategies. <span style="border: 1px solid black; padding: 2px;">2.4</span></p>
<p><b><i>P-5 By adopting a price based procurement strategy, what areas of a project does this detract from, if any?</i></b></p>
<p style="text-align: center;"><span style="border: 1px solid black; padding: 2px;">2.6</span></p> <p>Detracts from the experience of personnel on the project, the quality of the product that is delivered, can impact on costs and also impacts on relationships within the project teams and does not make for a good contract environment. This commences early on in a project though, i.e. if a design consultant does not have sufficient funds to service the project as required it can lead to a poor project documentation immediately adding risk to the project.</p> <p>When projects aren't focussed on price but more so the project outcome, you can get the outcome you want.</p>

***P-6 Do you think a non-price approach delivers a greater project outcome when compared to a price-based approach, why or why not?***

Yes definitely as a project can be better serviced to the level required to achieve the desired outcome. 2.5

***P-7 Do you think a non-price approach increases or creates additional project costs, why or why not?***

Yes it probably does slightly as the quality is paid for upfront but ultimately over the duration of the construction project the costs are very similar due to variations sought when a contractor has supplied a low price. If three contractors have priced a project in the order of \$750 million while a fourth has priced it at \$500 million it would take a very good contractor to be able to actually deliver that project for \$500 million. There'll end up being \$250 million worth of claims of which \$150 million may be approved but during this process there has been a lot of heart ache, pain and time required in this process. It may end up coming out marginally less but in the end I don't believe it is worth it when looking at the areas that are detracted from.

2.7

***P-8 Which procurement approach do you think the industry should try and move towards in an attempt to achieve greater project outcomes and why?***

The best project outcome I've been involved in has been a collaborative agreement. Started off as an ECI and then the preferred Contractor was selected. Rather than going to a standard D & C, a collaborative project agreement was drawn up. Worked very similar to a D & C and also an alliance. It worked really well.

Each strategy has its place, for smaller projects under \$100 million construct only but when projects are in the order of \$500 million a D & C or an alliance to some extent is probably a better way to go.

2.8

***P-9 Do you find that procurement is a difficult, vague and ambiguous process, why or why not?***

Not generally however it is made difficult by the government, particularly TMR and QR make it difficult although this is often related to them needing to be transparent as they are government organisation. It can be a fairly easy process if it is done clearly with well-structured policies and procedures.

2.9

<b>PERFORMANCE MEASURES (PM)</b>
<p><b><i>PM-1 How have you been involved in performance measurement for civil construction projects?</i></b></p> <p>Yes through reporting, performance meetings and monitoring of construction Contractors.</p> <p style="text-align: center;">3.1</p>
<p><b><i>PM-2 What measures do you find are typically adopted in performance measurement?</i></b></p> <p>Typical measures include, quality, safety, environment, cost and time are the five standard items but also includes teams, project management performance, experience, knowledge.</p> <p>Some projects will go as deep as measuring the number of non-conformances that are raised, public complaints received but typically depends on the project.</p> <p>I believe that focussing on the higher levels is a better approach. 3.2</p>
<p><b><i>PM-3 Do common procurement strategies allow the adoption of sufficient performance measures and are they utilised in projects?</i></b></p> <p>I think generally it could be done better. Projects typically have a standard template that has to be followed. You get a score from 1 to 5. There always seems to be a reason or an excuse if someone is performing poorly and this makes it difficult to really measure true performance.</p> <p>Other methods used in major projects is more relationship performance, such as relationship contracting but it doesn't really get used much anymore. From experience with the RTA this has worked well on some projects and worked very poorly on others. 2.4</p>
<p><b><i>PM-4 Are typically adopted performance measures reflective of current practices in the civil construction industry, why or why not?</i></b></p> <p>Yes but whether the outcomes of these measures are used effectively and what is done with them is the issue. It's a common issue, the learnings are never really utilised and implemented in future projects. You'll commonly see the same issues working for the same Client over and over again. 3.3</p>
<p><b><i>PM-5 How is performance measurement in the construction industry perceived?</i></b></p> <p>Generally it's a pain. It can also be difficult if a Contractor is performing poorly as raising this can cause arguments and things get rather adversarial. However this more so come back to how it is done – if it was done correctly and done well there would be less issues and better outcomes. 3.4</p>

***PM-6 If a project has an emphasis on performance measurement and is implemented well, how do you believe this affects the project outcome?***

It gives another set of goals for the project and that it's not just focussed on finishing on time and making money but actually seeing tangible outcomes in a project. In NSW there is a lot of work being done on achieving best for project outcome – you have your specifications as a minimum requirement but the focus is on achieving more than just this. An example of this is independent project reviewer's that come through once a month and review's the project independent of the quality records and looks for greater than minimum outcomes. Definitely think that if a project has a focus on performance measurement and it is done well, a greater project outcome will be achieved. 3.5

***PM-7 Is performance measurement an arduous element in project delivery, why or why not?***

It can be depending on the structure and process in place. It's difficult when Contractors are performing poorly as it creates arguments and adversity 3.4

***PM-8 Do you think new areas of performance measurement aside from those typically used could be introduced that better reflect current practice in the civil construction industry?***

Yes things are moving forward, previously you really only had two areas which were time and cost, then quality started to come into it and now you've got other such as safety, community, environment. I think now though the next level is to drive for greater project outcomes so that when a member of the public sees a project they can appreciate a project and what has been achieved. The way to do this is to possibly tie it to monetary benefits. It's difficult because some Contractor's don't care about that kind of thing whereas others like to walk away from a project knowing that they've done a great job. If we could end up with everyone adopting this approach that would certainly benefit the industry. 3.6

***PM-9 What areas or if not, why do you think it is not necessary?***

There's areas for innovation that could be introduced and tied to monetary benefits, i.e. cost saving sharing. Some Contractors introduce their own measures i.e. have competing teams on a project that compete against each other to do the best job. But they key is setting a mindset of doing a good quality job. 3.6

***PM-10 Do you think that current performance measurement adopted under procurement strategies encourages Contractors to be innovative at the benefit of the Client?***

Very rarely. Typical contract arrangements don't encourage this nor really pursue it. 3.7

***PM-11 If not, what types of performance measurement could be introduced to encourage this?***

Certainly think that performance measures should be introduced to encourage this. This needs to be driven by the procurement approach, i.e. a D & C allows for a greater scope of innovation when compared to a construct only where everything is basically already pre-defined. Strategies such as D & C and ECI allow for collaboration between the Contractor, Client and Designers to pursue innovation early and provide costs savings which help to demonstrate that costs related to innovation are worth pursuing. 3.7

***PM-12 Have you found that the construction industry is typically slow to change, develop and adopt new process or techniques that could improve performance?***

The government is definitely slow. They are not open to any new construction processes or techniques. The industry itself certainly moves quickly when it's allowed to but it depends on the client's openness to this.

We've tried to adopt things on QLD TMR projects that are used overseas all the time and would really help us but because TMR hasn't seen it before they aren't interested at all in allowing us to use it. Even procedures that have been used across the border in NSW, TMR aren't interested. How do you get a new process started when they won't even let you trial it, it's unbelievable really.

Overseas you see processes and read things which demonstrate how far behind we are with our processes in Australia. Even moving from NSW to QLD I have found that QLD is quite behind NSW in a lot of areas. In some areas QLD are slightly ahead but in many areas they are behind. I feel that when I come up to a project in QLD I take a step back in time to some extent. 3.4

***Are you aware of the KPI's developed for the Australian Construction Industry by the Australian Construction Industry Forum and the Australian Procurement and Construction Council?***

No. Not familiar with the KPIs.

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**  
Luke Seeney

<b>Name</b>	IP04	<b>Date</b>	24/07/15
<b>Organisation</b>	State Government Works Authority		
<b>Location</b>	Interviewee's Local Offices		
<b>Time Start</b>	7:30am	<b>Time End</b>	8:15am
<b>INTERVIEWEE BACKGROUND INFORMATION (BI)</b>			
<b><i>BI-1 What is your current role within your organisation?</i></b>			
Team Leader of Pre-Construction			
<b><i>BI-2 How long have you been involved in the construction industry?</i></b>			
Started in 1988, been involved for 27 years. <span style="border: 1px solid black; padding: 2px;">1.1</span>			
<b><i>BI-3 Throughout this time, what has been your typical role?</i></b>			
<p>Started as a Project Engineer in the United Kingdom with a construction contractor on the channel tunnel between England and France for 1.5 years.</p> <p>Left this role and has primarily been involved in government roles in both the UK and Australia. Has experience in project planning, design, maintenance, construction supervision and a large amount of procurement experience, particularly with current organisation.</p> <p style="text-align: right;"><span style="border: 1px solid black; padding: 2px;">1.3</span></p>			
<b><i>BI-4 Have you primarily been involved in public or private industry?</i></b>			
<p>Primarily involved in public sector.</p> <p style="text-align: center;"><span style="border: 1px solid black; padding: 2px;">1.4 and 1.5</span></p>			

<b>PROCUREMENT (P)</b>
<p><b><i>P-1 Have you been involved in the development of procurement strategies?</i></b></p> <p>Not so much in the development of these strategies, but largely in the implementation of these strategies and providing input to the procurement team about strategies. <span style="border: 1px solid black; padding: 2px;">2.1</span></p>
<p><b><i>P-2 If so, what do you find are the most commonly developed procurement strategies?</i></b></p> <p>There was a long period where for construction projects it was always cheapest price wins. In the UK this eventually started to change with the introduction of a quality element assessment. 20% quality and 80% price. This largely happened in the late 90's in the UK to try and get away from the adversarial form of contract. <span style="border: 1px solid black; padding: 2px;">2.2</span></p> <p>After moving to current organisation in 2008, began using non-price strategy as this is what is required.</p>
<p><b><i>P-3 Do you think that these strategies provide sufficient scope in relation to performance measurement?</i></b></p> <p style="text-align: center;"><span style="border: 1px solid black; padding: 2px;">2.3</span></p> <p>Yes, but it is very difficult to implement the findings of performance measurement, particularly in the government sector as consultants and contractors will complain to local MP's, government ministers etc. if they are deemed to be performing poorly and excluded from tendering opportunities etc.</p>
<p><b><i>P-4 In what way do you think the project outcome differs if a procurement strategy is price based as opposed to value or non-price based strategies?</i></b></p> <p>You can get a much better outcome if it isn't price based because the cheapest price tries to cut corners, lower quality, scope omissions, not follow the specifications.</p> <p>An example from experience was a tender submitted for a water industry project in which it was established that the Contractor could not build the project for the price that was tendered however due to it being lowest price wins, the Contractor was engaged. It was tendered on the basis of no waste of materials. The Contractor relied solely on variations to try and recover costs on the project which damaged relationships as the Contractor was always pursuing variations for even the slightest change. <span style="border: 1px solid black; padding: 2px;">2.4</span></p>
<p><b><i>P-5 By adopting a price based procurement strategy, what areas of a project does this detract from, if any?</i></b></p> <p>Quality, time – trying to do it quicker and tend not to use the same level of resourcing to undertake the project. <span style="border: 1px solid black; padding: 2px;">2.6</span></p>

***P-6 Do you think a non-price approach delivers a greater project outcome when compared to a price-based approach, why or why not?***

Yes as it is important to always try and maximise the project outcome but there always has to be an element of price to ensure that project budget is still achieved. 2.5

***P-7 Do you think a non-price approach increases or creates additional project costs, why or why not?***

No, but it is very difficult adopting this approach as many of the non-price elements are very subjective and difficult to justify your outcomes. When looking at the whole of life project costs, a non-price approach does not typically yield increased costs, and it is better for relationships as there is not such a large focus on the fight for dollars. 2.7

***P-8 Which procurement approach do you think the industry should try and move towards in an attempt to achieve greater project outcomes and why?***

Try to move towards 20 – 30% quality included in overall assessment on all projects. Trying to get industry to understand this approach is difficult. Contractors will tell you that they are open to this approach until they lose a tender.

Was involved in an ECI, design and construct process. Contractor put in lowest price but had omitted elements of the scope and simply left bits out. In assessment of the tender, continual back and forth asking for information on the cost of doing the omitted elements. This then resulted in the procurement team adjusting their price which came in at about a million dollars less than the next lowest tender. Procurement team developed a risk assessment process for this tenderer assessing how difficult they would be to work with, likelihood of variation claims etc. This process resulted in the second lowest price becoming the preferred contractor. The lowest priced contractor then complained to a contact they had within Campbell Newman’s office and the procurement team was interrogated on how they had undertaken the process demonstrating that although you can introduce non-price elements, the subjectivity of these elements makes it difficult to justify procurement decisions and outcomes. 2.8

***P-9 Do you find that procurement is a difficult, vague and ambiguous process, why or why not?***

Yes and no based on the climate the industry is operating in. Subjective procurement approaches are difficult because justifying why someone scored a 9 for quality and someone scored an 8.5 is very difficult. The difference between an 8 and a 9 could be that they make you confident they can do the job well, while the other makes you very confident – this is difficult to justify. This is made more arduous in a political environment. The losers are never happy with the procurement outcome despite the best interests and process of the procurement team.

Procurement itself isn’t difficult especially with the structure around state government but it’s dealing with the outcomes and the feedback requirements that make it difficult. 2.9

<b>PERFORMANCE MEASURES (PM)</b>
<p><b><i>PM-1 How have you been involved in performance measurement for civil construction projects?</i></b></p>
<p>At the moment for design consultants yes. Prior to this when doing construction supervision in the UK it was always priced based and no element was given to performance and hence did not get measured. <span style="border: 1px solid black; padding: 2px;">3.1</span></p>
<p><b><i>PM-2 What measures do you find are typically adopted in performance measurement?</i></b></p>
<p>Quality, time, relationship management which is very subjective and cost. <span style="border: 1px solid black; padding: 2px;">3.2</span></p>
<p><b><i>PM-3 Do common procurement strategies allow the adoption of sufficient performance measures and are they utilised in projects?</i></b></p>
<p>Yes especially with current organisation. It is typically part of the process these days and is utilised but what is then done with this data is another issue. Current organisation more so uses procurement to ensure that a baseline is being achieved, not so much determine who's the best. Many Consultants believe that a higher score helps them however this is not the case. They are ranked on a score of 1 – 5 across various elements and as long as they are achieving a minimum of 3, it means they are doing everything they are being asked of. Whether a Consultant has a 3 or a 5, they will still be considered for projects. It's if they are below the baseline (3) that they may be excluded. <span style="border: 1px solid black; padding: 2px;">2.3</span></p> <p>Current organisation only wants to know about who is under performing and that is all it is used for.</p>
<p><b><i>PM-4 Are typically adopted performance measures reflective of current practices in the civil construction industry, why or why not?</i></b></p>
<p>Have not been directly involved with Construction in Australia but previously in the UK there was no performance measures on projects when undertaking construction supervision. It has evolved but whether this reflects current practice, would not expect so. <span style="border: 1px solid black; padding: 2px;">3.3</span></p>
<p><b><i>PM-5 How is performance measurement in the construction industry perceived?</i></b></p>
<p>Very keen as they think it is of benefit for future award of projects, however this is not really apparent, just want to make sure they achieve minimum standard. <span style="border: 1px solid black; padding: 2px;">3.4</span></p>
<p><b><i>PM-6 If a project has an emphasis on performance measurement and is implemented well, how do you believe this affects the project outcome?</i></b></p>
<p>Hopefully it concentrates the Contractors mind on what the Client really desires and they will try and achieve the scope and the objective of the project which should generally yield a greater project outcome for both the Client and Contractor. <span style="border: 1px solid black; padding: 2px;">3.5</span></p>

<p><b><i>PM-7 Is performance measurement an arduous element in project delivery, why or why not?</i></b></p> <p>It is arduous when there is disagreement, when someone is not performing well. Opposite when everyone is doing well.</p> <p>In the construction industry it is very difficult because it is not black and white i.e. the manufacturing industry is easier to measure because if something is being produced and 1 in 10 products are defective it is easy to measure performance related to defective products. Construction is not like this, even on an objective measurable such as a date that something needs to be completed – there are so many variables impacting on this that subjectivity is brought back into it. 3.4</p>
<p><b><i>PM-8 Do you think new areas of performance measurement aside from those typically used could be introduced that better reflect current practice in the civil construction industry?</i></b></p> <p>Possibly. 3.6</p>
<p><b><i>PM-9 What areas or if not, why do you think it is not necessary?</i></b></p> <p>Time and cost should always be measured but there is always excuses that can shift the blame. It's not necessarily that new measures should be introduced, but further clarity provided around how to measure elements. The issue is the subjectivity associated with many of the measures used today. 3.6</p>
<p><b><i>PM-10 Do you think that current performance measurement adopted under procurement strategies encourages Contractors to be innovative at the benefit of the Client?</i></b></p> <p>Contractors do genuinely try and innovate but this is primarily financially driven for themselves. Some of the design and construct they do try and encourage innovation through cost saving splits. The issue, especially with government, is that they have taken conservative to a new level in regards to innovation. As soon as a Contractor or consultant tries to innovate or suggest something, the organisational branch responsible for this area says no. The government in Queensland is extremely risk averse and not willing to take on any risk.</p> <p>In Queensland the approach to innovation is terrible, in the UK they were more open and willing to accept innovation. E &amp; T branch stands up for innovation and states that they want innovation but the message does not filter down.</p> <p>This can be changed, it was noticeable that when Campbell Newman was elected, there was a whole different attitude from the branch regarding engineering and technology on the approach to innovation as it was driven from the higher levels. They were more willing to look at innovation and accept it. However since his departure, it has started to revert back towards the old view and is becoming extremely difficult.</p> <p>It is especially bad here in Queensland and is the worst I have seen throughout my career across the UK and Australia. 3.7</p>

***PM-11 If not, what types of performance measurement could be introduced to encourage this?***

The only thing seen successful is when it is politically driven from the high levels and part of government strategy and enforced. This could then flow through to performance measurement.

3.7

***PM-12 Have you found that the construction industry is typically slow to change, develop and adopt new processes or techniques that could improve performance?***

Contractors do genuinely try to innovate, use new techniques and develop alternative processes but they are stifled by governments which slows the process. The other thing stifling innovation and change in the industry is so many different design standards and specifications across the country and states. In the UK there is one common design standards allowing Contractors to move freely and undertaken works throughout the whole country easily. This stifles innovation as a technique used in NSW cannot be used in QLD because the specification has different requirements. This makes it difficult for the industry to change.

3.4

***Are you aware of the KPI's developed for the Australian Construction Industry by the Australian Construction Industry Forum and the Australian Procurement and Construction Council?***

No. Not familiar with, nor heard of the KPIs.

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**  
Luke Seeney

<b>Name</b>	IP05	<b>Date</b>	24/07/15
<b>Organisation</b>	City Council Works Authority		
<b>Location</b>	Via phone interview		
<b>Time Start</b>	2:00pm	<b>Time End</b>	2:45pm
<b>INTERVIEWEE BACKGROUND INFORMATION (BI)</b>			
<b><i>BI-1 What is your current role within your organisation?</i></b>			
<p>Contracts Manager Capital Efficiency Expenditure Program</p> <p>According to my role statement “The Contracts Manager Capital Expenditure Efficiency Program provides corporate-wide leadership and expertise in best practice procurement and contract management for capital works projects.”</p>			
<b><i>BI-2 How long have you been involved in the construction industry?</i></b>			
<p>14 years. <input type="text" value="1.1"/></p>			
<b><i>BI-3 Throughout this time, what has been your typical role?</i></b>			
<p>Spent some time early on in design but for the large part of career to date I’ve been involved in procurement and contract administration. <input type="text" value="1.3"/></p>			
<b><i>BI-4 Have you primarily been involved in public or private industry?</i></b>			
<p>Primarily involved in public sector but also spent five years in both Europe and Australia working for Consultancies in the pre-construction phase. Have spent 6 years working on the post award phase and another three years in the tendering and award phase.</p> <p align="center"><input type="text" value="1.4 and 1.5"/></p>			

<b>PROCUREMENT (P)</b>
<p><b><i>P-1 Have you been involved in the development of procurement strategies?</i></b></p> <p>Yes from all aspects such as pre-construction, tendering and award as well as post award.</p> <p>There is always great intentions at the start of the procurement development process but it typically ends in a rush and hastiness due to time constraints or a lack of focus on areas where it should have been.</p> <p style="text-align: center;">2.1</p>
<p><b><i>P-2 If so, what do you find are the most commonly developed procurement strategies?</i></b></p> <p>Being a large city council we have our own act with legislation governing our procurement policies. This is common to local government act however assigns specialist powers to the mayor which is the key difference between the acts.</p> <p>The most commonly talked about strategies are:</p> <ul style="list-style-type: none"> <li>- bundling of projects;</li> <li>- having briefs prepared in advance so we're ready to go when we get budget; and</li> <li>- encouraging innovation from tenderers.</li> </ul> <p>The most commonly developed strategies are; 2.2</p> <ul style="list-style-type: none"> <li>- briefing the industry (by issuing program forecasts and/or notifying the market or a tender opportunity prior to each project); and</li> <li>- splitting projects into phases/stages (to spread costs across financial years, or to de-risk the main work by completing enabling works in advance).</li> </ul> <p>The most commonly implemented strategy in recent years (driven by advisors such as A.T. Kearney) appears to be a trend towards Strategic Sourcing and Category Management.</p> <p>The most commonly implemented non-strategy is rush-it-through procurement because we are behind schedule and politics demand evidence of something happening/finished.</p>
<p><b><i>P-3 Do you think that these strategies provide sufficient scope in relation to performance measurement?</i></b></p> <p style="text-align: right;">2.3</p> <p>Yes but there is always a focus on time, cost and quality.</p> <p>I like the well-known quote from an unknown author "Statistics can be made to prove anything - even the truth."</p> <p>In regards to the question:</p> <ul style="list-style-type: none"> <li>- Organisations find ways to manipulate rubber numbers to support whatever they want to demonstrate;</li> <li>- Often organisations don't have any firm/clear/robust measure of success, aside from the almighty dollar. Triple bottom line was one catchcry in the late 1990s – these change just like any other fashion; and</li> </ul>

- Even with the best of intentions, it's very difficult to quantify the success of a procurement strategy because the measure is subjective; and
- Each project is unique in that it is not a routine activity but a specific set of activities undertaken to accomplish a singular goal, and thus the procurer of a project cannot directly compare the effect of one strategy against the effect of a different strategy.

The models don't stop the adoption of KPI's but typically this focusses on time, cost and quality. There is no real impediment to adopting non-price KPI's under which strategy is adopted.

***P-4 In what way do you think the project outcome differs if a procurement strategy is price based as opposed to value or non-price based strategies?***

It may not necessarily impact on the project outcome however this depends on the Contractor who has provided the lowest price. The Contractor may be a smarter more efficient Contractor hence leading to cost savings however there is a tendency that Contractors who come in tight typically yield more aggressive, antagonistic relationships because they are seeking dollar. However, there is more differences between the culture of the Contractor and the culture of the Client that can lead to hostile relationships. If you have a Contractor who is a hard nut Contractor, regardless of their price they will always try and gouge you for dollar which is a reflection of their culture, not necessarily the price they have tendered. 2.4

***P-5 By adopting a price based procurement strategy, what areas of a project does this detract from, if any?***

It's not necessarily a given that it will detract from an area but if it does this is typically related to quality. Again however it depends on the Contractor's approach and their culture. 2.6

***P-6 Do you think a non-price approach delivers a greater project outcome when compared to a price-based approach, why or why not?***

2.5

It could do, but the subjective nature of the non-price areas makes it difficult to quantify. In assessing Contractor's during the tendering and award process they can sound brilliant on paper and then they turn up on site and they are no good. Assessing non-price areas does not guarantee a greater outcome but yes it should generally lead to better outcomes. It is difficult to get a true measure of non-price criteria. This make price assessment so easy as \$1 is always going to be less than \$3.

A good client organisation with robust, defensible records of past project performance would certainly be able to get some better outcomes on future projects by using these records. The difficulty is in getting good quality data out of these measurement systems and keeping this data consistent to allow comparison. Even small things such as a Superintendent's opinion of a contractor can skew this data making comparison's difficult on a project to project basis.

In previous experience I am familiar with a certain Contractor who has a track record of being very difficult to work with. This has been ongoing for 15 years and is still continuing today. They are very claim driven and this creates tense relationships. The issue is that over these 15

<p>years there is no solid records regarding their performance so defending a decision to exclude them from the tendering process is extremely difficult and cannot be done. <span style="border: 1px solid black; padding: 2px;">2.5</span></p>
<p><b><i>P-7 Do you think a non-price approach increases or creates additional project costs, why or why not?</i></b></p>
<p>Not necessarily, but it depends on the project. <span style="border: 1px solid black; padding: 2px;">2.7</span></p>
<p><b><i>P-8 Which procurement approach do you think the industry should try and move towards in an attempt to achieve greater project outcomes and why?</i></b></p>
<p>I would like to see the industry move towards performance driven specifications as opposed to prescriptive specifications. Currently the industry engages Contractors with very prescriptive specifications and standards that they must adhere to i.e. we want asphalt compacted to x,y,z, we want asphalt layers to be x thick etc. Rather than saying to the Contractor, deliver us a new road from A to B which needs to last for 10 years and accommodate a traffic volume of z. If it fails during this period the Contractor must come back and correct the issues.</p> <p>In Europe I became familiar with this approach which means you end up in the procurement space using different strategies such as build, own, operate. You can also introduce a maintenance element in which the Contractor maintains the asset during the period.</p> <p>The benefit of adopting this approach is it allows for freedom in the construction of the project while still achieving the desired outcome. The issue is it can be difficult to specify the certain performance criteria. One example was a section of roadway in a major city in which this methodology was adopted. The life was 10 years or a certain AADT volume. At the end of the 9 year mark it was thought there was still a year remaining under the arrangement however the Contractor pointed out that since the seventh year, the AADT volumes had actually exceeded the specified volume and the Client ended up having to undertake the maintenance for the final year as well as repay the associated costs for years 8 and 9. <span style="border: 1px solid black; padding: 2px;">2.8</span></p>
<p><b><i>P-9 Do you find that procurement is a difficult, vague and ambiguous process, why or why not?</i></b></p>
<p>No due to structured processes and policies. <span style="border: 1px solid black; padding: 2px;">2.9</span></p>
<b>PERFORMANCE MEASURES (PM)</b>
<p><b><i>PM-1 How have you been involved in performance measurement for civil construction projects?</i></b></p>
<p>I have been involved from the level of overseeing and monitoring project performance and preparation of associated reporting. <span style="border: 1px solid black; padding: 2px;">3.1</span></p>

<p><b><i>PM-2 What measures do you find are typically adopted in performance measurement?</i></b></p> <p>Timeliness <span style="border: 1px solid black; padding: 2px;">3.2</span>  Quality  Safety Management and Enviro Management  Community impacts/inconvenience (including traffic management)  Relationship / teamwork (a fluffy – used in many of the earlier alliance/partnership delivery models)  Claimsmanship (difficult to measure as there are many factors, many of them caused by the client, that result in claims)</p>
<p><b><i>PM-3 Do common procurement strategies allow the adoption of sufficient performance measures and are they utilised in projects?</i></b></p> <p>Yes, they allow performance measures. But no, measures are seldom implemented and even less frequently monitored. <span style="border: 1px solid black; padding: 2px;">2.3</span></p>
<p><b><i>PM-4 Are typically adopted performance measures reflective of current practices in the civil construction industry, why or why not?</i></b></p> <p>There’s always going to be a need to measure quality, time and cost. Other measures are subjective and can be introduced dependent on the project and its requirements. <span style="border: 1px solid black; padding: 2px;">3.3</span></p>
<p><b><i>PM-5 How is performance measurement in the construction industry perceived?</i></b></p> <p>I don’t think it really makes it onto the radar. There’s always often a lot of talk that performance measurement is going to be undertaken on a project but typically that’s as much interest that is shown.</p> <p>Some Contractor’s though will make a point of performance measurement and good ratings to the point where they will bully the Superintendent. They see it as an opportunity to improve their ‘written’ track record and corporate profile.</p> <p>In the early days I initially thought performance measurement was garbage due to the questions around how you appoint suitable and measurable non-price criteria. You typically don’t get a lot of ‘buy-in’ on performance measurement as it is not measured itself, i.e. a project manager will be measured on how the project is travelling regarding time and cost but not on whether he has completed his performance reporting for the month. <span style="border: 1px solid black; padding: 2px;">3.4</span></p>
<p><b><i>PM-6 If a project has an emphasis on performance measurement and is implemented well, how do you believe this affects the project outcome?</i></b></p> <p>It depends on the ‘buy-in’ to the performance measurement process and what’s done with this data. It may not necessarily change the project outcome more so just provide another record of identifying what could have been improved throughout the project. <span style="border: 1px solid black; padding: 2px;">3.5</span></p>

***PM-7 Is performance measurement an arduous element in project delivery, why or why not?***

Not half as arduous as you'd be lead to believe if you listen to the grumbling of those that haven't completed their reports. Following the initial, major obstacle of setting appropriate measures, further obstacles that make it all seem arduous:

1. Poor understanding of the need for / benefits of measurement
2. Poor understanding of the process for obtaining and recording measurements

Insufficient (usually nil) incentives to obtaining and recording measurements.

It's difficult to find objective measures to subjective activities. If for example you are reviewing the Contractor's performance for the month and there are 65 RFI's does this mean you have an incompetent Contractor, a poor design with poor documentation, or a difficult Superintendent?

What also makes it difficult is that all parties need to understand what is being measured and why it is being measured. The education process can be difficult because a Contractor will immediately go on the defensive if a performance measures is rated poorly because they may not understand the background to why that area is being monitored. 3.4

***PM-8 Do you think new areas of performance measurement aside from those typically used could be introduced that better reflect current practice in the civil construction industry?***

Yes I think so which ties in with earlier comments related to performance specifications as opposed to prescriptive specifications. This is encouraged through some of the models such as ECI. 3.6

***PM-9 What areas or if not, why do you think it is not necessary?***

See PM-8. 3.6

***PM-10 Do you think that current performance measurement adopted under procurement strategies encourages Contractors to be innovative at the benefit of the Client?***

The answer is an emphatic "No!"

Some contractors are very innovative and entrepreneurial in their techniques for maximising the returns they are seeking from the project. The client might call it devious or opportunistic; but from the contractor's perspective it is smart. This however is not to the benefit of the Client. 3.7

***PM-11 If not, what types of performance measurement could be introduced to encourage this?***

Adoption of performance specifications as opposed to prescriptive specifications would breed innovation as it is in the interest of the Contractor to be innovative to deliver the cheapest product while still achieving the desired outcome. 3.7

***PM-12 Have you found that the construction industry is typically slow to change, develop and adopt new process or techniques that could improve performance?***

No, they are much quicker than clients however the operation of the industry under such a prescriptive environment makes it difficult for them to change or adopt new techniques as the industry keeps dictating how things are to be done. We typically tell them what we want and how to do it which stifles change because it is always the same processes.

The other thing that stifles this is the tender process. The pre-construction phase can go on for years and then we only allow a typical tender period of four weeks which allows no time to try and develop innovative alternatives and delivery processes.

3.4

***Are you aware of the KPI's developed for the Australian Construction Industry by the Australian Construction Industry Forum and the Australian Procurement and Construction Council?***

No have not heard of it.

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**  
Luke Seeney

<b>Name</b>	IP06	<b>Date</b>	27.07.2015
<b>Organisation</b>	State Government Works Authority		
<b>Location</b>	Interviewee's Local Offices		
<b>Time Start</b>	3:45pm	<b>Time End</b>	4:45pm
<b>INTERVIEWEE BACKGROUND INFORMATION (BI)</b>			
<b><i>BI-1 What is your current role within your organisation?</i></b>			
Principal Project Officer.			
<b><i>BI-2 How long have you been involved in the construction industry?</i></b>			
I have been involved in the industry for 30 years. <span style="border: 1px solid black; padding: 2px;">1.1</span>			
<b><i>BI-3 Throughout this time, what has been your typical role?</i></b>			
Throughout this time I began as a construction technician before moving into a project management role, then into a resource manager role before moving into contract administration. This area (contract administration) is where I have spent the majority of my career. <span style="border: 1px solid black; padding: 2px;">1.3</span>			
<b><i>BI-4 Have you primarily been involved in public or private industry?</i></b>			
I spent one year in private industry before moving into the public sector where I have spent the rest of my career. <span style="border: 1px solid black; padding: 2px;">1.4 and 1.5</span>			

<b>PROCUREMENT (P)</b>
<p><b><i>P-1 Have you been involved in the development of procurement strategies?</i></b></p> <p>Not so much in the development but more so the application of these strategies during the preconstruction phases as well as the post award phase.</p> <p style="text-align: right;">2.1</p>
<p><b><i>P-2 If so, what do you find are the most commonly developed procurement strategies?</i></b></p> <p>The most commonly developed strategy is Principal Design and then the construction goes to open market for tender.</p> <p style="text-align: right;">2.2</p>
<p><b><i>P-3 Do you think that these strategies provide sufficient scope in relation to performance measurement?</i></b></p> <p style="text-align: right;">2.3</p> <p>Yes, the strategies allow for the adoption of performance measures as required dependent on the project and its requirements. Each project has its own unique elements however the areas that are measured are typically the same.</p>
<p><b><i>P-4 In what way do you think the project outcome differs if a procurement strategy is price based as opposed to value or non-price based strategies?</i></b></p> <p>If a strategy is priced based there tends to be greater conflict between the Principal and the Contractor due to variation claims. This can create corner cutting, poor quality results and time overruns. In my experience I have found that non-price approaches tend to somewhat remove this conflict area which leads to better relationships. The issue with a non-price approach is that you can sometimes pay a premium if you aren't vigilant in your assessment process and can result in less competitive pricing.</p> <p style="text-align: right;">2.4</p>
<p><b><i>P-5 By adopting a price based procurement strategy, what areas of a project does this detract from, if any?</i></b></p> <p>There is the potential that this will detract from quality, environment and safety due to short cuts especially where there are large numbers of claims which could result in a disgruntled Contractor if the results of these claims are not favourable to the Contractor.</p> <p style="text-align: right;">2.6</p>
<p><b><i>P-6 Do you think a non-price approach delivers a greater project outcome when compared to a price-based approach, why or why not?</i></b></p> <p>Yes, I believe it improves the project outcome, not only from the viewpoint of the asset that gets delivered but also the quality of relationship between the Client and Contractor is greater which is important for future projects. The only issue is that target estimates are usually inflated compared to price only tenders.</p> <p style="text-align: right;">2.5</p>

<p><b><i>P-7 Do you think a non-price approach increases or creates additional project costs, why or why not?</i></b></p>
<p>Yes as normally there are higher overhead costs due to increased staff numbers, site facilities and resources that are allocated to the project as opposed to price driven where the Contractor will take a bare minimum approach to resourcing to save costs. There is also typically greater contingency in the prices to cover project risks and the profit margin, which is normally agreed upfront, tends to be higher than a price driven approach. <span style="float: right;">2.7</span></p>
<p><b><i>P-8 Which procurement approach do you think the industry should try and move towards in an attempt to achieve greater project outcomes and why?</i></b></p>
<p>From experience I would like to see the industry move towards collaborative project agreements and the design and construct type approach. This leads to better relationships and has better conflict resolution processes, the Contractor is paid on actual costs which can help to reduce the cost of projects. This wouldn't work on the smaller project though where it is more economical for the Principal to undertake the design and then just appoint a construction contractor to build it. <span style="float: right;">2.8</span></p>
<p><b><i>P-9 Do you find that procurement is a difficult, vague and ambiguous process, why or why not?</i></b></p>
<p>Not usually as there are typically well defined strategies and processes however for the Contractors it could sometimes be seen as ambiguous due to non-price criteria. It depends also on the quality of the documentation produced as if it is of a poor quality it can lead to a large number of notice to tenderers as well as a number of request for information. <span style="float: right;">2.9</span></p>
<p><b>PERFORMANCE MEASURES (PM)</b></p>
<p><b><i>PM-1 How have you been involved in performance measurement for civil construction projects?</i></b></p>
<p>Monitoring of construction contractor's on projects, assessment of their performance and completion of reports. Participating in workshops for relationship management and trying to work better together. <span style="float: right;">3.1</span></p>
<p><b><i>PM-2 What measures do you find are typically adopted in performance measurement?</i></b></p>
<p>Many agencies now employ pre-qualification processes as an initial performance measure to minimise the number of Contractors that can tender on works. On a project basis the areas that are typically measured include time, cost, cash flow targets, quality, lot area opening and closure rates, environment – noise, vibration, dust, flora and fauna, traffic, using blue tooth devices to measure travel time. Safety – near misses, LTIs. <span style="float: right;">3.2</span></p>

***PM-3 Do common procurement strategies allow the adoption of sufficient performance measures and are they utilised in projects?***

Yes they do, measures can be implemented to suit the project however it is difficult to include KPI's without clear, accurate and agreed evidence 2.3 data.

***PM-4 Are typically adopted performance measures reflective of current practices in the civil construction industry, why or why not?***

This is not clear, there will always be a need to measure the projects performance against time, cost and quality but whether the other areas reflect the way the industry operates is difficult to ascertain.

3.3

***PM-5 How is performance measurement in the construction industry perceived?***

It is generally perceived with a lot of suspicion as to whether or not it is fair to be measured by contract administrator without quantitative real data regarding some of the areas that are measured.

Within the last four or five year years things have improved. Most Contractor's say they support it when they are being measured favourable however if things go south they become very defensive. It creates conflict within the project and sometimes it is difficult to obtain the right data to defend yourself. Some areas are black and white but many are subjective making it very difficult to justify the decision making process. Contractors are often very protective of their reputation hence defensive behaviour if the performance measurement does not reflect well on them.

3.4

***PM-6 If a project has an emphasis on performance measurement and is implemented well, how do you believe this affects the project outcome?***

It will typically yield greater outcomes for the project and can lead to good relationships when things are going well. It can achieve better value for money for the Client by ensuring the Contractor is performing satisfactorily. It can also create additional costs for the Contractor i.e. if a traffic measurable is not achieved, they may need to make significant changes to the traffic management plan which can result in unplanned costs to the Contractor. Without a measurable things like this would go unnoticed.

3.5

***PM-7 Is performance measurement an arduous element in project delivery, why or why not?***

It can be if things aren't going well. In these instances you are often having to defend yourself and the decision making process. It can be emotionally draining due to difficult conversations with Contractors in environments that can already be high pressure and high stress. It's hard work emotionally.

3.4

***PM-8 Do you think new areas of performance measurement aside from those typically used could be introduced that better reflect current practice in the civil construction industry?***

No, not necessarily. 3.6

***PM-9 What areas or if not, why do you think it is not necessary?***

Our organisation already has a number of tools to undertake performance measurement. There does not need to be a focus on new areas, more so a focus on measuring the current areas and using the current tools to do this. They are not utilised enough but this also comes back to experience and training. There needs to be greater training on how to measure the appropriate areas, particularly in regards to specifications and there needs to be development of suitable documents and checks that can be used to measure the areas. This also extends to what to do with the data once you have it and how to make changes and learn from the findings. 3.6

***PM-10 Do you think that current performance measurement adopted under procurement strategies encourages Contractors to be innovative at the benefit of the Client?***

No, innovation from the Contractor is purely for them to improve their bottom line, not necessarily benefit the client or achieve a greater outcome. The difficulty with innovation, particularly under construct only contracts is that it will typically require a departure from the design or specification which creates a whole number of headaches regarding design changes and approvals as well as delays. With D & Cs there is more opportunity to innovate but again it is rarely encourage from a performance measurement perspective. 3.7

***PM-11 If not, what types of performance measurement could be introduced to encourage this?***

Innovation alone could be written into the strategies and measured to encourage the pursuit of innovation. There is somewhat of an opportunity to do this when tendering in that an alternate tender can be submitted however this is often difficult as the amount of time the Contractor has to tender is usually short making it difficult to explore innovation.

A way of doing it is to introduce something into the schedule that allows for innovation. This is difficult though as our specifications often over specify, and are very prescriptive providing little flexibility. Our organisation stifles innovation through prescription and there is a trust issue with contractors to do the right thing given that at the end of the day, it is public infrastructure. 3.7

***PM-12 Have you found that the construction industry is typically slow to change, develop and adopt new process or techniques that could improve performance?***

Yes, the industry is very generational in that techniques and processes are hand down from generation to generation with processes that are very traditional. While technology has changed a lot in the last 10 years, the processes and techniques are very similar and familiar. This is heavily influenced though by the customer side in that the restrictive design and specification requirements require sign off by management if there are departures from the norm.

3.4

***Are you aware of the KPI's developed for the Australian Construction Industry by the Australian Construction Industry Forum and the Australian Procurement and Construction Council?***

Have not heard of these and hence am not familiar with them.

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**  
Luke Seeney

<b>Name</b>	IP07	<b>Date</b>	27.07.2015
<b>Organisation</b>	Queensland Regional Council		
<b>Location</b>	Interviewee's Offices		
<b>Time Start</b>	1:30pm	<b>Time End</b>	2:30pm
<b>INTERVIEWEE BACKGROUND INFORMATION (BI)</b>			
<b><i>BI-1 What is your current role within your organisation?</i></b>			
Currently the Director Infrastructure Services			
<b><i>BI-2 How long have you been involved in the construction industry?</i></b>			
Has been involved in the industry since 1984 – 31 years of experience. <span style="border: 1px solid black; padding: 2px;">1.1</span>			
<b><i>BI-3 Throughout this time, what has been your typical role?</i></b>			
Was initially heavily involved in contract management and administration for 2 – 3 years before moving into a Director's role where I have always been involved in overseeing the procurement and delivery of transport infrastructure. <span style="border: 1px solid black; padding: 2px;">1.3</span>			
<b><i>BI-4 Have you primarily been involved in public or private industry?</i></b>			
Public industry. <span style="border: 1px solid black; padding: 2px;">1.4 and 1.5</span>			

<b>PROCUREMENT (P)</b>
<p><b><i>P-1 Have you been involved in the development of procurement strategies?</i></b></p>
<p>Yes I have been involved in the development of purchasing policies and procurement strategies although this is heavily dictated by the Local Government Act. Always need to maintain transparency due to being a local council and the fact that all dollars are so heavily scrutinised. One simple example of this was the purchasing of a numbers of rollers in which we didn't go to the cheapest supplier due to other benefits but a senant enquiry was launched and I had to answer and justify the purchasing decision that was made. <span style="border: 1px solid black; padding: 2px;">2.1</span></p> <p>We generally try and meet our needs through in-house supply with a nucleus of resources that are supplemented by external supply on an as needs basis.</p>
<p><b><i>P-2 If so, what do you find are the most commonly developed procurement strategies?</i></b></p>
<p>Typically design and then construct. Our tendering process is dictated by price and the Local Government Act. Up to a value of \$5000 we can just engage someone to do the work. For values of \$5001 - \$15,000 we are required to obtain two quotes, for values of \$15,001 - \$200k we need to obtain three quotes and for values in excess of this we need to advertise and go to marker, do full tender assessment and obtain council approval. We have a panel of suppliers that we go out to and we go to those who have done good work for us in the past and can be relied upon.</p> <p>More and more it seems as though Contractor's would prefer to go design and construct but this is typically not the best approach for us as our project are typically of a small nature. We've tried it in the past and been burnt by poor Contractor performance. It's a good concept but, like all strategies, has its place. <span style="border: 1px solid black; padding: 2px;">2.2</span></p>
<p><b><i>P-3 Do you think that these strategies provide sufficient scope in relation to performance measurement?</i></b></p>
<p style="text-align: center;"><span style="border: 1px solid black; padding: 2px;">2.3</span></p> <p>Yes, the procurement strategy does not typically prohibit performance measurement. Our policies typically do not contain specifics about performance measurement. For us it comes down to resourcing and the fact that we only use basic documentation on our projects. This is a contentious issue within our council due to size and limited resources available to support this kind of thing.</p> <p>For us it comes down to individual Officers previous experience with Contractors. If we've had response issues or delivery problems in the past we won't typically engage the Contractor again if possible. However we don't document this which makes it difficult to justify decision making. We should be trying to but again it comes back to resourcing and lack of appropriate systems.</p>

***P-4 In what way do you think the project outcome differs if a procurement strategy is price based as opposed to value or non-price based strategies?***

In the past, being a smaller council, we have had a focus on price but there has been incidences where this has ended disastrously for us. There was one project in particular where we engaged a Contractor to construct a new bridge who was selected on the basis of cheapest price. There was significant issues with delivery of the project due to capability and experience and it ended up costing twice as much as what was expected in contract management costs to manage the Contractor and get the project completed.

You typically get what you pay for and we now put in criteria to allow assessment against price, experience, and capability. 2.4

***P-5 By adopting a price based procurement strategy, what areas of a project does this detract from, if any?***

It does not necessarily always detract from areas of a project but if it does it is typically related to the quality of the delivered asset, can impact on the timing and delivery of the project and ultimately whether the project is as fit for purpose as it could be. 2.6

***P-6 Do you think a non-price approach delivers a greater project outcome when compared to a price-based approach, why or why not?***

Yes absolutely but that doesn't mean that a cheap Contractor can't do a good job. Sometimes you get lucky and a Contractor will rate well against things such as experience, capability and also be the cheapest. 2.5

***P-7 Do you think a non-price approach increases or creates additional project costs, why or why not?***

Not typically, in consideration of whole of project costs you can basically end up in the same place from a cost perspective. If you've got good relationships with your Contractors you make sure that they are making some money, we are getting what we want and that things are still coming in at a good value. 2.7

***P-8 Which procurement approach do you think the industry should try and move towards in an attempt to achieve greater project outcomes and why?***

I think that TMR's approach to having a panel of pre-qualified Contractors works really well and helps to push Contractors to maintain minimum levels and keeps the cowboys out. But again this comes back to having the right systems and available resources to effectively utilise these processes.

There's not really one particular approach but value based procurement seems to deliver effective results and works for all parties. 2.8

<p><b><i>P-9 Do you find that procurement is a difficult, vague and ambiguous process, why or why not?</i></b></p>
<p>No not from our perspective. It is pretty clear cut due to our policies and procedures (local government act). There is a lot of bureaucracy being government but that is the nature of the environment that we operate in. This can make it difficult but just need to ensure transparency and justification of decision making. There is also internal and external auditing that is carried out to ensure that things are being done correctly and clear up any potential issues. <span style="border: 1px solid black; padding: 2px;">2.9</span></p>
<p><b>PERFORMANCE MEASURES (PM)</b></p>
<p><b><i>PM-1 How have you been involved in performance measurement for civil construction projects?</i></b></p>
<p>Through the measurement of quality against specifications, supervision of the contract on a day to day basis for quality and conformance as well as the preparation of performance reports as well as things such as site instructions to correct conformance issues etc. <span style="border: 1px solid black; padding: 2px;">3.1</span></p>
<p><b><i>PM-2 What measures do you find are typically adopted in performance measurement?</i></b></p>
<p>Conformance against the specifications, quality, time and safety. There is some measurement of environment but not a lot due to our projects typically being low risk in regards to potential environmental impact. <span style="border: 1px solid black; padding: 2px;">3.2</span></p>
<p><b><i>PM-3 Do common procurement strategies allow the adoption of sufficient performance measures and are they utilised in projects?</i></b></p>
<p>Yes they do and we typically write in performance measures on a project by project basis as our strategies do not really cover this. The larger the project, the more emphasis that is placed on this due to higher risks which council cannot afford. <span style="border: 1px solid black; padding: 2px;">2.3</span></p>
<p><b><i>PM-4 Are typically adopted performance measures reflective of current practices in the civil construction industry, why or why not?</i></b></p>
<p>Yes but it can be difficult to get Contractor's on board regarding performance measurement especially on the smaller projects. It's hard to get them focussed on risk management particularly around public safety through construction sites. <span style="border: 1px solid black; padding: 2px;">3.3</span></p>
<p><b><i>PM-5 How is performance measurement in the construction industry perceived?</i></b></p>
<p>Seems to be difficult to justify the need to Contractors as it tends to come back to price and they see it as an extra cost to the project that they don't want to carry especially on the smaller projects. This is understandable especially considering some jobs they just want to get in and out with minimal fuss. <span style="border: 1px solid black; padding: 2px;">3.4</span></p>

***PM-6 If a project has an emphasis on performance measurement and is implemented well, how do you believe this affects the project outcome?***

It improves the project outcome as it provides a measureable against areas which, if done well can deliver a greater outcome. By undertaking performance measurement in these regards it gives the Contractor something to aim for and also creates the need for the Contractor to pay more attention to the measured areas. Focus brings attention, which brings detail which can yield a better outcome. 3.5

***PM-7 Is performance measurement an arduous element in project delivery, why or why not?***

Not particularly and is covered as part of the contract administration. The difficult side of it is that it creates conflict if poor performance is being observed and addressed. There's always a million reasons, or excuses, as to why something may not be going as well as it could be and this also makes it difficult to measure. 3.4

***PM-8 Do you think new areas of performance measurement aside from those typically used could be introduced that better reflect current practice in the civil construction industry?***

Yes but as to which areas it's difficult to determine. The other consideration is the cost of such measures and whether they yield a substantial benefit to make it worthwhile. The other issue is these measures can be manipulated i.e. a Contractor can nominate a team for a project but at the end of the day, are those guys actually going to be dedicated to your project it will be the graduate do most of the work with marginal input from the nominated team member. You think you're getting one thing and end up with another. 3.6

***PM-9 What areas or if not, why do you think it is not necessary?***

See PM-8.

3.6

***PM-10 Do you think that current performance measurement adopted under procurement strategies encourages Contractors to be innovative at the benefit of the Client?***

No, not necessarily. The problem with the construction industry is that there are tried and true techniques that deliver all the time. For a council like us, it is difficult to justify trialling new techniques due to the cost risks associated with this and the fact that we have limited budgets and these must be justified. Prefer to allow someone else to trial it before looking into it.

Everyone seems to talk about innovation but innovative pursuits are rarely undertaken. Comes back to risk.

3.7

***PM-11 If not, what types of performance measurement could be introduced to encourage this?***

It would be good to just see innovation in general but again it comes back to risk. We've looked into things in the past regarding replacement of our old wooden bridges with fibre composite bridges but then this opened up a whole new issue of who had experience with these, who could deliver. Same thing with foamed bitumen pavements, reasonably innovative but not often used and issues associated with cost compared to more traditional pavements. 3.7

***PM-12 Have you found that the construction industry is typically slow to change, develop and adopt new process or techniques that could improve performance?***

Yes absolutely. But it is different for everyone. I've found with our organisation it is extremely difficult to change the culture. Things have been done the same way forever and people don't want to change. Some people are prepared to innovate but at the same time I've been hammered when trying to bring in new ideas. It's a human comfort thing and you often receive pushback.

People are also jealous and people don't want to be shown up by the ideas of others. 3.4

***Australian Construction Industry Forum and the Australian Procurement and Construction Council?***

No I have not heard of these. This is a lack of connection from these kind of organisations with local governments. Local governments tend to operate in a bit of a bubble in that, if you're a local supplier, within a reasonable range regarding price, you'll tend to get the job.

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**  
Luke Seeney

<b>Name</b>	IP08	<b>Date</b>	30.07.2015
<b>Organisation</b>	Multi National Engineering Consultancy		
<b>Location</b>	Interviewee's Offices		
<b>Time Start</b>	5.00pm	<b>Time End</b>	6.00pm
<b>INTERVIEWEE BACKGROUND INFORMATION (BI)</b>			
<b><i>BI-1 What is your current role within your organisation?</i></b>			
<p>Queensland Transportation Team Leader</p> <ul style="list-style-type: none"> <li>• Responsible for project proposals / project delivery across all phases</li> <li>• Resource on a global scale (India, Australia, New Zealand and Fiji)</li> <li>• Design checks and reviews</li> <li>• Training</li> </ul>			
<b><i>BI-2 How long have you been involved in the construction industry?</i></b>			
<p>30 years involved in the industry</p> <p align="center">1.1</p>			
<b><i>BI-3 Throughout this time, what has been your typical role?</i></b>			
<p>Originally started purely in design and progressed through the ranks of a State government agency. Cadet, Technical Officer, Designer, Senior Designer, Design Manager now focussed more so on Project Management and Program Management as well as the roles identified in BI-1.</p> <p align="center">1.3</p>			
<b><i>BI-4 Have you primarily been involved in public or private industry?</i></b>			
<p>20 years of public industry experience with both state and local governments and 10 years of private industry experience.</p> <p align="center">1.4 and 1.5</p>			

<b>PROCUREMENT (P)</b>
<p><b><i>P-1 Have you been involved in the development of procurement strategies?</i></b></p> <p>Involvement more so with business strategies and Client strategies but not so much in the development of procurement strategies.</p> <p>Have been involved from the side of responding to strategies. Heavily involved in the tender stages of projects for MWH and actually responding to the chosen procurement strategy. This includes everything from EOIs to sole invitees, RFTs and all the difference variances. Have been involved in some D &amp; C projects as well. <span style="border: 1px solid black; padding: 2px;">2.1</span></p> <p>As a private consultant we are responsive to the procurement strategy chosen by the agency procuring the works.</p>
<p><b><i>P-2 If so, what do you find are the most commonly developed procurement strategies?</i></b></p> <p>Most commonly it's two stage design and then construct, some larger projects are done under design and construct arrangements but typically most projects are still done as design first, then call for tenders for the construction phase. <span style="border: 1px solid black; padding: 2px;">2.2</span></p>
<p><b><i>P-3 Do you think that these strategies provide sufficient scope in relation to performance measurement?</i></b></p> <p align="right"><span style="border: 1px solid black; padding: 2px;">2.3</span></p> <p>Yes but often the areas are grey – it's not 100% clear on what areas of performance they are measuring. This is where there can be confusion as there are mixed messages, especially between state and local government as to what performance measures are typically used. We've found it very difficult to understand exactly what targets we are trying to hit, especially from the point of preparation of project proposals and delivery in terms of what you are trying to hit.</p> <p>This is more so an issue here in Queensland – for example the work we do with the New Zealand Transport Authority uses a PACE score which measures the performance of the design consultant which sets out clear criteria that we are assessed against. It's a set framework that is clear and easily understood and defines clear targets for you to work against. Typical areas cover innovation, design quality, presentation etc.</p> <p>The system is a lot clearer and well defined than systems that are used in Queensland. A lot of local governments don't do it at all, some State government departments have similar systems but they are very basic and broad criteria.</p>
<p><b><i>P-4 In what way do you think the project outcome differs if a procurement strategy is price based as opposed to value or non-price based strategies?</i></b></p> <p>It depends on the Consultant's drivers. If they want to win a job and they know it's price based, they'll tender a very skinny price which has associated risks in terms of variations. This is more evident with Contractor's who tender low and will look to make money through variations to supplement the low price. <span style="border: 1px solid black; padding: 2px;">2.4</span></p>

***P-5 By adopting a price based procurement strategy, what areas of a project does this detract from, if any?***

It would typically impact on resourcing – the right person may not be assigned to the project due to limited costs and the project simply can't afford the more quality people. You'll find that more cost effective people will be assigned to the project even if they don't necessarily have the right experience to undertake the role.

Purely based on price could also result in a lower quality of deliverable as well due to the resourcing issues described above, as well as the fact the reduced cost means reduced time and the Contractor simply can't dedicate the necessary time to deliver the project at 100%. 2.6

***P-6 Do you think a non-price approach delivers a greater project outcome when compared to a price-based approach, why or why not?***

No not necessarily, there needs to be a good balance between both price and non-price criteria to ensure value for money. This allows the right team to be dedicated to the job with sufficient resources, time and cost to deliver the project while still ensuring that costs do not get out of hand.

One thing about a non-price strategy is that it actually requires the Consultant/Contractor to think about how they are going to deliver the project and have a sound methodology, process and systems in place to demonstrate to the Principal that they can effectively deliver the product. It removes the price element to a degree and makes them focus on the other areas that they can bring to the table. 2.5

***P-7 Do you think a non-price approach increases or creates additional project costs, why or why not?***

At the moment the industry is moving more towards an initial EOI phase before going to full tender. This is a good move from the industry as it allows all interested parties to provide an initial response from which then only a select few are invited for full offer.

This is a good move as the effort to respond to an EOI is significantly less which reduces tendering costs significantly.

I don't think that by adopting a non-price approach, there are necessarily any additional costs. 2.7

***P-8 Which procurement approach do you think the industry should try and move towards in an attempt to achieve greater project outcomes and why?***

Moves toward value based approaches are becoming the norm these days and with the current strategies to initially undertake an EOI phase before going to full tender cuts down the work for all parties involved and is good for the industry. There's no need to have say 17 full tender responses when this could have been reduced to three or four through an initial EOI phase. For us the cost of an EOI is about one third the cost of a full offer resulting in significant savings.

I think though that the strategy should be on a sliding price scale, whereby for low cost, low risk projects you could adopt price only approach whereas for the larger projects a value based approach with a focus on non-price criteria should be adopted.

The way that TMR handle the larger projects whereby they initially assess the non-price offer and whoever scores the best they then open the price envelope is a good approach but again this initially assessment can be manipulated and then if the price isn't what they were hoping, they just negotiate with the selected tenderer anyway.

2.8

***P-9 Do you find that procurement is a difficult, vague and ambiguous process, why or why not?***

It's a black art, I compare it to stormwater drainage! I refer back to the work we do in New Zealand and they have a very clear prescriptive way of how procurement is done. You clearly know what you need to hit and specifically what they are looking for.

From my perspective I don't think that some of the state government agencies in Queensland completely understand their own procurement strategies, procedures and policies and actually don't know how to apply them. An example of this is we have local staffed offices and you'll tender on a project with a high weighting given to local presence and yet a Brisbane based large Consultancy with nothing more than a staffed phone in the local area will be awarded the job.

The feedback you get through the 'process' and the feedback you get off the record are two completely different things. Often the preferred supplier is already known and they'll manipulate the numbers to get the one they want.

This can be a catch with the EOI process in that the Principal may already have an idea of the three or four suppliers they want for a project, they go to EOI allowing them to easily eliminate the tenderers they were never going to go to in the first place without needing to provide justification as you would in an RFT.

An example of this was we put in four bids for active transport projects with a large city council. The first bid, we were told we had an excellent engineering team but we were too high on price. The next two bids, we had the same engineering team, we reduced the hours somewhat to reduce the cost and we were actually the lowest price – we were told they didn't think we had enough hours dedicated to the team so we lost that bid. This went against the procurement strategy which was price driven. On the fourth submission, through all the different weightings we lost that bid by 0.2 points. Off the record, person A from the council knew Consultant B and, perceive it the way you want, Consultant B won all projects. In my opinion this is an example of manipulation of the scoring system on a strategy that is not solely price focussed.

2.9

**PERFORMANCE MEASURES (PM)**

***PM-1 How have you been involved in performance measurement for civil construction projects?***

Not overly, when I have been involved it's from a post project completion perspective looking back at how the project went and performance areas that could have been improved or were done well etc.

3.1

<p><b><i>PM-2 What measures do you find are typically adopted in performance measurement?</i></b></p>
<p>Every Client wants you to deliver a quality product, on time with no variations. Our mandate is that we try and always deliver a quality product on time with minimal additional cost to the Client. If that means it costs us a little bit, that's how it goes and it's just part of the process.</p> <p style="text-align: right;">3.2</p>
<p><b><i>PM-3 Do common procurement strategies allow the adoption of sufficient performance measures and are they utilised in projects?</i></b></p>
<p>Yes because at the end of the day the Client is typically concerned with getting a quality product that is delivered within the desired timeframe. The focus on innovation, or winning an award for a project, or do you get paid for inspiring a consultant to be innovative. The answer to these is typically not interested and no. There is not a lot of incentive there for either party however we actually try and drive for our own benefit to be innovative. This sometimes causes us delivery headaches but it allows us to leverage future projects from these initiatives and try and adopt new ways of doing things that are better and more efficient for all concerned parties.</p> <p style="text-align: right;">2.3</p>
<p><b><i>PM-4 Are typically adopted performance measures reflective of current practices in the civil construction industry, why or why not?</i></b></p>
<p>Yes because at the end of the day it always comes back to time, cost and quality.</p> <p style="text-align: right;">3.3</p>
<p><b><i>PM-5 How is performance measurement in the construction industry perceived?</i></b></p>
<p>It's a mixed bag but it's necessary on projects however it needs to be consistent in the way it's measured and the way it is reported. Often the performance measures and processes can be in place, but they aren't followed or reported on or acted on effectively.</p> <p>It would be good to have more structured performance feedback. TMR have systems such as the Consultant Performance Report as do some larger city councils but you rarely get these. I've found that over time, especially with a lot more people coming from overseas, they are not familiar with the policies and practices of the agencies they are working for and do not know to follow these procedures. Some of them have very little idea which indicates that although the systems may be there, there need to be better training and skilling of government officers in the use of these systems.</p> <p style="text-align: right;">3.4</p>
<p><b><i>PM-6 If a project has an emphasis on performance measurement and is implemented well, how do you believe this affects the project outcome?</i></b></p>
<p>It is beneficial to the project because the checks and balances are in place. There are key target areas that can be aimed for which ultimately help to produce a greater outcome for the project as opposed to if these weren't measured.</p> <p>A basic example of this was a recent project that we were undertaking and a key performance area was on the presentation and quality of the drawings produced. We prepared a set of preliminary drawings which we were going to be assessed against. In review, it was clear that</p> <p style="text-align: right;">3.5</p>

<p>these drawings were not of the detail required for a preliminary set of drawings so we took the time to correct this – had we not be getting specifically measured on this, we may have submitted the drawings as they were.</p>
<p><b><i>PM-7 Is performance measurement an arduous element in project delivery, why or why not?</i></b></p>
<p>No, typically many of the areas should be part of your QA process and procedures anyway and therefore are part of the everyday way that business is conducted. <span style="border: 1px solid black; padding: 2px;">3.4</span></p>
<p><b><i>PM-8 Do you think new areas of performance measurement aside from those typically used could be introduced that better reflect current practice in the civil construction industry?</i></b></p>
<p>Somewhat. <span style="border: 1px solid black; padding: 2px;">3.6</span></p>
<p><b><i>PM-9 What areas or if not, why do you think it is not necessary?</i></b></p>
<p>I think there could be more incentives incorporated to do things differently or strive for better outcomes. Projects are typically always a thankless task with PM’s driven purely by a quality product that is on time. If you’ve introduced anything else, well done but who really cares.</p> <p>Focussing back on the New Zealand Transport Authority, they actually have specific criteria that rewards things such as innovation and bringing new approaches to the table. <span style="border: 1px solid black; padding: 2px;">3.6</span></p>
<p><b><i>PM-10 Do you think that current performance measurement adopted under procurement strategies encourages Contractors to be innovative at the benefit of the Client?</i></b></p>
<p>No, a lot of time agencies can tend to see innovation as a short cut, a reduction in standard from the norm or a reduction in the quality of a deliverable. Need to be careful that innovation isn’t perceived as doing less which can sometimes be the case.</p> <p>Innovation does not tend to be rewarded. It is talked about in government agencies and they talk about using engineering judgement and looking outside the scope of design tends and developing projects to use a monitoring sticks however there is a disconnect between the upper levels with this thinking and the PM’s delivering the projects who come back to wanting a quality product that is on time. There’s a disconnect between the management message to what is being done on the ground. You suggest stepping outside the design standards and people get cold shudders. This is where innovation is stifled. It’s a pity because there is real opportunity there. <span style="border: 1px solid black; padding: 2px;">3.7</span></p>
<p><b><i>PM-11 If not, what types of performance measurement could be introduced to encourage this?</i></b></p>
<p>One thing that needs to be done is the agencies themselves need to get in some quality people to demonstrate that they are serious about it. For example, hiring people that are leaders in elements of the industry that can drive the teams and put out the message that we’re really open</p>

for business to do things differently. This message can come from industry all it wants but if these agencies are not receptive to this it just hits a block wall.

There also needs to be a release of control in that some of the risk sharing and financial benefits are shared onto Consultants and Contractor for developing techniques that are innovative and could reduce construction costs, maintenance costs, increase asset life.

At the moment there is no incentive.

Too often the standards are applied in a prescriptive manner more so than being looked at as a guide. Government agencies are extremely risk averse and will avoid at all costs.

***PM-12 Have you found that the construction industry is typically slow to change, develop and adopt new process or techniques that could improve performance?***

The industry particularly Construction Contractors seem to be innovative and very adaptable as they need to be as the game is always changing.

From a Consultant perspective the industry has moved towards a bowling alley approach in that let's put up the bumpers and protect the general public from themselves as much as we can. In doing this we've dumbed down people's ability to sit within an environment to make smart choices, for example making drivers less aware of what's around them i.e. motorway off ramps that can be hit at 110km/h which then gradually slows them down via diminishing curves etc. You should be able to just put a fairly short exit curve and make the driver think about what they are doing – I'm exiting the Motorway, I need to slow down and prepare to do this. We don't use our infrastructure efficiently.

Despite all this, we haven't significantly reduced road crashes and loss of life on the roads but we've certainly increased design costs and construction costs. There's need to be more of a focus on changing drive behaviour as opposed to providing ever greater infrastructure to try and accommodate the drive behaviour. An example of this was the cyclist campaign whereby depending on the speed you need to give 1 to 1.5m of space. As a cyclist I have noticed a significant change in driver behaviour since this campaign where drivers are more aware of giving you the space.

3.4

***Are you aware of the KPI's developed for the Australian Construction Industry by the Australian Construction Industry Forum and the Australian Procurement and Construction Council?***

No am not aware that these exist.

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**  
Luke Seeney

<b>Name</b>	IP09	<b>Date</b>	28.07.2015
<b>Organisation</b>	Tier 2 Construction Contractor		
<b>Location</b>	Interviewee's Offices		
<b>Time Start</b>	9.00am	<b>Time End</b>	10.00am
<b>INTERVIEWEE BACKGROUND INFORMATION (BI)</b>			
<b><i>BI-1 What is your current role within your organisation?</i></b>			
<p>Currently the Engineering Manager for the Northern Region. <span style="border: 1px solid black; padding: 2px;">1.3</span></p>			
<b><i>BI-2 How long have you been involved in the construction industry?</i></b>			
<p>Have been involved in the industry for 35 years. 30 of these years were in the UK construction industry, 5 years in the QLD construction industry. <span style="border: 1px solid black; padding: 2px;">1.1</span></p>			
<b><i>BI-3 Throughout this time, what has been your typical role?</i></b>			
<p>From the start I've always been managing the delivery of projects working for Construction Contractors and also doing Project Engineer roles. This initially started with small projects and naturally progressed to larger project. My roles have always included tendering on projects as well as contract administration. Did a short stint with a local council where I was involved in selection and preparation of contracts to go out to market. <span style="border: 1px solid black; padding: 2px;">1.3</span></p>			
<b><i>BI-4 Have you primarily been involved in public or private industry?</i></b>			
<p>Involved basically the whole time in private industry but there was an 18 month stint in local government. <span style="border: 1px solid black; padding: 2px;">1.4 and 1.5</span></p>			

<b>PROCUREMENT (P)</b>
<p><b><i>P-1 Have you been involved in the development of procurement strategies?</i></b></p> <p>During the stint with the local council in the UK I was trying to change the way we procured Contractors and the contracts we used to be more fair to all parties and obtain better pricing.</p> <p>I've also been involved in representing Contractors by providing inputs to agencies as to what types of strategies would be best suited to a particular type of project. Ultimately that decision is not the Contractors but I have provided advice on this in the past. There is such a large range of models now that it's difficult to know which one to use and some are better suited than others depending on project circumstances. <span style="border: 1px solid black; padding: 2px;">2.1</span></p>
<p><b><i>P-2 If so, what do you find are the most commonly developed procurement strategies?</i></b></p> <p>Most common ones are schedule of rates, construct only. These work pretty well where the work is well defined and well documented to make sure the Client doesn't get too many variations (quality of documentation). Target cost reimbursable contracts are also common. Less common are design and construct but this is on the lower end of the scale in terms of percentages.</p> <p>I prefer D &amp; C because as a Contractor you can have a constructability influence because often with design and then construct you get designs where you are left scratching your head and also asking yourself why they did what they did because it's really expensive and didn't need to be done like that.</p>
<p><b><i>P-3 Do you think that these strategies provide sufficient scope in relation to performance measurement?</i></b> <span style="float: right;"><span style="border: 1px solid black; padding: 2px;">2.3</span></span></p> <p>Not just about all the strategies have measurable KPI's.</p>
<p><b><i>P-4 In what way do you think the project outcome differs if a procurement strategy is price based as opposed to value or non-price based strategies?</i></b></p> <p>Theoretically this could be detrimental to things such as traffic management and things like that but that's normally up to the administrator to control. <span style="float: right;"><span style="border: 1px solid black; padding: 2px;">2.4</span></span></p> <p>A strategy that is based purely on price is not such a bad thing, I've lived with that for 18 out of the 35 years that I've been in the industry where it's been solely based on price. Contractors typically think, "oh so that bloke thinks he can do it for X, good on him, go for it". If he goes bust he goes bust!</p> <p>It differs though, dependent entirely on the project circumstances. A strategy that's based purely on price will be no good if it's expected that there could be lots of changes because the Client will get slaughtered with variations. If it's a well-defined project, with good quality drawings and contract documents such as a TMR project, personally I can't see why it's not purely just on price.</p>

<p>TMR also has a rule where if you are 15% or more below the mean bid your bid could be regarded as an ‘unusually low bid’ and you get removed from the tender assessment or asked to show cause which I think is nonsense especially considering it seems to be applied only sometimes and not others. <span style="border: 1px solid black; padding: 2px;">2.4</span></p>
<p><b><i>P-5 By adopting a price based procurement strategy, what areas of a project does this detract from, if any?</i></b></p>
<p>Covered in P-4.</p>
<p><b><i>P-6 Do you think a non-price approach delivers a greater project outcome when compared to a price-based approach, why or why not?</i></b></p>
<p>No, but again it depends on the Contractor. Some will game the system in that they can use safety and traffic, for instance, as justification to do something that costs the Client in variations on the basis that there’s a safety issue which can be justified by a standard but at the end of the day is there actually a hazard or just a theoretical hazard? <span style="border: 1px solid black; padding: 2px;">2.5</span></p>
<p><b><i>P-7 Do you think a non-price approach increases or creates additional project costs, why or why not?</i></b></p>
<p>It’s entirely on the job and circumstances and how many changes there are. If there’s no changes in the job, you’re better off with the pure price strategy but if there’s expected to be lots of changes you’d be better off with something like a target cost reimbursable arrangement. But it’s also important that the Client is well informed, aware of the contract conditions and knows what they are on about otherwise they will tell you not to do things that really should be done. <span style="border: 1px solid black; padding: 2px;">2.7</span></p>
<p><b><i>P-8 Which procurement approach do you think the industry should try and move towards in an attempt to achieve greater project outcomes and why?</i></b></p>
<p>You can’t really go one way or the other. It really depends on the project and selecting a suitable strategy for the project type and conditions.</p> <p>I like the approach that TMR adopts whereby Contractors are required to be pre-qualified and if you are on this panel then that should mean there are no other questions apart from price – lowest price wins. If you are on the pre-qualification list, why does there need to be any further assessment of your ability to deliver the project? <span style="border: 1px solid black; padding: 2px;">2.8</span></p>

***P-9 Do you find that procurement is a difficult, vague and ambiguous process, why or why not?***

Yes, of course. There's so many different contract models and approaches and Client's will sometimes try and cherry pick bits and pieces and throw them together and it doesn't really work.

They for instance want target reimbursable contract applied to that bit of the project, and this bit of the project we'll apply schedule of rates which creates a whole heaps of grey area in between. This can be exploited by the Contractor and conversely can be exploited by the Principal.

Ambiguity in the delivery of the strategy and the administration of the contract happens all the time.

2.9

**PERFORMANCE MEASURES (PM)**

***PM-1 How have you been involved in performance measurement for civil construction projects?***

Yes I have. Involved in performance meetings and scoring of teams.

3.1

***PM-2 What measures do you find are typically adopted in performance measurement?***

Performance measures for safety, traffic management, community, quality, time, cost, and environment.

In regards to quality, it's almost impossible to do a job without some NCR's, not because the quality is bad, but just the way the system works. In some instances now, the way the specifications are written you actually have to raise an NCR when you get to a certain point in order for the Client to agree to a method of dealing with that particular issue. This provides a paper work means of dealing with the issue, rather than a fault on behalf of the Contractor.

3.2

***PM-3 Do common procurement strategies allow the adoption of sufficient performance measures and are they utilised in projects?***

Yes they do. Regarding whether they are utilised - On some jobs people just give lips service to it but in the majority of cases people genuinely often try and achieve the best they can. What tends to happen is they'll score everyone low at the start of the job and then gradually these scores will increase. At the end if you're only half way up but you've doubled your starting score that's deemed a success.

2.3

***PM-4 Are typically adopted performance measures reflective of current practices in the civil construction industry, why or why not?***

The Contracting industry is a reflection of what's thrown at them. If performance measures weren't there, no one would worry about it. The measures are not typically needed, for most reasonable, responsible Contractors they would do what performance measures drive anyway, with or without the measures. 3.3

***PM-5 How is performance measurement in the construction industry perceived?***

Just another task to be done. Just more contract administration. The administration required to run a contract here in Australia is significantly greater than the vast majority of places around the world. This is driven by the specifications, so many hold points, so much testing requirements, the interaction with the Superintendent on site is of a very high level here. I've done many jobs (in the UK) where the Superintendent hasn't been on site, we only have a chat when we really have an issue.

An example here is concrete – you have to have on site testing and on site slumps and the Superintendent rep standing over you umming and arring about it slumps 90mm and its supposed to be 80mm and then they reject the load. Then they do their checklist and it's tick, tick, tick, oh hang on its two minutes over so that gets rejected – you don't get this anywhere else. The testing is done at the concrete plant, they have documented procedures and their accreditation stating that the batch plant is certified and as long as it's come from that plant then it's ok and you just pour it.

It tends to annoy you when you see a Contractor or completely stuffs up a contract and then gets awarded the next one. This comes back to having gathered the performance data but done nothing with it.

It works well until something goes wrong and then it creates conflict. It's better than not doing it because it allows both sides to see how the other side is thinking. For example, the main Superintendent may not necessarily know what his guys doing on site and we can say "that bloke is being difficult, he'll watch us do something and then tell us we've done it wrong". Why didn't he say something initially? It provides a forum where issues can be aired. 3.4

***PM-6 If a project has an emphasis on performance measurement and is implemented well, how do you believe this affects the project outcome?***

If it is implemented well it should have a positive effect on the project. But the key is that it needs to be implemented well. 3.5

***PM-7 Is performance measurement an arduous element in project delivery, why or why not?***

Yes. There are more arduous things on the job, but it is difficult. It's just another thing you have to do which takes your eye off the ball from delivering the job. 3.4

<p><b><i>PM-8 Do you think new areas of performance measurement aside from those typically used could be introduced that better reflect current practice in the civil construction industry?</i></b></p>
<p>Yes. Things such as community which are monitored now, what's the real value? You always get people who are particularly vocal and didn't want the job to happen in the first place which has nothing to do with you as a Contractor but you end up with a low score for your community measure. <span style="border: 1px solid black; padding: 2px;">3.6</span></p>
<p><b><i>PM-9 What areas or if not, why do you think it is not necessary?</i></b></p>
<p>I think what would be better is a report on the Contractor from the Client's perspective detailing how you've performed on the job. That's always subjective though dependent on the individual who's preparing the report. <span style="border: 1px solid black; padding: 2px;">3.6</span></p>
<p><b><i>PM-10 Do you think that current performance measurement adopted under procurement strategies encourages Contractors to be innovative at the benefit of the Client?</i></b></p>
<p>No they do not. There's nothing in there to specifically measure innovation. <span style="border: 1px solid black; padding: 2px;">3.7</span></p>
<p><b><i>PM-11 If not, what types of performance measurement could be introduced to encourage this?</i></b></p>
<p>It would be good if there were reimbursement incentives to drive innovation to get some recognition to say that "hey you've saved us \$100k, he's a portion of it". Often we can save a Client millions but there's no recognition of it.</p> <p>Purely a simple measure against innovation would be good. <span style="border: 1px solid black; padding: 2px;">3.7</span></p>
<p><b><i>PM-12 Have you found that the construction industry is typically slow to change, develop and adopt new process or techniques that could improve performance?</i></b></p>
<p>Yes it is incredibly slow, driven by the Client. Contractor's are often very quick to pick up advancements in plant and bits of kit, technology etc but on the Client's side they are very slow to change. The Client often lags behind the Contractor.</p> <p>An example is foam bitumen pavement in which Queensland thinks it's ahead of the rest of Australia which it probably is, but this is two decades behind the rest of the world. They quiet frequently go out to reinvent the wheel that's already been invented somewhere else.</p> <p>Yes there needs to be a balance between rushing in and doing things and applying due diligence to things but it's too slow here. The current approach stifles the industry in that things that are true and tried elsewhere can't be used here. It would be good to see performance driven specifications instead of prescriptive specifications which they drive now. An example was on Kingsford Smith Drive, whereby we asked a question of could we do it this way, the response was the BCC document, Clause x, states that it has to be this, so no you can't – even though there is nothing wrong with the alternative. Another example was a job out west whereby the stone specified was a Type 2.1 but when you go out west far enough you can get 2.1 The</p>

specification stated 2.1 and we can cart it 500km to get it but does it really need to be a 2.1 or could a 2.3 have been used.

Too much of picking up the rule book and drawing the picture as per the rule book and that's as far as the engineering though goes. It's not engineering, it's simply documentation. The silly thing now in Queensland is there's no consistency with standards. For example you can do one job that can be governed by Austroads, TMR standards and BCC standards where you end up with three levels of specifications you need to comply with and then they need to tell you which one trumps the other – it's really easy to get caught out, because one will say x and one will say y and you are supposed to construct to the higher standard but you missed it. It seems to be getting less clear rather than more clear even though they seem to be trying to move towards Austroads. Yes they might be trying to transition to a better approach, but in the meantime it's worse.

There's an issue in the application and perception of standards in that they are often looked at as cast in stone when really they should be used as a guide. A classic example one was several years ago where we had an off-ramp off the Bruce Highway. It was only going to be in place for 18 months and it was only taking 100 cars per day. The design standard said that "they shall not build the ramp at a grade steeper than 7%". Now this was an ideal, that's what you'd like to achieve. Well the result of this meant that there would be a height difference of three metres going from the old Bruce Highway to the new Bruce Highway so you couldn't build it. In the end we had to build an RE wall and grade it all the way out to provide the connection. 18 months later it was demolished and removed. To do this also required multiple side tracks to implement the solution when all that was required was to change the grade to 7.2% grade which would have resulted in huge cost savings.

The way the industry is going is that designers aren't actually designing anything, all their doing is looking at the rule book and drawing what the rule book says. That's not real engineering input and that's not achieving value for money.

A number of years ago and is still the case now, a number of people at the top of politics and agencies such as TMR were preaching best for value and looking at the standards and stepping outside the box but that's as far as it gets. It gets to the middle layer of bureaucrats and none of them want to take a risk because it's their backside that they're worried about and not the money because the money is the tax payers.

We are over constructing our infrastructure. From my perspective of the time that I've been here compared to that spent in the UK is that the country is paying way too much for its infrastructure and it's not all about high wages. You've got a double hit here where by the cost to do the work is high compounded by the specified work is high cost. It's nuts.

I think Australia in general borrowed a lot from the UK regarding the administration and delivery of construction projects and that has resulted in the industry being as it is today.

3.4

***Are you aware of the KPI's developed for the Australian Construction Industry by the Australian Construction Industry Forum and the Australian Procurement and Construction Council?***

No I have not heard of these, do they actually exist?

<b>Name</b>	IP10	<b>Date</b>	22/07/15
<b>Organisation</b>	Local Regional Council		
<b>Location</b>	Interviewee's Offices		
<b>Time Start</b>	11:00am	<b>Time End</b>	12:00pm
<b>INTERVIEWEE BACKGROUND INFORMATION (BI)</b>			
<b><i>BI-1 What is your current role within your organisation?</i></b>			
<p>Coordinator Infrastructure Planning and Design</p> <p align="right">1.3</p>			
<b><i>BI-2 How long have you been involved in the construction industry?</i></b>			
<p>A total of 15 years of experience which also includes time spent in the environmental side of the industry.</p> <p align="center">1.1</p>			
<b><i>BI-3 Throughout this time, what has been your typical role?</i></b>			
<p>Typically I've been overseeing the department in the design space (internal and external), operational works (construction by developers), survey, soils, asset management and interacting with planning.</p> <p align="center">1.3</p>			
<b><i>BI-4 Have you primarily been involved in public or private industry?</i></b>			
<p>Public industry for 8 years with two different local regional councils and and prior to that was private industry.</p> <p align="center">1.4 and 1.5</p>			

<b>PROCUREMENT (P)</b>
<p><b><i>P-1 Have you been involved in the development of procurement strategies?</i></b></p> <p>Not really because with local government you already have legislation such as the local government act which dictates your strategy and approaches. However I was involved in the working group for procurement policies and procedures which were formulated out of the regulations and legislation. <span style="border: 1px solid black; padding: 2px;">2.1</span></p>
<p><b><i>P-2 If so, what do you find are the most commonly developed procurement strategies?</i></b></p> <p>Typically it is design in house and then go to construction which was done by council crews. This is how most of our projects are delivered apart from major projects outside the capability of the council. This was largely related to projects that involved structures such as bridges and projects that were a mix of state and local government.</p> <p>Contrary to this, the regional council I now work for is external design but still in house construction apart from bridges and major arterial roads. <span style="border: 1px solid black; padding: 2px;">2.2</span></p>
<p><b><i>P-3 Do you think that these strategies provide sufficient scope in relation to performance measurement?</i></b></p> <p style="text-align: center;"><span style="border: 1px solid black; padding: 2px;">2.3</span></p> <p>Yes, I have not found in the past that strategies typically dictate the performance measures for project specifically. They more so include the generic things such a past performance, experience and price but then we write in our own project specific performance measures.</p>
<p><b><i>P-4 In what way do you think the project outcome differs if a procurement strategy is price based as opposed to value or non-price based strategies?</i></b></p> <p>If I was going price based and I knew little about the people tendering on the project I think there would be major issues for the project. In saying this, being a local council, we are traditionally price based as all dollars need to be justified being rate payers money.</p> <p>If you were to try and go for a higher priced offer you would have difficulty justifying it. For council we are required to obtain two quotes for values of \$5001 - \$15,000, for values of \$15,001 - \$200k we need to obtain three quotes and for values in excess of this we need to advertise and go to market, do full tender assessment and obtain council approval. <span style="border: 1px solid black; padding: 2px;">2.4</span></p>
<p><b><i>P-5 By adopting a price based procurement strategy, what areas of a project does this detract from, if any?</i></b></p> <p>Lack of quality in deliverables. <span style="border: 1px solid black; padding: 2px;">2.4</span></p> <p>In some cases you get what you pay for. In one example we engaged an external consultant to prepare a cheap and nasty design which came back missing basic things and it made it very difficult for the construction crews. In that instance we got what we paid for and that made us</p>

implement performance measures in the next project. At the same time, if someone is significantly cheaper we will clarify why and ensure that they have not missed elements of the scope.

What can happen is that sometimes going with the cheaper price can require a greater amount of management from the client's side to get what we want which creates additional costs. Omissions can also results in significant costs during construction which hurt the whole of project costs which could have been avoided by spending a little more upfront.

2.4

***P-6 Do you think a non-price approach delivers a greater project outcome when compared to a price-based approach, why or why not?***

It can, but it depends on how clear you are with your scope and what you ask for.

2.5

***P-7 Do you think a non-price approach increases or creates additional project costs, why or why not?***

2.7

Not so much because we would be more confident in what they were going to deliver and the overall projects costs could actually be less due to savings in variations. This also means that, if we were confident in their ability and experience, we don't have to manage them as much.

***P-8 Which procurement approach do you think the industry should try and move towards in an attempt to achieve greater project outcomes and why?***

I definitely think the industry should try and move away from price based procurement and place an emphasis on past performance and quality including their systems especially on large projects, high risk projects and large dollar projects.

From a local council perspective it took us a long time to get the powers at be to understand the value for money approach and that by utilising our own crews we were actually get the same product at a cheaper price when opposed to using Contractors. An example is roads that have been reconstructed by Contractors and these are now failing which is blowing out whole of asset costs whereas the ones done by local crews are not having these issues.

2.8

***P-9 Do you find that procurement is a difficult, vague and ambiguous process, why or why not?***

If you ask the people that put this stuff together they'll tell you that it's a simple process but if you ask my officers they'll tell you that it's not. But this somewhat comes back to lack of training and understanding of the procedures and just appreciated that we are under legislation and that we need to do it a certain way. Personally I don't think it's arduous and it's there for a reason to ensure we aren't wasting money. It's a risk based approach to ensure that you are getting the right number of quotes etc and can justify the decisions made.

We need to be able to adequately justify all dollars spent and the procurement policies that we act under help us to do this.

2.9

<p>Of note is that the legislation under which we operate regarding procurement is the same for everything that is procured not specifically just for engineering and construction projects which is why we need to add project specific elements to our strategies. The policy covers everything from the purchase of a new computer to the construction of a new road.</p>
<p><b>PERFORMANCE MEASURES (PM)</b></p>
<p><b><i>PM-1 How have you been involved in performance measurement for civil construction projects?</i></b></p>
<p>To a small extent, more so on the design side, attending regular meetings to monitor consultant progress and performance as well as reviewing reports that were submitted.</p> <p>I was also involved in the monitoring of waste management contracts which had very specific KPIs in which I was monitoring, recording and recording performance against various KPI's. This was a high risk contract worth a large amount of money to council hence the implementation of many KPIs to assist in successful delivery of the project. <span style="border: 1px solid black; padding: 2px;">3.1</span></p>
<p><b><i>PM-2 What measures do you find are typically adopted in performance measurement?</i></b></p>
<p>Milestones, certification, quality, time, cost. <span style="border: 1px solid black; padding: 2px;">3.2</span></p>
<p><b><i>PM-3 Do common procurement strategies allow the adoption of sufficient performance measures and are they utilised in projects?</i></b></p>
<p>Yes, our procurement approaches have overarching measures and then we write in our own project specific performance measures as needed. The measures implemented under the procurement strategy can be adjusted in terms of weighting to suit the project requirements and needs. These are decided on a risk based approach, for example, this design is rather complicated so we would increase the weighting on experience. <span style="border: 1px solid black; padding: 2px;">2.3</span></p>
<p><b><i>PM-4 Are typically adopted performance measures reflective of current practices in the civil construction industry, why or why not?</i></b></p>
<p>From a local government perspective no, trialled and tested first before adopting a new approach. Scenic Rim did design and construct for certain type of bridge, written in that innovation but then cost became an issue. More traditional approach was cheaper and whole of life costs were cheaper under traditional. Whole of life, too much looking at capital cost not enough operational costs <span style="border: 1px solid black; padding: 2px;">3.3</span></p>
<p><b><i>PM-5 How is performance measurement in the construction industry perceived?</i></b></p>
<p>Is pretty well accepted and most companies typically have their own systems in place which measure a lot of similar areas anyway. <span style="border: 1px solid black; padding: 2px;">3.4</span></p>

***PM-6 If a project has an emphasis on performance measurement and is implemented well, how do you believe this affects the project outcome?***

I think if the right performance measures are implemented then it should help to yield a greater project outcome. This emphasises the importance of performance measurement. 3.5

***PM-7 Is performance measurement an arduous element in project delivery, why or why not?***

If you ask the staff that work for me it would be a resounding yes because we don't typically have a lot of structure around it or systems in place to assist in the measurement. People who are new to it will definitely tell you that it's an arduous task. For council it's a lack of system and support tools to help us do this on projects. This comes back to cost because the systems we are using has a module there for performance measurement, but to develop that module has a large cost associated with it. Currently this is not budgeted in council's budget. Systems such as these don't win votes on election day, it's the projects that have been delivered. 3.4

***PM-8 Do you think new areas of performance measurement aside from those typically used could be introduced that better reflect current practice in the civil construction industry?***

From a local government perspective I don't think so much that there are. 3.6

***PM-9 What areas or if not, why do you think it is not necessary?***

I think it's important though that these measures are kept up to date with current technology and processes to ensure that industry performance is monitored relative to how it operates. 3.6

***PM-10 Do you think that current performance measurement adopted under procurement strategies encourages Contractors to be innovative at the benefit of the Client?***

From a local government perspective, no it does not. This is based on risk in that we are not that open to new technologies and processes etc until they have been proven by someone else who has shown that it is successful. We can't go out and be the first to trial new things which could fail and we have just spent a large amount of tax payer dollars in doing it. Traditionally very conservative in local government from that perspective because we aren't looking for that new technology etc.

We trialled a design and construct contract out for a new bridge whereby we had a typical approach to what type of bridge it would be but in the tender we asked for innovative alternatives for the bridge type. Tenders came back in with alternatives but then cost became an issue and it proved much more cost effective to go with the traditional approach.

In saying this the industry tends to look at capital costs as opposed to whole of life costs and can sometimes miss the benefits that could be achieved through alternatives. This could be a result of local councillors only looking as far ahead as a four year term and it's about today in regards to cost not 10 years. 3.7

***PM-11 If not, what types of performance measurement could be introduced to encourage this?***

I think performance measurement could be used to drive the industry to change but how this is done or what measures should be used is difficult to define.

3.7

***PM-12 Have you found that the construction industry is typically slow to change, develop and adopt new process or techniques that could improve performance?***

Possibly from a design perspective because Engineer's are typically conservative, particularly in local government. You'll attend industry briefings and conferences and they'll have new technologies etc. on display and then the following year the same things are on display and still no one has really implemented them.

3.4

***Are you aware of the KPI's developed for the Australian Construction Industry by the Australian Construction Industry Forum and the Australian Procurement and Construction Council?***

No I have not heard of these.

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**  
Luke Seeney

<b>Name</b>	IP11	<b>Date</b>	28.07.2015
<b>Organisation</b>	Local City Council		
<b>Location</b>	Interviewee's Offices		
<b>Time Start</b>	10.45am	<b>Time End</b>	11.30am
<b>INTERVIEWEE BACKGROUND INFORMATION (BI)</b>			
<b><i>BI-1 What is your current role within your organisation?</i></b>			
Civil Engineering Officer <span style="border: 1px solid black; padding: 2px;">1.3</span>			
<b><i>BI-2 How long have you been involved in the construction industry?</i></b>			
47 years <span style="border: 1px solid black; padding: 2px;">1.1</span>			
<b><i>BI-3 Throughout this time, what has been your typical role?</i></b>			
<p>In my current role I perform all engineering roles for the city council which includes the preparation or project briefs, assessment of tenders and decision making regarding award, design review.</p> <p>I initially started as drafter, then to design, senior design, contracting in the 80s as a gun for hire for 14 years, spent 8 years as a Civil Engineering Officer in development assessment for 8 years, then took this role as a Civil Engineering Officer.</p> <p>I also spent time as a Site Engineer in WA, military based project, Jindalee Operational Radar Network (JORN) project, then site Superintendent at Gardner Road land fill project with BCC Construction. <span style="border: 1px solid black; padding: 2px;">1.3</span></p>			
<b><i>BI-4 Have you primarily been involved in public or private industry?</i></b>			
Primarily public sector with 33 years' experience, but then also 14 years of private industry experience. <span style="border: 1px solid black; padding: 2px;">1.4 and 1.5</span>			

<b>PROCUREMENT (P)</b>
<p><b><i>P-1 Have you been involved in the development of procurement strategies?</i></b></p>
<p>No not really. Generally each organisation already has the system in place which you need to follow when procuring goods and services. <span style="border: 1px solid black; padding: 2px;">2.1</span></p>
<p><b><i>P-2 If so, what do you find are the most commonly developed procurement strategies?</i></b></p>
<p>It depends on the project and its requirements. There isn't typically one strategy that is followed but it depends on the system in place and what it dictates as to what will be utilised. We typically used a mix of non-price and price base criteria to ensure that there is not just a pure focus on cost as it is important to ensure you are obtaining the right team, with the right experience that can do deliver the desired outcome. <span style="border: 1px solid black; padding: 2px;">2.2</span></p>
<p><b><i>P-3 Do you think that these strategies provide sufficient scope in relation to performance measurement?</i></b></p>
<p align="center"><span style="border: 1px solid black; padding: 2px;">2.3</span></p> <p>Absolutely it does not stop prohibit the implementation of desired performance measures. We are very upfront and open regarding performance measurement to the Consultants and Contractors that we procure and make it clear that if they do not perform, then they won't necessarily be considered for projects in the future.</p>
<p><b><i>P-4 In what way do you think the project outcome differs if a procurement strategy is price based as opposed to value or non-price based strategies?</i></b></p>
<p>There is pro's and con's on both approaches. Price based you know where you stand in regards to dollars and it is more so on the supplier to manage their resources and time effectively to deliver the product at the given price however when it is non-price it can increase competition and drive more of a value based approach. <span style="border: 1px solid black; padding: 2px;">2.4</span></p>
<p><b><i>P-5 By adopting a price based procurement strategy, what areas of a project does this detract from, if any?</i></b></p>
<p>Not necessarily, it comes back to your experience with the service provider and whether you are confident that they can deliver for the dollars allowed. In saying that, you need to be careful that you aren't accepting a low price at the detriment to the quality of the product. If the project gets delivered at a cheap price but then in five years' time it has failed or is costing significantly more in maintenance costs than expected, this is a poor outcome. <span style="border: 1px solid black; padding: 2px;">2.4</span></p>
<p><b><i>P-6 Do you think a non-price approach delivers a greater project outcome when compared to a price-based approach, why or why not?</i></b></p>
<p>Not necessarily, this comes back to the way a project is documented and scoped and as long as this is done clearly and concisely you should be able to achieve a similar outcomes. <span style="border: 1px solid black; padding: 2px;">2.5</span></p>

<p><b><i>P-7 Do you think a non-price approach increases or creates additional project costs, why or why not?</i></b></p>
<p>No, not when you consider the overall costs of design and construction. Often what can happen is that the lowest price will end up costing large amounts in variations and this causes greater costs than were expected. <span style="border: 1px solid black; padding: 2px;">2.7</span></p>
<p><b><i>P-8 Which procurement approach do you think the industry should try and move towards in an attempt to achieve greater project outcomes and why?</i></b></p>
<p>Move towards value based procurement that considers both price and non-price criteria. I have never been in favour of purely priced based selection. <span style="border: 1px solid black; padding: 2px;">2.8</span></p>
<p><b><i>P-9 Do you find that procurement is a difficult, vague and ambiguous process, why or why not?</i></b></p>
<p>Not necessarily as the systems are typically well defined and in place with clear guidelines. <span style="border: 1px solid black; padding: 2px;">2.9</span></p>
<p><b>PERFORMANCE MEASURES (PM)</b></p>
<p><b><i>PM-1 How have you been involved in performance measurement for civil construction projects?</i></b></p>
<p>Yes through the preparation or project performance reporting, meetings, pre-start meetings and post construction meetings and workshops to discuss the outcomes and performance of the project. <span style="border: 1px solid black; padding: 2px;">3.1</span></p>
<p><b><i>PM-2 What measures do you find are typically adopted in performance measurement?</i></b></p>
<p>Past performance, experience, personnel, reliability, quality, time, organisational structure and background, cost, work health and safety risk. <span style="border: 1px solid black; padding: 2px;">3.2</span></p>
<p><b><i>PM-3 Do common procurement strategies allow the adoption of sufficient performance measures and are they utilised in projects?</i></b></p>
<p>Yes they do and we can always write in specific measures for individual projects if necessary. <span style="border: 1px solid black; padding: 2px;">2.3</span></p>
<p><b><i>PM-4 Are typically adopted performance measures reflective of current practices in the civil construction industry, why or why not?</i></b></p>
<p>In general yes they are but there are some operators who like to do things their way regardless of the measures that are in place. <span style="border: 1px solid black; padding: 2px;">3.3</span></p>

<b><i>PM-5 How is performance measurement in the construction industry perceived?</i></b>
<p>Generally organisations, typically larger ones understand that there is a lot to be learnt from every project. Performance measurement is typically expected in the industry and is not a new thing. They come to expect that it will be implemented and compliance with KPIs etc will be expected. The only ones who aren't open to it are the ones who are performing badly. <span style="float: right; border: 1px solid black; padding: 2px;">3.4</span></p>
<b><i>PM-6 If a project has an emphasis on performance measurement and is implemented well, how do you believe this affects the project outcome?</i></b>
<p>Absolutely yield better project outcomes. I think everyone comes out happier as it typically drives better results and outcomes for the project. In some instances it may make delivery of a project more difficult but if it is for the good of the project than there is usually not an issue. <span style="float: right; border: 1px solid black; padding: 2px;">3.5</span></p>
<b><i>PM-7 Is performance measurement an arduous element in project delivery, why or why not?</i></b>
<p>No not necessarily. No project every runs smoothly and performance measurement is just part of this process. Generally a good Consultant or Contractor will take each project as a pre-start to winning some more project so they are typically open to performance measurement. <span style="float: right; border: 1px solid black; padding: 2px;">3.4</span></p>
<b><i>PM-8 Do you think new areas of performance measurement aside from those typically used could be introduced that better reflect current practice in the civil construction industry?</i></b>
<p>No, I can't really see how else I would like to measure performance outside of the areas that are already being measured. The big one is past performance and confidence in their ability to deliver. <span style="float: right; border: 1px solid black; padding: 2px;">3.6</span></p>
<b><i>PM-9 What areas or if not, why do you think it is not necessary?</i></b>
<p>Refer PM-8. <span style="float: right; border: 1px solid black; padding: 2px;">3.6</span></p>
<b><i>PM-10 Do you think that current performance measurement adopted under procurement strategies encourages Contractors to be innovative at the benefit of the Client?</i></b>
<p>In some ways yes. We will sometimes write into our briefs that alternatives solutions and methodologies are welcomed that can achieve better outcomes or reduction in costs. We can allow for this in our weightings, i.e. time saving innovations can be awarded through the time weighting in the assessment process, not necessarily through a specific innovation weighting. <span style="float: right; border: 1px solid black; padding: 2px;">3.7</span></p>
<b><i>PM-11 If not, what types of performance measurement could be introduced to encourage this?</i></b>
<p>Refer PM-10. <span style="float: right; border: 1px solid black; padding: 2px;">3.7</span></p>

***PM-12 Have you found that the construction industry is typically slow to change, develop and adopt new process or techniques that could improve performance?***

Over the last two decades the industry has become very dynamic. This seems to be partly attributable to bright, young engineers coming up through the ranks who have come out of a different egg shell in regards to technology and the environment in general. In a way it is almost arrogant in some regard with the new approaches being brought in and an attitude of let's try this or I want to do it this way but at the same time this brings about change. No one likes change but it is inevitable however change does not always mean progress.

3.4

***Are you aware of the KPI's developed for the Australian Construction Industry by the Australian Construction Industry Forum and the Australian Procurement and Construction Council?***

No I have not heard of these.

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**  
Luke Sceney

<b>Name</b>	IP12	<b>Date</b>	31.07.2015
<b>Organisation</b>	Multi National Design and Contract Administration Consultancy		
<b>Location</b>	Interviewee's Offices		
<b>Time Start</b>	10.30	<b>Time End</b>	11.30
<b>INTERVIEWEE BACKGROUND INFORMATION (BI)</b>			
<b><i>BI-1 What is your current role within your organisation?</i></b>			
<p>Operations Manager for the Gold Coast operations which includes finance, HR and IT while I also fulfil the role of Transport Planning Manager whereby I oversee the delivery of transport infrastructure projects primarily for state and local government projects but also private agencies. This also includes Project Director and Project Manager roles and I am also involved in the tendering on projects on a daily basis.</p> <p align="right">1.3</p>			
<b><i>BI-2 How long have you been involved in the construction industry?</i></b>			
<p>23 years</p> <p align="right">1.1</p>			
<b><i>BI-3 Throughout this time, what has been your typical role?</i></b>			
<p>Initially started as a designer, before moving into Technical Advisor roles, then moved into Project Management space as a senior Project Manager, then I became a Principal Technical Advisor for a state government organisation before moving into my current role.</p> <p align="right">1.3</p>			
<b><i>BI-4 Have you primarily been involved in public or private industry?</i></b>			
<p>Over my career it has been almost a 50/50 split between public and private industry.</p> <p align="right">1.4 and 1.5</p>			

<b>PROCUREMENT (P)</b>
<p><b><i>P-1 Have you been involved in the development of procurement strategies?</i></b></p> <p>Yes I have been. I've been involved in the procurement of engineering consultants for projects and also currently involved in the procurement of resources, contractors and sub-consultants. Being the Operations Manager I also procure services to assist in the day to day running of the business. <span style="border: 1px solid black; padding: 2px;">2.1</span></p>
<p><b><i>P-2 If so, what do you find are the most commonly developed procurement strategies?</i></b></p> <p>Typically it is a mixture of price and non-price based strategies. This is more so government Client's whereas with private agencies it is more price driven. Strategies are typically value based these day. <span style="border: 1px solid black; padding: 2px;">2.2</span></p>
<p><b><i>P-3 Do you think that these strategies provide sufficient scope in relation to performance measurement?</i></b> <span style="border: 1px solid black; padding: 2px;">2.3</span></p> <p>Yes, particularly public service projects have a strong focus on performance measurement for Consultants and Contractors.</p>
<p><b><i>P-4 In what way do you think the project outcome differs if a procurement strategy is price based as opposed to value or non-price based strategies?</i></b></p> <p>It depends, the industry is very cyclic and is reflective of the current status of the economy. Particularly at the moment there is a heavy focus on price. At the moment the agencies are spoilt for choice with a lot of companies and resources available placing more of an emphasis on price. This has been more so over the last three years with the down turn in the economy. <span style="border: 1px solid black; padding: 2px;">2.4</span></p>
<p><b><i>P-5 By adopting a price based procurement strategy, what areas of a project does this detract from, if any?</i></b></p> <p>The major outcome of a price based strategy is a reduction in the quality which is closely linked to the delivery timeframes. With reduced price comes the need to deliver quicker as the funds are not there to waste time.</p> <p>There is also the issue of your own staff being put under pressure to perform the task that should have taken longer than what has been allowed but due to the low price, the budget isn't there to allow this much time.</p> <p>You need to squeeze the price, which squeezes the time and squeezes the quality. <span style="border: 1px solid black; padding: 2px;">2.4</span></p>

***P-6 Do you think a non-price approach delivers a greater project outcome when compared to a price-based approach, why or why not?***

Yes, the quality will definitely improve, the timeframes will be more realistic and the team performance would generally be better because you have the time to do the proper reviews and checking. 2.5

***P-7 Do you think a non-price approach increases or creates additional project costs, why or why not?***

Yes the Client will pay slightly more but then benefits and the quality far outweigh the cost in the long term. This can also help with whole of project costs as it can result in less variations.

It allows you to cover the risks better and with more attention.

2.7

***P-8 Which procurement approach do you think the industry should try and move towards in an attempt to achieve greater project outcomes and why?***

I believe that there needs to be a balanced approach to procurement in that you don't like to create laziness, and we don't want to go back to the 2008, 9 and 10 periods where due to the lack of resources we have to go through a dramatic increase in labour costs. You need to keep the world real and price always needs to be considered to keep the project realistic while also incorporating non-price measures to ensure the desired outcome can actually be delivered.

2.8

***P-9 Do you find that procurement is a difficult, vague and ambiguous process, why or why not?***

This is currently being made difficult due to lack of experience, foreigners coming in that don't understand processes and systems, you have very poorly scoped briefs coming out making it difficult to know what the Client wants. Knowing what they want and what they can actually have make it difficult to prepare a correct, well scoped and well-priced bid.

It is time consuming from the perspective that many agencies have a panel that you need to be on to be a preferred supplier. To get on this panel you need to demonstrate appropriate experience, systems and resources. Then you need to show this all over again when bidding on a project. Why do you need to demonstrate it to get on the panel, then demonstrate it again for a project?

Every time you prepare a tender it costs money so having to demonstrate these areas time and time again is very costly especially in today's market. As an example, five years ago, our winning ratio was one in three and these days it is closer to 1 in 7 or 8, sometimes 10. This is an indication of current market conditions which creates significant additional overhead costs,

2.9

<b>PERFORMANCE MEASURES (PM)</b>
<p><b><i>PM-1 How have you been involved in performance measurement for civil construction projects?</i></b></p>
<p>Yes heavily involved in the monitoring and reporting against performance measures and KPI's. This is typically done on a monthly basis and involves the preparation of charts, graphs and reports to demonstrate the month's performance. <span style="border: 1px solid black; padding: 2px;">3.1</span></p>
<p><b><i>PM-2 What measures do you find are typically adopted in performance measurement?</i></b></p>
<p>Quality, time, relationships, resources and team, capacity and capability, previous experience, communication from a personal and team perspective. <span style="border: 1px solid black; padding: 2px;">3.2</span></p>
<p><b><i>PM-3 Do common procurement strategies allow the adoption of sufficient performance measures and are they utilised in projects?</i></b></p>
<p>Yes and they do help in the delivery of a project but they are not the be all and end all regarding the delivery or outcome of a project. <span style="border: 1px solid black; padding: 2px;">2.3</span></p>
<p><b><i>PM-4 Are typically adopted performance measures reflective of current practices in the civil construction industry, why or why not?</i></b></p>
<p>Yes <span style="border: 1px solid black; padding: 2px;">3.3</span></p>
<p><b><i>PM-5 How is performance measurement in the construction industry perceived?</i></b></p>
<p>The industry abides by the rules and the processes and policies that are in place. If the agencies commissioning the works insist on performance measurement, then typically the industry is typically to undertake and assist in the process as it is part of winning the work. It's not costly, it doesn't take too much time, it's fairly straight forward and you just do it because it provides a paper trail and hopefully you get some good feedback so you can improve.</p> <p>I think performance measurement is good but it's only a part of project delivery and achieving an outcome. It's a paper trail but it doesn't make the relationship and better and worse. Performance measurement is a risk to Consultants and Contractors but it encourages them to lift their game and do a better job. It's a tool that will be used more and more to weed out poor performing operators in the future. <span style="border: 1px solid black; padding: 2px;">3.4</span></p>
<p><b><i>PM-6 If a project has an emphasis on performance measurement and is implemented well, how do you believe this affects the project outcome?</i></b></p>
<p>Performance measurement is just a communication tool more than anything. It gives direction. You can't underestimate the early warnings about how you are travelling and I follow this religiously as it gives you a good heads up about how you are travelling. <span style="border: 1px solid black; padding: 2px;">3.5</span></p>

<p>In this regard it can help deliver a greater project outcome as it provides another monitoring tool for the successful delivery of the project. 3.5</p>
<p><b><i>PM-7 Is performance measurement an arduous element in project delivery, why or why not?</i></b></p>
<p>No, refer PM-6. 3.4</p>
<p><b><i>PM-8 Do you think new areas of performance measurement aside from those typically used could be introduced that better reflect current practice in the civil construction industry?</i></b></p>
<p>It's not so much to do with performance measurement, it's more to do with the project budget and funding. 3.6</p>
<p><b><i>PM-9 What areas or if not, why do you think it is not necessary?</i></b></p>
<p>Innovation can sometimes be costly and you need to invest in the process, time and resources to implement the innovation. With an understanding Client they may support this but it is a cost issue.</p> <p>It can take long term vision to invest in innovation and may not yield benefits until later in the project lifecycle which can be difficult to get Client's to see. 3.6</p>
<p><b><i>PM-10 Do you think that current performance measurement adopted under procurement strategies encourages Contractors to be innovative at the benefit of the Client?</i></b></p>
<p>No, but there is a government incentive in the research and development area where if we innovate on a project there is tax incentives from the ATO that can be received. Yes you may not get money from the Client but you can account for this as a cost offset. 3.7</p>
<p><b><i>PM-11 If not, what types of performance measurement could be introduced to encourage this?</i></b></p>
<p>Cost incentive performance measures are difficult especially in the government sector, its ok in the land development sector where costs are not so heavily scrutinised. . The issue is getting the Client to see the benefit in innovation and getting them to come to the party and contribute to the cost. It's difficult to justify innovation to the Client and to try and get them to accept the costs which constricts the industry's ability to innovate.</p> <p>The difficulty with innovation, particularly in the government sector is that they are so entrenched in their specifications and standards that you can't go above, around or sideways on these. Even if you try and innovate something at no cost to them, it is very difficult to get them to accept that something is better than the ways it's been getting done for the last 10 years. 3.7</p>

People are smart and they can innovate products that are not always to the norm but can still deliver what is desired and this should be given more consideration.

It's all about risk and the legalities of the design and the project. The biggest fear is how you would fair if you are legally challenged. How do you comply, if you don't actually comply with the specification or standard, regardless of the innovation? You have to be careful to not impede on your own insurances and if you get taken to court, what are your chances to defend what you have done.

The government is sometimes so risk averse that it is over the top. Some of the processes that they require can simply kill a project before it's even got up due to risk averseness.

***PM-12 Have you found that the construction industry is typically slow to change, develop and adopt new process or techniques that could improve performance?***

I think that businesses generally move with the time and there is no time to be complacent or continue to do things the way it's been done 10 years ago. The industry generally moves with the times not only with technology, but how we build teams and deliver projects. Right now in the current construction market businesses are changing to be as lean and mean as possible due to the current conditions of the economy.

I think technology is a wonderful thing that most of the industry embrace, looking ahead five to ten years from now, technology has a lot to give us in regards to quality and time.

3.4

***Are you aware of the KPI's developed for the Australian Construction Industry by the Australian Construction Industry Forum and the Australian Procurement and Construction Council?***

No I have not heard of these.

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**  
Luke Sceney

<b>Name</b>	IP13	<b>Date</b>	31.07.2015
<b>Organisation</b>	Tier 3 Construction Contractor		
<b>Location</b>	Interviewee's Offices		
<b>Time Start</b>	3.30pm	<b>Time End</b>	4.45pm
<b>INTERVIEWEE BACKGROUND INFORMATION (BI)</b>			
<b><i>BI-1 What is your current role within your organisation?</i></b>			
<p>Managing Director of the company.</p> <p align="right">1.3</p>			
<b><i>BI-2 How long have you been involved in the construction industry?</i></b>			
<p>I started working in the industry part time when I was 14 and have been in the industry ever since. A total of 24 years so far.</p> <p align="right">1.1</p>			
<b><i>BI-3 Throughout this time, what has been your typical role?</i></b>			
<p>Started as a labourer and got an apprenticeship whereby I showed a lot of ambition. I didn't just want to be a Carpenter – I always wanted to lead jobs. Had an opportunity to start leading small projects. Then went onto larger projects as a Foremen where I was responsible for basically everything. Then went on to become a project manager but was also involved in the business side from a hiring and firing side – responsible for HR Management. Then I became General Manager of the company I was working for before moving on launching my own construction company where we have now been in operation for almost 8 years.</p> <p align="right">1.3</p>			
<b><i>BI-4 Have you primarily been involved in public or private industry?</i></b>			
<p>Always worked in private industry but undertake both government and private sector construction projects.</p> <p align="center">1.4 and 1.5</p>			

<b>PROCUREMENT (P)</b>
<b><i>P-1 Have you been involved in the development of procurement strategies?</i></b>
Yes, particularly with this company where I have directly been involved in the development of our procurement strategies and purchasing policies. <span style="border: 1px solid black; padding: 2px;">2.1</span>
<b><i>P-2 If so, what do you find are the most commonly developed procurement strategies?</i></b>
At the end of the day it is always heavily price focussed. Yes there are other considerations given just as experience and that kind of thing but if you are not competitive on price you won't win the work. <span style="border: 1px solid black; padding: 2px;">2.2</span>
<b><i>P-3 Do you think that these strategies provide sufficient scope in relation to performance measurement?</i></b>
Yes <span style="border: 1px solid black; padding: 2px;">2.3</span>
<b><i>P-4 In what way do you think the project outcome differs if a procurement strategy is price based as opposed to value or non-price based strategies?</i></b>
The reality is every project, at the end of the day, is price driven. We do a lot of local government work. Every project we have ever priced, price point as always had the highest ranking. Other areas such as experience, quality and safety may be allocated weighting of 5 or 10 but price is always at least 30 if not more. <span style="border: 1px solid black; padding: 2px;">2.4</span>
<b><i>P-5 By adopting a price based procurement strategy, what areas of a project does this detract from, if any?</i></b>
<span style="border: 1px solid black; padding: 2px;">2.4 and 2.6</span>
<p>When things are price driven, it makes you think harder and smart about how you can deliver a project to the maximum while still achieving a minimum cost. Being price based, you will always get companies who will have very low margins or even negative margins to win work, especially at the moment where we have a saturated market. This can be a sign of two things – the first is that very poor quality documentation has been provided and the Contractor realises there is a large opportunity for changes and variations in the project. This is being seen more and more as again, Consultants are being driven by price in a saturated market where the documents being produced are of a lesser quality than what they would normally be. We're finding that 100's of thousands of dollars are being won or lost on one line items in specifications. Some companies have specific people who read every word of every contract purely seeking opportunity for variations which will drive the price up. It depends though, it comes back to the documentation and the Client.</p> <p>One of the hardest things to deal with is when you do have a legitimate variation but Client's feel like they are being shafted. This makes it tough, especially when you are doing work for a repeat Client, as we do, you always try and protect the Client but some are renowned for producing poor quality documentation but you try and clear this up during the tendering phase.</p>

<p>This said, you still need to try and maintain a level playing field as other Contractors won't ask these questions and will simply not factor in the costs. <span style="border: 1px solid black; padding: 2px;">2.4 and 2.6</span></p>
<p><b><i>P-6 Do you think a non-price approach delivers a greater project outcome when compared to a price-based approach, why or why not?</i></b></p>
<p>A lot of the time I don't think there would be a huge amount of difference but it comes back to having good quality documentation and a good brief from the Client. I think these are the two keys to a good, or bad outcome. <span style="border: 1px solid black; padding: 2px;">2.5</span></p>
<p><b><i>P-7 Do you think a non-price approach increases or creates additional project costs, why or why not?</i></b></p>
<p>Not necessarily. <span style="border: 1px solid black; padding: 2px;">2.7</span></p>
<p><b><i>P-8 Which procurement approach do you think the industry should try and move towards in an attempt to achieve greater project outcomes and why?</i></b></p>
<p>Personally I would like to see it move towards more of the design and construct type arrangement. It's nothing against Consultants I just find that a lot of firms are backwards when it comes to understanding construction and methodologies. There are new technologies that are coming out every day that are not being understood, utilised or implemented by Consultants whereas in the D &amp; C space you can have this input and ensure that things are utilising the latest and greatest in regards to methodologies and construction processes. For instance, we recently undertook a project that was design and then build. During the construction phase a new drainage system was required as part of the works, we're queried the Principal because it appeared that no consideration had been given to how the drain could be maintained. As a result, we were engaged to develop a new solution working with the maintenance department – in a D &amp; C environment this would have been avoided. <span style="border: 1px solid black; padding: 2px;">2.8</span></p> <p>Even simple things like Engineer's undertaking inspections – we're in a market where everything needs to be built yesterday. Days of 48 hours' notice to get an Engineer on site for an inspection, it's not good enough anymore. Client's want more in less time these days.</p>
<p><b><i>P-9 Do you find that procurement is a difficult, vague and ambiguous process, why or why not?</i></b></p>
<p>Sometimes I find it can be difficult especially if you are dealing with Client nominated suppliers. I think if documentation is poor, it's going to add cost to the project and it can make things more difficult during tendering. It can also be made difficult by specifications include products that haven't been made for 20 years. This does happen believe it or not and this can add stress and heartache to the process. I'd say one out of every three tenders we find products that can not be sourced and it's primarily due to old specifications that get continually recycled project by project. <span style="border: 1px solid black; padding: 2px;">2.9</span></p>

<b>PERFORMANCE MEASURES (PM)</b>
<p><b><i>PM-1 How have you been involved in performance measurement for civil construction projects?</i></b></p>
<p>Yes through the monitoring of KPIs on construction projects and of course operating on projects against KPIs. <span style="border: 1px solid black; padding: 2px;">3.1</span></p>
<p><b><i>PM-2 What measures do you find are typically adopted in performance measurement?</i></b></p>
<p>Quality, safety (this is huge), time, cost, past performance, environmental <span style="border: 1px solid black; padding: 2px;">3.2</span></p>
<p><b><i>PM-3 Do common procurement strategies allow the adoption of sufficient performance measures and are they utilised in projects?</i></b></p>
<p>Yes, there's always your common once and it's done on a percentage basis. There's always an item for environmental, quality, and safety. It also depends on the project though – measures will be adjusted to suit the project. We had a project recently that was high risk and safety was ranked equally against price. This required us to give significant thought to our methodologies and the safety aspect as this was a very critical element of the project. <span style="border: 1px solid black; padding: 2px;">2.3</span></p>
<p><b><i>PM-4 Are typically adopted performance measures reflective of current practices in the civil construction industry, why or why not?</i></b></p>
<p>I think what we get monitored on is fair and reasonable. I think the issue with performance measurement is that areas of performance that are supposed to help the industry by limiting who can undertake work based on things such as quality systems and past performance are not being taken seriously. There's Contractor's winning work who don't have the correct ISO systems in place yet they are still awarded the work because of this price driven approach with a lack of focus on quality. I'm not saying these Contractor's can't deliver a quality product, but without the correct certifications etc, how can they demonstrate that they have these systems in place? <span style="border: 1px solid black; padding: 2px;">3.3</span></p>
<p><b><i>PM-5 How is performance measurement in the construction industry perceived?</i></b></p>
<p>I think if you don't market you'll never get anyway, performance measurement can help with this. It's all about smoke and mirrors in this world, we seem bigger than we actually are. I think it's a good thing. We do a lot of work for repeat Client's and this comes back to them monitoring us and being happy with how we've performed and hence awarding us more work.</p> <p>We take it very seriously and we always utilise the Project Officer / Principals' Rep as much as we can to ensure we are meeting their expectation. We use them, to help us to make sure that it meets their standards.</p> <p>It can be made difficult by not only having to perform against specified measures but also standards and legislation. What I read and interpret and what someone else reads and interprets can be different and you might think you are doing everything right but in actual fact you aren't</p>

<p>but it's not because you didn't try, it's because your interpretation was different. I don't think anyone is right or wrong, as long as the job is progressing well and safely and the intent is there, what's the problem?</p>
<p><b><i>PM-6 If a project has an emphasis on performance measurement and is implemented well, how do you believe this affects the project outcome?</i></b></p>
<p>I think it definitely change the outcome of the project for the better. 3.5</p>
<p><b><i>PM-7 Is performance measurement an arduous element in project delivery, why or why not?</i></b></p>
<p>No it's just part and parcel of delivering the project. 3.4</p>
<p><b><i>PM-8 Do you think new areas of performance measurement aside from those typically used could be introduced that better reflect current practice in the civil construction industry?</i></b></p>
<p>No not really. Contractors like us will always try and achieve the best we can. It's how we survive. You'll always get rogue companies but that happens in every industry. We generally try and value add and achieve the best we can for our Client's regardless of the performance measures. 3.6</p>
<p><b><i>PM-9 What areas or if not, why do you think it is not necessary?</i></b></p>
<p>Refer PM-8. 3.6</p>
<p><b><i>PM-10 Do you think that current performance measurement adopted under procurement strategies encourages Contractors to be innovative at the benefit of the Client?</i></b></p>
<p>Not overly, from our perspective innovation is driven by our business model. If we can value add to a project and have the Client appreciate this it often means they'll use us again. Next time they have a difficult project, they'll come to us. 3.7</p>
<p><b><i>PM-11 If not, what types of performance measurement could be introduced to encourage this?</i></b></p>
<p>It comes back to pain share, gain share. Often with innovation you can provide a cost saving but this then impacts on your bottom line also. Why would we do this unless there is some incentive there for us to do that? We've used innovation in the past to not only save Clients money but also build relationships but it would be good to see financial benefits for us as well.</p> <p>An example of this was we were doing work for a private agency in which we were able to save them \$100k on a car park they needed constructed. This \$100k was put towards completing other works which they gave to us. This is an example of how you can be rewarded for seeking innovation at the benefit of the Client. 3.7</p>

***PM-12 Have you found that the construction industry is typically slow to change, develop and adopt new process or techniques that could improve performance?***

The whole industry is very cyclic and that has been very turbulent over the last 10 years with the GFC and change of governments a couple of times now in Queensland.

The construction sector is a hard game. It's hard physically, it's hard mentally, and it's a tough, tough industry. You don't just knock off and switch off in this industry. There has to be change in the industry, it is currently such a volatile market that Contractors are living on the shirt tails of the next project. Gone are the days of making 10% margin on a project and when you are delivering millions dollars job and coming away with less than 10% why bother? There is so much management required now to keep a company alive and often these can be out of your control. Things like poor documentation can make or break you, ridiculous time lines. But at the end of the day it comes back to making smart business decisions.

One of the issues is the Australia market has priced itself out of the game in regards to labour. It's cheaper to import products these days.

The industry is stifled by red tape. You've got to go through three levels of red tape with everything you do. Federal, State and Local tape. We should move away from state governments, have a solid Federal arm and then let local council handle the rest. To do this though would require the merger of more local councils into larger councils similar to that of the large city councils like BCC and CGC. These councils are capable of handling their needs without the input of state government. 3.4

***Are you aware of the KPI's developed for the Australian Construction Industry by the Australian Construction Industry Forum and the Australian Procurement and Construction Council?***

No I am not familiar with these.

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**  
Luke Seeney

<b>Name</b>	IP14	<b>Date</b>	30.09.15
<b>Organisation</b>	Local Environmental and Planning Consultancy		
<b>Location</b>	Gelly Consulting Offices		
<b>Time Start</b>	10.30am	<b>Time End</b>	11.00am
<b>INTERVIEWEE BACKGROUND INFORMATION (BI)</b>			
<b><i>BI-1 What is your current role within your organisation?</i></b>			
<p>Currently the director of the consultancy. I am also the Vice President for the Chamber of Commerce at Broadbeach.</p> <p align="center">1.3</p>			
<b><i>BI-2 How long have you been involved in the construction industry?</i></b>			
<p>I have been involved in the industry for 20 years.</p> <p align="center">1.1</p>			
<b><i>BI-3 Throughout this time, what has been your typical role?</i></b>			
<p>I started as an Environmental Planner with council before moving on to senior levels in council in that capacity as well as providing planning advice. I then went out and established my own consultancy which has grown from one office to three in various locations throughout Australia.</p> <p align="center">1.3</p>			
<b><i>BI-4 Have you primarily been involved in public or private industry?</i></b>			
<p>I have 7 years of public experience with the remainder of the years in private industry.</p> <p align="center">1.4 and 1.5</p>			

<b>PROCUREMENT (P)</b>
<p><b><i>P-1 Have you been involved in the development of procurement strategies?</i></b></p>
<p>Yes, I have been involved in the development of procurement approaches for our consultancy as well as the implementation of strategies from a local government perspective. <span style="border: 1px solid black; padding: 2px;">2.1</span></p>
<p><b><i>P-2 If so, what do you find are the most commonly developed procurement strategies?</i></b></p>
<p>In my opinion the most common procurement approach that I see and have been involved in a design and construct procurement approaches. <span style="border: 1px solid black; padding: 2px;">2.2</span></p>
<p><b><i>P-3 Do you think that these strategies provide sufficient scope in relation to performance measurement?</i></b></p>
<p>Most projects have a performance aspect and criteria to them. This is typically approved by a local or state agency that is implemented through the procurement strategy and monitor on the project. This is then back to the administrators of the project to implement and monitor through reporting mechanisms etc. <span style="border: 1px solid black; padding: 2px;">2.3</span></p>
<p><b><i>P-4 In what way do you think the project outcome differs if a procurement strategy is price based as opposed to value or non-price based strategies?</i></b></p>
<p>You often realise that you pay for what you get and in some instances clients will go for price only and, not all the time but some of the time, this does come back to have 'hidden' costs associated with that approach. <span style="border: 1px solid black; padding: 2px;">2.4</span></p>
<p><b><i>P-5 By adopting a price based procurement strategy, what areas of a project does this detract from, if any?</i></b></p>
<p>The biggest impacts are usually time related because the cheapest price hasn't fully scoped the project sufficiently and then starts to seek variation or seek to change a design or outcome that has been agreed to. This is to suit their low price which doesn't necessarily mean it is wrong or right but this can cause time delays to seek approvals to accommodate, what in some instances, may be a better idea but often it's the contractor trying to change the job to suit the price as opposed to the outcome. <span style="border: 1px solid black; padding: 2px;">2.6</span></p>
<p><b><i>P-6 Do you think a non-price approach delivers a greater project outcome when compared to a price-based approach, why or why not?</i></b></p>
<p>Not necessarily, in a competitive environment there could always be someone who could deliver the same product at a cheaper price. <span style="border: 1px solid black; padding: 2px;">2.5</span></p>

<p><b><i>P-7 Do you think a non-price approach increases or creates additional project costs, why or why not?</i></b></p>
<p>It sometimes can, but that comes back to knowing your contractor and what they can bring to the table from a whole of project perspective. <span style="border: 1px solid black; padding: 2px;">2.7</span></p>
<p><b><i>P-8 Which procurement approach do you think the industry should try and move towards in an attempt to achieve greater project outcomes and why?</i></b></p>
<p>I don't necessarily have a preference, however I do find that the design and construct approach has the advantage that you build the relationships with the people that you are designing an outcome for, this creates strength and reliability in the team dedicated to the outcome.</p> <p>There always has to be a balance between price and non-price criteria so you can objectively select contractors, if required, based on price but it is also important to have the non-price elements to ensure you get the right contractor for the project. <span style="border: 1px solid black; padding: 2px;">2.8</span></p>
<p><b><i>P-9 Do you find that procurement is a difficult, vague and ambiguous process, why or why not?</i></b></p>
<p>The process of tendering is difficult due to the amount of information that is required to tick a lot of boxes that aren't the focus of the project.</p> <p>In terms of the assessment of tenders and the implementation of strategies, this is not really difficult due to structured policies and procedures on how to undertake the process. <span style="border: 1px solid black; padding: 2px;">2.9</span></p>
<p><b>PERFORMANCE MEASURES (PM)</b></p>
<p><b><i>PM-1 How have you been involved in performance measurement for civil construction projects?</i></b></p>
<p>I've been involved from a monitoring and reporting perspective on projects. <span style="border: 1px solid black; padding: 2px;">3.1</span></p>
<p><b><i>PM-2 What measures do you find are typically adopted in performance measurement?</i></b></p>
<p>Processes, techniques, ability to satisfactorily deliver what it is that is desired. They are also monitored heavily on safety. <span style="border: 1px solid black; padding: 2px;">3.2</span></p>
<p><b><i>PM-3 Do common procurement strategies allow the adoption of sufficient performance measures and are they utilised in projects?</i></b></p>
<p>Yes they do with some overarching performance measures that are dictated through local or state policy. <span style="border: 1px solid black; padding: 2px;">2.3</span></p>

<p><b><i>PM-4 Are typically adopted performance measures reflective of current practices in the civil construction industry, why or why not?</i></b></p>
<p>I don't have a definitive answer to that but from my perspective it has evolved and continues to evolve. The level of performance and the measures of performance have changed and increased to reflect new standards and information. <span style="border: 1px solid black; padding: 2px;">3.3</span></p>
<p><b><i>PM-5 How is performance measurement in the construction industry perceived?</i></b></p>
<p>It is not new to anyone, people understand they get reviewed, they get monitored, they've got a standard to meet. <span style="border: 1px solid black; padding: 2px;">3.4</span></p>
<p><b><i>PM-6 If a project has an emphasis on performance measurement and is implemented well, how do you believe this affects the project outcome?</i></b></p>
<p>I don't think it affects the outcome because at some point you have to deliver that outcome at the end of the day. What it does impact on is how you get to the outcome. If everyone is performing well and to the plan, it makes the delivery of the project quicker and easier. <span style="border: 1px solid black; padding: 2px;">3.5</span></p>
<p><b><i>PM-7 Is performance measurement an arduous element in project delivery, why or why not?</i></b></p>
<p>It can be, because a lot of it is not within your control. In some cases, I have found that the performance measures have been extensive and lengthy and can take a lot of time to monitor and undertake.</p> <p>It is also made difficult in terms of the relationships that you build when contractors aren't meeting satisfactory levels of performance due to the conflict that it can create. The key is to quickly identify the issue to avoid potentially increasing the impacts at a later stage in the project which is possible through monitoring performance. <span style="border: 1px solid black; padding: 2px;">3.4</span></p>
<p><b><i>PM-8 Do you think new areas of performance measurement aside from those typically used could be introduced that better reflect current practice in the civil construction industry?</i></b></p>
<p>I think it is done fairly well and that there are enough measures in place that it does work. <span style="border: 1px solid black; padding: 2px;">3.6</span></p>
<p><b><i>PM-9 What areas or if not, why do you think it is not necessary?</i></b></p>
<p>Refer to PM-8. <span style="border: 1px solid black; padding: 2px;">3.6</span></p>
<p><b><i>PM-10 Do you think that current performance measurement adopted under procurement strategies encourages Contractors to be innovative at the benefit of the Client?</i></b></p>
<p>They can, through adaptive management to a job as you may be able to find a better way of doing something and still hit the performance targets. <span style="border: 1px solid black; padding: 2px;">3.7</span></p>

***PM-11 If not, what types of performance measurement could be introduced to encourage this?***

It is not necessarily the measures that will encourage this but the openness of the client to accept changes and be willing to allow exploration of new techniques or processes.

3.7

***PM-12 Have you found that the construction industry is typically slow to change, develop and adopt new process or techniques that could improve performance?***

I would say that the industry has adapted as time has gone on, willingly or not. They tend to do this relatively quickly and they basically need to in order to keep pace in the industry.

3.4

***Are you aware of the KPI's developed for the Australian Construction Industry by the Australian Construction Industry Forum and the Australian Procurement and Construction Council?***

No I have not heard of these.

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**  
Luke Seeney

<b>Name</b>	IP15	<b>Date</b>	16.09.15
<b>Organisation</b>	Engineering Consultancy		
<b>Location</b>	Interviewee's Offices		
<b>Time Start</b>	5.00pm	<b>Time End</b>	6.00pm
<b>INTERVIEWEE BACKGROUND INFORMATION (BI)</b>			
<b><i>BI-1 What is your current role within your organisation?</i></b>			
<p>Director of a local engineering consultancy as well as a sub-contractor for a government agency project managing the pre-construction and construction phase of civil infrastructure projects for the Principal.</p> <p align="center">1.3</p>			
<b><i>BI-2 How long have you been involved in the construction industry?</i></b>			
<p>33 years.</p> <p align="center">1.1</p>			
<b><i>BI-3 Throughout this time, what has been your typical role?</i></b>			
<p>I started in civil design before moving into construction as a project manager and then into consultancy / business management while also performing the project manager role for state government agency.</p> <p align="center">1.3</p>			
<b><i>BI-4 Have you primarily been involved in public or private industry?</i></b>			
<p>50/50 split across the public and private sectors.</p> <p align="center">1.4 and 1.5</p>			

<b>PROCUREMENT (P)</b>
<p><b><i>P-1 Have you been involved in the development of procurement strategies?</i></b></p>
<p>No not in the development but I have been heavily involved in the implementation of strategies in accordance with those already developed. <span style="border: 1px solid black; padding: 2px;">2.1</span></p>
<p><b><i>P-2 If so, what do you find are the most commonly developed procurement strategies?</i></b></p>
<p>Construct only is the most common procurement approach used. <span style="border: 1px solid black; padding: 2px;">2.2</span></p>
<p><b><i>P-3 Do you think that these strategies provide sufficient scope in relation to performance measurement?</i></b></p>
<p>The procurement types have a number of set performance measures already which are utilised on the project. They do not prohibit performance measurement. <span style="border: 1px solid black; padding: 2px;">2.3</span></p>
<p><b><i>P-4 In what way do you think the project outcome differs if a procurement strategy is price based as opposed to value or non-price based strategies?</i></b></p>
<p>I think regardless of the approach it is, to a large extent, dependent on the contractor that you get. When you go out to the market, you have an idea of what kind of dollars to expect. If a price comes in that is unusually low compared to what you expected to pay then, you automatically get a cost buffer built in. At the end of the day, the project will end up getting back towards the initial true cost that you were expecting in the first place.</p> <p>The outcome isn't impacted so much by a price only approach, but where the issue is, is that there could potentially be a lot more pain in achieving that outcome if the strategy was price driven. <span style="border: 1px solid black; padding: 2px;">2.4</span></p>
<p><b><i>P-5 By adopting a price based procurement strategy, what areas of a project does this detract from, if any?</i></b></p>
<p>It can impact on the relationships and the administration of the contract which is in reference to the point made in P-4 about the contractor having a greater tendency to seek variations. At the same time though, the costs were initially lower so, to a certain extent, you are comfortable with paying some variations. In saying that, whether you go with the low price contractor or the median price contractor, you will still get a similar amount of variations. <span style="border: 1px solid black; padding: 2px;">2.6</span></p>
<p><b><i>P-6 Do you think a non-price approach delivers a greater project outcome when compared to a price-based approach, why or why not?</i></b></p>
<p style="text-align: center;"><span style="border: 1px solid black; padding: 2px;">2.5</span></p> <p>No not necessarily. If you wanted a four lane road to start with you will still get your four lane road but it's about how you got that four lane road that is impacted by the choice of strategy.</p>

<p>The benefit with a non-price approach from a tender assessment perspective, is that it gives you more flexibility to select the contractor that you may desire.</p>
<p><b><i>P-7 Do you think a non-price approach increases or creates additional project costs, why or why not?</i></b></p>
<p>No not necessarily. Similarly to the response in P-5, you always end up around the expected costs of the project that were initially budgeted for. <span style="border: 1px solid black; padding: 2px;">2.7</span></p>
<p><b><i>P-8 Which procurement approach do you think the industry should try and move towards in an attempt to achieve greater project outcomes and why?</i></b></p>
<p>In my opinion I think a hybrid of the alliance type arrangement could potentially work well. With a traditional design first then build, the client has ultimate control of the product he desires. With a design and construct approach, you loosely get what you want, but not specifically because the control around the design has been lost by the client. In my experience, you get compromised situations in D &amp; C because the driver is not about outcome, it's about price and the contractor is doing things for the wrong reason. The driver is always going to be the contractor's bottom line in a D &amp; C arrangement.</p> <p>My view is that a traditional construct only works well but it could have some non-price criteria to allow you to better select the appropriate contractor. <span style="border: 1px solid black; padding: 2px;">2.8</span></p>
<p><b><i>P-9 Do you find that procurement is a difficult, vague and ambiguous process, why or why not?</i></b></p>
<p>No it's not difficult because of the structured processes. When you get into a tough situation with procurement it's just about have the courage to employ the guidance from the policies and follow the correct process even if it means tough conversations with contractors.</p> <p>The procurement process isn't difficult, but the issue is about corporate will to apply those requirements because the industry will kick up a stink and run to ministers etc. from which you will be asked to justify your processes etc. <span style="border: 1px solid black; padding: 2px;">2.9</span></p> <p>It doesn't matter how explicit the tender documents are, or how well you can justify your decisions, there is always issues because you are dealing with businesses in a high stakes gain.</p>
<p><b>PERFORMANCE MEASURES (PM)</b></p>
<p><b><i>PM-1 How have you been involved in performance measurement for civil construction projects?</i></b></p>
<p>Yes I have through the preparation of monthly performance reports and participating in workshops with contractors regarding this reporting. <span style="border: 1px solid black; padding: 2px;">3.1</span></p>

<p><b><i>PM-2 What measures do you find are typically adopted in performance measurement?</i></b></p>
<p>Relationships, time, progress, quality of product, contractors team, capability and experience, claims, disputes. <span style="border: 1px solid black; padding: 2px;">3.2</span></p>
<p><b><i>PM-3 Do common procurement strategies allow the adoption of sufficient performance measures and are they utilised in projects?</i></b></p>
<p>The strategies typically include some performance measures for a project which are pre-determined as part of the strategy. <span style="border: 1px solid black; padding: 2px;">2.3</span></p>
<p><b><i>PM-4 Are typically adopted performance measures reflective of current practices in the civil construction industry, why or why not?</i></b></p>
<p>Yes, they typically provide sufficient measurement of performance relative to civil construction projects. There isn't a great deal that can be measured as such and it's important to ensure that it isn't an onerous process by having excessive measures. <span style="border: 1px solid black; padding: 2px;">3.3</span></p>
<p><b><i>PM-5 How is performance measurement in the construction industry perceived?</i></b></p>
<p>I think they understand that it is part of project delivery and something that you have to do. It also feeds into the pre-qualification system so if they want to maintain their status, they have to do it. <span style="border: 1px solid black; padding: 2px;">3.4</span></p>
<p><b><i>PM-6 If a project has an emphasis on performance measurement and is implemented well, how do you believe this affects the project outcome?</i></b></p>
<p>I believe that performance measurement itself doesn't change the project outcome, it is just a means of monitoring the contractor and making sure they can maintain their pre-qualification status. The way the contracts are set up means that this dictates the outcome and that the contractor is compliant in regards to areas such as quality, traffic management, environment etc.</p> <p>Performance measurement more so changes how the project is delivered, not so much what is delivered.</p> <p>The only thing that drives performance is dollar. A contractor will not do anything more than what they are required to do, regardless of whether it's being monitored or not. The way to drive behaviours is to put a financial reward on it. <span style="border: 1px solid black; padding: 2px;">3.5</span></p>
<p><b><i>PM-7 Is performance measurement an arduous element in project delivery, why or why not?</i></b></p>
<p>It can be difficult if when dealing with poor performance due to conflict. The issue is that many of the performance measurement systems are a consensus system where the client scores the contractor and the contractor scores themselves and then you meet in the middle. So it isn't</p>

<p>truly reflective of the client's perspective on the contractor. It's a compromise, whereas if you didn't have to agree, you could have a true position of each person's thoughts. 3.4</p>
<p><b><i>PM-8 Do you think new areas of performance measurement aside from those typically used could be introduced that better reflect current practice in the civil construction industry?</i></b></p>
<p>No not necessarily. The main elements are already being measured and again you don't want to over complicate the process or make it more difficult than it needs to be. 3.6</p>
<p><b><i>PM-9 What areas or if not, why do you think it is not necessary?</i></b></p>
<p>Refer PM-8. 3.6</p>
<p><b><i>PM-10 Do you think that current performance measurement adopted under procurement strategies encourages Contractors to be innovative at the benefit of the Client?</i></b></p>
<p>No I don't think it does. 3.7</p>
<p><b><i>PM-11 If not, what types of performance measurement could be introduced to encourage this?</i></b></p>
<p>I don't think performance measurement can have any input into innovation. I think this can be achieved by the adoption of the appropriate procurement strategy that provides the necessary freedoms to allow for innovation. What drives innovation is the dollars in the pocket of the contractor, not performance measurement. There's very little room for innovation once construction has started, innovation is in terms of the design of what you're building and the materials. Construction techniques are very much optimised so I think there's little room for innovation in this respect. 3.7</p> <p>Performance measurement won't drive innovation because in a way, it's after the event.</p>
<p><b><i>PM-12 Have you found that the construction industry is typically slow to change, develop and adopt new process or techniques that could improve performance?</i></b></p>
<p>No not really, I think the industry responds and adopts well as contractors need to in order to be able to survive in a free market. 3.4</p> <p><b><i>Are you aware of the KPI's developed for the Australian Construction Industry by the Australian Construction Industry Forum and the Australian Procurement and Construction Council?</i></b></p> <p>No I am not.</p>

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**  
Luke Seeney

<b>Name</b>	IP16	<b>Date</b>	09.09.2015
<b>Organisation</b>	Tier 2 Construction Contractor		
<b>Location</b>	Interviewee's Site Office		
<b>Time Start</b>	6.45am	<b>Time End</b>	7.30am
<b>INTERVIEWEE BACKGROUND INFORMATION (BI)</b>			
<b><i>BI-1 What is your current role within your organisation?</i></b>			
I am currently a Project Manager delivery civil infrastructure projects. <span style="float: right; border: 1px solid black; padding: 2px;">1.3</span>			
<b><i>BI-2 How long have you been involved in the construction industry?</i></b>			
12 years of industry experience. <span style="float: right; border: 1px solid black; padding: 2px;">1.1</span>			
<b><i>BI-3 Throughout this time, what has been your typical role?</i></b>			
Started as a graduate engineer in a Project Manager role with an asphalt company where I spent 2.5 years. Then moved to the company I am currently with and have been here for 9.5 years. Started with them as a Site Engineer before transitioning into a Project Manager role. <span style="float: right; border: 1px solid black; padding: 2px;">1.3</span>			
<b><i>BI-4 Have you primarily been involved in public or private industry?</i></b>			
Have been involved entirely in private industry. <span style="float: right; border: 1px solid black; padding: 2px;">1.4 and 1.5</span>			

<b>PROCUREMENT (P)</b>
<b><i>P-1 Have you been involved in the development of procurement strategies?</i></b>
I have not been involved in the development of strategies but am heavily involved in responding to procurement strategies from a tendering perspective. <span style="border: 1px solid black; padding: 2px;">2.1</span>
<b><i>P-2 If so, what do you find are the most commonly developed procurement strategies?</i></b>
Construct only and design and construct. <span style="border: 1px solid black; padding: 2px;">2.2</span>
<b><i>P-3 Do you think that these strategies provide sufficient scope in relation to performance measurement?</i></b>
It doesn't really prohibit the adoption of performance measures. <span style="border: 1px solid black; padding: 2px;">2.3</span>
<b><i>P-4 In what way do you think the project outcome differs if a procurement strategy is price based as opposed to value or non-price based strategies?</i></b>
It becomes a contractual nightmare because everyone is fighting for every dollar. If it is purely price based it is sometime difficult to achieve high quality as everyone is always looking at the bottom line and looking for any opportunity to cut corners. It creates relationship issues due to the push for dollars. We have recently come from a project that was 70% price, 30% non-price and have now come to a project with the same client but it is 100% price driven strategy and we are already having issues because of this. <span style="border: 1px solid black; padding: 2px;">2.4</span>
<b><i>P-5 By adopting a price based procurement strategy, what areas of a project does this detract from, if any?</i></b>
Primarily quality and relationships due to tense contractual environment. Also things like traffic management as this is where Contractors will skimp on costs as well as things like community stakeholder engagement. <span style="border: 1px solid black; padding: 2px;">2.6</span>
<b><i>P-6 Do you think a non-price approach delivers a greater project outcome when compared to a price-based approach, why or why not?</i></b>
It depends on the project. A non-price solution works out better for both the Contractor and the Client. A non-price approach allows for you to choose the Contractor that you want as opposed to someone who's purely trying to win the job based on price. <span style="border: 1px solid black; padding: 2px;">2.5</span>

***P-7 Do you think a non-price approach increases or creates additional project costs, why or why not?***

Not always but it depends on the project and the complexity of the job as well as the definition of the project scope. If they aren't sure what the job is and what they want out of a job, a non-price approach makes this a little easier – it allows them to change the scope a bit easier as opposed to a hard-line bottom dollar procurement approach.

Ultimately it comes back to the project characteristics as to which approach should be used.

2.7

***P-8 Which procurement approach do you think the industry should try and move towards in an attempt to achieve greater project outcomes and why?***

I think the industry is going away from the alliance approach to procurement and I don't think it will ever go back that way. This is good and bad. Alliances make it easier for the Contractor in terms of the environment to work in because you know you are going to get paid for what you do. What it does do though is it creates laziness in engineers such that hard dollar contracts you need to be sharp with your quantities and how you are going to get paid for every item and how each bit of gear that is doing work is going to be covered – you don't need to think about this in an alliance situation.

I think you still need a combination of both price and non-price relative to the job is the key. I like the design and construct approach to procurement and that there should be more projects undertaken using this approach. Construct only you see sometimes that they have to rush the design to meet certain deadlines and this sometimes leads to missing the key reasons as to why the job is happening.

It is important to get the procurement approach right in order to achieve the best for the project. The current project we are delivering had a very short design time frame and we are already finding significant issues. In 4 weeks we've submitted 30 RFI's already. Given the short design timeframe, an alternative procurement approach may have been better suited as opposed to the construct only approach that has been used in this case.

2.8

***P-9 Do you find that procurement is a difficult, vague and ambiguous process, why or why not?***

Our procurement of sub-contractors is very, very structured with set systems and authority levels making the process very easy. Our system is time consuming but it is necessary to cover our decisions and engagement of various sub-contractors.

Generally in responding to tenders from market it is typically straight forward as it is very structured. We don't generally have any issues in tendering and responding to the chosen strategy from the Client.

2.9

<b>PERFORMANCE MEASURES (PM)</b>
<p><b><i>PM-1 How have you been involved in performance measurement for civil construction projects?</i></b></p> <p>We have a supply management system in place that we use for our sub-contractors. Through this system we monitor the performance of our sub-contractors and undertake regular reviews on them across various performance categories. We score them from 1 to 5 across various areas such as quality, safety, timeliness etc. and we use this to either procure sub-contractors or if they are performing poorly we will have them removed as a supplier. This system has only been in place for 2 to 3 years. Before this, we monitored performance but nothing was documented or recorded and was only project specific. The new system is across the whole company allowing for transparency across all sub-contractors.</p> <p>I have a team of engineers on projects that undertake this process which I then review, prepare reports and authorise the engagement of sub-contractors. <span style="border: 1px solid black; padding: 2px;">3.1</span></p>
<p><b><i>PM-2 What measures do you find are typically adopted in performance measurement?</i></b></p> <p>Construction management, community engagement, contract relationships, safety, traffic, environment, quality. This happens every month. For the current project the Client established a relationship workshop as this was critical to the delivery of the project.</p> <p>Safety, quality are the two biggest. Claim management and time. But time is hard to judge as there can be many reasons behind timeliness issues including the Client themselves. <span style="border: 1px solid black; padding: 2px;">3.2</span></p>
<p><b><i>PM-3 Do common procurement strategies allow the adoption of sufficient performance measures and are they utilised in projects?</i></b></p> <p>Yes they do and all projects involve some form of performance measurement. <span style="border: 1px solid black; padding: 2px;">2.3</span></p>
<p><b><i>PM-4 Are typically adopted performance measures reflective of current practices in the civil construction industry, why or why not?</i></b></p> <p>Yes I think they are. They are relative to how we operate and it is reasonably simple to see the areas of measurement against the different categories and what is required. <span style="border: 1px solid black; padding: 2px;">3.3</span></p>
<p><b><i>PM-5 How is performance measurement in the construction industry perceived?</i></b></p> <p>We regard this as very important for our business. In the past there has been issues around subjectivity related to some of the categories but organisations are getting better at taking this out by giving breakdowns of what each score reflects and what is required against each indicator. <span style="border: 1px solid black; padding: 2px;">3.4</span></p>

I think performance measurement is good as it allows for issues to be addressed early and fleshes them out rather than leaving them linger. With our sub-contractors they know that their performance is always being measured so we can address any issues straight away.

***PM-6 If a project has an emphasis on performance measurement and is implemented well, how do you believe this affects the project outcome?***

In one way or another we've always monitored performance but I think that if it wasn't done it could create a lesser outcome for the project as people would be aware that they aren't under the microscope. 3.5

***PM-7 Is performance measurement an arduous element in project delivery, why or why not?***

It's pretty straight forward. It typically only takes about half an hour a month to complete the performance surveys so it is pretty simply.

Our sub-contractor performance scoring system only takes about 10 minutes to complete so again it's simple due to our structure system and processes. We have got tools in place to support our staff in undertaking these processes. 3.4

***PM-8 Do you think new areas of performance measurement aside from those typically used could be introduced that better reflect current practice in the civil construction industry?***

Not really, I think it is done pretty well. 3.6

***PM-9 What areas or if not, why do you think it is not necessary?***

Refer above. 3.6

***PM-10 Do you think that current performance measurement adopted under procurement strategies encourages Contractors to be innovative at the benefit of the Client?***

No not typically. There has been projects in the past with a particular emphasis on innovation which was encouraged through cost saving incentives – if we saved on direct job costs, we got half of the savings and the client got half of the savings. This resulted in some very good outcomes. On our current project, there is nothing that encourages us to come up with innovative techniques or solutions so therefore we will not be pursuing this on this project.

Our approach to innovation will always be based on incentives. 3.7

***PM-11 If not, what types of performance measurement could be introduced to encourage this?***

I'm not sure if this could be done through performance measurement, more so through the adoption of an appropriate strategy such as design and construct which provides the opportunity for the contractor to become involved at an early stage.

I like the idea of performance driven specifications however the problem is you sometimes don't know all the issues surrounding a project and can miss things. There's example of where this works and where it doesn't. I don't think there is one across the board solution, each project needs to be considered individually. I'd like to see it move towards more freedom for the contractor, I prefer it this way.

I think a way of doing this is through the design and construct approach as it gives us the opportunity to get involved early and come up with other ways to make things work that ends up saving both us and the client money. 3.7

***PM-12 Have you found that the construction industry is typically slow to change, develop and adopt new process or techniques that could improve performance?***

Not generally, especially the larger companies. It's not within their interest to resist industry change otherwise you'll fall behind and you can't afford to do this. 3.4

***Are you aware of the KPI's developed for the Australian Construction Industry by the Australian Construction Industry Forum and the Australian Procurement and Construction Council?***

No I have not heard of these.

<b>Name</b>	IP17	<b>Date</b>	06.10.2015
<b>Organisation</b>	Multi National Design Consultancy		
<b>Location</b>	Interviewee's Offices		
<b>Time Start</b>	5.00pm	<b>Time End</b>	5.45pm
<b>INTERVIEWEE BACKGROUND INFORMATION (BI)</b>			
<b><i>BI-1 What is your current role within your organisation?</i></b>			
<p>I am currently a Project Manager/Senior Engineer delivering civil and structural infrastructure projects. <span style="border: 1px solid black; padding: 2px;">1.3</span></p>			
<b><i>BI-2 How long have you been involved in the construction industry?</i></b>			
<p>10 years of industry experience. <span style="border: 1px solid black; padding: 2px;">1.1</span></p>			
<b><i>BI-3 Throughout this time, what has been your typical role?</i></b>			
<p>I started as a graduate engineer as a Structural Engineer with a private company where I spent approximately 4 years before moving into the role of a Civil Engineer which has transitioned into a Senior Engineering role where I primarily manage the delivery of our civil and structural projects. <span style="border: 1px solid black; padding: 2px;">1.3</span></p>			
<b><i>BI-4 Have you primarily been involved in public or private industry?</i></b>			
<p>All of my experience has been in the private sector. <span style="border: 1px solid black; padding: 2px;">1.4 and 1.5</span></p>			

<b>PROCUREMENT (P)</b>
<p><b><i>P-1 Have you been involved in the development of procurement strategies?</i></b></p> <p>No I have not been involved in the development of procurement strategies but I am often involved in procurement from a tendering perspective. Aside from project management, I prepare a large amount of the tender submissions for both civil and structural projects so I am very familiar with procurement procedures and policies through this. <span style="border: 1px solid black; padding: 2px;">2.1</span></p>
<p><b><i>P-2 If so, what do you find are the most commonly developed procurement strategies?</i></b></p> <p>I find that the majority of works are still procured under a design and then construct arrangement. Sometimes you will see the odd design and construct project but these are not all that common from what I have seen.</p> <p>On very large projects you will sometimes see alliance type arrangements in place but this doesn't seem to happen much anymore will traditional design and then construct still making up the majority of strategies. <span style="border: 1px solid black; padding: 2px;">2.2</span></p>
<p><b><i>P-3 Do you think that these strategies provide sufficient scope in relation to performance measurement?</i></b></p> <p>I think so. The strategy doesn't really determine what will be measured in regards to performance, it more so sets up the environment for which performance measurement can then be conducted. i.e. the measures on a design and then construct project could be different to those on a design and construct project. <span style="border: 1px solid black; padding: 2px;">2.3</span></p>
<p><b><i>P-4 In what way do you think the project outcome differs if a procurement strategy is price based as opposed to value or non-price based strategies?</i></b></p> <p>It's difficult to say especially given that price strategies can be influenced by so many factors i.e. in the current environment just because you get a cheap price doesn't necessarily mean anything of detriment, it could simply be a reflection of the current economic situation where there isn't a lot of work. <span style="border: 1px solid black; padding: 2px;">2.4</span></p>
<p><b><i>P-5 By adopting a price based procurement strategy, what areas of a project does this detract from, if any?</i></b></p> <p>The areas that a price strategy can detract from are primarily your areas of personnel in that the most skilled and respected and expensive people will not be dedicated to the project which could have a flow on effect to the quality of the asset that is delivered. It can also effect relationships as on price only strategies the dollars could be tight and any little thing that doesn't go to plan (as is often the case) will mean dollars and when there aren't dollars there in the first place, it can create tense relationships as variations are sought and every dollar is scrutinised. <span style="border: 1px solid black; padding: 2px;">2.6</span></p> <p>It also creates time issues especially in the design phases whereby the amount of time that is allocated to tasks may not be enough. This is done to keep the costs down but can create design</p>

and documentation issues as everyone is under the pump to get things done quicker which can lead to oversights, omissions and ultimately quality issues.

***P-6 Do you think a non-price approach delivers a greater project outcome when compared to a price-based approach, why or why not?***

Potentially yes as the outcome can be a combination of things such as the relationships that are formed during delivery. At the end of the day, it may not change the asset that is ultimately delivered but it can impact on things such as the way traffic is managed, the way community relations are handled, the impacts on the environment during delivery. For instance, if the contractor is tight on dollars regarding that budget allocation for environmental protection, he may just go with the bare minimum to achieve compliance whereas a contractor who isn't tight on dollars may provide what would be expected as opposed to just the bare minimum.

As mentioned in the previous questions, I think the biggest impact area is around relationships whereby with a non-price approach there won't be as big a push for every variation and the contractor will be more likely to work with you and 'give a bit' so to speak.

Contrary to the previous question it can have the opposite impact on time in that more time can be allocated to correctly suit the tasks at hand and therefore a greater level of detail and focus can be given to achieving the right result. 2.5

***P-7 Do you think a non-price approach increases or creates additional project costs, why or why not?***

In terms of the entire project I don't think it does. A project will always have an expected dollar figure or estimate and I think both approaches would typically end up being somewhere around that figure regardless of a price or non-price approach. The difference would be how you get to that figure i.e. price only might be low initially but you get towards this figure through variations, a non-price approach might be closer to this budget figure to start with and still have some variations which move the ultimate dollar amount back towards that initial figure. 2.7

***P-8 Which procurement approach do you think the industry should try and move towards in an attempt to achieve greater project outcomes and why?***

It depends on the project but I think the use of either a design and then construct, or a design and construct approach works well.

On projects that are relatively simple, have low risk, few complexities and are just your everyday run of the mill projects, I see no issues with using a design and then construct approach. On these projects there's really no need for a contractor to be involved early on in the process and can easily be handled by your typical design consultancies.

On more complex projects though which may include greater risk and require the use of specialist techniques or skills, I think the design and construct approach is the way to go as this allows for the contractor to be involved early on in the project lifecycle and provide input during the critical phases of design. If a construct only approach was

<p>taken with this type of project, it opens up the client to greater risks and prohibits the ability of the contractor to identify, what could be, more efficient and effective construction solutions.</p>
<p><b><i>P-9 Do you find that procurement is a difficult, vague and ambiguous process, why or why not?</i></b></p>
<p>Not really, it's always pretty clear cut but what makes it difficult is short response times and sometimes a lack of clarity or definition around what the client wants. I often find that we submit tenders where you just don't have the time to give it as much attention and perfection as you would like. 2.9</p>
<p><b>PERFORMANCE MEASURES (PM)</b></p>
<p><b><i>PM-1 How have you been involved in performance measurement for civil construction projects?</i></b></p>
<p>I have been involved from the perspective of being measured and the perspective of measuring our in-house performance. This has included preparation of reports regarding performance, participating in performance meetings. 3.1</p>
<p><b><i>PM-2 What measures do you find are typically adopted in performance measurement?</i></b></p>
<p>These days most projects cover off on the same elements which include time, cost, quality and also things such as environment, traffic management, safety, community measures. There also seems to be a bit more emphasis on relationships these days. 3.2</p>
<p><b><i>PM-3 Do common procurement strategies allow the adoption of sufficient performance measures and are they utilised in projects?</i></b></p>
<p>Yes they do, and just about all project utilise performance measurement in some regards on project today. 2.3</p>
<p><b><i>PM-4 Are typically adopted performance measures reflective of current practices in the civil construction industry, why or why not?</i></b></p>
<p>Yes I think so. All the major elements of a project are typically covered under typically adopted performance measures. I'm not sure what other areas could be measured. It's important that it doesn't drill down too far but at the same time still keeps track of the major elements as this assists in making sure these targets are hit. 3.3</p>
<p><b><i>PM-5 How is performance measurement in the construction industry perceived?</i></b></p>
<p>Performance measurement is relatively common place these days and I think people have just accepted that on every project your performance will be somehow measured and monitored. I</p>

<p>don't really see an issue with it or why there would be as if you are performing well, there shouldn't be any issues. 3.4</p>
<p><b><i>PM-6 If a project has an emphasis on performance measurement and is implemented well, how do you believe this affects the project outcome?</i></b></p>
<p>It may not necessarily change the ultimate outcome that is delivered as at some point you need to provide what you are being paid for but what it does effect is how you get to that outcome. By having measures on performance and monitoring this well, it should help delivery of the project, make for smoother delivery with less issues and assist both the contract and the client in getting to the finish line.</p>
<p><b><i>PM-7 Is performance measurement an arduous element in project delivery, why or why not?</i></b></p>
<p>No I don't think so. On most of the projects that we do, our clients are of a larger size and typically have the systems and procedures in place to undertake performance measurement. Some of the smaller councils don't tend to have the same level of systems or emphasis on performance measurement, but this could be a reflection of the size of the projects that these organisations do which are typically of a small nature. 3.4</p>
<p><b><i>PM-8 Do you think new areas of performance measurement aside from those typically used could be introduced that better reflect current practice in the civil construction industry?</i></b></p>
<p>No not necessarily. I think many of the major areas are already covered off and reflect the way the industry goes about business. It's important that performance measurement continue in industry and that the way this is done, implement and utilised continues to develop with the industry. 3.6</p>
<p><b><i>PM-9 What areas or if not, why do you think it is not necessary?</i></b></p>
<p>Refer to PM-8. 3.6</p>
<p><b><i>PM-10 Do you think that current performance measurement adopted under procurement strategies encourages Contractors to be innovative at the benefit of the Client?</i></b></p>
<p>No not really. Innovation is a difficult one as no one really wants to be the 'first guy' to try something out as it can potentially cost large amounts of dollars and may go wrong.</p> <p>Difficulty also arises in that new techniques or processes etc. have to go through a large amount of red tape before they can be trialled as they may not necessarily align with current requirements. This then creates time issues on projects that simply can't absorb this kind of red tape. 3.7</p>

***PM-11 If not, what types of performance measurement could be introduced to encourage this?***

There could potentially be a measure placed on what new technologies, or processes were brought to the table by the contractor during delivery but again, during construction there is little time or opportunity to be trialling this.

I think a better approach is for the agencies to drive this and to do it through their approaches to procurement. This relates back to the previous questions regarding a design and construct approach. This approach allows the contractor to become involved at an early stage, have input into how things could be done better, or more efficiently, or using alternate products. This is where the innovation could be bred. It's important that incentives be tied to this as there are potential costs associated for the contractor in pursuing these innovations and he should be compensated accordingly if dollars can be saved by the client. 3.7

***PM-12 Have you found that the construction industry is typically slow to change, develop and adopt new process or techniques that could improve performance?***

It can be, especially in regards to some of the old construction methodologies etc but normally if a new piece of technology or technique comes out that is proven, it will often be picked up rapidly by the industry.

***Are you aware of the KPI's developed for the Australian Construction Industry by the Australian Construction Industry Forum and the Australian Procurement and Construction Council?***

No I am not aware that these have been developed. 3.4

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**  
Luke Sceney

<b>Name</b>	IP18	<b>Date</b>	01.10.15
<b>Organisation</b>	Multi National Private Works Company		
<b>Location</b>	Interviewee's Offices		
<b>Time Start</b>	12.00pm	<b>Time End</b>	12.45pm
<b>INTERVIEWEE BACKGROUND INFORMATION (BI)</b>			
<i><b>BI-1 What is your current role within your organisation?</b></i>			
<p>Contract Administration / Project Manager</p> <p align="center">1.3</p>			
<i><b>BI-2 How long have you been involved in the construction industry?</b></i>			
<p>21 years</p> <p align="center">1.1</p>			
<i><b>BI-3 Throughout this time, what has been your typical role?</b></i>			
<p>Started as a Carpenter/Joiner and became trade qualified, then worked my way through the industry into a Project Manager role which is what I do most of the time these days although for this project I am fulfilling the role of Senior Contracts Administrator/QA Manager/Design Manager.</p> <p align="center">1.3</p>			
<i><b>BI-4 Have you primarily been involved in public or private industry?</b></i>			
<p>Spent 5 years in public industry with the remainder of the 16 years in private industry.</p> <p align="center">1.4 and 1.5</p>			

<b>PROCUREMENT (P)</b>
<p><b><i>P-1 Have you been involved in the development of procurement strategies?</i></b></p>
<p>I have not been involved in the development of strategies at the corporate level however I have significant experience in the application of procurement strategies and the engagement of contractors and the like. <span style="border: 1px solid black; padding: 2px;">2.1</span></p>
<p><b><i>P-2 If so, what do you find are the most commonly developed procurement strategies?</i></b></p>
<p>I have found that design and construct is the most common type of procurement strategy used in the projects that I have been involved on throughout my career. A lot of our projects although D &amp; C, we typically have the design relatively progressed first, then engage a contractor through a D &amp; C strategy to finish the design and undertake the construction. This is to minimise the differences in cost from the initial design to what is completed on the ground.</p> <p>In my experience, the worst case I have seen for a bare bones D &amp; C was a cost difference of between 30 to 40% from what was initially budgeted to what was actually design and delivered. We try and avoid this by initially progressing the design to a comfortable stage before engaging the D &amp; C contractor. <span style="border: 1px solid black; padding: 2px;">2.2</span></p>
<p><b><i>P-3 Do you think that these strategies provide sufficient scope in relation to performance measurement?</i></b></p>
<p>The procurement strategies don't typically dictate what we can and can't measure. We adopt what is required on a project specific basis which are typically always the same kinds of measures. <span style="border: 1px solid black; padding: 2px;">2.3</span></p>
<p><b><i>P-4 In what way do you think the project outcome differs if a procurement strategy is price based as opposed to value or non-price based strategies?</i></b></p>
<p>It doesn't necessarily change the outcome, but it impacts on the way that you get to the outcome. It can be a lot more difficult from a contract administration point of view to deliver a project that has been procured purely on price because of the intense focus from the contractor about trying to find dollars. <span style="border: 1px solid black; padding: 2px;">2.4</span></p>
<p><b><i>P-5 By adopting a price based procurement strategy, what areas of a project does this detract from, if any?</i></b></p>
<p>The first thing that suffers is quality if you go for price only. You can never have all three, time, cost and quality. If you got for price only, the others have to suffer. It also impacts on the relationship between the client and the contractor due to variations and the conflict that this can cause.</p> <p>Usually it will also impact on the experience of the personnel that are on the project as the dollars aren't there for the contractor to have his best and most expensive resources on the project. <span style="border: 1px solid black; padding: 2px;">2.6</span></p>

***P-6 Do you think a non-price approach delivers a greater project outcome when compared to a price-based approach, why or why not?***

Similar to before, I don't think it so much changes the outcome but it's the way you got to the outcome which is different. It impacts on the way that you deliver the project. For instance, on this project we wanted to achieve a certain productivity rate for our piling works. To achieve this, we had to accept that it was going to cost us \$1.5 million extra to get the piling contractor that could achieve this productivity rate. We could have gone price only and gone with the cheaper contractor but we wouldn't have been able to hit the performance targets we needed to deliver the project as we wanted. 2.5

***P-7 Do you think a non-price approach increases or creates additional project costs, why or why not?***

No not necessarily, from my experience you can almost guarantee that you will spend more time administering the contract. The cost and time required to manage the delivery of a price only driven strategy can often lead to greater costs. Usually you have to keep a contract administrator on the project for 6 months after it's finished to deal with the number of contract variations and sort everything out when it's a price only approach. 2.7

***P-8 Which procurement approach do you think the industry should try and move towards in an attempt to achieve greater project outcomes and why?***

I think the industry should stick to design and construct type approaches as I think there is a lack of the required skill sets and experience in consultancies across the board to deliver a well-documented, detailed and finalised design for construction. I don't think I've seen one in 15 years in regards to complete and accurate documentation. 2.8

***P-9 Do you find that procurement is a difficult, vague and ambiguous process, why or why not?***

Yes, depending on where you are based and the skill sets that you have. Queensland is a good example of that in that we have still lost the majority of our good tradesmen, and engineers to the mining and gas sector. You tend to find that the people you can get or procure at short notice are not the best people for the job. 2.9

**PERFORMANCE MEASURES (PM)**

***PM-1 How have you been involved in performance measurement for civil construction projects?***

Yes, I have from a reporting and monitoring perspective on the contractor delivering the works.

3.1

<p><b><i>PM-2 What measures do you find are typically adopted in performance measurement?</i></b></p>
<p>Safety, environment, traffic management, compliance against various requirements of the contract. 3.2</p>
<p><b><i>PM-3 Do common procurement strategies allow the adoption of sufficient performance measures and are they utilised in projects?</i></b></p>
<p>Yes, we adopt what is required on a project specific basis which are typically always the same kinds of measures. 2.3</p>
<p><b><i>PM-4 Are typically adopted performance measures reflective of current practices in the civil construction industry, why or why not?</i></b></p>
<p>If anything I think that we over monitor their performance in some ways. We have removed some of their ability to make decisions based on what they know and their experience. We've hog tied them to, in some cases, out dated standards and practices that are necessarily the best way to do things anymore. It is prescriptive to the point that when you ask them to change the something they can't just do it, they have to go back to the designer or whoever it may be to get an answer that we already know but we simply don't have the freedoms to just make the appropriate changes. 3.3</p>
<p><b><i>PM-5 How is performance measurement in the construction industry perceived?</i></b></p>
<p>I think people have started to gloss over when you mention the word QA and performance. The issue is that it's a grey area that often comes back to someone's opinion and is an area of subjectivity. 3.4</p>
<p><b><i>PM-6 If a project has an emphasis on performance measurement and is implemented well, how do you believe this affects the project outcome?</i></b></p>
<p>It doesn't really impact on the outcome but it impacts on the way the project is run and delivered. 3.5</p>
<p><b><i>PM-7 Is performance measurement an arduous element in project delivery, why or why not?</i></b></p>
<p>In my experience, the measurement of performance for civil construction contractors is the most difficult discipline to measure because of the openness of many of the tasks that they are required to undertake and difficult in defining a black and white measurable.</p> <p>It's also made difficult because so often you will do it and the client or the clerk of works will come back and say I don't agree with how you've measured our performance or how you've justified your measures or how you've come to that conclusion. It can become a very cyclic argument that you may never be able to formally close out in some regards. This then creates tension between the contractor and the client. 3.4</p>

<p><b><i>PM-8 Do you think new areas of performance measurement aside from those typically used could be introduced that better reflect current practice in the civil construction industry?</i></b></p>
<p>I think we need to go back to a bit more of a practical approach to performance measurement. I don't think there is an answer or a valid way to deal with it yet. <span style="border: 1px solid black; padding: 2px;">3.6</span></p>
<p><b><i>PM-9 What areas or if not, why do you think it is not necessary?</i></b></p>
<p>Refer PM-8. <span style="border: 1px solid black; padding: 2px;">3.6</span></p>
<p><b><i>PM-10 Do you think that current performance measurement adopted under procurement strategies encourages Contractors to be innovative at the benefit of the Client?</i></b></p>
<p>No, it basically means that they are going to stick to the bare minimum to achieve what is required of them, achieve sign off and protect their insurance. <span style="border: 1px solid black; padding: 2px;">3.7</span></p>
<p><b><i>PM-11 If not, what types of performance measurement could be introduced to encourage this?</i></b></p>
<p>There are ways but it needs to be implemented through the procurement strategy not through performance measurement. This comes back to saying to the contractor, if you find yourself a cost saving or a way to do something better that is more efficient, gives a better result, last longer, we will give you X percentage of the savings that you can put on the table. It has to be monetary or it's not going to get their interest. <span style="border: 1px solid black; padding: 2px;">3.7</span></p>
<p><b><i>PM-12 Have you found that the construction industry is typically slow to change, develop and adopt new process or techniques that could improve performance?</i></b></p>
<p>Yes, I have found it slow to change. Really nothing has changed on these sites other than safety type measures in probably close to 150 years. Everything else that is around here I can find you in a catalogue somewhere from the turn of the century. <span style="border: 1px solid black; padding: 2px;">3.4</span></p>
<p><b><i>Are you aware of the KPI's developed for the Australian Construction Industry by the Australian Construction Industry Forum and the Australian Procurement and Construction Council?</i></b></p>
<p>No.</p>

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**  
Luke Seeney

<b>Name</b>	IP19	<b>Date</b>	30.09.15
<b>Organisation</b>	Tier 2 Government Construction Contractor		
<b>Location</b>	Gelly Consulting Offices		
<b>Time Start</b>	7.30am	<b>Time End</b>	8.00am
<b>INTERVIEWEE BACKGROUND INFORMATION (BI)</b>			
<b><i>BI-1 What is your current role within your organisation?</i></b>			
<p>I am a Project Manager / Project Engineer <span style="border: 1px solid black; padding: 2px;">1.3</span></p>			
<b><i>BI-2 How long have you been involved in the construction industry?</i></b>			
<p>10 years <span style="border: 1px solid black; padding: 2px;">1.1</span></p>			
<b><i>BI-3 Throughout this time, what has been your typical role?</i></b>			
<p>I spent 1.5 years as a Structural Engineer, then moved into government where I spent 1.5 years as a Civil Designer, then transitioned into the Project Manager / Engineer role and have been in that role ever since. <span style="border: 1px solid black; padding: 2px;">1.3</span></p>			
<b><i>BI-4 Have you primarily been involved in public or private industry?</i></b>			
<p>I've spent 1.5 years in private industry and 8.5 years in the public sector. <span style="border: 1px solid black; padding: 2px;">1.4 and 1.5</span></p>			

<b>PROCUREMENT (P)</b>
<p><b><i>P-1 Have you been involved in the development of procurement strategies?</i></b></p>
<p>I have only had minor input into the actual development of strategies but the majority of my procurement experience is through the engagement of sub-contractors or tendering on civil construction projects ourselves.</p> <p>Recently I was involved with providing input into changing the dollar thresholds around how we procure and the requirements from a cost perspective. This was to provide some greater freedom and allow easier procurement for light items as the previous thresholds were at levels that didn't align with typical costs of things in the current industry for smaller type items. We now only need one quote for anything under \$25k whereas before anything over \$10k required three quotes. <span style="border: 1px solid black; padding: 2px;">2.1</span></p>
<p><b><i>P-2 If so, what do you find are the most commonly developed procurement strategies?</i></b></p>
<p>The most typical ones that I find used are construct only approaches where the design has already been completed, we tender on it and go and build it. <span style="border: 1px solid black; padding: 2px;">2.2</span></p>
<p><b><i>P-3 Do you think that these strategies provide sufficient scope in relation to performance measurement?</i></b></p>
<p>Yes, it does, with our approaches focussing primarily on cost which is probably not the best way to do it. <span style="border: 1px solid black; padding: 2px;">2.3</span></p>
<p><b><i>P-4 In what way do you think the project outcome differs if a procurement strategy is price based as opposed to value or non-price based strategies?</i></b></p>
<p>You tend to get people buying the jobs who don't necessarily have the right experience or skills to deliver the job. I find that if it's price only, there's always a push for variations to try and make some dollar out of the project.</p> <p>You have to be careful in regards to what is and what isn't included when you are going for price only. Often price only approaches will have many qualifying elements and fine print about what is and isn't included as part of the price. We've been burnt in the past with sub-contractors where we have gone on price only, only to find in the fine print that there is a minimum quantity that has to be constructed, whereby they'll charge you for this amount whether they construct that much or not. <span style="border: 1px solid black; padding: 2px;">2.4</span></p>
<p><b><i>P-5 By adopting a price based procurement strategy, what areas of a project does this detract from, if any?</i></b></p>
<p>It detracts from the experience of the contractor, there's an impact on relationships because of the push for variations, it impacts on trust because you need to build in a bit of contingency to cover off on the low price. It creates conflict due to the push for variations. <span style="border: 1px solid black; padding: 2px;">2.6</span></p>

<p>There's also a reduction in quality due to the reduced costs.</p>
<p><b><i>P-6 Do you think a non-price approach delivers a greater project outcome when compared to a price-based approach, why or why not?</i></b></p>
<p>It can but you have to be careful about the way you undertake this approach to procurement to ensure that you can satisfactorily justify why you didn't go with the cheapest price. <span style="border: 1px solid black; padding: 2px;">2.5</span></p>
<p><b><i>P-7 Do you think a non-price approach increases or creates additional project costs, why or why not?</i></b></p>
<p>No, I believe it does the opposite because you cover everything and you don't get hit with the same number of variations etc. <span style="border: 1px solid black; padding: 2px;">2.7</span></p>
<p><b><i>P-8 Which procurement approach do you think the industry should try and move towards in an attempt to achieve greater project outcomes and why?</i></b></p>
<p>It's always good having a design and construct approach because, as the contractor, we can have input into the solution and you aren't constrained by the design as you are in a construct only approach. Sometimes with that approach the design is not always the right one but at that point there is little room for changes. Sometimes you are on site and you know what should be done but you're restricted because the design has already been documented and signed off, it's a bit frustrating.</p> <p>I think that design and construct is the way to go. <span style="border: 1px solid black; padding: 2px;">2.8</span></p>
<p><b><i>P-9 Do you find that procurement is a difficult, vague and ambiguous process, why or why not?</i></b></p>
<p>It's very difficult for us as a government contractor as there is a lot of red tape regarding us procuring sub-contractors to assist us in the construction of a project. Before we even think about procuring someone, we have to go to a procurement delegate, we have to justify why we are choosing the particular sub-contractors and get their sign off, then we have to actually undertake the procurement process and then we have to get approval from the procurement delegate. This makes it very difficult. It was also made difficult previously in regards to being able to procure sub-contractors due to the low thresholds but with the recent changes it has become a bit easier.</p> <p>In regards to tendering on projects, procurement is difficult as often there is only short timeframes to prepare and submit your bid. <span style="border: 1px solid black; padding: 2px;">2.9</span></p>

<b>PERFORMANCE MEASURES (PM)</b>
<p><b><i>PM-1 How have you been involved in performance measurement for civil construction projects?</i></b></p>
<p>I've been involved from the perspective of monitoring and reporting on sub-contractors as well as being monitored in regards to our performance as the Principal Contractor. We get monitored and reported on monthly and any issues regarding our performance is addressed in these meetings. We also then get an overall learnings report which takes into consideration how we have performed on the project, what went well, what didn't and how we can improve on the next project. <span style="border: 1px solid black; padding: 2px;">3.1</span></p>
<p><b><i>PM-2 What measures do you find are typically adopted in performance measurement?</i></b></p>
<p>Time and cost are the big two. There's a focus on safety (safety first), quality, environment, traffic management, community complaints and relations. <span style="border: 1px solid black; padding: 2px;">3.2</span></p>
<p><b><i>PM-3 Do common procurement strategies allow the adoption of sufficient performance measures and are they utilised in projects?</i></b></p>
<p>Yes, they do – the project can be monitored in the areas as required to suit the project. <span style="border: 1px solid black; padding: 2px;">2.3</span></p>
<p><b><i>PM-4 Are typically adopted performance measures reflective of current practices in the civil construction industry, why or why not?</i></b></p>
<p>Yes they are but some of the areas are subjective and difficult to report accurately on. <span style="border: 1px solid black; padding: 2px;">3.3</span></p>
<p><b><i>PM-5 How is performance measurement in the construction industry perceived?</i></b></p>
<p>It's just a part of delivering the project these days, some of the areas are difficult to measure but that's related to the subjectivity of the areas. I believe you need performance measurement so you know whether you are or aren't doing a good job. If you're not performing as expected, you need to know so that you can improve and change the way you are doing what you are doing. Sometimes you don't realise that you aren't doing what the Client wanted as your thinking was different to theirs, performance measurement addresses this. <span style="border: 1px solid black; padding: 2px;">3.4</span></p>
<p><b><i>PM-6 If a project has an emphasis on performance measurement and is implemented well, how do you believe this affects the project outcome?</i></b></p>
<p>Ideally you should be able to deliver on time and on budget if all areas are being monitored closely and it's been done and acted upon well. <span style="border: 1px solid black; padding: 2px;">3.5</span></p>

<p><b><i>PM-7 Is performance measurement an arduous element in project delivery, why or why not?</i></b></p> <p>No, it's pretty easy. You just have your monthly reporting and it makes it easier for you as you know where you are sitting in regards to the delivery of the project. 3.4</p>
<p><b><i>PM-8 Do you think new areas of performance measurement aside from those typically used could be introduced that better reflect current practice in the civil construction industry?</i></b></p> <p>No not really. All the major areas are basically covered these days. 3.6</p>
<p><b><i>PM-9 What areas or if not, why do you think it is not necessary?</i></b></p> <p>Refer to PM-8. 3.6</p>
<p><b><i>PM-10 Do you think that current performance measurement adopted under procurement strategies encourages Contractors to be innovative at the benefit of the Client?</i></b></p> <p>No, I think it's the opposite. It's stick to what you know, don't introduce any risk and deliver on budget. Don't change anything. There is such a focus on time, cost etc. that there's no room to be creative or take on some risk and spend a bit of money. It's too strict to be able to innovate.</p> <p>The prescriptiveness of the specifications, drawings and documentation that we are required to operate under basically stops us from being innovative. The government steers away from risk, the typical approach is, it's worked for 30 or 40 years, we'll stick to what works. You can always bring things up in the constructability review but it's pretty limited in regards to make changes. In this climate they don't really want to take risks. 3.7</p>
<p><b><i>PM-11 If not, what types of performance measurement could be introduced to encourage this?</i></b></p> <p>The government does try to promote innovations through awards and that kind of thing but really the innovation needs to come from the design phase. This is why D &amp; C is good because, as the contractor, you can make changes to various elements of the design such as the pavement where you can still achieve the desired outcome, but you can do it a better way. 3.7</p>
<p><b><i>PM-12 Have you found that the construction industry is typically slow to change, develop and adopt new process or techniques that could improve performance?</i></b></p> <p>Yes, the industry is slow to change. The theory is, what worked back then still works now, if it isn't broken don't fix it. 3.4</p> <p><b><i>Are you aware of the KPI's developed for the Australian Construction Industry by the Australian Construction Industry Forum and the Australian Procurement and Construction Council?</i></b></p> <p>No I have not heard of these.</p>

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**  
Luke Sceney

<b>Name</b>	IP20	<b>Date</b>	17.09.15
<b>Organisation</b>	Tier 1 Construction Contractor		
<b>Location</b>	Via Telephone		
<b>Time Start</b>	4.00pm	<b>Time End</b>	4.45pm
<b>INTERVIEWEE BACKGROUND INFORMATION (BI)</b>			
<b><i>BI-1 What is your current role within your organisation?</i></b>			
<p>I am currently a Project Manager for the delivery of our civil construction projects.</p> <p align="right">1.3</p>			
<b><i>BI-2 How long have you been involved in the construction industry?</i></b>			
<p>13.5 years of experience. 1.1</p>			
<b><i>BI-3 Throughout this time, what has been your typical role?</i></b>			
<p>I started as a graduate in a position as a Site Engineer. Did this for three years then transitioned through Project Engineer and Construction Manager roles and then onto the PM role.</p> <p align="right">1.3</p>			
<b><i>BI-4 Have you primarily been involved in public or private industry?</i></b>			
<p>Always worked in private industry however have delivered a number of public projects.</p> <p align="center">1.4 and 1.5</p>			

<b>PROCUREMENT (P)</b>
<p><b><i>P-1 Have you been involved in the development of procurement strategies?</i></b></p> <p>Yes I have. I've been involved in developing how we will go about procuring our sub-contractors etc. or whether we will just self-supply.</p> <p>I've also been directly involved in the preparation of tender documents in response to strategies employed by agencies who are procuring for the delivery of civil infrastructure projects. <span style="border: 1px solid black; padding: 2px;">2.1</span></p>
<p><b><i>P-2 If so, what do you find are the most commonly developed procurement strategies?</i></b></p> <p>It depends on who you are working for and what they want to deliver. The majority of projects that I've been involved with are design and construct strategies. <span style="border: 1px solid black; padding: 2px;">2.2</span></p>
<p><b><i>P-3 Do you think that these strategies provide sufficient scope in relation to performance measurement?</i></b></p> <p>Yes, the strategy allows for project specific measures to be put in place. <span style="border: 1px solid black; padding: 2px;">2.3</span></p>
<p><b><i>P-4 In what way do you think the project outcome differs if a procurement strategy is price based as opposed to value or non-price based strategies?</i></b></p> <p>As long as the work is scoped well and to what the performance characteristics need to be, a price only approach still works well and won't necessarily change the outcome. The key is to ensuring that the project is defined well and that the Contractors are pre-qualified, which covers off on the non-price elements, then there shouldn't be any issues.</p> <p>It depends on where the project is at though. If for instance it's a D &amp; C where the Principal is looking for someone to take, say a concept design, and then turn it into a finished product, you need to consider the non-price elements otherwise you may not get what you want. <span style="border: 1px solid black; padding: 2px;">2.4</span></p>
<p><b><i>P-5 By adopting a price based procurement strategy, what areas of a project does this detract from, if any?</i></b></p> <p>Depending on the Contractors motivation for the project, they may come hunting for dollars through variations if the strategy is driven by lowest price wins. <span style="border: 1px solid black; padding: 2px;">2.6</span></p>
<p><b><i>P-6 Do you think a non-price approach delivers a greater project outcome when compared to a price-based approach, why or why not?</i></b></p> <p>I think that price plus other elements delivers the best outcome for a project. But price only can work if you've got it scoped and documented correctly. The way to get the best price is to get the best design, documented and scope correctly for the contractor. <span style="border: 1px solid black; padding: 2px;">2.5</span></p>

***P-7 Do you think a non-price approach increases or creates additional project costs, why or why not?***

It adds costs up front in the tender phase of the project for both the contractor and the principal due to extra work in the preparation and assessment of tenders. I don't think it changes the delivery costs of the project though. Whether it was price or non-price, in theory the delivery costs should still work out the same. 2.7

***P-8 Which procurement approach do you think the industry should try and move towards in an attempt to achieve greater project outcomes and why?***

I think the economy gets best value out of design and construct because I think contractors are a lot better at managing the design then the clients are because the contractors are motivated to provide an efficient design i.e. meeting the functional outcomes while not gold plating the design. If we want to build more infrastructure for the same cost, I think the best way to do it is through D & C.

I would say the types of strategies used have reverted back a little in that there doesn't seem to be as many alliance strategies used anymore. Money is tighter, margins are tighter. I think the reason for the recession away from alliance strategies etc. is because I don't think client's believed they were getting the value for money from these strategies given the current market conditions. Also the reduction in work has made contractor's hungrier and clients have probably worked out they can get better value using competitive price procurement approaches.

I think there would be more benefit to the community if performance driven specifications were utilised to a greater extent. It would cost less and therefore you can deliver more of it for the same amount of money. 2.8

***P-9 Do you find that procurement is a difficult, vague and ambiguous process, why or why not?***

Yes, it's difficult because on a number of projects I've been involved in, the tendering process has taken a lot longer than was originally set out. I think some of it is because of poor quality documentation but I think more so, sometimes agencies don't know 100% what they want to procure to start with. The market will always come back with idea that the client may not have thought of initially and this can draw the process out.

Timeframes make it difficult. The main issue is client's not being certain on what they want to deliver. They generally know what they want to deliver but there's still too much grey so that when the market comes back to them with three different shades of grey, they struggle.

They need to be prepared to accept less grey, or be prepared to accept sizeable innovation from the contractors in relation to this grey. Whether that be innovation in regards to design rationalisation or innovation in regards to technology. 2.9

<b>PERFORMANCE MEASURES (PM)</b>
<p><b><i>PM-1 How have you been involved in performance measurement for civil construction projects?</i></b></p>
<p>For the delivery of civil construction projects I've been involved from the perspective of having people report on those measures to me or I've been reporting to a superior on the measures and carrying out the performance measurement and reporting. <span style="border: 1px solid black; padding: 2px;">3.1</span></p>
<p><b><i>PM-2 What measures do you find are typically adopted in performance measurement?</i></b></p>
<p>Cost – regarding what you've spent, how much is left to spend to complete and comparison to budget. Also how much your progress claim values align with your expenditure so that you cash flows are correct.</p> <p>Other measures include time, safety, environment, traffic management, community but these ones are less tangible. <span style="border: 1px solid black; padding: 2px;">3.2</span></p>
<p><b><i>PM-3 Do common procurement strategies allow the adoption of sufficient performance measures and are they utilised in projects?</i></b></p>
<p>Different approaches allow for different inputs. Commonly they are focused around delivering the required product on the right date but the strategies allow you to adopt measures accordingly to suit the project. <span style="border: 1px solid black; padding: 2px;">2.3</span></p>
<p><b><i>PM-4 Are typically adopted performance measures reflective of current practices in the civil construction industry, why or why not?</i></b></p>
<p>I think performance measures are fairly correct in the current industry and are reflective of the way the industry operates. <span style="border: 1px solid black; padding: 2px;">3.3</span></p>
<p><b><i>PM-5 How is performance measurement in the construction industry perceived?</i></b></p>
<p>I think that performance measurement is understood to be just part of the way we do business now. <span style="border: 1px solid black; padding: 2px;">3.4</span></p>
<p><b><i>PM-6 If a project has an emphasis on performance measurement and is implemented well, how do you believe this affects the project outcome?</i></b></p>
<p>Yes I think it can change the way the project is delivered and can change the project outcome. I think it can change the outcome in a positive sense. It allows you to find out earlier if there are problems and allows for a forum to make sure everyone is on the same page. I think it aligns the contractor and client a bit closer and opens up discussion around the measures. <span style="border: 1px solid black; padding: 2px;">3.5</span></p>

<p><b><i>PM-7 Is performance measurement an arduous element in project delivery, why or why not?</i></b></p>
<p>It depends on what level of performance measurement is implemented. Some clients take it too far, while others don't take it far enough. 3.4</p>
<p><b><i>PM-8 Do you think new areas of performance measurement aside from those typically used could be introduced that better reflect current practice in the civil construction industry?</i></b></p>
<p>No. I don't think so. It is being relatively well done now and the measures are reflective of industry. 3.6</p>
<p><b><i>PM-9 What areas or if not, why do you think it is not necessary?</i></b></p>
<p>See response PM-8. 3.6</p>
<p><b><i>PM-10 Do you think that current performance measurement adopted under procurement strategies encourages Contractors to be innovative at the benefit of the Client?</i></b></p>
<p>A lot of the opportunity to be innovative is available at the tender phase and design phase. Once you're in construction, innovation costs you time and/or money so the opportunity is limited.</p> <p>The other issue is that when you are in the construction phase, innovation will rarely benefit the client as the contract is set so therefore they aren't interested in pursuing it. There could be better ways of sharing the benefits of innovation, i.e. cost savings, time savings. 3.7</p>
<p><b><i>PM-11 If not, what types of performance measurement could be introduced to encourage this?</i></b></p>
<p>Cost incentives will always drive innovation. It's difficult to be innovative during the delivery phase, performance measurements in place or not. I.e. you might be able to utilise an innovative product but a lot of clients don't allow new materials without a whole heaps of testing etc. which is not possible in the timeframes for most projects. 3.7</p>
<p><b><i>PM-12 Have you found that the construction industry is typically slow to change, develop and adopt new process or techniques that could improve performance?</i></b></p>
<p>I think the industry isn't that good in this regard due to the time taken to prove up new things or the time that government clients require to see this proving up makes it prohibitive on projects. If the government wants to pursue or encourage innovation, they need to be doing this constantly, not waiting for a project to do this for them. 3.4</p> <p>I think the government approach to standards and specifications stifles the industry. Their approach to risk also potentially contributes to this. For instance, something might go wrong on one project, so they change the specifications to avoid this happening again and add in another factor of safety.</p>

*Are you aware of the KPI's developed for the Australian Construction Industry by the Australian Construction Industry Forum and the Australian Procurement and Construction Council?*

No.

## **Appendix D Participant Profiles**

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**

Luke Seeney

<b>ID</b>	<b>Organisation</b>	<b>Current Position</b>	<b>Years of Experience</b>	<b>Qualifications</b>
IP01	Private Company Works Authority	Project Manager and Principal's Representative	17 years private industry	Bachelor or Architectural Design
IP02	Tier 2 Contractor	Manager of Business Development and Relations	15 years private industry	Bach. of Engineering (Civil), CPEng, RPEQ
IP03	Multi National Consultancy	Senior Contracts Manager	4.5 years public, 9 years private industry	Bach. of Engineering (Civil) CPEng. RPEQ
IP04	State Government Agency	Team Leader Pre-Construction	1.5 years private, 25.5 years public industry	Bach. of Engineering (Civil) CPEng. RPEQ
IP05	City Council Agency	Contracts Manager Capital Efficiency Expenditure Program	5 years private, 9 years public industry	Masters of Infrastructure Engineering and Management
IP06	State Government Agency	Principal Project Officer	1 year private, 29 years public industry	Associate Degree Civil Engineering
IP07	Regional Council Agency	Director Infrastructure Services	31 years public industry	Bach. of Engineering (Civil) Masters of Business Administration RPEQ, Emeritus IPWEAQ Member
IP08	Multi National Consultancy	Qld Transportation Team Leader	20 years public, 10 years private industry	Bach. of Eng. Tech. (Civil)
IP09	Tier 2 Construction Contractor	Engineering Manager, Northern Region	1.5 years public, 33.5 years private industry	Bach. of Engineering (Civil)
IP10	Regional Council Agency	Coordinator Infrastructure Planning and Design	7 years private, 8 years public industry	Bach. of Engineering (Civil)
IP11	City Council Agency	Civil Engineering Officer	14 years private, 33 years public industry	No formal qualification
IP12	Multi National Consultancy	Operations Manager	12 years public, 11 years private industry	Associate Degree Civil Engineering
IP13	Tier 3 Contractor	Managing Director	24 years private industry	Trade – Carpenter with an open builders licence
IP14	Local Environmental and Planning Consultancy	Director	7 years public, 13 years private industry	Masters in Urban Planning Bach. of Science (Environmental)

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**  
Luke Seeney

IP15	Local Design Consultancy	Director	16 years public, 17 years private industry	Bach. of Engineering (Civil)
IP16	Tier 2 Contractor	Project Manager	12 years private industry	Bach. of Engineering (Civil)
IP17	TBC			TBC
IP18	Multi National Private Works Agency	Contract Administrator/Project Manager	5 years public, 16 years private industry	Diploma Project Management, Clerk of Works, Open Builders Licence
IP19	Tier 2 Contractor	Project Manager / Engineer	1.5 years private, 8.5 years public industry	Bach. of Engineering (Civil)
IP20	Tier 1 Contractor	Project Manager	13.5 years private industry	Bach. of Engineering (Civil)

## **Appendix E Procurement Experience**

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**

Luke Seeney

ID	Participant Procurement Experience
IP01	Typically used off the shelf approach to procurement predominately two stage design and construct, construction management format, and traditional lump sum. Have been involved in the development of strategies - every project that the organisation undertakes, the team establishes which procurement approach best suits the project and develops an appropriate strategy. Our organisation also has a spreadsheet that can be used if there is uncertainty around the strategy which, through a number of in depth questions, can help to establish which approach could be best suited for a specific project. The spreadsheet primarily focusses on risk and who is best placed to take on this risk, i.e. a program risk should be offloaded to the Contractor as the Contractor is driving the program.
IP02	For current company have developed procurement policies and procedures that form part of the management system. Sit on both sides i.e. we tender and try and get procured for works but at the same time we procure a number of Sub-contractors to assist in the delivery of works that we win.
IP03	Not overly, generally the procurement strategy has been selected for a project before my involvement begins. However I am familiar with a large array of procurement strategies and contracts being a Senior Contracts Manager. This includes straight road construction contracts through to early contractor involvement and alliance arrangements.
IP04	Not so much in the development of these strategies, but largely in the implementation of these strategies and providing input to the procurement team about strategies.
IP05	Yes from all aspects such as pre-construction, tendering and award as well as post award. There is always great intentions at the start of the procurement development process but it typically ends in a rush and hastiness due to time constraints or a lack of focus on areas where it should have been.
IP06	Not so much in the development but more so the application of these strategies during the preconstruction phases as well as the post award phase.
IP07	Yes I have been involved in the development of purchasing policies and procurement strategies although this is heavily dictated by the Local Government Act. Always need to maintain transparency due to being a local council and the fact that all dollars are so heavily scrutinised. One simple example of this was the purchasing of a numbers of rollers in which we didn't go to the cheapest supplier due to other benefits but a senant enquiry was launched and I had to answer and justify the purchasing decision that was made. We generally try and meet our needs through in-house supply with a nucleus of resources that are supplemented by external supply on an as needs basis.
IP08	Involved more so with business strategies and Client strategies but not so much in the development of procurement strategies. Have been involved from the side of responding to strategies. Heavily involved in the tender stages of projects for MWH and actually responding to the chosen procurement strategy. This includes everything from EOI's to sole invitees, RFT's and all the difference variances. Have been involved in some D & C projects as well. As a private consultant we are responsive to the procurement strategy chosen by the agency procuring the works.
IP09	During the stint with the local council in the UK I was trying to change the way we procured Contractors and the contracts we used to be more fair to all parties and obtain better pricing. I've also been involved in representing Contractors by providing inputs to agencies as to what types of strategies would be best suited to a particular type of project. Ultimately that decision is not the Contractors but I have provided advice on this in the past. There is such a large range of models now that it's difficult to know which one to use and some are better suited than others depending on project circumstances.
IP10	Not really because with local government you already have legislation such as the local government act which dictates your strategy and approaches. However I was involved in the working group for procurement policies and procedures which were formulated out of the regulations and legislation.
IP11	No not really. Generally each organisation already has the system in place which you need to follow when procuring goods and services.
IP12	Yes I have been. I've been involved in the procurement of engineering consultants for projects and also currently involved in the procurement of resources, contractors and sub-consultants. Being the Operations Manager I also procure services to assist in the day to day running of the business.

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IP13	Yes, particularly with this company where I have directly been involved in the development of our procurement strategies and purchasing policies.
IP14	Yes, I have been involved in the development of procurement approaches for our consultancy as well as the implementation of strategies from a local government perspective.
IP15	No not in the development but I have been heavily involved in the implementation of strategies in accordance with those already developed.
IP16	I have not been involved in the development of strategies but am heavily involved in responding to procurement strategies from a tendering perspective.
IP17	No I have not been involved in the development of procurement strategies but I am often involved in procurement from a tendering perspective. Aside from project management, I prepare a large amount of the tender submissions for both civil and structural projects so I am very familiar with procurement procedures and policies through this.
IP18	I have not been involved in the development of strategies at the corporate level however I have significant experience in the application of procurement strategies and the engagement of contractors and the like.
IP19	I have only had minor input into the actual development of strategies but the majority of my procurement experience is through the engagement of sub-contractors or tendering on civil construction projects ourselves.  Recently I was involved with providing input into changing the dollar thresholds around how we procure and the requirements from a cost perspective. This was to provide some greater freedom and allow easier procurement for light items as the previous thresholds were at levels that didn't align with typical costs of things in the current industry for smaller type items. We now only need one quote for anything under \$25k whereas before anything over \$10k required three quotes.
IP20	Yes I have. I've been involved in developing how we will go about procuring our sub-contractors etc. or whether we will just self-supply.  I've also been directly involved in the preparation of tender documents in response to strategies employed by agencies who are procuring for the delivery of civil infrastructure projects.

## **Appendix F Common Procurement Strategies**

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**

Luke Seeney

ID	Common Procurement Strategies	Sufficient Scope for Performance Measurement
IP01	<p>Our most common strategies are design and construct and traditional lump sum. Third used strategy but not often is the construction management format.</p> <p>Unwritten law at the organisation that for projects under \$1M a traditional lump sum format is typically used.</p> <p>In the \$2 - \$3M moving to a design and construct contract especially where there is high risk.</p>	<p>No our strategies do not typically include sufficient performance measurement. Organisation is looking to increase current focus on performance measurement. Strategy however does not really dictate the performance measures.</p>
IP02	<p>Typically open or closed tender process of various types. We prefer invitation only process.</p>	<p>Yes, there are typically structured performance measures under the strategy that are utilised on the project.</p>
IP03	<p>Typically the most common is still the construct only approach. Appears to be a shift occurring on the bigger project toward ECI and design &amp; construct arrangements.</p>	<p>Yes there is always sufficient scope for performance measurement.</p>
IP04	<p>Long period for construction projects where it was always cheapest price wins but this started to change towards quality assessment. Non-price strategies are typically used these days.</p>	<p>Yes they do.</p>
IP05	<p>We are governed by legislation governing our procurement strategies. Most common strategies are bundling or project, industry briefings first, splitting project, appears to be trend towards strategic sourcing and category management.</p>	<p>Yes there is sufficient scope for performance measurement.</p>
IP06	<p>Most common strategy is Principal design and the go to open market tender for construction.</p>	<p>Yes the strategies allow for the adoption of performance measures.</p>
IP07	<p>Typically design first and then construct. We are governed by local government act.</p>	<p>Yes procurement strategies allow for sufficient performance measurement and do not prohibit adoption of project specific measures.</p>
IP08	<p>Most common is two stage design and then construct. Some larger project are D &amp; C but typically most are design first, then call tenders for construction.</p>	<p>Yes they do but often not 100% clear what the measures are.</p>
IP09	<p>Most common strategies are schedule of rates, construct only. Target cost reimbursable contract are also common. I prefer D &amp; C.</p>	<p>Yes, just about all strategies have measureable KPI's.</p>
IP10	<p>Typically design in house and then go to construction.</p>	<p>Yes I have not found that the strategies provide generic measures and then allow for the adoption of project specific measures.</p>
IP11	<p>It depends on the project but we will use a mix of price and non-price criteria in our strategies.</p>	<p>They absolutely do, there is no prohibition in the adoption of sufficient measures.</p>
IP12	<p>It's typically a mixture of price and non-price components used in strategies. Private is more price driven approaches.</p>	<p>Yes particularly in public service project where there is a strong focus on performance measurement.</p>
IP13	<p>The strategies are typically always heavily price focussed with other considerations such as experience.</p>	<p>Yes they do.</p>
IP14	<p>In my opinion the most common procurement approach that I see and have been involved in a design and construct procurement approaches.</p>	<p>Most projects have a performance aspect and criteria to them. This is typically approved by a local or state agency that is implemented through the procurement strategy and monitor on the project. This is then back to the administrators of the project to implement</p>

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		and monitor through reporting mechanisms etc.
IP15	Construct only is the most common procurement approach used.	The procurement types have a number of set performance measures already which are utilised on the project. They do not prohibit performance measurement.
IP16	Construct only and design and construct.	It doesn't really prohibit the adoption of performance measures.
IP17	<p>I find that the majority of works are still procured under a design and then construct arrangement. Sometimes you will see the odd design and construct project but these are not all that common from what I have seen.</p> <p>On very large projects you will sometimes see alliance type arrangements in place but this doesn't seem to happen much anymore will traditional design and then construct still making up the majority of strategies.</p>	I think so. The strategy doesn't really determine what will be measured in regards to performance, it more so sets up the environment for which performance measurement can then be conducted. i.e. the measures on a design and then construct project could be different to those on a design and construct project.
IP18	<p>I have found that design and construct is the most common type of procurement strategy used in the projects that I have been involved on throughout my career. A lot of our projects although D &amp; C, we typically have the design relatively progressed first, then engage a contractor through a D &amp; C strategy to finish the design and undertake the construction. This is to minimise the differences in cost from the initial design to what is completed on the ground.</p> <p>In my experience, the worst case I have seen for a bare bones D &amp; C was a cost difference of between 30 to 40% from what was initially budgeted to what was actually design and delivered. We try and avoid this by initially progressing the design to a comfortable stage before engaging the D &amp; C contractor.</p>	The procurement strategies don't typically dictate what we can and can't measure. We adopt what is required on a project specific basis which are typically always the same kinds of measures.
IP19	The most typical ones that I find used are construct only approaches where the design has already been completed, we tender on it and go and build it.	Yes, it does, with our approaches focussing primarily on cost which is probably not the best way to do it.
IP20	It depends on who you are working for and what they want to deliver. The majority of projects that I've been involved with are design and construct strategies.	Yes, the strategy allows for project specific measures to be put in place.

## **Appendix G Price Based Procurement**

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**

Luke Seeney

ID	Price Based Procurement	Specific Impact Areas
IP01	<p>Typically deliver poorer quality outcomes but a non-price strategy does not guarantee a greater outcome.</p> <p>Can get someone that seriously cuts their price because they are so keen to work and will do a good job.</p> <p>Typically if you choose the right people, experience, methodology rather than just price it should generally yield a greater outcome.</p> <p>Price based procurement creates so much focus on price that it can lead to difficult relationships as the Contractor is trying every which way to make some money.</p>	<ul style="list-style-type: none"> <li>• Quality</li> <li>• Relationships</li> <li>• Under – resourcing</li> <li>• Corner cutting</li> </ul>
IP02	<p>Typically when adopting the lowest price this ends up in a lot of variations, delay and disruption to the project ultimately impacting on the project outcome.</p>	<ul style="list-style-type: none"> <li>• Variations (cost)</li> <li>• Time (delays)</li> <li>• Disruptions</li> <li>• Omissions and rework</li> <li>• Safety</li> <li>• Quality</li> </ul>
IP03	<p>You get what you pay for. Often it works out the same regardless of approach it's just how you pay for it. Cheaper contractors will cost you in variations. Definitely feel price delivers a poorer outcome when compared to non-price.</p>	<ul style="list-style-type: none"> <li>• Experience of personnel on the project</li> <li>• Quality</li> <li>• Costs</li> <li>• Relationships</li> </ul>
IP04	<p>Cheapest price tries to cut corners, lower quality, scope omissions, not following specifications</p>	<ul style="list-style-type: none"> <li>• Quality</li> <li>• Time</li> <li>• Resourcing</li> <li>• Relationships</li> </ul>
IP05	<p>May not impact on the outcome greatly, depends on the Contractor and culture of the Contractor.</p>	<ul style="list-style-type: none"> <li>• Quality</li> </ul>
IP06	<p>Greater conflict between the Principal and the Contractor due to variations.</p>	<ul style="list-style-type: none"> <li>• Corner cutting</li> <li>• Quality</li> <li>• Time</li> <li>• Relationships</li> <li>• Environment</li> <li>• Safety</li> </ul>
IP07	<p>From our perspective being a local council price based has often ended disastrously for us.</p>	<ul style="list-style-type: none"> <li>• Quality</li> <li>• Time</li> <li>• Fit for purpose</li> </ul>
IP08	<p>Price based has associated risk in terms of variations. This is to supplement the low price if a Contractor has gone skinny on price.</p>	<ul style="list-style-type: none"> <li>• Resourcing</li> <li>• Quality</li> <li>• Time</li> </ul>
IP09	<p>Not such a bad thing. Lived with that for 18 out of 35 years' experience. Differs though and dependent on the project. No good if lots of changes expected.</p>	<ul style="list-style-type: none"> <li>• Price</li> <li>• Quality</li> <li>• Time</li> </ul>
IP10	<p>I think there could be major issues on a price only approach especially if little is known about the Contractor.</p>	<ul style="list-style-type: none"> <li>• Quality</li> <li>• Resourcing</li> <li>• Time</li> </ul>
IP11	<p>Pro's and con's to both.</p>	<ul style="list-style-type: none"> <li>• Quality</li> </ul>
IP12	<p>Very cyclic industry, depends on economy.</p>	<ul style="list-style-type: none"> <li>• Quality</li> <li>• Timeframes</li> <li>• Resourcing</li> <li>• Cost</li> </ul>

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IP13	<p>Makes you think harder and smarter about how you can deliver a project. Achieving maximum outcome for lowest price. Depends on the market. I don't think there would be a huge difference. Comes back to having good quality documentation and a good brief.</p>	<ul style="list-style-type: none"> <li>• Cost</li> <li>• Quality</li> </ul>
IP14	<p>You often realise that you pay for what you get and in some instances clients will go for price only and, not all the time but some of the time, this does come back to have 'hidden' costs associated with that approach.</p>	<ul style="list-style-type: none"> <li>• Time</li> <li>• Cost</li> </ul>
IP15	<p>I think regardless of the approach it is, to a large extent, dependent on the contractor that you get. When you go out to the market, you have an idea of what kind of dollars to expect. If a price comes in that is unusually low compared to what you expected to pay then, you automatically get a cost buffer built in. At the end of the day, the project will end up getting back towards the initial true cost that you were expecting in the first place.</p> <p>The outcome isn't impacted so much by a price only approach, but where the issue is, is that there could potentially be a lot more pain in achieving that outcome if the strategy was price driven.</p>	<ul style="list-style-type: none"> <li>• Relationships</li> <li>• Costs</li> </ul>
IP16	<p>It becomes a contractual nightmare because everyone is fighting for every dollar. If it is purely price based it is sometime difficult to achieve high quality as everyone is always looking at the bottom line and looking for any opportunity to cut corners. It creates relationship issues due to the push for dollars. We have recently come from a project that was 70% price, 30% non-price and have now come to a project with the same client but it is 100% price driven strategy and we are already having issues because of this.</p>	<ul style="list-style-type: none"> <li>• Quality</li> <li>• Relationships</li> <li>• Traffic Management</li> <li>• Community</li> </ul>
IP17	<p>It's difficult to say especially given that price strategies can be influenced by so many factors i.e. in the current environment just because you get a cheap price doesn't necessarily mean anything of detriment, it could simply be a reflection of the current economic situation where there isn't a lot of work.</p>	<ul style="list-style-type: none"> <li>• Personnel and experience</li> <li>• Relationships</li> <li>• Quality</li> <li>• Time</li> </ul>
IP18	<p>It doesn't necessarily change the outcome, but it impacts on the way that you get to the outcome. It can be a lot more difficult from a contract administration point of view to deliver a project that has been procured purely on price because of the intense focus from the contractor about trying to find dollars.</p>	<ul style="list-style-type: none"> <li>• Quality</li> <li>• Relationships</li> <li>• Experience</li> </ul>
IP19	<p>You tend to get people buying the jobs who don't necessarily have the right experience or skills to deliver the job. I find that if it's price only, there's always a push for variations to try and make some dollar out of the project.</p>	<ul style="list-style-type: none"> <li>• Experience</li> <li>• Relationships</li> <li>• Conflict</li> <li>• Quality</li> </ul>

	<p>You have to be careful in regards to what is and what isn't included when you are going for price only. Often price only approaches will have many qualifying elements and fine print about what is and isn't included as part of the price. We've been burnt in the past with sub-contractors where we have gone on price only, only to find in the fine print that there is a minimum quantity that has to be constructed, whereby they'll charge you for this amount whether they construct that much or not.</p>	
<p>IP20</p>	<p>As long as the work is scoped well and to what the performance characteristics need to be, a price only approach still works well and won't necessarily change the outcome. The key is to ensuring that the project is defined well and that the Contractors are pre-qualified, which covers off on the non-price elements, then there shouldn't be any issues.</p> <p>It depends on where the project is at though. If for instance it's a D &amp; C where the Principal is looking for someone to take, say a concept design, and then turn it into a finished product, you need to consider the non-price elements otherwise you may not get what you want.</p>	<ul style="list-style-type: none"> <li>• Relationships</li> <li>• Cost</li> </ul>

## **Appendix H Non-Price Based Approaches**

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**  
Luke Seeney

<b>ID</b>	<b>Does Non - Price Based Procurement Lead to Better Project Outcomes when compared to price based procurement?</b>	<b>Does a Non-Price Approach create additional project costs?</b>
IP01	<p>Generally yes, non-priced procurement should typically yield a greater project outcome.</p> <p>...it is a complex mesh that should typically yield a greater outcome. For me it is fundamentally the personality meshing of the team that is going to result in the best outcome as they understand each other, they talk to each other, they work together to come up with the best result, not necessarily the best and easiest. Generally if everyone has the right fee, i.e. the consultant is happy, the contractor is happy, the client is happy, you get a greater outcome. Happy projects, are typically successful projects.</p>	<p>It can create additional upfront costs as typically the assessment process can take longer, require greater resourcing as well as the fact that the cheapest price may not be the price that is accepted but from experience, cheapest price can often result in additional costs during the project through variations for example that may not have come up otherwise. Overall it's difficult to gauge one against the other however, no not generally when looking at the overall cost of a project.</p>
IP02	<p>Far better outcome for a value or non-price approach. At the end of the day, the price you start with, isn't the price you end with. Typically when adopting the lowest price this ends up in a lot of variations, delay and disruption to the project ultimately impacting on the project outcome.</p>	<p>In the procurement phase yes there is additional cost for both the Contractor and the Principal due to increases in the preparation of the documentation, the submission requirements and the assessment process. However ultimately, it leads to better outcomes overall and reduced hidden costs.</p>
IP03	<p>Yes definitely as a project can be better serviced to the level required to achieve the desired outcome.</p>	<p>Yes it probably does slightly as the quality is paid for upfront but ultimately over the duration of the construction project the costs are very similar due to variations sought when a contractor has supplied a low price. If three contractors have priced a project in the order of \$750 million while a fourth has priced it at \$500 million it would take a very good contractor to be able to actually deliver that project for \$500 million. There'll end up being \$250 million worth of claims of which \$150 million may be approved but during this process there has been a lot of heart ache, pain and time required in this process. It may end up coming out marginally less but in the end I don't believe it is worth it when looking at the areas that are detracted from.</p>
IP04	<p>Yes as it is important to always try and maximise the project outcome but there always has to be an element of price to ensure that project budget is still achieved.</p>	<p>No, but it is very difficult adopting this approach as many of the non-price elements are very subjective and difficult to justify your outcomes. When looking at the whole of life project costs, a non-price approach does not typically yield increased costs, and it is better for relationships as there is not such a large focus on the fight for dollars.</p>
IP05	<p>It could do, but the subjective nature of the non-price areas makes it difficult to quantify. In assessing Contractor's during the tendering and award process they can sound brilliant on paper and then they turn up on site and they are no good. Assessing non-price areas does not guarantee</p>	<p>Not necessarily, but it depends on the project.</p>

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	<p>a greater outcome but yes it should generally lead to better outcomes. It is difficult to get a true measure of non-price criteria. This make price assessment so easy as \$1 is always going to be less than \$3.</p> <p>A good client organisation with robust, defensible records of past project performance would certainly be able to get some better outcomes on future projects by using these records. The difficulty is in getting good quality data out of these measurement systems and keeping this data consistent to allow comparison. Even small things such as a Superintendent's opinion of a contractor can skew this data making comparison's difficult on a project to project basis.</p> <p>In previous experience I am familiar with a certain Contractor who has a track record of being very difficult to work with. This has been ongoing for 15 years and is still continuing today.</p> <p>They are very claim driven and this creates tense relationships. The issue is that over these 15 years there is no solid records regarding their performance so defending a decision to exclude them from the tendering process is extremely difficult and cannot be done.</p>	
IP06	<p>Yes, I believe it improves the project outcome, not only from the viewpoint of the asset that gets delivered but also the quality of relationship between the Client and Contractor is greater which is important for future projects. The only issue is that target estimates are usually inflated compared to price only tenders.</p>	<p>Yes as normally there are higher overhead costs due to increased staff numbers, site facilities and resources that are allocated to the project as opposed to price driven where the Contractor will take a bare minimum approach to resourcing to save costs. There is also typically greater contingency in the prices to cover project risks and the profit margin, which is normally agreed upfront, tends to be higher than a price driven approach.</p>
IP07	<p>Yes absolutely but that doesn't mean that a cheap Contractor can't do a good job. Sometimes you get lucky and a Contractor will rate well against things such as experience, capability and also be the cheapest.</p>	<p>Not typically, in consideration of whole of project costs you can basically end up in the same place from a cost perspective. If you've got good relationships with your Contractors you make sure that they are making some money, we are getting what we want and that things are still coming in at a good value.</p>
IP08	<p>No not necessarily, there needs to be a good balance between both price and non-price criteria to ensure value for money. This allows the right team to be dedicated to the job with sufficient resources, time and cost to deliver the project while still ensuring that costs do not get out of hand.</p> <p>One thing about a non-price strategy is that it actually requires the Consultant/Contractor to think about how they are going to deliver the project and have a sound methodology, process</p>	<p>At the moment the industry is moving more towards an initial EOI phase before going to full tender. This is a good move from the industry as it allows all interested parties to provide an initial response from which then only a select few are invited for full offer. This is a good move as the effort to respond to an EOI is significantly less which reduces tendering costs significantly.</p> <p>I don't think that by adopting a non-price approach, there are necessarily any additional costs.</p>

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	and systems in place to demonstrate to the Principal that they can effectively deliver the product. It removes the price element to a degree and makes them focus on the other areas that they can bring to the table.	
IP09	No, but again it depends on the Contractor. Some will game the system in that they can use safety and traffic, for instance, as justification to do something that costs the Client in variations on the basis that there's a safety issue which can be justified by a standard but at the end of the day is there actually a hazard or just a theoretical hazard?	It's entirely on the job and circumstances and how many changes there are. If there's no changes in the job, you're better off with the pure price strategy but if there's expected to be lots of changes you'd be better off with something like a target cost reimbursable arrangement.  But it's also important that the Client is well informed, aware of the contract conditions and knows what they are on about otherwise they will tell you not to do things that really should be done.
IP10	It can, but it depends on how clear you are with your scope and what you ask for.	Not so much because we would be more confident in what they were going to deliver and the overall projects costs could actually be less due to savings in variations. This also means that, if we were confident in their ability and experience, we don't have to manage them as much.
IP11	Not necessarily, this comes back to the way a project is documented and scoped and as long as this is done clearly and concisely you should be able to achieve a similar outcomes.	No, not when you consider the overall costs of design and construction. Often what can happen is that the lowest price will end up costing large amounts in variations and this causes greater costs than were expected.
IP12	Yes, the quality will definitely improve, the timeframes will be more realistic and the team performance would generally be better because you have the time to do the proper reviews and checking.	Yes the Client will pay slightly more but then benefits and the quality far outweigh the cost in the long term. This can also help with whole of project costs as it can result in less variations. It allows you to cover the risks better and with more attention.
IP13	A lot of the time I don't think there would be a huge amount of difference but it comes back to having good quality documentation and a good brief from the Client. I think these are the two keys to a good, or bad outcome.	Not necessarily.
IP14	Not necessarily, in a competitive environment there could always be someone who could deliver the same product at a cheaper price.	It sometimes can, but that comes back to knowing your contractor and what they can bring to the table from a whole of project perspective.
IP15	No not necessarily. If you wanted a four lane road to start with you will still get your four lane road but it's about how you got that four lane road that is impacted by the choice of strategy.  The benefit with a non-price approach from a tender assessment perspective, is that it gives you more flexibility to select the contractor that you may desire.	No not necessarily. Similarly to the response in P-5, you always end up around the expected costs of the project that were initially budgeted for.
IP16	It depends on the project. A non-price solution works out better for both the Contractor and the Client. A non-price approach allows for you to	Not always but it depends on the project and the complexity of the job as well as the definition of the project scope. If they aren't

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	<p>choose the Contractor that you want as opposed to someone who's purely trying to win the job based on price.</p>	<p>sure what the job is and what they want out of a job, a non-price approach makes this a little easier – it allows them to change the scope a bit easier as opposed to a hard-line bottom dollar procurement approach.</p> <p>Ultimately it comes back to the project characteristics as to which approach should be used.</p>
IP17	<p>Potentially yes as the outcome can be a combination of things such as the relationships that are formed during delivery. At the end of the day, it may not change the asset that is ultimately delivered but it can impact on things such as the way traffic is managed, the way community relations are handled, the impacts on the environment during delivery. For instance, if the contractor is tight on dollars regarding that budget allocation for environmental protection, he may just go with the bare minimum to achieve compliance whereas a contractor who isn't tight on dollars may provide what would be expected as opposed to just the bare minimum.</p> <p>As mentioned in the previous questions, I think the biggest impact area is around relationships whereby with a non-price approach there won't be as big a push for every variation and the contractor will be more likely to work with you and 'give a bit' so to speak.</p> <p>Contrary to the previous question it can have the opposite impact on time in that more time can be allocated to correctly suit the tasks at hand and therefore a greater level of detail and focus can be given to achieving the right result.</p>	<p>In terms of the entire project I don't think it does. A project will always have an expected dollar figure or estimate and I think both approaches would typically end up being somewhere around that figure regardless of a price or non-price approach. The difference would be how you get to that figure i.e. price only might be low initially but you get towards this figure through variations, a non-price approach might be closer to this budget figure to start with and still have some variations which move the ultimate dollar amount back towards that initial figure.</p>
IP18	<p>Similar to before, I don't think it so much changes the outcome but it's the way you got to the outcome which is different. It impacts on the way that you deliver the project. For instance, on this project we wanted to achieve a certain productivity rate for our piling works. To achieve this, we had to accept that it was going to cost us \$1.5 million extra to get the piling contractor that could achieve this productivity rate. We could have gone price only and gone with the cheaper contractor but we wouldn't have been able to hit the performance targets we needed to deliver the project as we wanted.</p>	<p>No not necessarily, from my experience you can almost guarantee that you will spend more time administering the contract. The cost and time required to manage the delivery of a price only driven strategy can often lead to greater costs. Usually you have to keep a contract administrator on the project for 6 months after it's finished to deal with the number of contract variations and sort everything out when it's a price only approach.</p>
IP19	<p>It can but you have to be careful about the way you undertake this approach to procurement to ensure that you can satisfactorily justify why you didn't go with the cheapest price.</p>	<p>No, I believe it does the opposite because you cover everything and you don't get hit with the same number of variations etc.</p>
IP20	<p>I think that price plus other elements delivers the best outcome for a project. But price only can work if you've got it scoped and documented correctly. The way to get the best price is to get</p>	<p>It adds costs up front in the tender phase of the project for both the contractor and the principal due to extra work in the preparation and assessment of tenders. I don't think it</p>

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	the best design, documented and scope correctly for the contractor.	changes the delivery costs of the project though. Whether it was price or non-price, in theory the delivery costs should still work out the same.
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## **Appendix I Procurement Processes**

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**

Luke Seeney

ID	<i>Do you find that procurement is a difficult, vague and ambiguous process?</i>
IP01	<p>Not at our organisation as it has fairly defined views on what sort of project should be procured in what manner. This is unique to our organisation and typically government sector due to similar projects, similar risk profile, how much it is going to cost and how long it will take.</p> <p>However, in commercial environments where minimising cost is an issue, it can become vague because you are trying to minimise cost, as well as time, not necessarily looking to offload risk, so choosing the right option could be more complicated and also disastrous if the wrong approach is adopted.</p>
IP02	<p>Not typically, it is fairly structured in our area as most of our works are government projects. We know exactly what the criteria is, we know how the assessment is done. There is always some subjectivity in non-price criteria but is needed.</p>
IP03	<p>Not generally however it is made difficult by the government, particularly TMR and QR make it difficult although this is often related to them needing to be transparent as they are government organisation. It can be a fairly easy process if it is done clearly with well-structured policies and procedures.</p>
IP04	<p>Yes and no based on the climate the industry is operating in. Subjective procurement approaches are difficult because justifying why someone scored a 9 for quality and someone scored an 8.5 is very difficult. The difference between an 8 and a 9 could be that they make you confident they can do the job well, while the other makes you <i>very</i> confident – this is difficult to justify. This is made more arduous in a political environment. The losers are never happy with the procurement outcome despite the best interests and process of the procurement team.</p> <p>Procurement itself isn't difficult especially with the structure around state government but it's dealing with the outcomes and the feedback requirements that make it difficult.</p>
IP05	<p>No due to structured processes and policies.</p>
IP06	<p>Not usually as there are typically well defined strategies and processes however for the Contractors it could sometimes be seen as ambiguous due to non-price criteria. It depends also on the quality of the documentation produced as if it is of a poor quality it can lead to a large number of notice to tenderers as well as a number of request for information.</p>
IP07	<p>No not from our perspective. It is pretty clear cut due to our policies and procedures (local government act). There is a lot of bureaucracy being government but that is the nature of the environment that we operate in. This can make it difficult but just need to ensure transparency and justification of decision making. There is also internal and external auditing that is carried out to ensure that things are being done correctly and clear up any potential issues.</p>
IP08	<p>It's a black art, I compare it to stormwater drainage! I refer back to the work we do in New Zealand and they have a very clear prescriptive way of how procurement is done. You clearly know what you need to hit and specifically what they are looking for.</p> <p>From my perspective I don't think that some of the state government agencies in Queensland completely understand their own procurement strategies, procedures and policies and actually don't know how to apply them. An example of this is we have local staffed offices and you'll tender on a project with a high weighting given to local presence and yet a Brisbane based large Consultancy with nothing more than a staffed phone in the local area will be awarded the job.</p> <p>The feedback you get through the 'process' and the feedback you get off the record are two completely different things. Often the preferred supplier is already known and they'll manipulate the numbers to get the one they want.</p> <p>This can be a catch with the EOI process in that the Principal may already have an idea of the three or four suppliers they want for a project, they go to EOI allowing them to easily eliminate the tenderers they were never going to go to in the first place without needing to provide justification as you would in an RFT.</p>

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	<p>An example of this was we put in four bids for active transport projects with a large city council. The first bid, we were told we had an excellent engineering team but we were too high on price. The next two bids, we had the same engineering team, we reduced the hours somewhat to reduce the cost and we were actually the lowest price – we were told they didn't think we had enough hours dedicated to the team so we lost that bid. This went against the procurement strategy which was price driven. On the fourth submission, through all the different weightings we lost that bid by 0.2 points. Off the record, person A from the council knew Consultant B and, perceive it the way you want, Consultant B won all projects. In my opinion this is an example of manipulation of the scoring system on a strategy that is not solely price focussed.</p>
IP09	<p>Yes, of course. There's so many different contract models and approaches and Client's will sometimes try and cherry pick bits and pieces and throw them together and it doesn't really work.</p> <p>They for instance want target reimbursable contract applied to that bit of the project, and this bit of the project we'll apply schedule of rates which creates a whole heaps of grey area in between. This can be exploited by the Contractor and conversely can be exploited by the Principal.</p> <p>Ambiguity in the delivery of the strategy and the administration of the contract happens all the time.</p>
IP10	<p>If you ask the people that put this stuff together, they'll tell you that it's a simple process but if you ask my officers they'll tell you that it's not. But this somewhat comes back to lack of training and understanding of the procedures and just appreciated that we are under legislation and that we need to do it a certain way. Personally I don't think it's arduous and it's there for a reason to ensure we aren't wasting money. It's a risk based approach to ensure that you are getting the right number of quotes etc and can justify the decisions made.</p> <p>We need to be able to adequately justify all dollars spent and the procurement policies that we act under help us to do this.</p> <p>Of note is that the legislation under which we operate regarding procurement is the same for everything that is procured not specifically just for engineering and construction projects which is why we need to add project specific elements to our strategies. The policy covers everything from the purchase of a new computer to the construction of a new road.</p>
IP11	<p>Not necessarily as the systems are typically well defined and in place with clear guidelines.</p>
IP12	<p>This is currently being made difficult due to lack of experience, foreigners coming in that don't understand processes and systems, you have very poorly scoped briefs coming out making it difficult to know what the Client wants. Knowing what they want and what they can actually have make it difficult to prepare a correct, well scoped and well-priced bid.</p> <p>It is time consuming from the perspective that many agencies have a panel that you need to be on to be a preferred supplier. To get on this panel you need to demonstrate appropriate experience, systems and resources. Then you need to show this all over again when bidding on a project. Why do you need to demonstrate it to get on the panel, then demonstrate it again for a project?</p> <p>Every time you prepare a tender it costs money so having to demonstrate these areas time and time again is very costly especially in today's market. As an example, five years ago, our winning ratio was one in three and these days it is closer to 1 in 7 or 8, sometimes 10. This is an indication of current market conditions which creates significant additional overhead costs.</p>
IP13	<p>Sometimes I find it can be difficult especially if you are dealing with Client nominated suppliers. I think if documentation is poor, it's going to add cost to the project and it can make things more difficult during tendering. It can also be made difficult by specifications include products that haven't been made for 20 years. This does happen believe it or not and this can add stress and heartache to the process. I'd say one out of every three tenders we find products that can not be sourced and it's primarily due to old specifications that get continually recycled project by project.</p>

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IP14	<p>The process of tendering is difficult due to the amount of information that is required to tick a lot of boxes that aren't the focus of the project.</p> <p>In terms of the assessment of tenders and the implementation of strategies, this is not really difficult due to structured policies and procedures on how to undertake the process.</p>
IP15	<p>No it's not difficult because of the structured processes. When you get into a tough situation with procurement it's just about have the courage to employ the guidance from the policies and follow the correct process even if it means tough conversations with contractors.</p> <p>The procurement process isn't difficult, but the issue is about corporate will to apply those requirements because the industry will kick up a stink and run to ministers etc. from which you will be asked to justify your processes etc.</p> <p>It doesn't matter how explicit the tender documents are, or how well you can justify your decisions, there is always issues because you are dealing with businesses in a high stakes gain.</p>
IP16	<p>Our procurement of sub-contractors is very, very structured with set systems and authority levels making the process very easy. Our system is time consuming but it is necessary to cover our decisions and engagement of various sub-contractors.</p> <p>Generally, in responding to tenders from market it is typically straight forward as it is very structured. We don't generally have any issues in tendering and responding to the chosen strategy from the Client.</p>
IP17	<p>Not really, it's always pretty clear cut but what makes it difficult is short response times and sometimes a lack of clarity or definition around what the client wants. I often find that we submit tenders where you just don't have the time to give it as much attention and perfection as you would like.</p>
IP18	<p>Yes, depending on where you are based and the skill sets that you have. Queensland is a good example of that in that we have still lost the majority of our good tradesmen, and engineers to the mining and gas sector. You tend to find that the people you can get or procure at short notice are not the best people for the job.</p>
IP19	<p>It's very difficult for us as a government contractor as there is a lot of red tape regarding us procuring sub-contractors to assist us in the construction of a project. Before we even think about procuring someone, we have to go to a procurement delegate, we have to justify why we are choosing the particular sub-contractors and get their sign off, then we have to actually undertake the procurement process and then we have to get approval from the procurement delegate. This makes it very difficult. It was also made difficult previously in regards to being able to procure sub-contractors due to the low thresholds but with the recent changes it has become a bit easier.</p> <p>In regards to tendering on projects, procurement is difficult as often there is only short timeframes to prepare and submit your bid.</p>
IP20	<p>Yes, it's difficult because on a number of projects I've been involved in, the tendering process has taken a lot longer than was originally set out. I think some of it is because of poor quality documentation but I think more so, sometimes agencies don't know 100% what they want to procure to start with. The market will always come back with idea that the client may not have thought of initially and this can draw the process out.</p> <p>Timeframes make it difficult. The main issue is client's not being certain on what they want to deliver. They generally know what they want to deliver but there's still too much grey so that when the market comes back to them with three different shades of grey, they struggle.</p> <p>They need to be prepared to accept less grey, or be prepared to accept sizeable innovation from the contractors in relation to this grey. Whether that be innovation in regards to design rationalisation or innovation in regards to technology.</p>

## **Appendix J Future Approaches to Procurement**

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ID	Which procurement approach do you think the industry should move towards?
IP01	I think there has been a general industry shift towards non-price approaches, but still need fair value for money. Possibly choosing mean fee instead of lowest fee. Don't want high or low fee, want mean fee.
IP02	A balance of price and non-price approach as opposed to a price only procurement technique which results in Contractors cutting margins, conflicts and difficulties in delivering the project.
IP03	<p>The best project outcome I've been involved in has been a collaborative agreement. Started off as an ECI and then the preferred Contractor was selected. Rather than going to a standard D &amp; C, a collaborative project agreement was drawn up. Worked very similar to a D &amp; C and also an alliance. It worked really well.</p> <p>Each strategy has its place, for smaller projects under \$100 million construct only but when projects are in the order of \$500 million a D &amp; C or an alliance to some extent is probably a better way to go.</p>
IP04	<p>Try to move towards 20 – 30% quality included in overall assessment on all projects. Trying to get industry to understand this approach is difficult. Contractors will tell you that they are open to this approach until they lose a tender.</p> <p>Was involved in an ECI, design and construct process. Contractor put in lowest price but had omitted elements of the scope and simply left bits out. In assessment of the tender, continual back and forth asking for information on the cost of doing the omitted elements. This then resulted in the procurement team adjusting their price which came in at about a million dollars less than the next lowest tender. Procurement team developed a risk assessment process for this tenderer assessing how difficult they would be to work with, likelihood of variation claims etc. This process resulted in the second lowest price becoming the preferred contractor. The lowest priced contractor then complained to a contact they had within the Premier's office and the procurement team was interrogated on how they had undertaken the process demonstrating that although you can introduce non-price elements, the subjectivity of these elements makes it difficult to justify procurement decisions and outcomes.</p>
IP05	<p>I would like to see the industry move towards performance driven specifications as opposed to prescriptive specifications. Currently the industry engages Contractors with very prescriptive specifications and standards that they must adhere to i.e. we want asphalt compacted to x,y,z, we want asphalt layers to be x thick etc. Rather than saying to the Contractor, deliver us a new road from A to B which needs to last for 10 years and accommodate a traffic volume of z. If it fails during this period, the Contractor must come back and correct the issues.</p> <p>In Europe I became familiar with this approach which means you end up in the procurement space using different strategies such as build, own, operate. You can also introduce a maintenance element in which the Contractor maintains the asset during the period.</p> <p>The benefit of adopting this approach is it allows for freedom in the construction of the project while still achieving the desired outcome. The issue is it can be difficult to specify the certain performance criteria. One example was a section of roadway in a major city in which this methodology was adopted. The life was 10 years or a certain AADT volume. At the end of the 9 year mark it was thought there was still a year remaining under the arrangement however the Contractor pointed out that since the seventh year, the AADT volumes had actually exceeded the specified volume and the Client ended up having to undertake the maintenance for the final year as well as repay the associated costs for years 8 and 9.</p>
IP06	From experience I would like to see the industry move towards collaborative project agreements and the design and construct type approach. This leads to better relationships and has better conflict resolution processes, the Contractor is paid on actual costs which can help to reduce the cost of projects. This wouldn't work on the smaller project though where it is more economical for the Principal to undertake the design and then just appoint a construction contractor to build it.

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IP07	<p>I think that TMR’s approach to having a panel of pre-qualified Contractors works really well and helps to push Contractors to maintain minimum levels and keeps the cowboys out. But again this comes back to having the right systems and available resources to effectively utilise these processes.</p> <p>There’s not really one particular approach but value based procurement seems to deliver effective results and works for all parties.</p>
IP08	<p>Moves toward value based approaches are becoming the norm these days and with the current strategies to initially undertake an EOI phase before going to full tender cuts down the work for all parties involved and is good for the industry. There’s no need to have say 17 full tender responses when this could have been reduced to three or four through an initial EOI phase. For us the cost of an EOI is about one third the cost of a full offer resulting in significant savings.</p> <p>I think though that the strategy should be on a sliding price scale, whereby for low cost, low risk projects you could adopt price only approach whereas for the larger projects a value based approach with a focus on non-price criteria should be adopted.</p> <p>The way that TMR handle the larger projects whereby they initially assess the non-price offer and whoever scores the best they then open the price envelope is a good approach but again this initial assessment can be manipulated and then if the price isn’t what they were hoping, they just negotiate with the selected tenderer anyway.</p>
IP09	<p>You can’t really go one way or the other. It really depends on the project and selecting a suitable strategy for the project type and conditions.</p> <p>I like the approach that TMR adopts whereby Contractors are required to be pre-qualified and if you are on this panel then that should mean there are no other questions apart from price – lowest price wins. If you are on the pre-qualification list, why does there need to be any further assessment of your ability to deliver the project?</p>
IP10	<p>I definitely think the industry should try and move away from price based procurement and place an emphasis on past performance and quality including their systems especially on large projects, high risk projects and large dollar projects.</p> <p>From a local council perspective, it took us a long time to get the powers at be to understand the value for money approach and that by utilising our own crews we were actually get the same product at a cheaper price when opposed to using Contractors. An example is roads that have been reconstructed by Contractors and these are now failing which is blowing out whole of asset costs whereas the ones done by local crews are not having these issues.</p>
IP11	<p>Move towards value based procurement that considers both price and non-price criteria. I have never been in favour of purely priced based selection.</p>
IP12	<p>I believe that there needs to be a balanced approach to procurement in that you don’t like to create laziness, and we don’t want to go back to the 2008, 9 and 10 periods where due to the lack of resources we have to go through a dramatic increase in labour costs. You need to keep the world real and price always needs to be considered to keep the project realistic while also incorporating non-price measures to ensure the desired outcome can actually be delivered.</p>
IP13	<p>Personally I would like to see it move towards more of the design and construct type arrangement. It’s nothing against Consultants I just find that a lot of firms are backwards when it comes to understanding construction and methodologies.</p> <p>There are new technologies that are coming out every day that are not being understood, utilised or implemented by Consultants whereas in the D &amp; C space you can have this input and ensure that things are utilising the latest and greatest in regards to methodologies and construction processes. For instance, we recently undertook a project that was design and then build. During the construction phase a new drainage system was required as part of the works, we queried the Principal because it appeared that no consideration had been given to how the drain could be</p>

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	<p>maintained. As a result, we were engaged to develop a new solution working with the maintenance department – in a D &amp; C environment this would have been avoided.</p> <p>Even simple things like Engineer’s undertaking inspections – we’re in a market where everything needs to be built yesterday. Days of 48 hours’ notice to get an Engineer on site for an inspection, it’s not good enough anymore. Client’s want more in less time these days.</p>
IP14	<p>I don’t necessarily have a preference, however I do find that the design and construct approach has the advantage that you build the relationships with the people that you are designing an outcome for, this creates strength and reliability in the team dedicated to the outcome.</p> <p>There always has to be a balance between price and non-price criteria so you can objectively select contractors, if required, based on price but it is also important to have the non-price elements to ensure you get the right contractor for the project.</p>
IP15	<p>In my opinion I think a hybrid of the alliance type arrangement could potentially work well. With a traditional design first then build, the client has ultimate control of the product he desires. With a design and construct approach, you loosely get what you want, but not specifically because the control around the design has been lost by the client. In my experience, you get compromised situations in D &amp; C because the driver is not about outcome, it’s about price and the contractor is doing things for the wrong reason. The driver is always going to be the contractor’s bottom line in a D &amp; C arrangement.</p> <p>My view is that a traditional construct only works well but it could have some non-price criteria to allow you to better select the appropriate contractor.</p>
IP16	<p>I think the industry is going away from the alliance approach to procurement and I don’t think it will ever go back that way. This is good and bad. Alliances make it easier for the Contractor in terms of the environment to work in because you know you are going to get paid for what you do. What it does do though is it creates laziness in engineers such that hard dollar contracts you need to be sharp with your quantities and how you are going to get paid for every item and how each bit of gear that is doing work is going to be covered – you don’t need to think about this in an alliance situation.</p> <p>I think you still need a combination of both price and non-price relative to the job is the key. I like the design and construct approach to procurement and that there should be more projects undertaken using this approach. Construct only you see sometimes that they have to rush the design to meet certain deadlines and this sometimes leads to missing the key reasons as to why the job is happening.</p> <p>It is important to get the procurement approach right in order to achieve the best for the project. The current project we are delivering had a very short design time frame and we are already finding significant issues. In 4 weeks we’ve submitted 30 RFI’s already. Given the short design timeframe, an alternative procurement approach may have been better suited as opposed to the construct only approach that has been used in this case.</p>
IP17	<p>It depends on the project but I think the use of either a design and then construct, or a design and construct approach works well.</p> <p>On projects that are relatively simple, have low risk, few complexities and are just your everyday run of the mill projects, I see no issues with using a design and then construct approach. On these projects there’s really no need for a contractor to be involved early on in the process and can easily be handled by your typical design consultancies.</p> <p>On more complex projects though which may include greater risk and require the use of specialist techniques or skills, I think the design and construct approach is the way to go as this allows for the contractor to be involved early on in the project lifecycle and provide input during the critical phases of design. If a construct only approach was taken with this type of project, it opens up the</p>

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	client to greater risks and prohibits the ability of the contractor to identify, what could be, more efficient and effective construction solutions.
IP18	I think the industry should stick to design and construct type approaches as I think there is a lack of the required skill sets and experience in consultancies across the board to deliver a well-documented, detailed and finalised design for construction. I don't think I've seen one in 15 years in regards to complete and accurate documentation.
IP19	<p>It's always good having a design and construct approach because, as the contractor, we can have input into the solution and you aren't constrained by the design as you are in a construct only approach. Sometimes with that approach the design is not always the right one but at that point there is little room for changes. Sometimes you are on site and you know what should be done but you're restricted because the design has already been documented and signed off, it's a bit frustrating.</p> <p>I think that design and construct is the way to go.</p>
IP20	<p>I think the economy gets best value out of design and construct because I think contractors are a lot better at managing the design then the clients are because the contractors are motivated to provide an efficient design i.e. meeting the functional outcomes while not gold plating the design. If we want to build more infrastructure for the same cost, I think the best way to do it is through D &amp; C.</p> <p>I would say the types of strategies used have reverted back a little in that there doesn't seem to be as many alliance strategies used anymore. Money is tighter, margins are tighter. I think the reason for the recession away from alliance strategies etc. is because I don't think client's believed they were getting the value for money from these strategies given the current market conditions. Also the reduction in work has made contractor's hungrier and clients have probably worked out they can get better value using competitive price procurement approaches.</p> <p>I think there would be more benefit to the community if performance driven specifications were utilised to a greater extent. It would cost less and therefore you can deliver more of it for the same amount of money.</p>

## **Appendix K Performance Measurement Experience**

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Luke Seeney

ID	Participant Performance Measurement Experience
IP01	<p>I am not particularly experienced in regards to civil works as what we build is typically light weight – car parks, buildings and roads. We see little benefit in going into detailed performance measurement because it would yield little benefit.</p> <p>The organisation does however have a prequalified tender list from which Contractor’s must be selected. To get on this list the necessary paper work must be completed and relevant experience in projects to that undertaken by our organisation must be shown. Through continual use of these Contractor’s a typically benchmark is established and this alone can be used when determining what to expect from appointed Contractor’s.</p>
IP02	<p>I’ve been involved in performance measurement for the majority of my career, preparing reports, reviewing reports, assessing outcomes of performance measurement.</p>
IP03	<p>Experience through reporting, performance meetings and monitoring of construction Contractors.</p>
IP04	<p>I am directly involved at the moment for design consultants yes. Prior to this when doing construction supervision in the UK it was always priced based and no element was given to performance and hence did not get measured.</p>
IP05	<p>I have been involved from the level of overseeing and monitoring project performance and preparation of associated reporting.</p>
IP06	<p>Monitoring of construction contractor’s on projects, assessment of their performance and completion of reports. Participating in workshops for relationship management and trying to work better together.</p>
IP07	<p>Through the measurement of quality against specifications, supervision of the contract on a day to day basis for quality and conformance as well as the preparation of performance reports as well as things such as site instructions to correct conformance issues etc.</p>
IP08	<p>Not overly, when I have been involved it’s from a post project completion perspective looking back at how the project went and performance areas that could have been improved or were done well etc.</p>
IP09	<p>Yes I have. Involved in performance meetings and scoring of teams.</p>
IP10	<p>I’ve been involved to a small extent, more so on the design side, attending regular meetings to monitor consultant progress and performance as well as reviewing reports that were submitted.</p> <p>I was also involved in the monitoring of waste management contracts which had very specific KPIs in which I was monitoring, recording and recording performance against various KPI’s. This was a high risk contract worth a large amount of money to council hence the implementation of many KPIs to assist in successful delivery of the project.</p>
IP11	<p>I have experience through the preparation or project performance reporting, meetings, pre-start meetings and post construction meetings and workshops to discuss the outcomes and performance of the project.</p>
IP12	<p>Yes I am heavily involved in the monitoring and reporting against performance measures and KPI’s. This is typically done on a monthly basis and involves the preparation of charts, graphs and reports to demonstrate the month’s performance.</p>
IP13	<p>Yes I have experience through the monitoring of KPIs on construction projects and of course operating on projects against KPIs.</p>
IP14	<p>I’ve been involved from a monitoring and reporting perspective on projects.</p>
IP15	<p>Through the preparation of monthly performance reports and participating in workshops with contractors regarding this reporting.</p>
IP16	<p>We have a supply management system in place that we use for our sub-contractors. Through this system we monitor the performance of our sub-contractors and undertake regular reviews on them across various performance categories. We score them from 1 to 5 across various areas such as quality, safety, timeliness etc. and we use this to either procure sub-contractors or if they are performing poorly we will have them removed as a supplier. This system has only been in place for 2 to 3 years. Before this, we monitored performance but nothing was documented or recorded and was only project specific. The new system is across the whole company allowing for transparency across all sub-contractors.</p> <p>I have a team of engineers on projects that undertake this process which I then review, prepare reports and authorise the engagement of sub-contractors.</p>

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IP17	I have been involved from the perspective of being measured and the perspective of measuring our in-house performance. This has included preparation of reports regarding performance, participating in performance meetings.
IP18	From a reporting and monitoring perspective on the contractor delivering the works.
IP19	I've been involved from the perspective of monitoring and reporting on sub-contractors as well as being monitored in regards to our performance as the Principal Contractor. We get monitored and reported on monthly and any issues regarding our performance is addressed in these meetings. We also then get an overall learnings report which takes into consideration how we have performed on the project, what went well, what didn't and how we can improve on the next project.
IP20	For the delivery of civil construction projects, I've been involved from the perspective of having people report on those measures to me or I've been reporting to a superior on the measures and carrying out the performance measurement and reporting.

## **Appendix L Common Performance Measures**

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**

Luke Seeney

ID	Common Performance Measures
IP01	<p>In the organisations structural works as opposed to civil works – which some could be transferred to civil if required:</p> <ul style="list-style-type: none"> <li>• Square metre rates as a first benchmark;</li> <li>• Trade package analysis of rates (not normally done however);</li> <li>• Time to deliver the project;</li> <li>• Variation types, causes, number of.</li> </ul> <p>The organisation is trying to get more sophisticated regarding measurement of quality both through their procurement process i.e. who they procure as well as in measurement of quality of what is being delivered. Would rather spend an additional \$100K to ensure quality of deliverables upfront as opposed to \$500K through poor design and documentation that results in a large number of variations at a significantly increased cost. This is a result of past experience where we have been burnt but also a shift in the industry. If this approach was tried 10 years ago when building and designing was flat out, no one would listen as everyone had plenty of work and would just move on to the next job, however the industry is not currently in that phase. We have a lot of current Consultants and Contractors who are more than happy to increase their quality of work to try and achieve greater results, particularly as the environment is currently highly competitive. 10 years ago you got what you got, whereas now the lack of work, increased competition as a result is opening doors regarding quality.</p>
IP02	<p>It depends on the project but typically as a Contractor, measurement focusses on safety, environment, timing, cost, traffic, community, quality. There is a lot of quality data that is looked at in the measurement of our performance. Problem being with all of this data is that it is lag data and always a minimum of a month behind.</p> <p>This lag can, in some instance, be somewhat mitigated by using lead indicators for things such as safety where the number of work hours can be a lead indicator for fatigue. This isn't possible though on cost and program.</p>
IP03	<p>Typical measures include, quality, safety, environment, cost and time are the five standard items but also includes teams, project management performance, experience, knowledge. Some projects will go as deep as measuring the number of non-conformances that are raised, public complaints received but typically depends on the project. I believe that focussing on the higher levels is a better approach.</p>
IP04	<p>Quality, time, relationship management which is very subjective and cost.</p>
IP05	<p>Timeliness Quality Safety Management and Enviro Management Community impacts/inconvenience (including traffic management) Relationship / teamwork (a fluffy – used in many of the earlier alliance/partnership delivery models) Claimsmanship (difficult to measure as there are many factors, many of them caused by the client, that result in claims)</p>
IP06	<p>Many agencies now employ pre-qualification processes as an initial performance measure to minimise the number of Contractors that can tender on works. On a project basis the areas that are typically measured include time, cost, cash flow targets, quality, lot area opening and closure rates, environment – noise, vibration, dust, flora and fauna, traffic, using blue tooth devices to measure travel time. Safety – near misses, LTIs.</p>
IP07	<p>Conformance against the specifications, quality, time and safety. There is some measurement of environment but not a lot due to our projects typically being low risk in regards to potential environmental impact.</p>
IP08	<p>Every Client wants you to deliver a quality product, on time with no variations. Our mandate is that we try and always deliver a quality product on time with minimal additional cost to the Client. If that means it costs us a little bit, that's how it goes and it's just part of the process.</p>
IP09	<p>Performance measures for safety, traffic management, community, quality, time, cost, and environment. In regards to quality, it's almost impossible to do a job without some NCR's, not because the quality is bad, but just the way the system works. In some instances now, the way the specifications are written you actually have to raise an NCR when you get to a certain point in order for the Client to agree to a method of dealing with that particular issue. This provides a paper work means of dealing with the issue, rather than a fault on behalf of the Contractor.</p>

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**

Luke Seeney

IP10	Milestones, certification, quality, time, cost.
IP11	Past performance, experience, personnel, reliability, quality, time, organisational structure and background, cost, work health and safety risk.
IP12	Quality, time, relationships, resources and team, capacity and capability, previous experience, communication from a personal and team perspective.
IP13	Quality, safety (this is huge), time, cost, past performance, environmental
IP14	Processes, techniques, ability to satisfactorily deliver what it is that is desired. They are also monitored heavily on safety.
IP15	Relationships, time, progress, quality of product, contractors team, capability and experience, claims, disputes.
IP16	Construction management, community engagement, contract relationships, safety, traffic, environment, quality. This happens every month. For the current project the Client established a relationship workshop as this was critical to the delivery of the project. Safety, quality are the two biggest. Claim management and time. But time is hard to judge as there can be many reasons behind timeliness issues including the Client themselves.
IP17	These days most projects cover off on the same elements which include time, cost, quality and also things such as environment, traffic management, safety, community measures. There also seems to be a bit more emphasis on relationships these days.
IP18	Safety, environment, traffic management, compliance against various requirements of the contract.
IP19	Time and cost are the big two. There's a focus on safety (safety first), quality, environment, traffic management, community complaints and relations.
IP20	Cost – regarding what you've spent, how much is left to spend to complete and comparison to budget. Also how much your progress claim values align with your expenditure so that you cash flows are correct. Other measures include time, safety, environment, traffic management, community but these ones are less tangible.

## **Appendix M Scope for Performance Measurement**

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**

Luke Seeney

ID	Do procurement approaches allow sufficient scope for performance measurement?
IP01	Yes, but we haven't taken advantage of performance measurement previously. We are currently trying to increase the way it captures, records and processes data.
IP02	Yes, however the utilisation is often the issue. The data is gathered however this does not typically lead to results as the same Contractors are still being invited to tender on projects despite poor performance.
IP03	<p>I think generally it could be done better. Projects typically have a standard template that has to be followed. You get a score from 1 to 5. There always seems to be a reason or an excuse if someone is performing poorly and this makes it difficult to really measure true performance.</p> <p>Other methods used in major projects is more relationship performance, such as relationship contracting but it doesn't really get used much anymore. From experience with the RTA this has worked well on some projects and worked very poorly on others.</p>
IP04	<p>Yes, especially with current organisations. It is typically part of the process these days and is utilised but what is then done with this data is another issue. Current organisation more so use procurement to ensure that a baseline is being achieved, not so much determine who's the best.</p> <p>Many Consultants believe that a higher score helps them however this is not the case. They are ranked on a score of 1 – 5 across various elements and as long as they are achieving a minimum of 3, it means they are doing everything they are being asked of. Whether a Consultant has a 3 or a 5, they will still be considered for projects. It's if they are below the baseline (3) that they may be excluded.</p> <p>Current organisations only want to know about who is under performing and that is all it is used for.</p>
IP05	Yes, they allow performance measures. But no, measures are seldom implemented and even less frequently monitored.
IP06	Yes, they do, measures can be implemented to suit the project however it is difficult to include KPI's without clear, accurate and agreed evidence and data.
IP07	Yes, they do and we typically write in performance measures on a project by project basis as our strategies do not really cover this. The larger the project, the more emphasis that is placed on this due to higher risks which council cannot afford.
IP08	Yes, because at the end of the day the Client is typically concerned with getting a quality product that is delivered within the desired timeframe.
IP09	Yes, they do. Regarding whether they are utilised - On some jobs people just give lip service to it but in the majority of cases people genuinely often try and achieve the best they can. What tends to happen is they'll score everyone low at the start of the job and then gradually these scores will increase. At the end if you're only half way up but you've doubled your starting score that's deemed a success.
IP10	Yes, our procurement approaches have overarching measures and then we write in our own project specific performance measures as needed. The measures implemented under the procurement strategy can be adjusted in terms of weighting to suit the project requirements and needs. These are decided on a risk based approach, for example, this design is rather complicated so we would increase the weighting on experience.
IP11	Yes, they do and we can always write in specific measures for individual projects if necessary.
IP12	Yes, and they do help in the delivery of a project but they are not the be all and end all regarding the delivery or outcome of a project.
IP13	Yes, there's always your common ones and it's done on a percentage basis. There's always an item for environmental, quality, and safety. It also depends on the project though – measures will be adjusted to suit the project. We had a project recently that was high risk and safety was ranked

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	equally against price. This required us to give significant thought to our methodologies and the safety aspect as this was a very critical element of the project.
IP14	Yes, they do with some overarching performance measures that are dictated through local or state policy.
IP15	The strategies typically include some performance measures for a project which are pre-determined as part of the strategy.
IP16	Yes, they do and all projects involve some form of performance measurement.
IP17	Yes, they do, and just about all project utilise performance measurement in some regards on project today.
IP18	Yes, we adopt what is required on a project specific basis which are typically always the same kinds of measures.
IP19	Yes, they do – the project can be monitored in the areas as required to suit the project.
IP20	Different approaches allow for different inputs. Commonly they are focused around delivering the required product on the right date but the strategies allow you to adopt measures accordingly to suit the project.

## **Appendix N Relativity of Performance Measures**

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**  
Luke Seeney

ID	Are performance measures reflective of the way the industry operates?
IP01	The key is the resources that are available and the ability of these resources to provide what is needed. Time, Cost and Quality will always come into it, however it is about the measurement of the people, who do a good job and have given us the result we wanted. Time, Cost and Quality are always the benchmark, however there is more depth that could be given to the measurement of people and relationships.
IP02	Yes, pretty well, the industry has come a long way in regards to technology however it still comes back to time, cost, quality, safety, environment, community, stakeholder relationships. There are still the main performance areas.
IP03	I think generally it could be done better. Projects typically have a standard template that has to be followed. You get a score from 1 to 5. There always seems to be a reason or an excuse if someone is performing poorly and this makes it difficult to really measure true performance.  Other methods used in major projects is more relationship performance, such as relationship contracting but it doesn't really get used much anymore. From experience with the RTA this has worked well on some projects and worked very poorly on others.
IP04	Have not been directly involved in the field with Construction in Australia but previously in the UK there was no performance measures on projects when undertaking construction supervision. It has evolved but whether this reflects current practice, would not expect so.
IP05	There's always going to be a need to measure quality, time and cost. Other measures are subjective and can be introduced dependent on the project and its requirements.
IP06	This is not clear, there will always be a need to measure the projects performance against time, cost and quality but whether the other areas reflect the way the industry operates is difficult to ascertain.
IP07	Yes, but it can be difficult to get Contractor's on board regarding performance measurement especially on the smaller projects. It's hard to get them focussed on risk management particularly around public safety through construction sites.
IP08	Yes, because at the end of the day it always comes back to time, cost and quality.
IP09	The Contracting industry is a reflection of what's thrown at them. If performance measures weren't there, no one would worry about it. The measures are not typically needed, for most reasonable, responsible Contractors they would do what performance measures drive anyway, with or without the measures.
IP10	From a local government perspective, no, trialled and tested first before adopting a new approach. Scenic Rim did design and construct for certain type of bridge, written in that innovation but then cost became an issue. More traditional approach was cheaper and whole of life costs were cheaper under traditional. Whole of life, too much looking at capital cost not enough operational costs
IP11	In general, yes they are but there are some operators who like to do things their way regardless of the measures that are in place.
IP12	Yes
IP13	I think what we get monitored on is fair and reasonable. I think the issue with performance measurement is that areas of performance that are supposed to help the industry by limiting who can undertake work based on things such as quality systems and past performance are not being taken seriously.  There's Contractor's winning work who don't have the correct ISO systems in place yet they are still awarded the work because of this price driven approach with a lack of focus on quality. I'm not saying these Contractors can't deliver a quality product, but without the correct certifications etc, how can they demonstrate that they have these systems in place?

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IP14	I don't have a definitive answer to that but from my perspective it has evolved and continues to evolve. The level of performance and the measures of performance have changed and increased to reflect new standards and information.
IP15	Yes, they typically provide sufficient measurement of performance relative to civil construction projects. There isn't a great deal that can be measured as such and it's important to ensure that it isn't an onerous process by having excessive measures.
IP16	Yes, I think they are. They are relative to how we operate and it is reasonably simple to see the areas of measurement against the different categories and what is required.
IP17	Yes, I think so. All the major elements of a project are typically covered under typically adopted performance measures. I'm not sure what other areas could be measured. It's important that it doesn't drill down too far but at the same time still keeps track of the major elements as this assists in making sure these targets are hit.
IP18	If anything I think that we over monitor their performance in some ways. We have removed some of their ability to make decisions based on what they know and their experience. We've hog tied them to, in some cases, out dated standards and practices that are not necessarily the best way to do things anymore. It is prescriptive to the point that when you ask them to change something they can't just do it, they have to go back to the designer or whoever it may be to get an answer that we already know but we simply don't have the freedoms to just make the appropriate changes.
IP19	Yes, they are but some of the areas are subjective and difficult to report accurately on.
IP20	I think performance measures are fairly correct in the current industry and are reflective of the way the industry operates.

## **Appendix O New Areas of Performance Measures**

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**

Luke Seeney

ID	Could there be new area of performance measurements and in what areas?
IP01	Yes, everything needs to be looked at more so than just time, cost and quality. People and inter-relationships are the key to making or breaking a project which I believe is more important than time, cost and quality as these are dependent on the people and resources involved in the project.
IP02	No not really needed.  There is always someone using a different measure of safety performance etc. but the overarching performance areas are typically good for the way things are done. Would prefer if more lead indicators could be identified to assist in the prediction and mitigation before things even become an issue.
IP03	Yes things are moving forward, previously you really only had two areas which were time and cost, then quality started to come into it and now you've got other such as safety, community, environment. I think now though the next level is to drive for greater project outcomes so that when a member of the public sees a project they can appreciate a project and what has been achieved. The way to do this is to possibly tie it to monetary benefits. It's difficult because some Contractor's don't care about that kind of thing whereas others like to walk away from a project knowing that they've done a great job. If we could end up with everyone adopting this approach that would certainly benefit the industry.  There's areas for innovation that could be introduced and tied to monetary benefits, i.e. cost saving sharing. Some Contractors introduce their own measures i.e. have competing teams on a project that compete against each other to do the best job. But they key is setting a mindset of doing a good quality job.
IP04	Possibly.  Time and cost should always be measured but there is always excuses that can shift the blame. It's not necessarily that new measures should be introduced, but further clarity provided around how to measure elements. The issue is the subjectivity associated with many of the measures used today.
IP05	Yes, I think so which ties in with earlier comments related to performance specifications as opposed to prescriptive specifications. This is encouraged through some of the models such as ECI.
IP06	No, not necessarily.  Our organisation already has a number of tools to undertake performance measurement. There does not need to be a focus on new areas, more so a focus on measuring the current areas and using the current tools to do this. They are not utilised enough but this also comes back to experience and training. There needs to be greater training on how to measure the appropriate areas, particularly in regards to specifications and there needs to be development of suitable documents and checks that can be used to measure the areas. This also extends to what to do with the data once you have it and how to make changes and learn from the findings.
IP07	Yes but as to which areas it's difficult to determine. The other consideration is the cost of such measures and whether they yield a substantial benefit to make it worthwhile. The other issue is these measures can be manipulated i.e. a Contractor can nominate a team for a project but at the end of the day, are those guys actually going to be dedicated to your project it will it be the graduate do most of the work with marginal input from the nominated team member. You think you're getting one thing and end up with another.
IP08	Somewhat.  I think there could be more incentives incorporated to do things differently or strive for better outcomes. Projects are typically always a thankless task with PM's driven purely by a quality product that is on time. If you've introduced anything else, well done but who really cares.

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	Focussing back on the New Zealand Transport Authority, they actually have specific criteria that rewards things such as innovation and bringing new approaches to the table.
IP09	<p>Yes. Things such as community which are monitored now, what's the real value? You always get people who are particularly vocal and didn't want the job to happen in the first place which has nothing to do with you as a Contractor but you end up with a low score for your community measure.</p> <p>I think what would be better is a report on the Contractor from the Client's perspective detailing how you've performed on the job. That's always subjective though dependent on the individual who's preparing the report.</p>
IP10	<p>From a local government perspective, I don't think so much that there are.</p> <p>I think it's important though that these measures are kept up to date with current technology and processes to ensure that industry performance is monitored relative to how it operates.</p>
IP11	No, I can't really see how else I would like to measure performance outside of the areas that are already being measured. The big one is past performance and confidence in their ability to deliver.
IP12	<p>It's not so much to do with performance measurement, it's more to do with the project budget and funding.</p> <p>Innovation can sometimes be costly and you need to invest in the process, time and resources to implement the innovation. With an understanding Client they may support this but it is a cost issue.</p> <p>It can take long term vision to invest in innovation and may not yield benefits until later in the project lifecycle which can be difficult to get Client's to see.</p>
IP13	No not really. Contractors like us will always try and achieve the best we can. It's how we survive. You'll always get rogue companies but that happens in every industry. We generally try and value add and achieve the best we can for our Client's regardless of the performance measures.
IP14	I think it is done fairly well and that there are enough measures in place that it does work.
IP15	No not necessarily. The main elements are already being measured and again you don't want to over complicate the process or make it more difficult than it needs to be.
IP16	Not really, I think it is done pretty well.
IP17	No not necessarily. I think many of the major areas are already covered off and reflect the way the industry goes about business. It's important that performance measurement continue in industry and that the way this is done, implement and utilised continues to develop with the industry.
IP18	I think we need to go back to a bit more of a practical approach to performance measurement. I don't think there is an answer or a valid way to deal with it yet.
IP19	No not really. All the major areas are basically covered these days.
IP20	No. I don't think so. It is being relatively well done now and the measures are reflective of industry.

## **Appendix P Impact of Performance Measurement**

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**

Luke Seeney

ID	Impacts of Performance Measurement on Civil Construction Projects
IP01	<p>Unsure. Performance measurement that is undertaken concurrently with a project may not change the result of this project as it is lag data, however it does provide an opportunity to make changes to the current project to increase the performance or taking learnings and use them in future projects. This comes back to one of the difficulties of analysing the data and then implementing and using this data in an appropriate manner to yield a benefit.</p> <p>Performance measurement from one project starts to inform the next. It's more of a cumulative process as opposed to an individual project thing although the knowledge that a project is going to be using performance measurement could yield a greater outcome from the project as the team understands that it is being monitored and measured.</p> <p>If you take lessons learnt from previous projects, then yes it should deliver a better result on similar projects in the future.</p>
IP02	<p>If it's implemented well it improves outcomes, if you have KPIs there and they are monitored it should generally lead to a greater outcome. Again, however, this comes back to the utilisation of the data, how it is used and whether it is implemented.</p>
IP03	<p>It gives another set of goals for the project and that it's not just focussed on finishing on time and making money but actually seeing tangible outcomes in a project.</p> <p>In NSW there is a lot of work being done on achieving best for project outcome – you have your specifications as a minimum requirement but the focus is on achieving more than just this. An example of this is independent project reviewer's that come through once a month and review the project independent of the quality records and looks for greater than minimum outcomes.</p> <p>Definitely think that if a project has a focus on performance measurement and it is done well, a greater project outcome will be achieved.</p>
IP04	<p>Hopefully it concentrates the Contractors mind on what the Client really desires and they will try and achieve the scope and the objective of the project which should generally yield a greater project outcome for both the Client and Contractor.</p>
IP05	<p>It depends on the 'buy-in' to the performance measurement process and what's done with this data. It may not necessarily change the project outcome more so just provide another record of identifying what could have been improved throughout the project.</p>
IP06	<p>It will typically yield greater outcomes for the project and can lead to good relationships when things are going well. It can achieve better value for money for the Client by ensuring the Contractor is performing satisfactorily. It can also create additional costs for the Contractor i.e. if a traffic measurable is not achieved, they may need to make significant changes to the traffic management plan which can result in unplanned costs to the Contractor. Without a measurable, things like this would go unnoticed.</p>
IP07	<p>It improves the project outcome as it provides a measureable against areas which, if done well can deliver a greater outcome. By undertaking performance measurement in these regards it gives the Contractor something to aim for and also creates the need for the Contractor to pay more attention to the measured areas. Focus brings attention, which brings detail which can yield a better outcome.</p>
IP08	<p>It is beneficial to the project because the checks and balances are in place. There are key target areas that can be aimed for which ultimately help to produce a greater outcome for the project as opposed to if these weren't measured.</p> <p>A basic example of this was a recent project that we were undertaking and a key performance area was on the presentation and quality of the drawings produced. We prepared a set of preliminary drawings which we were going to be assessed against. In review, it was clear that these drawings were not of the detail required for a preliminary set of drawings so we took the</p>

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	time to correct this – had we not be getting specifically measured on this, we may have submitted the drawings as they were.
IP09	If it is implemented well, it should have a positive effect on the project. But the key is that it needs to be implemented well.
IP10	I think if the right performance measures are implemented then it should help to yield a greater project outcome. This emphasises the importance of performance measurement.
IP11	Absolutely yield better project outcomes. I think everyone comes out happier as it typically drives better results and outcomes for the project. In some instances, it may make delivery of a project more difficult but if it is for the good of the project, than there is usually not an issue.
IP12	Performance measurement is just a communication tool more than anything. It gives direction. You can't underestimate the early warnings about how you are travelling and I follow this religiously as it gives you a good heads up about how you are travelling.  In this regard it can help deliver a greater project outcome as it provides another monitoring tool for the successful delivery of the project.
IP13	I think it definitely changes the outcome of the project for the better.
IP14	I don't think it affects the outcome because at some point you have to deliver that outcome at the end of the day. What it does impact on is how you get to the outcome. If everyone is performing well and to the plan, it makes the delivery of the project quicker and easier.
IP15	I believe that performance measurement itself doesn't change the project outcome, it is just a means of monitoring the contractor and making sure they can maintain their pre-qualification status. The way the contracts are set up means that this dictates the outcome and that the contractor is compliant in regards to areas such as quality, traffic management, environment etc.  Performance measurement more so changes how the project is delivered, not so much what is delivered.  The only thing that drives performance is dollars. A contractor will not do anything more than what they are required to do, regardless of whether it's being monitored or not. The way to drive behaviours is to put a financial reward on it.
IP16	In one way or another we've always monitored performance but I think that if it wasn't done it could create a lesser outcome for the project as people would be aware that they aren't under the microscope.
IP17	It may not necessarily change the ultimate outcome that is delivered as at some point you need to provide what you are being paid for but what it does effect is how you get to that outcome. By having measures on performance and monitoring this well, it should help delivery of the project, make for smoother delivery with less issues and assist both the contractor and the client in getting to the finish line.
IP18	It doesn't really impact on the outcome but it impacts on the way the project is run and delivered.
IP19	Ideally you should be able to deliver on time and on budget if all areas are being monitored closely and it's been done and acted upon well.
IP20	I think it can change the way the project is delivered and can change the project outcome. I think it can change the outcome in a positive sense. It allows you to find out earlier if there are problems and allows for a forum to make sure everyone is on the same page. I think it aligns the contractor and client a bit closer and opens up discussion around the measures.

## **Appendix Q Perception of Performance Measurement**

**Project Performance Measures for Civil Construction Projects  
associated with Different Procurement Strategies**

Luke Seeney

ID	Perception of Performance Measurement
IP01	It is extremely highly valued but the problem has been with how do we gather it, understand it and use it. This is still our problem now – how do we draw out the meaningful data of the project, put it in a format that is sensible to use and how do we feed this back into the process. This is not well done by us and there needs to be enhancement in this. It's the feedback part and the ability of the Contractors and Consultancies to take this, process this and then use it in their way.
IP02	Contractors are typically open to performance measurement and those that aren't, typically have performance issues. From our perspective, definitely open to performance measurement because we know we perform well and this gives us a competitive advantage over our competitors and assist with our pre-qualification. For a long time, performance measurement wasn't taken seriously and in some cases still isn't as the data doesn't get used as well as it should, but if it's done properly, the data is used well, it can be a powerful tool.
IP03	Generally it's a pain. It can also be difficult if a Contractor is performing poorly as raising this can cause arguments and things get rather adversarial. However, this more so come back to how it is done – if it was done correctly and done well there would be less issues and better outcomes.
IP04	Very keen as they think it is of benefit for future award of projects, however this is not really apparent, just want to make sure they achieve minimum standard.
IP05	There's always going to be a need to measure quality, time and cost. Other measures are subjective and can be introduced dependent on the project and its requirements.
IP06	<p>It is generally perceived with a lot of suspicion as to whether or not it is fair to be measured by contract administrator without quantitative real data regarding some of the areas that are measured.</p> <p>Within the last four or five year things have improved. Most Contractor's say they support it when they are being measured favourable however if things go south they become very defensive. It creates conflict within the project and sometimes it is difficult to obtain the right data to defend yourself. Some areas are black and white but many are subjective making it very difficult to justify the decision making process. Contractors are often very protective of their reputation hence defensive behaviour if the performance measurement does not reflect well on them.</p>
IP07	Seems to be difficult to justify the need to Contractors as it tends to come back to price and they see it as an extra cost to the project that they don't want to carry especially on the smaller projects. This is understandable especially considering some jobs they just want to get in and out with minimal fuss.
IP08	<p>It's a mixed bag but it's necessary on projects however it needs to be consistent in the way it's measured and the way it is reported. Often the performance measures and processes can be in place, but they aren't followed or reported on or acted on effectively.</p> <p>It would be good to have more structured performance feedback. TMR have systems such as the Consultant Performance Report as do some larger city councils but you rarely get these. I've found that over time, especially with a lot more people coming from overseas, they are not familiar with the policies and practices of the agencies they are working for and do not know to follow these procedures. Some of them have very little idea which indicates that although the systems may be there, there need to be better training and skilling of government officers in the use of these systems.</p>
IP09	<p>Just another task to be done. Just more contract administration. The administration required to run a contract here in Australia is significantly greater than the vast majority of places around the world. This is driven by the specifications, so many hold points, so much testing requirements, the interaction with the Superintendent on site is of a very high level here. I've done many jobs (in the UK) where the Superintendent hasn't been on site, we only have a chat when we really have an issue.</p> <p>An example here is concrete – you have to have on site testing and on site slumps and the Superintendent rep standing over you umming and arring about it slumps 90mm and its supposed</p>

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	<p>to be 80mm and then they reject the load. Then they do their checklist and it's tick, tick, tick, oh hang on its two minutes over so that gets rejected – you don't get this anywhere else. The testing is done at the concrete plant, they have documented procedures and their accreditation stating that the batch plant is certified and as long as it's come from that plant then it's ok and you just pour it.</p> <p>It tends to annoy you when you see a Contractor or completely stuffs up a contract and then gets awarded the next one. This comes back to having gathered the performance data but done nothing with it.</p> <p>It works well until something goes wrong and then it creates conflict. It's better than not doing it because it allows both sides to see how the other side is thinking. For example, the main Superintendent may not necessarily know what his guys doing on site and we can say "that bloke is being difficult, he'll watch us do something and then tell us we've done it wrong". Why didn't he say something initially? It provides a forum where issues can be aired.</p>
IP10	Is pretty well accepted and most companies typically have their own systems in place which measure a lot of similar areas anyway.
IP11	Generally organisations, typically larger ones understand that there is a lot to be learnt from every project. Performance measurement is typically expected in the industry and is not a new thing. They come to expect that it will be implemented and compliance with KPIs etc will be expected. The only ones who aren't open to it are the ones who are performing badly.
IP12	<p>The industry abides by the rules and the processes and policies that are in place. If the agencies commissioning the works insist on performance measurement, then typically the industry is keen to undertake and assist in the process as it is part of winning the work. It's not costly, it doesn't take too much time, it's fairly straight forward and you just do it because it provides a paper trail and hopefully you get some good feedback so you can improve.</p> <p>I think performance measurement is good but it's only a part of project delivery and achieving an outcome. It's a paper trail but it doesn't make the relationship any better or worse. Performance measurement is a risk to Consultants and Contractors but it encourages them to lift their game and do a better job. It's a tool that will be used more and more to weed out poor performing operators in the future.</p>
IP13	<p>I think if you don't market you'll never get anyway, performance measurement can help with this. It's all about smoke and mirrors in this world, we seem bigger than we actually are. I think it's a good thing. We do a lot of work for repeat Client's and this comes back to them monitoring us and being happy with how we've performed and hence awarding us more work.</p> <p>We take it very seriously and we always utilise the Project Officer / Principals' Rep as much as we can to ensure we are meeting their expectation. We use them, to help us to make sure that it meets their standards.</p> <p>It can be made difficult by not only having to perform against specified measures but also standards and legislation. What I read and interpret and what someone else reads and interprets can be different and you might think you are doing everything right but in actual fact you aren't but it's not because you didn't try, it's because your interpretation was different. I don't think anyone is right or wrong, as long as the job is progressing well and safely and the intent is there, what's the problem?</p>
IP14	It is not new to anyone, people understand they get reviewed, they get monitored, they've got a standard to meet.
IP15	I think they understand that it is part of project delivery and something that you have to do. It also feeds into the pre-qualification system so if they want to maintain their status, they have to do it.

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IP16	<p>We regard this as very important for our business. In the past there has been issues around subjectivity related to some of the categories but organisations are getting better at taking this out by giving breakdowns of what each score reflects and what is required against each indicator.</p> <p>I think performance measurement is good as it allows for issues to be addressed early and fleshes them out rather than leaving them linger. With our sub-contractors they know that their performance is always being measured so we can address any issues straight away.</p>
IP17	<p>Performance measurement is relatively common place these days and I think people have just accepted that on every project your performance will be somehow measured and monitored. I don't really see an issue with it or why there would be as if you are performing well, there shouldn't be any issues.</p>
IP18	<p>I think people have started to gloss over when you mention the word QA and performance. The issue is that it's a grey area that often comes back to someone's opinion and is an area of subjectivity.</p>
IP19	<p>It's just a part of delivering the project these days, some of the areas are difficult to measure but that's related to the subjectivity of the areas. I believe you need performance measurement so you know whether you are or aren't doing a good job. If you're not performing as expected, you need to know so that you can improve and change the way you are doing what you are doing. Sometimes you don't realise that you aren't doing what the Client wanted as your thinking was different to theirs, performance measurement addresses this.</p>
IP20	<p>I think that performance measurement is understood to be just part of the way we do business now.</p>

## **Appendix R Issues with Performance Measurement**

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ID	Issues with Performance Measurement.
IP01	It's not typically arduous but the difficulty lies in the analysis and response. Many layers can impact on a particular element of performance which is why it is such a subjective process.
IP02	It is not generally difficult.. If the right systems are in place it can be easily done. On most of our projects it is just an hour at the monthly meeting and going through and scoring each other's performance. Often also a good way to bring out and resolve any issues and build relationships. On the flipside it can create tension and conflict if someone's performance is not satisfactory.
IP03	Depending on the structure and process in place it can be difficult. It's difficult when Contractors are performing poorly as it creates arguments and adversity.
IP04	<p>It is arduous when there is disagreement, when someone is not performing well. Opposite when everyone is doing well.</p> <p>In the construction industry it is very difficult because it is not black and white i.e. the manufacturing industry is easier to measure because if something is being produced and 1 in 10 products are defective it is easy to measure performance related to defective products. Construction is not like this, even on an objective measurable such as a date that something needs to be completed – there are so many variables impacting on this that subjectivity is brought back into it.</p>
IP05	<p>Not half as arduous as you'd be lead to believe if you listen to the grumbling of those that haven't completed their reports. Following the initial, major obstacle of setting appropriate measures, further obstacles that make it all seem arduous:</p> <ol style="list-style-type: none"> <li>1. Poor understanding of the need for / benefits of measurement</li> <li>2. Poor understanding of the process for obtaining and recording measurements</li> </ol> <p>Insufficient (usually nil) incentives to obtaining and recording measurements.</p> <p>It's difficult to find objective measures to subjective activities. If for example you are reviewing the Contractor's performance for the month and there are 65 RFI's does this mean you have an incompetent Contractor, a poor design with poor documentation, or a difficult Superintendent?</p> <p>What also makes it difficult is that all parties need to understand what is being measured and why it is being measured. The education process can be difficult because a Contractor will immediately go on the defensive if a performance measurement is rated poorly because they may not understand the background to why that area is being monitored.</p>
IP06	It can be difficult if things aren't going well. In these instances, you are often having to defend yourself and the decision making process. It can be emotionally draining due to difficult conversations with Contractors in environments that can already be high pressure and high stress. It's hard work emotionally.
IP07	It is not particularly difficult and is covered as part of the contract administration. The difficult side of it is that it creates conflict if poor performance is being observed and addressed. There's always a million reasons, or excuses, as to why something may not be going as well as it could be and this also makes it difficult to measure.
IP08	No it is not difficult, typically many of the areas should be part of your QA process and procedures anyway and therefore are part of the everyday way that business is conducted.
IP09	Yes it is difficult. There are more arduous things on the job, but it is difficult. It's just another thing you have to do which takes your eye off the ball from delivering the job.
IP10	If you ask the staff that work for me if it is difficult, it would be a resounding yes because we don't typically have a lot of structure around it or systems in place to assist in the measurement. People who are new to it will definitely tell you that it's an arduous task. For council it's a lack of system and support tools to help us do this on projects. This comes back to cost because the system we are using has a module there for performance measurement, but to develop that

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	module has a large cost associated with it. Currently this is not budgeted in council's budget. Systems such as these don't win votes on election day, it's the projects that have been delivered.
IP11	No it is not necessarily difficult. No project ever runs smoothly and performance measurement is just part of this process. Generally, a good Consultant or Contractor will take each project as a pre-start to winning some more projects so they are typically open to performance measurement.
IP12	Performance measurement is not a difficult process.
IP13	No it is not difficult and is just part and parcel of delivering the project.
IP14	It can be, because a lot of it is not within your control. In some cases, I have found that the performance measures have been extensive and lengthy and can take a lot of time to monitor and undertake.  It is also made difficult in terms of the relationships that you build when contractors aren't meeting satisfactory levels of performance due to the conflict that it can create. The key is to quickly identify the issue to avoid potentially increasing the impacts at a later stage in the project which is possible through monitoring performance.
IP15	It can be difficult if when dealing with poor performance due to conflict. The issue is that many of the performance measurement systems are a consensus system where the client scores the contractor and the contractor scores themselves and then you meet in the middle. So it isn't truly reflective of the client's perspective on the contractor. It's a compromise, whereas if you didn't have to agree, you could have a true position of each person's thoughts.
IP16	It's pretty straight forward. It typically only takes about half an hour a month to complete the performance surveys so it is pretty simply.  Our sub-contractor performance scoring system only takes about 10 minutes to complete so again it's simple due to our structure system and processes. We have got tools in place to support our staff in undertaking these processes.
IP17	No I don't think it is difficult. On most of the projects that we do, our clients are of a larger size and typically have the systems and procedures in place to undertake performance measurement. Some of the smaller councils don't tend to have the same level of systems or emphasis on performance measurement, but this could be a reflection of the size of the projects that these organisations do which are typically of a small nature.
IP18	In my experience, the measurement of performance for civil construction contractors is the most difficult discipline to measure because of the openness of many of the tasks that they are required to undertake and difficult in defining a black and white measurable.  It's also made difficult because so often you will do it and the client or the clerk of works will come back and say I don't agree with how you've measured our performance or how you've justified your measures or how you've come to that conclusion. It can become a very cyclic argument that you may never be able to formally close out in some regards. This then creates tension between the contractor and the client.
IP19	No, it's pretty easy. You just have your monthly reporting and it makes it easier for you as you know where you are sitting in regards to the delivery of the project.
IP20	It depends on what level of performance measurement is implemented. Some clients take it too far, while others don't take it far enough.

## **Appendix S Innovation Through Performance Measurement**

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ID	Do current performance measures encourage innovation and if not, what can be introduced to encourage this?
IP01	<p>No – a Contractor is going to be looking to make money. Innovation and drive comes out of financial desires for themselves not driven by performance measurement. A project could be setup through the procurement to state that the Contractor needs to come up with innovative ways and ideas to deliver the project. This could be driven by financial benefits, i.e. savings resulting from the innovation will be split equally between contractor and client.</p> <p>Yes, because without them how can innovation be measured and comparisons and learnings been made from previous projects.</p>
IP02	<p>Probably not, unfortunately. TMR has been grappling with this for a number of years to provide incentive for Contractors to come up with innovation but the issue is Contractors want to know that their intellectual property is being protected and that they get benefit out of it as well. If there is no tangible benefit for the Contractor, they will not pursue it.</p> <p>TMR starting to talk about new clauses and conditions of tender around innovative proposals where you put forward an alternative and if it is accepted there is a 50/50 share of cost savings. The problem is, TMR has a culture of doing things the way they have always done it and trying to get innovative and new ways of doings things over the line is a real challenge and Contractors end up throwing their hands in the air and give up. Unfortunate as there is a lot of efficiencies, cost savings and other tangibles that could be gained but it's a very hard process to try and prove and get things done differently.</p> <p>There is incentives that can be used, recognition of innovation in their procurement strategies through non-price criteria around innovation and looking at demonstrated project with innovation and alternative. Although it is a buzz word for the department, it is not really embraced. I'd like to see it embraced as we see it as one of our key differentiators as a business – we have some really clever guys that come up with good solutions but we often don't get to show and implement this.</p>
IP03	<p>Very rarely. Typical contract arrangements don't encourage this nor really pursue it.</p> <p>Certainly think that performance measures should be introduced to encourage this. This needs to be driven by the procurement approach, i.e. a D &amp; C allows for a greater scope of innovation when compared to a construct only where everything is basically already pre-defined. Strategies such as D &amp; C and ECI allow for collaboration between the Contractor, Client and Designers to pursue innovation early and provide costs savings which help to demonstrate that costs related to innovation are worth pursuing.</p>
IP04	<p>Contractors do genuinely try and innovate but this is primarily financially driven for themselves. Some of the design and construct they do try and encourage innovation through cost saving splits. The issue, especially with government, is that they have taken conservative to a new level in regards to innovation. As soon as a Contractor or consultant tries to innovate or suggest something, the organisational branch responsible for this area says no. The government in Queensland is extremely risk averse and not willing to take on any risk.</p> <p>In Queensland the approach to innovation is terrible, in the UK they were more open and willing to accept innovation. Julian Mitchell who is the head of E &amp; T branch stands up for innovation and states that they want innovation but the message does not filter down.</p> <p>This can be changed, it was noticeable that when Campbell Newman was elected, there was a whole different attitude from the branch regarding engineering and technology on the approach to innovation as it was driven from the higher levels. They were more willing to look at innovation and accept it. However since his departure, it has started to revert back towards the old view and is becoming extremely difficult.</p> <p>It is especially bad here in Queensland and is the worst I have seen throughout my career across the UK and Australia.</p>

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	<p>The only thing seen successful is when it is politically driven from the high levels and part of government strategy and enforced. This could then flow through to performance measurement.</p>
IP05	<p>The answer is an emphatic “No!”</p> <p>Some contractors are very innovative and entrepreneurial in their techniques for maximising the returns they are seeking from the project. The client might call it devious or opportunistic; but from the contractor’s perspective it is smart. This however is not to the benefit of the Client.</p> <p>Adoption of performance specifications as opposed to prescriptive specifications would breed innovation as it is in the interest of the Contractor to be innovative to deliver the cheapest product while still achieving the desired outcome.</p>
IP06	<p>No, innovation from the Contractor is purely for them to improve their bottom line, not necessarily benefit the client or achieve a greater outcome. The difficulty with innovation, particularly under construct only contracts is that it will typically require a departure from the design or specification which creates a whole number of headaches regarding design changes and approvals as well as delays. With D &amp; Cs there is more opportunity to innovate but again it is rarely encourage from a performance measurement perspective.</p> <p>Innovation alone could be written into the strategies and measured to encourage the pursuit of innovation. There is somewhat of an opportunity to do this when tendering in that an alternate tender can be submitted however this is often difficult as the amount of time the Contractor has to tender is usually short making it difficult to explore innovation.</p> <p>A way of doing it is to introduce something into the schedule that allows for innovation. This is difficult though as our specifications often over specify, and are very prescriptive providing little flexibility. Our organisation stifles innovation through prescription and there is a trust issue with contractors to do the right thing given that at the end of the day, it is public infrastructure.</p>
IP07	<p>No, not necessarily. The problem with the construction industry is that there are tried and true techniques that deliver all the time. For a council like us, it is difficult to justify trialling new techniques due to the cost risks associated with this and the fact that we have limited budgets and these must be justified. Prefer to allow someone else to trial it before looking into it.</p> <p>Everyone seems to talk about innovation but innovative pursuits are rarely undertaken. Comes back to risk.</p> <p>It would be good to just see innovation in general but again it comes back to risk. We’ve looked into things in the past regarding replacement of our old wooden bridges with fibre composite bridges but then this opened up a whole new issue of who had experience with these, who could deliver. Same thing with foamed bitumen pavements, reasonably innovative but not often used and issues associated with cost compared to more traditional pavements.</p>
IP08	<p>No, a lot of time agencies can tend to see innovation as a short cut, a reduction in standard from the norm or a reduction in the quality of a deliverable. Need to be careful that innovation isn’t perceived as doing less which can sometimes be the case.</p> <p>Innovation does not tend to be rewarded. It is talked about in government agencies and they talk about using engineering judgement and looking outside the scope of design trends and developing projects to use as monitoring sticks however there is a disconnect between the upper levels with this thinking and the PM’s delivering the projects who come back to wanting a quality product that is on time. There’s a disconnect between the management message to what is being done on the ground. You suggest stepping outside the design standards and people get cold shudders. This is where innovation is stifled. It’s a pity because there is real opportunity there.</p> <p>One thing that needs to be done is the agencies themselves need to get in some quality people to demonstrate that they are serious about it. For example, hiring people that are leaders in elements of the industry that can drive the teams and put out the message that we’re really open for</p>

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	<p>business to do things differently. This message can come from industry all it wants but if these agencies are not receptive to this it just hits a block wall.</p> <p>There also needs to be a release of control in that some of the risk sharing and financial benefits are shared onto Consultants and Contractors for developing techniques that are innovative and could reduce construction costs, maintenance costs, increase asset life.</p> <p>At the moment there is no incentive.</p> <p>Too often the standards are applied in a prescriptive manner more so than being looked at as a guide. Government agencies are extremely risk averse and will avoid at all costs.</p>
IP09	<p>No they do not. There's nothing in there to specifically measure innovation.</p> <p>It would be good if there were reimbursement incentives to drive innovation to get some recognition to say that "hey you've saved us \$100k, here's a portion of it". Often we can save a Client million but there's no recognition of it.</p> <p>Purely a simple measure against innovation would be good.</p>
IP10	<p>From a local government perspective, no it does not. This is based on risk in that we are not that open to new technologies and processes etc until they have been proven by someone else who has shown that it is successful. We can't go out and be the first to trial new things which could fail and we have just spent a large amount of tax payer dollars in doing it. Traditionally very conservative in local government from that perspective because we aren't looking for that new technology etc.</p> <p>We trialled a design and construct contract out for a new bridge whereby we had a typical approach to what type of bridge it would be but in the tender we asked for innovative alternatives for the bridge type. Tenders came back in with alternatives but then cost became an issue and it proved much more cost effective to go with the traditional approach.</p> <p>In saying this the industry tends to look at capital costs as opposed to whole of life costs and can sometimes miss the benefits that could be achieved through alternatives. This could be a result of local councillors only looking as far ahead as a four-year term and it's about today in regards to cost not 10 years.</p> <p>I think performance measurement could be used to drive the industry to change but how this is done or what measures should be used is difficult to define.</p>
IP11	<p>In some ways yes. We will sometimes write into our briefs that alternatives solutions and methodologies are welcomed that can achieve better outcomes or reduction in costs. We can allow for this in our weightings, i.e. time saving innovations can be awarded through the time weighting in the assessment process, not necessarily through a specific innovation weighting.</p>
IP12	<p>No, but there is a government incentive in the research and development area where if we innovate on a project there is tax incentives from the ATO that can be received. Yes you may not get money from the Client but you can account for this as a cost offset.</p>
IP13	<p>Not overly, from our perspective innovation is driven by our business model. If we can value add to a project and have the Client appreciate this it often means they'll use us again. Next time they have a difficult project, they'll come to us.</p> <p>It comes back to pain share, gain share. Often with innovation you can provide a cost saving but this then impacts on your bottom line also. Why would we do this unless there is some incentive</p>

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	<p>there for us to do that? We've used innovation in the past to not only save Clients money but also build relationships but it would be good to see financial benefits for us as well.</p> <p>An example of this was we were doing work for a private agency in which we were able to save them \$100k on a car park they needed constructed. This \$100k was put towards completing other works which they gave to us. This is an example of how you can be rewarded for seeking innovation at the benefit of the Client.</p>
IP14	<p>They can, through adaptive management to a job as you may be able to find a better way of doing something and still hit the performance targets.</p> <p>It is not necessarily the measures that will encourage this but the openness of the client to accept changes and be willing to allow exploration of new techniques or processes.</p>
IP15	<p>No I don't think it does.</p> <p>I don't think performance measurement can have any input into innovation. I think this can be achieved by the adoption of the appropriate procurement strategy that provides the necessary freedoms to allow for innovation. What drives innovation is the dollars in the pocket of the contractor, not performance measurement. There's very little room for innovation once construction has started, innovation is in terms of the design of what you're building and the materials. Construction techniques are very much optimised so I think there's little room for innovation in this respect.</p> <p>Performance measurement won't drive innovation because in a way, it's after the event.</p>
IP16	<p>No not typically. There has been projects in the past with a particular emphasis on innovation which was encouraged through cost saving incentives – if we saved on direct job costs, we got half of the savings and the client got half of the savings. This resulted in some very good outcomes. On our current project, there is nothing that encourages us to come up with innovative techniques or solutions so therefore we will not be pursuing this on this project.</p> <p>Our approach to innovation will always be based on incentives.</p> <p>I'm not sure if this could be done through performance measurement, more so through the adoption of an appropriate strategy such as design and construct which provides the opportunity for the contractor to become involved at an early stage.</p> <p>I like the idea of performance driven specifications however the problem is you sometimes don't know all the issues surrounding a project and can miss things. There's example of where this works and where it doesn't. I don't think there is one across the board solution, each project needs to be considered individually. I'd like to see it move towards more freedom for the contractor, I prefer it this way.</p> <p>I think a way of doing this is through the design and construct approach as it gives us the opportunity to get involved early and come up with other ways to make things work that ends up saving both us and the client money.</p>
IP17	<p>No not really. Innovation is a difficult one as no one really wants to be the 'first guy' to try something out as it can potentially cost large amounts of dollars and may go wrong.</p> <p>Difficulty also arises in that new techniques or processes etc. have to go through a large amount of red tape before they can be trialled as they may not necessarily align with current requirements. This then creates time issues on projects that simply can't absorb this kind of red tape.</p>

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	<p>There could potentially be a measure placed on what new technologies, or processes were brought to the table by the contractor during delivery but again, during construction there is little time or opportunity to be trialling this.</p> <p>I think a better approach is for the agencies to drive this and to do it through their approaches to procurement. This relates back to the previous questions regarding a design and construct approach. This approach allows the contractor to become involved at an early stage, have input into how things could be done better, or more efficiently, or using alternate products. This is where the innovation could be bred. It's important to that incentives be tied to this as there are potential costs associated for the contractor in pursuing these innovations and he should be compensated accordingly if dollars can be saved by the client.</p>
IP18	<p>No, it basically means that they are going to stick to the bare minimum to achieve what is required of them, achieve sign off and protect their insurance.</p> <p>There are ways but it needs to be implemented through the procurement strategy not through performance measurement. This comes back to saying to the contractor, if you find yourself a cost saving or a way to do something better that is more efficient, gives a better result, last longer, we will give you X percentage of the savings that you can put on the table. It has to be monetary or it's not going to get their interest.</p>
IP19	<p>No, I think it's the opposite. It's stick to what you know, don't introduce any risk and deliver on budget. Don't change anything. There is such a focus on time, cost etc. that there's no room to be creative or take on some risk and spend a bit of money. It's too strict to be able to innovate.</p> <p>The prescriptiveness of the specifications, drawings and documentation that we are required to operate under basically stops us from being innovative. The government steers away from risk, the typical approach is, it's worked for 30 or 40 years, we'll stick to what works. You can always bring things up in the constructability review but it's pretty limited in regards to make changes. In this climate they don't really want to take risks.</p> <p>The government does try to promote innovations through awards and that kind of thing but really the innovation needs to come from the design phase. This is why D &amp; C is good because, as the contractor, you can make changes to various elements of the design such as the pavement where you can still achieve the desired outcome, but you can do it a better way.</p>
IP20	<p>A lot of the opportunity to be innovative is available at the tender phase and design phase. Once you're in construction, innovation costs you time and/or money so the opportunity is limited.</p> <p>The other issue is that when you are in the construction phase, innovation will rarely benefit the client as the contract is set so therefore they aren't interested in pursuing it. There could be better ways of sharing the benefits of innovation, i.e. cost savings, time savings.</p> <p>Cost incentives will always drive innovation. It's difficult to be innovative during the delivery phase, performance measurements in place or not. I.e. you might be able to utilise an innovative product but a lot of clients don't allow new materials without a whole heaps of testing etc. which is not possible in the timeframes for most projects.</p>

## **Appendix T Industries Ability to Change**

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ID	Have you found that the construction industry is typically slow to change, develop and adopt new process or techniques that could improve performance?
IP01	Yes, there's always a continual drive to do things faster and cheaper and anything that can be trialled to try and achieve savings in these areas is usually done. In saying this, the industry is typically conservative and cautious when it comes to new processes and techniques but typically once these become relatively proven they are rapid to adopt these – it always comes back to cost. Conservative and cautious to outlay costs to try new techniques and processes due to the potential for it to fail, but once proven, rapid to adopt.
IP02	It varies, the industry is rather good at adopting new technology, but new processes and techniques not so good. A lot of people in the construction industry have been doing it a long time and are set in their ways. Difficult to get them to change the way they do things. MCE faced a real challenge moving from private clients to government clients which placed a whole compliance burden on MCE resources. Trying to get them to embrace a compliance type culture that team require is a difficult challenge. For the industry, change is difficult, technology is not.
IP03	<p>The government is definitely slow. They are not open to any new construction processes or techniques. The industry itself certainly moves quickly when it's allowed to but it depends on the client's openness to this.</p> <p>We've tried to adopt things on QLD TMR projects that are used overseas all the time and would really help us but because TMR hasn't seen it before they aren't interested at all in allowing us to use it. Even procedures that have been used across the border in NSW, TMR aren't interested. How do you get a new process started when they won't even let you trial it, it's unbelievable really.</p> <p>Overseas you see processes and read things which demonstrate how far behind we are with our processes in Australia. Even moving from NSW to QLD I have found that QLD is quite behind NSW in a lot of areas. In some areas QLD are slightly ahead but in many areas they are behind. I feel that when I come up to a project in QLD I take a step back in time to some extent.</p>
IP04	Contractors do genuinely try to innovate, use new techniques and develop alternative processes but they are stifled by governments which slows the process. The other thing stifling innovation and change in the industry is so many different design standards and specifications across the country and states. In the UK there is one common design standards allowing Contractors to move freely and undertaken works throughout the whole country easily. This stifles innovation as a technique used in NSW cannot be used in QLD because the specification has different requirements. This makes it difficult for the industry to change.
IP05	<p>No, they are much quicker than clients however the operation of the industry under such a prescriptive environment makes it difficult for them to change or adopt new techniques as the industry keeps dictating how things are to be done. We typically tell them what we want and how to do it which stifles change because it is always the same processes.</p> <p>The other thing that stifles this is the tender process. The pre-construction phase can go on for years and then we only allow a typical tender period of four weeks which allows no time to try and develop innovative alternatives and delivery processes.</p>
IP06	Yes, the industry is very generational in that techniques and processes are hand down from generation to generation with processes that are very traditional. While technology has changed a lot in the last 10 years, the processes and techniques are very similar and familiar. This is heavily influenced though by the customer side in that the restrictive design and specification requirements require sign off by management if there are departures from the norm.
IP07	<p>Yes absolutely. But it is different for everyone. I've found with our organisation it is extremely difficult to change the culture. Things have been done the same way forever and people don't want to change. Some people are prepared to innovate but at the same time I've been hammered when trying to bring in new ideas. It's a human comfort thing and you often receive pushback.</p> <p>People are also jealous and people don't want to be shown up by the ideas of others.</p>

<p>IP08</p>	<p>The industry particularly Construction Contractors seem to be innovative and very adaptable as they need to be as the game is always changing.</p> <p>From a Consultant perspective the industry has moved towards a bowling alley approach in that let's put up the bumpers and protect the general public from themselves as much as we can. In doing this we've dumbed down people's ability to sit within an environment to make smart choices, for example making drivers less aware of what's around them i.e. motorway off ramps that can be hit at 110km/h which then gradually slows them down via diminishing curves etc. You should be able to just put a fairly short exit curve and make the driver think about what they are doing – I'm exiting the Motorway, I need to slow down and prepare to do this. We don't use our infrastructure efficiently.</p> <p>Despite all this, we haven't significantly reduced road crashes and loss of life on the roads but we've certainly increased design costs and construction costs. There's need to be more of a focus on changing drive behaviour as opposed to providing ever greater infrastructure to try and accommodate the drive behaviour. An example of this was the cyclist campaign whereby depending on the speed you need to give 1 to 1.5m of space. As a cyclist I have noticed a significant change in driver behaviour since this campaign where drivers are more aware of giving you the space.</p>
<p>IP09</p>	<p>Yes it is incredibly slow, driven by the Client. Contractor's are often very quick to pick up advancements in plant and bits of kit, technology etc but on the Client's side they are very slow to change. The Client often lags behind the Contractor.</p> <p>An example is foam bitumen pavement in which Queensland thinks it's ahead of the rest of Australia which it probably is, but this is two decades behind the rest of the world. They quiet frequently go out to reinvent the wheel that's already been invented somewhere else.</p> <p>Yes there needs to be a balance between rushing in and doing things and applying due diligence to things but it's too slow here. The current approach stifles the industry in that things that are true and tried elsewhere can't be used here. It would be good to see performance driven specifications instead of prescriptive specifications which they drive now. An example was on Kingsford Smith Drive, whereby we asked a question of could we do it this way, the response was the BCC document, Clause x, states that it has to be this, so no you can't – even though there is nothing wrong with the alternative. Another example was a job out west whereby the stone specified was a Type 2.1 but when you go out west far enough you can get 2.1 The specification stated 2.1 and we can cart it 500km to get it but does it really need to be a 2.1 or could a 2.3 have been used.</p> <p>Too much of picking up the rule book and drawing the picture as per the rule book and that's as far as the engineering though goes. It's not engineering, it's simply documentation. The silly thing now in Queensland is there's no consistency with standards. For example you can do one job that can be governed by Austroads, TMR standards and BCC standards where you end up with three levels of specifications you need to comply with and then they need to tell you which one trumps the other – it's really easy to get caught out, because one will say x and one will say y and you are supposed to construct to the higher standard but you missed it. It seems to be getting less clear rather than more clear even though they seem to be trying to move towards Austroads. Yes they might be trying to transition to a better approach, but in the meantime it's worse.</p> <p>There's an issue in the application and perception of standards in that they are often looked at as cast in stone when really they should be used as a guide. A classic example one was several years ago where we had an off-ramp off the Bruce Highway. It was only going to be in place for 18 months and it was only taking 100 cars per day. The design standard said that "they shall not build the ramp at a grade steeper than 7%". Now this was an ideal, that's what you'd like to achieve. Well the result of this meant that there would be a height difference of three metres going from the old Bruce Highway to the new Bruce Highway so you couldn't build it. In the end we had to build an RE wall and grade it all the way out to provide the connection. 18 months</p>

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	<p>later it was demolished and removed. To do this also required multiple side tracks to implement the solution when all that was required was to change the grade to 7.2% grade which would have resulted in huge cost savings.</p> <p>The way the industry is going is that designers aren't actually designing anything, all their doing is looking at the rule book and drawing what the rule book says. That's not real engineering input and that's not achieving value for money.</p> <p>A number of years ago and is still the case now, a number of people at the top of politics and agencies such as TMR were preaching best for value and looking at the standards and stepping outside the box but that's as far as it gets. It gets to the middle layer of bureaucrats and none of them want to take a risk because it's their backside that they're worried about and not the money because the money is the tax payers.</p> <p>We are over constructing our infrastructure. From my perspective of the time that I've been here compared to that spent in the UK is that the country is paying way too much for its infrastructure and it's not all about high wages. You've got a double hit here where by the cost to do the work is high compounded by the specified work is high cost. It's nuts.</p> <p>I think Australia in general borrowed a lot from the UK regarding the administration and delivery of construction projects and that has resulted in the industry being as it is today.</p>
IP10	<p>Possibly from a design perspective because Engineer's are typically conservative, particularly in local government. You'll attend industry briefings and conferences and they'll have new technologies etc. on display and then the following year the same things are on display and still no one has really implemented them.</p>
IP11	<p>Over the last two decades the industry has become very dynamic. This seems to be partly attributable to bright, young engineers coming up through the ranks who have come out of a different egg shell in regards to technology and the environment in general. In a way it is almost arrogant in some regard with the new approaches being brought in and an attitude of let's try this or I want to do it this way but at the same time this brings about change. No one likes change but it is inevitable however change does not always mean progress.</p>
IP12	<p>I think that businesses generally move with the time and there is no time to be complacent or continue to do things the way it's been done 10 years ago. The industry generally moves with the times not only with technology, but how we build teams and deliver projects. Right now in the current construction market businesses are changing to be as lean and mean as possible due to the current conditions of the economy.</p> <p>I think technology is a wonderful thing that most of the industry embrace, looking ahead five to ten years from now, technology has a lot to give us in regards to quality and time.</p>
IP13	<p>The whole industry is very cyclic and that has been very turbulent over the last 10 years with the GFC and change of governments a couple of times now in Queensland.</p> <p>The construction sector is a hard game. It's hard physically, it's hard mentally, and it's a tough, tough industry. You don't just knock off and switch off in this industry. There has to be change in the industry, it is currently such a volatile market that Contractors are living on the shirt tails of the next project. Gone are the days of making 10% margin on a project and when you are delivering millions dollars job and coming away with less than 10% why bother? There is so much management required now to keep a company alive and often these can be out of your control. Things like poor documentation can make or break you, ridiculous time lines. But at the end of the day it comes back to making smart business decisions.</p> <p>One of the issues is the Australia market has priced itself out of the game in regards to labour. It's cheaper to import products these days.</p>

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	The industry is stifled by red tape. You've got to go through three levels of red tape with everything you do. Federal, State and Local tape. We should move away from state governments, have a solid Federal arm and then let local council handle the rest. To do this though would require the merger of more local councils into larger councils similar to that of the large city councils like BCC and CGC. These councils are capable of handling their needs without the input of state government.
IP14	I would say that the industry has adapted as time has gone on, willingly or not. They tend to do this relatively quickly and they basically need to in order to keep pace in the industry.
IP15	No not really, I think the industry responds and adopts well as contractors need to in order to be able to survive in a free market.
IP16	Not generally, especially the larger companies. It's not within their interest to resist industry change otherwise you'll fall behind and you can't afford to do this.
IP17	It can be, especially in regards to some of the old construction methodologies etc but normally if a new piece of technology or technique comes out that is proven, it will often be picked up rapidly by the industry.
IP18	Yes, I have found it slow to change. Really nothing has changed on these sites other than safety type measures in probably close to 150 years. Everything else that is around here I can find you in a catalogue somewhere from the turn of the century.
IP19	Yes, the industry is slow to change. The theory is, what worked back then still works now, if it isn't broken don't fix it.
IP20	<p>I think the industry isn't that good in this regard due to the time taken to prove up new things or the time that government clients require to see this proving up makes it prohibitive on projects. If the government wants to pursue or encourage innovation, they need to be doing this constantly, not waiting for a project to do this for them.</p> <p>I think the government approach to standards and specifications stifles the industry. Their approach to risk also potentially contributes to this. For instance, something might go wrong on one project, so they change the specifications to avoid this happening again and add in another factor of safety.</p>