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The New Zealand Construction Industry National Key Performance Indicators

Handbook & Industry Measures

2006 Data

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This third edition of the New Zealand Construction Industry Key Performance Indicators (KPIs) was produced as a CAENZ project. The New Zealand Centre for Advanced Engineering (CAENZ) thanks the many participants whose valuable contributions have been incorporated into this year's publication.

It is important to recognise that this pilot project was developed in part to promote further development of industry statistics and analysis to enhance contractor performance in this country.

The work reported here is thus the first step in this process. The 2006 project was sponsored by Building Research and has been developed by CAENZ in partnership with Building Research, BRANZ Limited, Constructing Excellence in the UK, and an industry-wide KPI Steering Group.

CAENZ is an independent-think tank and research facilitator funded by grants and sponsorships. CAENZ's mission is to advance social progress and economic growth for New Zealand through broadening national understanding of emerging technologies and facilitating early adoption of advanced technology solutions.

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Contents

Part I

1 Background to the KPI Project

1.1 The construction Industry today

New Zealand's built infrastructure underpins the country's economic activity. The transportation network enables people to be mobile. Housing and buildings give people their living and work space. Water supply, sewage and refuse disposal systems support a healthy lifestyle. All New Zealanders benefit from a robust and cost effective built infrastructure.

The main contributor to infrastructure development and maintenance is the construction industry which accounts for around 15% of GDP and employs an estimated 14% of the NZ workforce[1].

The construction industry in New Zealand at its best can compete with any in the world, however, there are a number of fundamental concerns:

1 The industry as a whole suffers from poor image, poor commercial performance, lack of customer and quality focus.

2 There is a national skills shortage with young people turning to other industries for their career development.

3 The performance of the industry is inconsistent, some projects return world class results, whilst others fail completely and a whole range in between.

4 Most importantly, the evidence for all of the above is anecdotal. New Zealand does not have a formal methodology in place to enable companies to measure and benchmark their performance.

The combination of these issues forces clients and the industry towards a 'lowest price' culture. Clients can only differentiate on price as there is no comparable trustworthy evidence on performance. This leads to cost cutting in order to win work, adversarial relationships, and poor commercial performance which negates investment in the people and technology of the industry.

The whole represents a downward spiral which points to increasing costs and less value for money for the delivery of NZ infrastructure.

1.2 Performance Improvement

Results from UK's Constructing Excellence and Australia's Construction Innovation programme show that significant improvements in economic performance can be achieved through innovation and sharing of best practice. Looking at just one recent study[1] which applies the UK's four year average performance improvement to New Zealand's construction industry, there is a potential to realise a saving of some $600m[1].

1.3 Performance Measurement

A fundamental component of any improvement programme in New Zealand relies on having a national performance measurement system in place.

Clients need a means of differentiating the better performing players.

The better performing players need a means of tangibly demonstrating their performance to differentiate themselves from the poorer performers who rely on lowest price to win the job,

[1] Clement Toh *An Analysis of the Contribution of NZ's Construction Sector to the National Economy*, CAE 2004

but are then unable to deliver.

All industry players need a means to measure their current performance and gain feedback on what needs to be improved to enable them to perform better.

Internationally, countries such as the UK have been able to demonstrate their year on year industry performance via a set of nationally recognised and supported Key Performance Indicators (KPIs). Figure 1 represents just one of a set of ten nationally recognised KPIs.

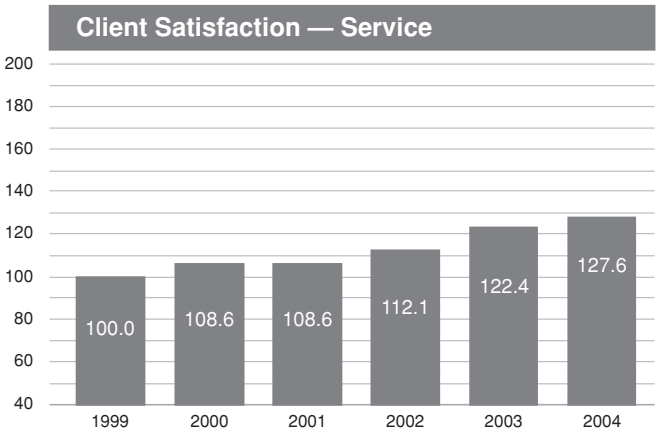


Figure 1.1: One of UK's ten KPIs demonstrating year-on-year industry improvement

Over the last few years, many NZ projects have established partnering/alliance and other best practices. Whilst benchmarking has been used in CAE's demonstration Project Programme for the last two years, and some companies measure certain indicators such as customer satisfaction, the results have been patchy and difficult to obtain. The complaint is that there is no 'national standard' to enable:

a) the comparison of 'apples to apples'; and

b) clear guidance on how to measure performance.

This project has seen the development and launch of a national set of KPIs for the New Zealand Construction Industry.

2 Introduction to KPIs

2.1 The Purpose of the KPIs

Worldwide, the annual publication of KPIs has been shown to stimulate a significant number of construction industry clients and their suppliers to assess their performance critically, and to take positive action to instil a culture of continuous improvement.

Now, in line with a nationwide push towards innovation and world-class delivery, New Zealand is being measured and the results made publicly available. The measures will be carried out year on year to demonstrate the trend and highlight opportunities for improvements in performance.

The premise on which these KPIs are published is that clients of the construction industry want their projects delivered:

- On time
- Safely
- Free from defects
- On budget
- Efficiently By profitable companies

and those regular clients expect continuous improvement from their construction team to achieve year-on-year:

- Reductions in project costs
- Reductions in project times

With the publication of Construction Industry KPIs, it is anticipated that working groups representing various parts of the construction industry will produce sets of KPIs which address people management and environmental issues. These, together with the above largely economic performance indicators begin to address the whole sustainability agenda.

KPIs can be used to establish a basic system of measurement for these critical issues, for benchmarking performance against the national levels of achievement, and for setting improvement targets.

This first set has enabled a benchmark comparison to be made with the performance of the UK construction industry. It is hoped that the future will see more countries adopting these KPIs to enable wider international benchmarking.

2.2 Terminology

For the purposes of this handbook, the following definitions are used:

Performance Indicator: a measure of a factor critical to success

Benchmark: the best performance achieved

Benchmarking: comparing performance against others, and using lessons from the best to make targeted improvements

2.3 KPIs in use

KPIs provide a simple means of assessing performance against the range of performance currently being achieved in the NZ construction industry. The main ways that KPIs can be used in the industry are:

- To provide a measurement framework for partnering and framework contracts
- To provide evidence of best value in public procurement
- To provide measures other than price to support procurement decisions
- As a marketing tool
- To meet the requirements of ISO 9001 quality management systems
- To provide a health check as part of a continuous improvement programme.

2.4 Benefits of using measurement

When used well, as part of a consistent improvement programme, KPIs can offer significant benefits including:

- Targets can be realistically set based on national performance data.
- Improvement efforts are focussed on issues that show poorer performance and are critical to success.
- Improvement targets are based on what has been achieved in practice, which removes the temptation to say 'it can't be done'.
- Benchmarking provides confidence that your organisation's performance compares favourably with best practice.
- For organisations in the public sector, benchmarking provides an assurance that 'Best Value' is being achieved.

Specific benefits can be achieved by the industry at various levels such as:

Industry and Government

- Demonstrate how we perform nationally and internationally as an industry.
- Find out "Who performs better?" "Why are they better?" "What actions do we need to take in order to improve our performance?"
- Set policy to encourage improved performance.

Individual Companies, Contractors, Consultants, material suppliers etc

- Benchmark against industry performance, use lessons learned from the best to make targeted improvements.
- The better players are able to demonstrate that they can differentiate on performance, not just price, developing a barrier to poorer performers in the market place.

Client Organisations

- Benchmark against the industry and other client organisations whether they have a repeat portfolio of ongoing projects such as retail organisations, developers and local government or clients with one-off projects.
- Choose the better performers using informed information
- Build contracts around incentives based on performance targets

Industry Bodies

- A set of national KPIs will enable the various industry bodies to adapt and develop '2nd tier' KPIs specific to their discipline or sector which will support the performance and improvement efforts of their members

Evidence from 'best practice' company's shows that performance measurement and benchmarking can yield real benefit to companies by shining a spotlight on their performance and showing where action is needed to improve. However to be of value, the measurement system needs to be founded on the correct principles.

3 The Measures

3.1 Construction Industry KPIs and APIs

The Construction Industry measures are predominantly concerned with economic issues. There are two levels of measure, KPIs and APIs.

At the highest level are the Headline or Key Performance Indicators (KPIs). These KPIs are represented in Section 3.2 and also on the 'All Construction' wallchart which includes data from all the major construction industry sectors excluding material suppliers.

At the second level are the Additional Performance Indicators (APIs) for those wanting a slightly different measure or more detail looking at one sector or type of construction. No APIs have been produced for 2006 at this time, except for profitability. It is envisaged that further APIs will be added or subtracted year on year as demand dictates.

3.2 Headline Indicators – KPIs

The headline KPIs comprise eleven measures in six families of measures:

1 Client Satisfaction
   - Product
   - Service

2 Quality - Defects

3 Predictability Cost
   - Construction cost
   - Design cost
   - Project cost

4 Predictability Time
   - Construction time
   - Design time
   - Project time

5 Safety (LTI)

6 Profitability

The Latter two measure Company performance, whilst the former measure project performance.

Each graph shows the range of performance being achieved currently across the whole New Zealand construction industry.

Each KPI graph is derived from a representative sample of data obtained from surveys of the industry (see page 47) which is arranged in a cumulative frequency graph from worst to best performance. The data are then divided into one hundred percentiles to allow the benchmark score to be calculated.

A note of caution

The KPIs are produced from the best data available at the time of publication. Users should ensure that they are comparing themselves against appropriate performance indicators. The

KPIs must be used as an aid to, not a substitute for, professional judgment.

Each KPI family and what it is measuring is described below:

1. Client satisfaction a. Product b. Service	Measures how satisfied the client was with the quality of the finished product and the service (of the whole project team). Usually measured at or shortly after completion and handover.
2. Defects	Measures the degree to which the completed facility was free from defects that impacted on the client. Usually measured at the point the project is offered for handover.
3. Predictability – cost a. Design b. Construction c. Project	Measures how well out-turn costs compared with original estimates.
4. Predictability – time a. Design b. Construction c. Project	Measures how closely the project was delivered to the original timetable.
5. Safety	A measure of the number of Lost Time Incidents per 200,000 hours worked. Equivalent to 100 Full Time Equivalent (FTE) employees
6. Profitability	Measures company profit before tax and interest as a percentage of sales.

Section 5, Methods of Measurement, explains each KPI in more detail.

3.3 Additional Indicators – APIs

The APIs offer a slightly alternative view from the KPIs, or the data broken down into more detail. It is envisaged that APIs will be added over time.

APIs must be used as an aid to, not a substitute for, professional judgment.

3.4 The 'All Construction' Wallchart

The All Construction Wallchart contains ten graphs in six families of KPIs. It can be obtained from CAENZ, or downloaded from www.caenz.com.

4 Using the KPIs

To use the KPIs, you will need to firstly collect your own data and analyse it to compare it to the National measures and obtain your benchmark scores. After that, there are a number of useful steps to go through. These are:

- Collecting Data
- Deciding what to benchmark against
- Measuring the Project or Company benchmark score
- Reporting the Results
- Analysing the Results
- Taking Action
- Remeasuring

Each of these stages above are described in more detail in this section.

4.1 Collecting Data

Normally, data will have to be collected from 2 sources - existing records and new surveys. The responsibility for providing data for the KPIs rests with both client and suppliers.

A contractor will normally be able to provide information on predictability of cost and time for the construction phase, and safety, but will have to go to the client to get data on client satisfaction and defects. On the other hand, a client will know results for satisfaction and defects, but will have to obtain information from their suppliers on the company measures such as profitability and safety.

A basic data collection form which can be copied is included in the Appendix on page 49.

Remember:

- Keep data collected from different projects separate.
- Record honestly. Some problems may be outside your direct control, but if the problem cannot be identified it cannot be solved!
- Maintain a simple audit trail - you may be asked to show where your data came from.

You will need to understand the Key Project Stages (detailed below) in order to collect the appropriate data.

The Key Project Stages

In order to collect data and use the KPIs, three project stages have been identified. These stages are described below and shown diagrammatically in Figure 4.1.

A Commit to Invest

The point at which the client decides to invest in a project for an agreed budget, sets out the business requirements in a client's brief and appoints and authorises the project team to complete the design. Early cost advice, feasibility studies, outline planning permission, planning appeals, land bank appraisals, etc would normally be carried out before Point A was

reached. At Point A, the client will be committed to paying for the completed design.

B Commit to Construct

The point at which the client authorises the project team to start the construction of the project and has made the site available to the constructor. The timing of Point B can depend upon the type of procurement method employed. The design will not necessarily be complete at Point B. At Point B, the client will be committed to paying for the completed design and the completed product.

C Available for Use

The point at which the product is available for substantial occupancy or use. Point C may be in advance of contract completion, for example where ancillary work (e.g. landscaping) is completed after the product has been put to use. At Point C, the product will available for the client to use.

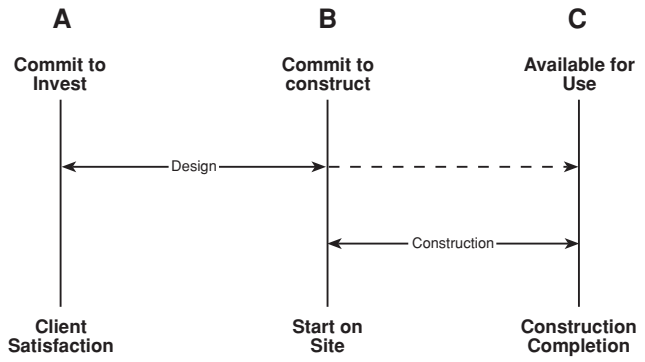


Figure 4.1 Key project stages

4.2 Deciding what to benchmark against

Before you can calculate your KPIs, you need to decide which set of data you are going to benchmark against. Many organisations compare themselves against the All Construction Headline data or KPIs which contains data from all key sectors of the construction industry. However, you may consider it is more appropriate to compare yourself against other API sets, in which case, refer to the 'API' section on page 30. Care must be taken that the correct definitions and methods of measurement are applied.

The Methods of Measurement (Section 5) and the data collection form (Appendix on page 49) give the formulae needed to calculate your performance. For most of the KPIs this is quite straightforward and can be carried out manually.

4.3 Measuring the Project or Company Benchmark score

Once you have measured your performance, you need to compare it with the industry data to find out your benchmark score. Having selected the appropriate graph (e.g. profitability), follow these steps with reference to the illustration below (Figure 4.2):

1 Plot your measured performance on the vertical axis.

2 Read across to the performance line

3 Read down to the horizontal axis. This is the benchmark score out of 100%

In the example (Figure 4.2), a company wishes to benchmark its pre-tax profitability. It has achieved a performance of 15%, which results in a benchmark score of 60%. This means that 60% of companies have achieved equal or lower profitability, and the remaining 40% have achieved higher profitability than the example company.

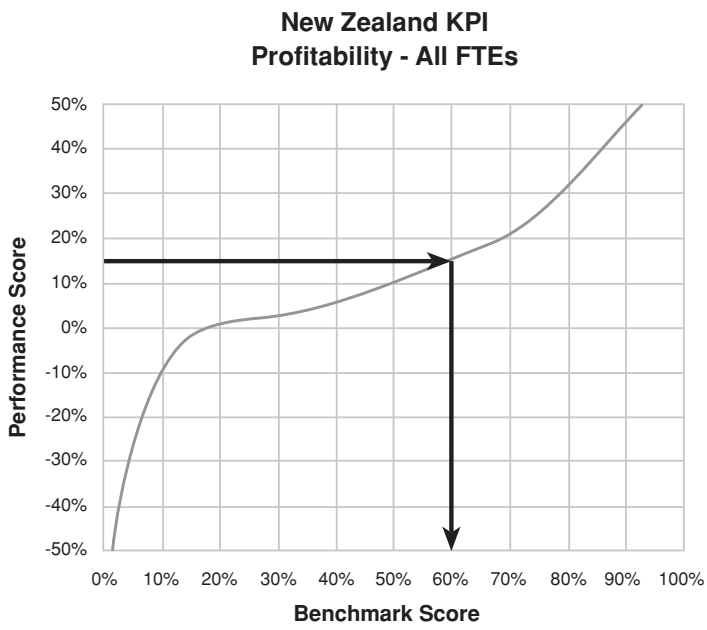


Figure 4.2: Measuring the Project or Company Benchmark

Dealing with 'flat' sections on graphs

A number of KPI graphs have sections where the performance line runs horizontally. This is because the underlying data set contains a relatively large number of results of the same value.

To achieve a correct benchmark score in these cases follow these steps with reference to the illustration below (Figure 4.3):

1 Plot the measured benchmark score on the vertical axis (1).

2 Read across to the graph line (2).

3 If the graph line is intersected at a 'flat' zone, follow the graph line to the last point of contact (3).

4 Read down to the horizontal axis (4). This is the company/project benchmark score out of 100%.

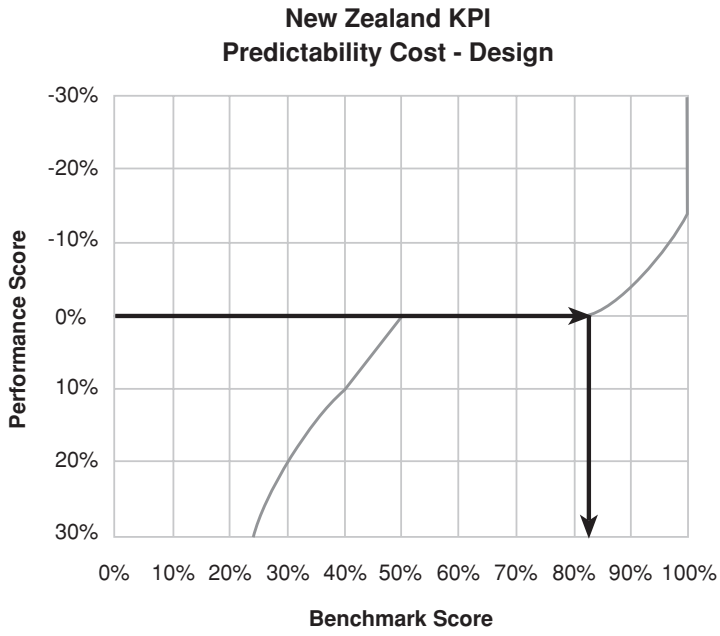


Figure 4.3: Dealing with 'flat' sections on graphs

In the example (see Figure 4.3) a company wishes to benchmark its predictability of cost of design.

It has achieved a performance of 0% which equates to a benchmark score of 82%. This means that 82% of projects have been delivered on cost, or at a higher design cost, than the example project, and 18% have been delivered at a lower design cost than the example project.

4.4 Reporting the Results

Now you have your benchmark scores, you need to let someone know about them. A convenient way to do this is to plot them on the radar chart contained on each wallchart.

The radar chart gives a rapid picture of the organisation's overall benchmark performance. In order to complete the radar chart, take the benchmark scores for each KPI, plot each result on the appropriate axis of the radar chart, and join with a line (see Figure 4.4). In general, the nearer the plotted line is to the outer perimeter of the radar chart, the higher the overall performance.

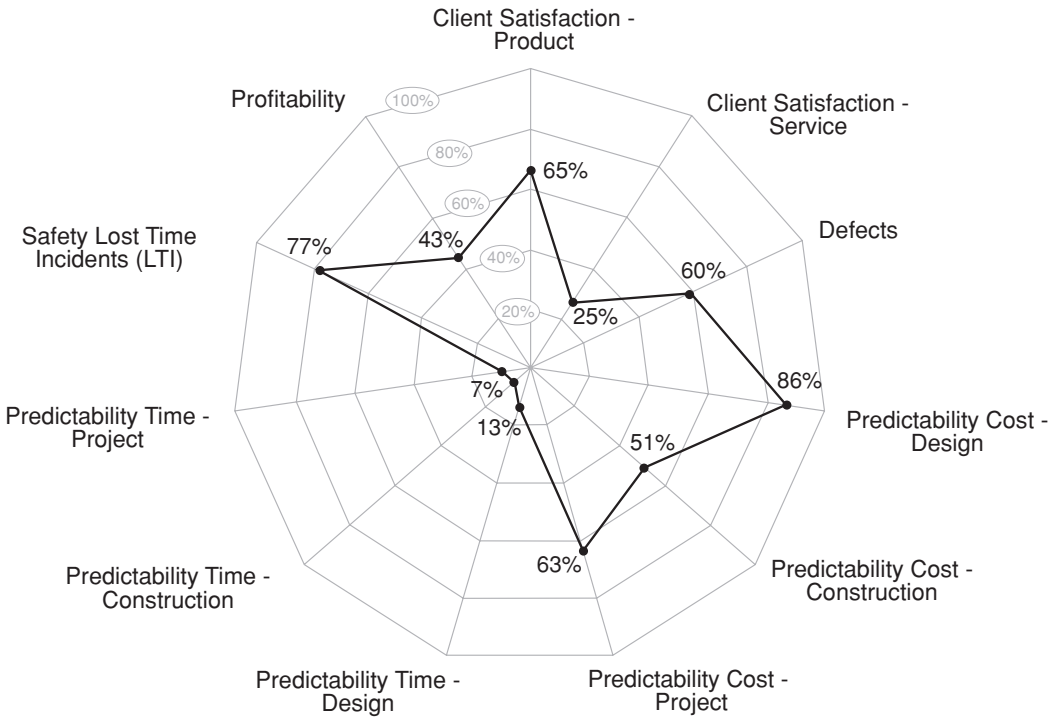


Figure 4.4: Example of a completed Radar Chart

It is straightforward to make your own radar chart using a standard spreadsheet programme. To avoid confusion make it clear exactly what the results refer to (e.g. an individual project, several projects, or the average for your organisation over the past 12 months).

Averaging performance

A number of organisations gather data on several projects and wish to plot their average performance.

The correct way to do this is to calculate the benchmark score for each project separately, then average the benchmark score. For example, an organisation completed 3 projects and measured client satisfaction.

The results are shown in the following table.

Performance (using the 1-10 scale)	Benchmark Score
5	25%
8	65%
9	90%

The overall performance is the average benchmark score (i.e. (25+65+90)/3 = 60%). It would be wrong to take the average performance (i.e. (5+8+9)/3 = 7.3) and use this to derive an overall benchmark score.

4.5 Analyse the Results

The radar chart paints a broad picture of strengths and weaknesses. It is important that you let the data 'speak' to you.

Look for links between different benchmark scores. For example, high benchmark scores for time predictability linked with low scores for client satisfaction with the product may indicate that corners are being cut to get the job done on time.

Set clear decision criteria to judge what action is needed. For example, some organisations consider that performance that is below the industry average is unacceptable and must be followed up with corrective action.

4.6 Take action

Too many organisations stop at just reporting the results, so they never get the benefit of using their performance data to make improvements. Action will be needed to maintain strengths and to eliminate weaknesses.

The KPIs cannot themselves tell you what action you need to take.

Key points to think about are:

Avoid strategies that improve one aspect at the expense of another (e.g. improve profitability by cutting corners on the product and increasing defects).

Improvements will take time, and may involve joint action between clients and suppliers. For this reason KPIs are ideally suited to support partnering.

4.7 Measure Again

Now you have completed your first set of KPIs it is vital that you capitalise on the lessons learned! There will be further improvements to be made, and you may need to review your measurement system and adjust it in the light of your experience to make it work more effectively for you.

Remember, high performing athletes collect and analyse a whole range of data on their performance, looking for ways to stay ahead. You wouldn't expect them to win one race and then stop checking their performance, so don't fall into the trap of using KPIs once and then forgetting them. Keep them in the forefront of people's minds by carrying out regular checks and performance reviews, and publicising the results widely.

There is no right answer to the question "How often should I measure my performance?" The table below gives some guidelines, but it is up to you to decide. Remember, too little sends out a signal that "This is not important" and too much can lead to overload and "analysis paralysis!"

5 Methods of Measurement

This section gives the methods of measurement for use with the All Construction Key Performance Indicators (KPIs) and Additional Performance Indicators (APIs).

To use the Construction Industry KPIs correctly, it is vital that the correct definition and method is used. This section provides the purpose, definition, method, formula and an example for each of the 11 KPIs and 4 APIs. Note that, except for the Profitability API, no graphs are provided for the Safety APIs. The Safety APIs are provided in this section as examples of alternative measures that a company may decide to use for internal reporting.

The methods of measurement should be used in conjunction with the measurement process described in Section 4.

KPIs

5.1 Client Satisfaction family of measures

1. Client Satisfaction Product	
Purpose	To determine the overall level of client satisfaction with the completed product.
Definition	How satisfied the client was with the finished product/facility, using a 1 to 10 scale, where: *10 = Totally satisfied* *8 = Mostly Satisfied* *5/6 = Neither satisfied nor dissatisfied* *3 = Mostly dissatisfied* *1 = Totally dissatisfied*
Method	1. On completion of each project, carry out a survey with the client to determine how satisfied the client was with the finished product/facility using the 1 to 10 scale above. 2. From the Client satisfaction - product KPI graph, measure the benchmark score.
Formula	The performance score for Client satisfaction - product is the rating from the client survey.
Example	During a post-project review, the client scores satisfaction with the product at 8 out of 10. Using the Client's satisfaction - product graph to calculate a benchmark score, the rating of 8 equates to a benchmark score of 55% on the All Construction chart.
Note	This question may be asked as part of a more comprehensive survey or post-project review.

2. Client Satisfaction Service	
Purpose	To determine the overall level of client satisfaction with the service of the consultants and main contractor during the project.
Definition	How satisfied the client was with the service of the consultants and main contractor, using a 1 to 10 scale, where: *10 = Totally satisfied* *8 = Mostly Satisfied* *5/6 = Neither satisfied nor dissatisfied* *3 = Mostly dissatisfied* *1 = Totally dissatisfied*
Method	1. On completion of each project, carry out a survey with the client to determine how satisfied the client was with the service of the consultants & the contractor using the 1 to 10 scale above. 2. From the Client satisfaction - service KPI graph, measure the benchmark score.
Formula	The performance score for Client satisfaction - service is the rating from the client survey.
Example	During a post-project review, the client scores satisfaction with the product at 6 out of 10. Using the Client's satisfaction - service graph to calculate a benchmark score, the rating of 6 equates to a benchmark score of 5% on the All Construction chart.
Note	This question may be asked as part of a more comprehensive survey or post-project review.

5.2 Defects

Purpose	To assess the impact on the client of any defects at the point of handover.
Definition	The condition of the product/facility with respect to defects at the time of handover, using a 1 to 10 where: *10 = Apparently defect free* *8 = A few defects and no significant impact on the client* *5/6 = Some defects and some impact on the client* *3 = Major defects with a major impact on the client* *1 = Totally defective*
Method	**1** On completion of the project **2** From the Defects KPI graph
Formula	The performance score for defects is the rating from the client survey.
Example	During the inspection at the point of handover, a small number of minor defects are discovered which can be corrected within the first month of use with minor disruption to the facility. The client scores the project 7 out of 10. Using the Defects graph to calculate a benchmark score, the rating of 7 equates to a benchmark score of 25% on the All Construction chart.
Note	This question may be asked as part of a more comprehensive survey or post-project review.

5.3 Cost Predictability family of measures

There are three KPIs – one for design cost (A to C) and one for construction cost (B to C) and one for the overall project (A to C).

Cost Predictability – Design, Construction & Project		
Purpose	To measure the reliability of cost estimates for (i) Design, (ii) Construction & (iii) the Project overall	
Definition	**i** Design cost – actual cost at Available for Use (C) less the estimated cost at Commit to Invest (A), expressed as a percentage of the estimated cost at Commit to Invest (A).	
	ii Construction cost – actual cost at Available for Use (C) less the estimated cost at Commit to Construct (B), expressed as a percentage of the estimated cost at Commit to Construct (B).	
	iii Project cost – actual cost at Available for Use (C) less the estimated cost at Commit to Invest (A), expressed as a percentage of the estimated cost at Commit to Invest (A).	
Method	**1** Identify the estimated and actual cost of design at A and C or the estimated and actual cost of construction at B and C, or the estimated and actual coat of the whole project as applicable, for a completed project.	
	2 Calculate the percentage change between the later and the earlier cost.	
	3 From the Predictability-cost KPI graph for design, construction or project, measure the benchmark score.	
Formula	Performance (%) predictability cost - **design** = $\frac{\text{Actual design cost at C} - \text{Estimated design cost at A}}{\text{Estimated design cost at A}} \times 100$	
Performance (%) predictability cost - **construction** = $\frac{\text{Actual construction cost at C} - \text{Estimated construction cost at B}}{\text{Estimated construction cost at B}} \times 100$		
Performance (%) predictability cost - **project** = $\frac{(\text{Actual design + construction cost at C}) - (\text{Estimated design + construction cost at A})}{(\text{Estimated design + construction cost at A})} \times 100$		
Example	Using the following data for a project:	
	Estimated cost of design at A	= $500k
	Final cost of design at C	= $490k
	Estimated cost of construction at A	= $3,300k
	Tendered cost of construction at B	= $3,400k
	Final cost of construction at C	= $3,475k
	Predictability cost - **design** (A to C) = $\frac{\$490k - \$500k}{\$500k} \times 100 = \mathbf{-2\%}$	

	Using the Predictability - cost (Design) graph to calculate a benchmark score, minus 2% equates to a benchmark score of 72% on the All Construction chart.
Predictability cost - **construction** (B to C) = $\frac{\$3{,}475k - \$3{,}300k}{\$3{,}300k} \times 100 = \mathbf{+5.3\%}$	
	Using the Predictability - cost (Construction) graph to calculate a benchmark score, plus 5.3% equates to a benchmark score of 31% on the All Construction chart.
	Predictability cost - **construction** (A to C) = $\frac{(\$490k + \$3{,}475k) - (\$500k + \$3{,}400k)}{(\$500k + \$3{,}400k)} \times 100 = \mathbf{+1.7\%}$
	Using the Predictability - cost (Project) graph to calculate a benchmark score, plus 1.7% equates to a benchmark score of 58% on the All Construction chart.

5.4 Time Predictability family of measures

There are three indicators – one for the design phase (A to B), one for the construction phase (B to C) and one for the overall project (A to C).

Time Predictability – Design, Construction & Project		
Purpose	To measure the reliability of time estimates for (i) design, (ii) construction and (iii) the whole project.	
Definition	**i** Design time – actual duration at Commit to Construct (B) less the estimated duration at Commit to Invest (A), expressed as a percentage of the estimated duration at Commit to Invest (A).	
	ii Construction time – actual duration at Available for Use (C) less the estimated duration at Commit to Construct (B), expressed as a percentage of the estimated duration at Commit to Construct (B).	
	iii Project time – actual duration at Available for Use (C) less the estimated duration at Commit to Invest (A), expressed as a percentage of the estimated duration at Commit to Invest (A).	
Method	**1** Identify the estimated and actual time for design between A and B or the estimated and actual time for construction between B and C, or the estimated and actual time for the whole project between A and C as applicable, for a completed project.	
	2 Calculate the percentage change between the later and the earlier time.	
	3 From the Predictability-time, design, cost or project KPI graph, measure the benchmark score.	
Formula	Performance (%) predictability time - design = $\frac{\text{Actual design time at B} - \text{Estimated design time at A}}{\text{Estimated design time at A}} \times 100$	
Formula	Performance (%) predictability time - construction = $\frac{\text{Actual construction time at C} - \text{Estimated construction time at B}}{\text{Estimated construction time at B}} \times 100$	
Formula	Performance (%) predictability cost - construction = $\frac{(\text{Actual design + construction time at C}) - (\text{Estimated design + construction time at A})}{(\text{Estimated design + construction time at A})} \times 100$	
Example	Using the following data for a project:	
	Estimated design time at A weeks	= 60
	Actual design time at B weeks	= 68
	Estimated construction period at A	= 54 weeks
	Construction contract period at B	= 56 weeks
	Actual construction period at C	= 60 weeks
	Predictability time - design (A to B) = $\frac{68 \text{ weeks} - 60 \text{ weeks}}{60 \text{ weeks}} \times 100 = \mathbf{+13\%}$	

	Using the Predictability - time (Design) graph to calculate a benchmark score, plus 13% equates to a benchmark score of 50% on the All Construction chart.
Predictability time - construction (A to B) = $\frac{60 \text{ weeks} - 56 \text{ weeks}}{56 \text{ weeks}} \times 100 = \mathbf{+7\%}$	
	Using the Predictability - time (Construction) graph to calculate a benchmark score, plus 7% equates to a benchmark score of 30% on the All Construction chart.
Predictability time - construction (A to C) = $\frac{(68 + 60 \text{ weeks}) - (60 + 54 \text{ weeks})}{(60 + 54 \text{ weeks})} \times 100 = +\mathbf{12.3\%}$	
	Using the Predictability - time (Project) graph to calculate a benchmark score, plus 12.3% equates to a benchmark score of 50% on the All Construction chart.

5.5 Safety (LTI)

This KPI has been chosen as most companies in New Zealand measure the number of Lost Time Incidents per 200,000 man hours (equivalent to 100 FTEs per year. excluding subcontractors). It is a company measure not a project measure.

However, the APIs include measures which include 100,000 employed and other ways of measuring safety incidents such as 3 day injuries etc. It is important to choose a method which is right for your business and fits with the way you currently collect data if at all possible.

Purpose	To measure the number of Lost Time Incidents per 200,000 man-hours worked.	
Definition	Lost Time Incidents (i.e. Lost Time injuries/fatalities which require time away from work).	
Method	**1** Identify the number of Lost Time Incidents in the year - on a properly managed site, details of all accidents will be recorded in the accident book. Note: There is a sample data collection form at Appendix C.	
	2 Identify the number of man hours worked in the year, for your company only.	
	3 Select the LTI Safety KPI graph and measure the benchmark score.	
Formula	Performance (LTI) Safety = $\frac{\text{Number of Lost Time Injuries per year}}{\text{Number of man-hours worked in the year}} \times 200{,}000$	
Example	Using the following data for a company	
	Number of Lost Time Incidents in the year	= 5
	Number of Man-hours worked in the year	= 142,850
	Performance (LTI) Safety = $\frac{5}{142{,}850} \times 200{,}000 = 7$	
	Using the Safety KPI graph to calculate a benchmark score, the LTI of 7 equates to a benchmark score of 70%.	
Note	The above example uses a firm wishing to calculate its 'company safety' (LTI) over the period of a year. Organisations wishing to calculate safety LTI over a different period or at a project rather than company level can use exactly the same method, but use the data for the period chosen or the project. Care should be taken when comparing *project* results against KPI graphs of *company* performance as the results could be misleading. Not all lost time incidents are recorded. The Safety (LTI) KPI graph has been adjusted to take account of this. In this first year, the sample size of companies responding to the survey was small. Therefore, care should be taken in using this KPI & the Safety APIs.	

5.6 Profitability

Purpose	To measure the profitability of a construction company before tax and interest.	
Definition	Company profit before tax and interest as a percentage of sales.	
Method	**1** Take the value of profit before tax and interest published in the annual accounts and express it as a percentage of the value of sales.	
	2 From the Profitability KPI graph, measure the benchmark score.	
Formula	Performance (%) profitability = $\frac{\text{Profit before tax and interest}}{\text{Value of Sales}} \times 100$	
Example	Using the following data for a company:	
	Profit before tax and interest	$210k
	Value of sales	$3.0m
	Performance (%) profitability = $\frac{\$0.21\text{m} \times 100}{\$3.0\text{m}} = \mathbf{+7\%}$	
	Using the Profitability graph to calculate a benchmark score, plus 7.0% equates to a benchmark score of 48% on the All Construction chart.	
	Note: Organisations wishing to calculate Profitability at a project rather than company level should use the formula: Performance (%) profitability = $\frac{\text{Project profit}}{\text{Project final account plus head office charges}} \times 100$	
	Care should be taken when comparing *project* results against KPI graphs of *company* performance as the results could be misleading.	

5.7 APIs - Safety Family of Measures

These APIs have been chosen as some companies in New Zealand measure accidents in a slightly different way. This set should enable most companies in New Zealand to be able to internally benchmark their performance without dramatically changing the way they currently measure and report. All measures are company measures.

a. Safety LID – Lost Incident Days		
Purpose	To measure the number of Lost Incident Days per 200,000 man-hours worked.	
Definition	Lost Incident Days (i.e. Days where work is not performed due to a safety incident). For your company only.	
Method	**1** Identify the number of Lost Incidents Days in the year - on a properly managed site, details of all accidents will be recorded in the accident book. A best practice site should also record the no. of Lost Incident Days. Note: There is a sample data collection form at Appendix C.	
	2 Identify the number of man hours worked in the year by ftes, for your company only.	
	3 Calculate the rate of LIDs per 200,000 hours worked	
	4 Select the LID Safety API graph and measure the benchmark score.	
Formula	Performance (LID) Safety = $\frac{\text{Number of Lost Incident Days per year}}{\text{Number of man-hours worked in the year}} \times 200{,}000$	
Example	Using the following data for a company	
	Number of Lost Time Incidents in the year	= 15
	Number of Man-hours worked in the year	= 142,850
	Performance (LID) Safety = $\frac{15}{142{,}850} \times 200{,}000 = 21$	
Notes	Organisations wishing to calculate LID at a project rather than company level should use the formula: Performance (LID) Safety = $\frac{\text{Number of Lost Incident Days during project}}{\text{Number of Man-hours worked during the project}} \times 200{,}000 \times \frac{52}{\text{Duration (wks)}}$ Care should be taken when comparing *project* results against KPI/API graphs of *company* performance as the results could be misleading. Not all incidents are recorded.	

b. Safety MIR – Medical Injury Rate		
Purpose	To measure the number of medical injuries (any work related injury which requires professional medical treatment) per 200,000 hours worked (by full time equivalent employees in the company).	
Definition	Medical injuries per 200,000 hours worked..	
Method	**1** Identify the number of Medical Injury Cases in the year - on a properly managed site, details of all accidents will be recorded in the accident book. A best practice site should also record the no. of Medical Injury Cases. Note: There is a sample data collection form at Appendix C.	
	2 Identify the number of man hours worked in the year, for your company only.	
	3 Calculate the rate of MIRs per 200,000 hours worked	
	4 Select the MIR Safety API graph and measure the benchmark score.	
Formula	Performance (MIR) Safety = $\frac{\text{Number of Medical Injury Cases per year}}{\text{Number of man-hours worked in the year}} \times 200{,}000$	
Example	Using the following data for a company	
	Number medical injuries in the year	= 22
	Number of Man-hours worked in the year	= 142,850
	Performance (MIR) Safety = $\frac{22}{142{,}850} \times 200{,}000 = 30$	
Note	Organisations wishing to calculate LDI at a project rather than company level should use the formula: Performance (MIR) Safety = $\frac{\text{Number of Medical Injuries during project}}{\text{Number of Man-hours worked during the project}} \times 200{,}000 \times \frac{52}{\text{Duration (wks)}}$ Care should be taken when comparing *project* results against KPI/API graphs of *company* performance as the results could be misleading. Not all incidents are recorded.	

c. Safety AIR – Accident Injury Rate This is the measure used in the UK Safety KPI to track the UK company safety performance & enables direct comparison with performance in New Zealand companies if desired.		
Purpose	To measure the number of Over 3 Day Lost Time Incidents (i.e. lost time injuries/fatalities which require more than 3 days away from work) per 100,000 employed (i.e. full time equivalent employees in the company) in the year.	
Definition	Over 3 Day Lost Time Incidents per 100,000 employed per year.	
Method	**1** Identify the number of Lost Time Injury Cases in the year requiring more than 3 days off work- on a properly managed site, details of all accidents will be recorded in the accident book. A best practice site should also record the length of time that the person was away from work due to the injury. Note: There is a sample data collection form at Appendix C.	
	2 Identify the average number of full time equivalent employed in the year, for your company only.	
	3 Calculate the rate of LTIs per 100,000 employed in the year.	
	4 Select the AIR Safety API graph and measure the benchmark score.	
Formula	Performance (AIR) Safety = $\frac{\text{Number of 3 day injuries per year}}{\text{Average number of employed in the year}} \times 100{,}000$	
Example	Using the following data for a company	
	Number of 3 day injuries in the year	= 3
	Number of Man-hours worked in the year	= 71
	Performance (AIR) Safety = $\frac{3}{71} \times 100{,}000 = 4225$	
Notes	To convert No. Man-hours worked to Average NO. employed = $\frac{\text{Number of Man hours worked}}{2000}$ Organisations wishing to calculate AIR at a project rather than company level should use the formula: Performance (AIR) Safety = $\frac{\text{Number of 3-day injuries during project}}{\text{Average number of employed during the project}} \times 100{,}000 \times \frac{52}{\text{Duration (wks)}}$ Care should be taken when comparing *project* results against KPI/API graphs of *company* performance as the results could be misleading. Not all incidents are recorded.	

5.8 Profitability API – By Size Band

Purpose	To measure the profitability of a construction company before tax and interest, specific to its size by no. employed or 'Full Time Equivalents' (FTEs).	
Definition	Company profit before tax and interest as a percentage of sales split into bands by size. ne 1 FTE over 1 & ne 5 FTEs over 5 & ne 10 FTEs over 10 & ne 100 FTEs Over 100 FTEs	
Method	**1** Take the value of profit before tax and interest published in the annual accounts and express it as a percentage of the value of sales.	
	2 From the Profitability by Size Band API graph, choose the right line for your company size band & measure the benchmark score.	
Formula	Performance (%) profitability = $\frac{\text{Profit before tax and interest}}{\text{Value of Sales}} \times 100$	
Example	Using the following data for a company with 90 FTEs:	
	Profit before tax and interest	$210k
	Value of sales	$3.0m
	Performance (%) profitability = $\frac{\$0.21\text{m}}{\$3.0\text{m}} \times 100 = \mathbf{+7\%}$	
	Using the Profitability- By Size Band API graph, 10 to 100 line to calculate a benchmark score, plus 7.0% equates to a benchmark score of 53% on the All Construction chart.	

Part 2

6 Industry Report — the Results

This section sets out the 20065 results for New Zealand.

The results are shown in three different ways:

1 The industry average (or median) for each KPI and API

2 The % of the industry reaching a 'best practice' target[2]

3 A separate graph for each measure (the KPIs are also displayed on the Wallchart).

6.1 Industry Average (Median) results

The Industry Average Performance for 'All Construction' is shown below.

KPI / API	*Measure*	*2004 Score*	*2005 Score*	*2006 Score*	*Gain/ Loss*
KPI Client Satisfaction – Product	Median Score out of 10	7.6 of 10	8.0 of 10	8.0 of 10	NC
KPI Client Satisfaction – Service		7.3 of 10	7.8 of 10	7.7 of 10	-
KPI Defects	Median Score out of 10	6.7 of 10	7.9 of 10	7.6 of 10	-
KPI Predictability Cost – Design (A to C)	Median % cost under or over budget	0%	0%	0%	NC
KPI Predictability Cost – Construction (B to C)		+2%	0%	+1.7%	-
KPI Predictability Cost – Project (A to C)		+5%	+1.5%	+2.8%	-
KPI Predictability Time – Design (A to B)	Median % time under or over programme	+10%	0%	+11.9%	-
KPI Predictability Time – Construction (B to C)		-1%	0%	0%	NC
KPI Predictability Time – Project (A to C)		+4%	+1.2%	+14.28%	-
KPI Safety – Adjusted for Underreporting – Lost Time Incidents per 200,000 hours worked (LTI)	Median LTIs	15 LTI's	14	13	+
KPI Profitability	Median profit %	10.1%	24%	7%	-

NR means Not Reported
NC means No Change

[2] These targets have been adopted from UK Constructing Excellence.

6.2 The percentage of the surveyed industry reaching a 'best practice' target[2]

KPI / API	*Measure*	*2004 Score*	*2005 Score*	*2006 Score*	*Gain/ Loss*
KPI Client Satisfaction – Product	% scoring 8/10 or better	72.5%	81.7%	87.8%	+
KPI Client Satisfaction – Service		61.5%	79.0%	39.2%	-
KPI Defects	% scoring 8/10 or better	40.0%	78.0%	31.1%	-
KPI Predictability Cost – Design (A to C)	% on target or better	53.1%	54.8%	54.8%	NC
KPI Predictability Cost – Construction (B to C)		41.6%	53.8%	39.1%	-
KPI Predictability Cost – Project (A to C)		33.3%	48.0%	40.0%	-
KPI Predictability Time – Design (A to B)	% on target or better	37.8%	51.8%	22.2%	-
KPI Predictability Time – Construction (B to C)		64.9%	72.5%	53.12%	-
KPI Predictability Time – Project (A to C)		34.2%	50.0%	22.9%	-
KPI Safety – Adjusted for Underreporting – Lost Time Incidents per 200,000 hours worked (LTI)	% companies achieving zero LTIs	3.7%	33%		+

NR means Not Reported

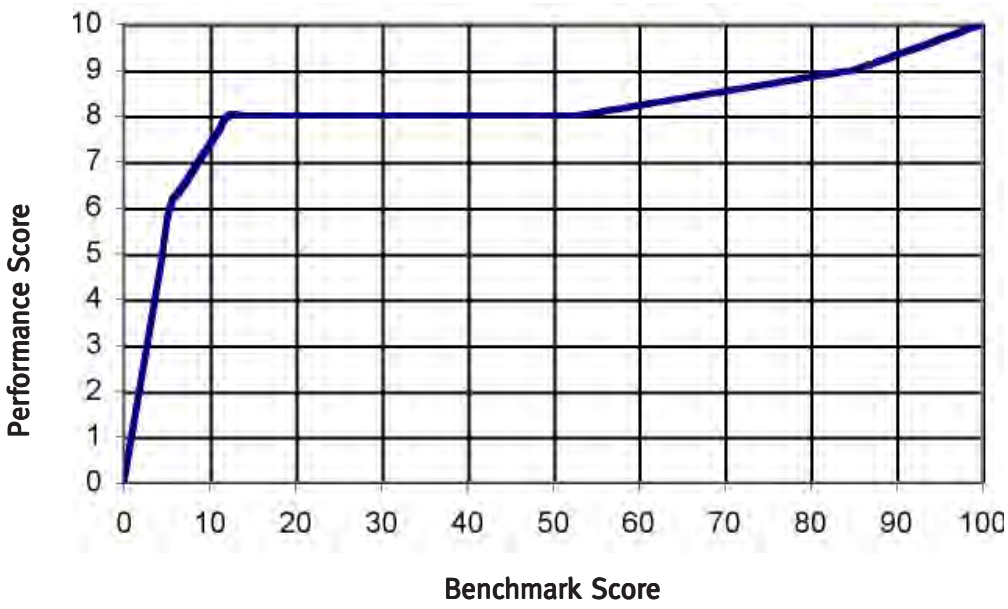
[2] These targets have been adopted from UK Constructing Excellence.

6.3 KPI and API individual graphs

The following graphs represent the 2006 results for New Zealand.

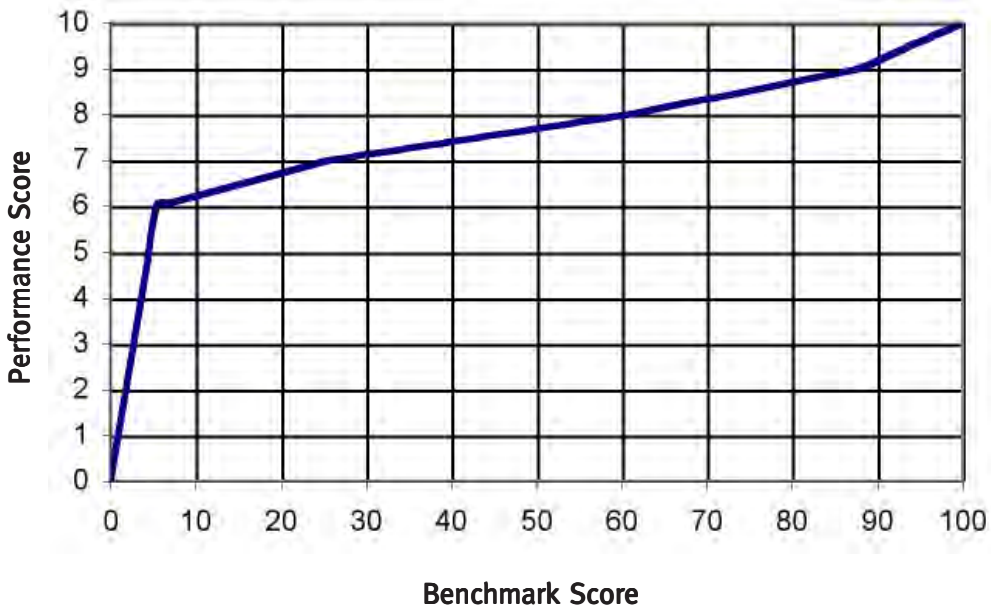
1 Client Satisfaction - (a) Product

Measures how satisfied the client was with the quality of the finished product on a scale of 1 to 10. Usually measured at or shortly after completion and handover.



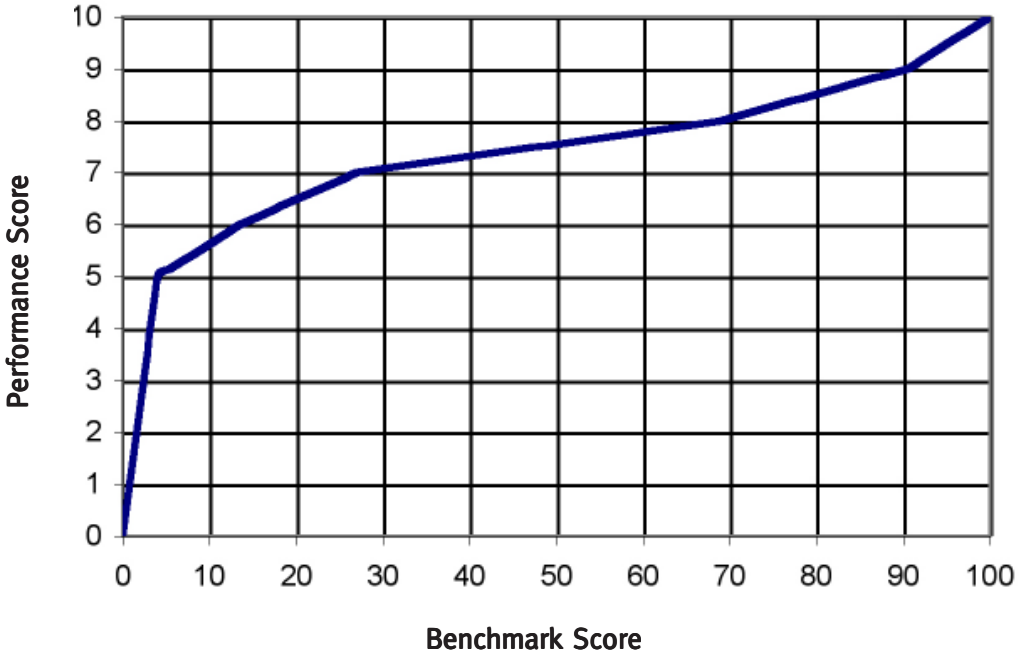
2 Client satisfaction - (b) Service

Measures how satisfied the client was with the quality of the service obtained from the construction consultancy team & the main contractor together on a scale of 1 to 10. Usually measured at or shortly after completion and handover.



3 Defects

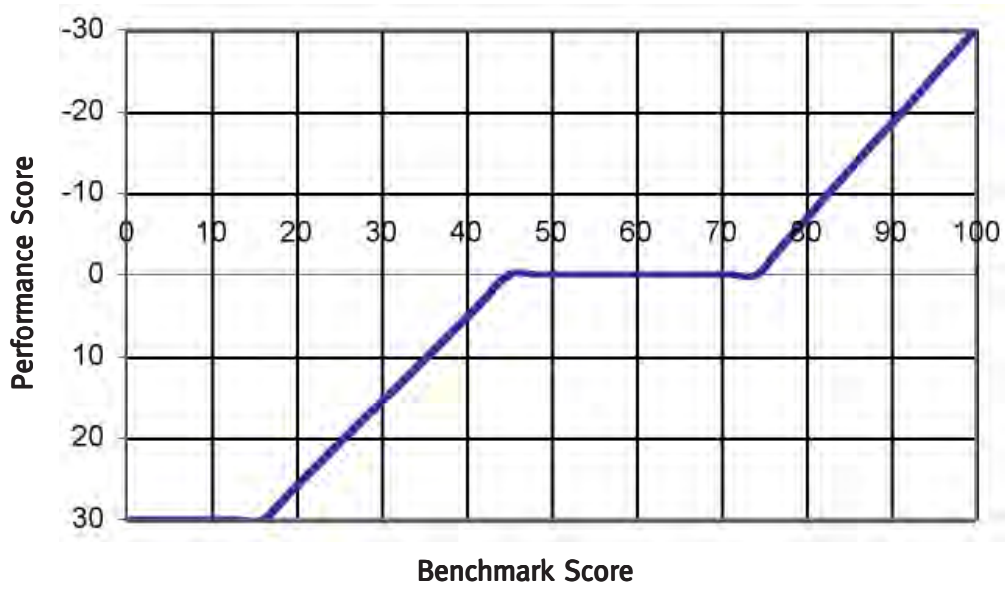
Measures the degree to which the completed facility was free from defects that impacted on the client on scale of 1 to 10. Usually measured at the point the project is offered for handover.



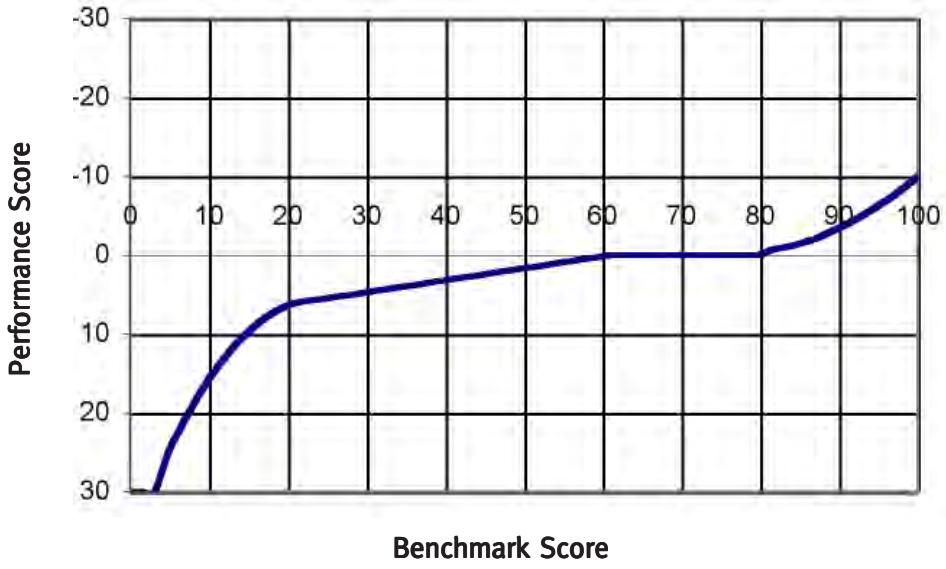
4 Cost Predictability

Measures how well out-turn costs compared with original estimates.

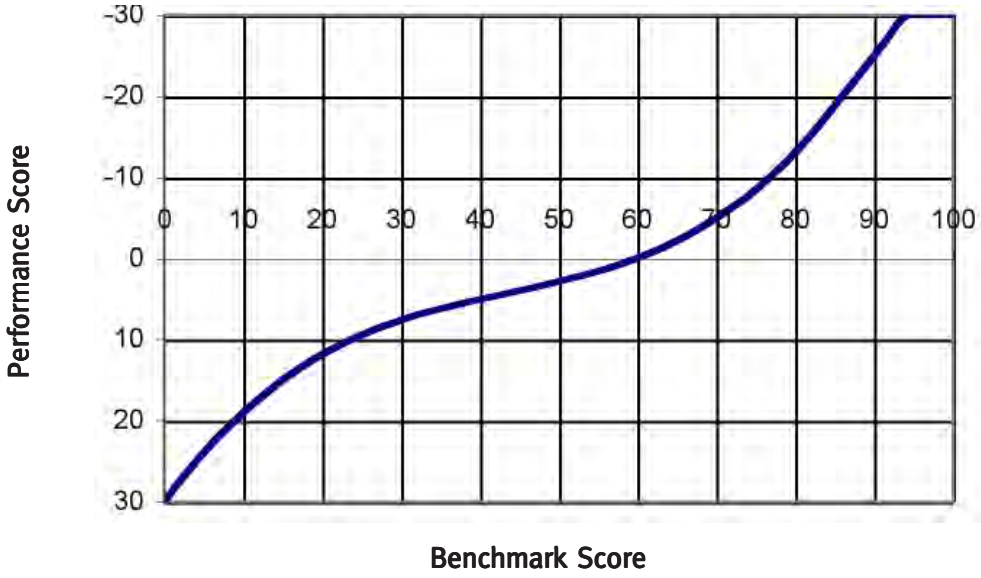
(i) Design



(ii) Construction



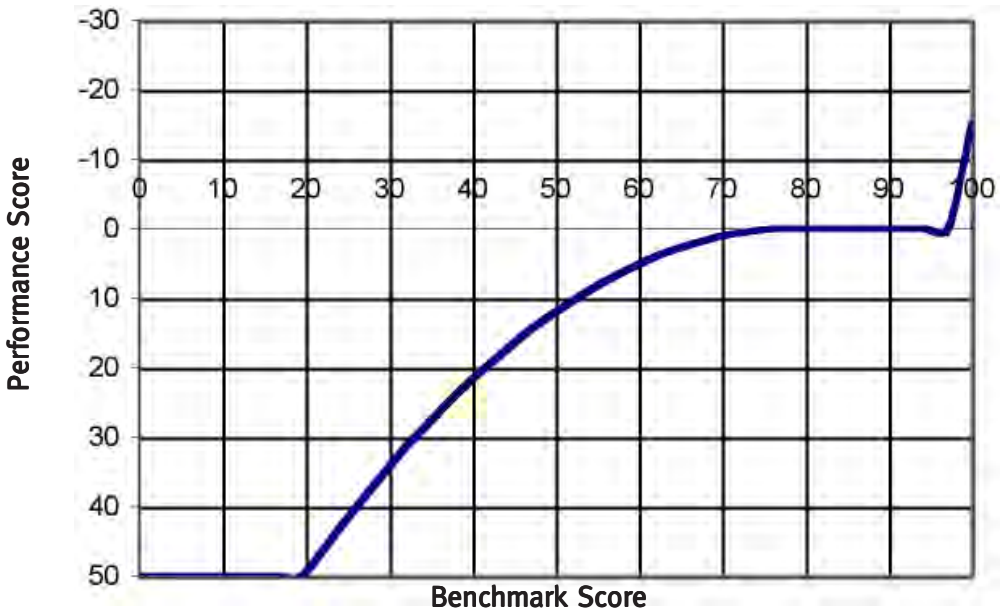
(iii) Project



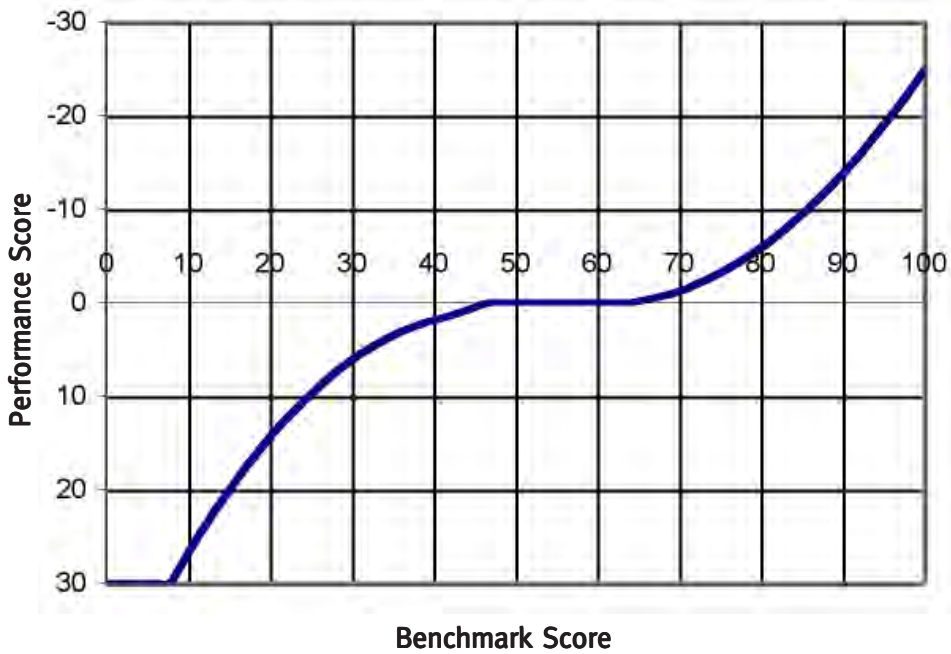
5 Time Predictability

Measures how closely the project was delivered to the original timetable.

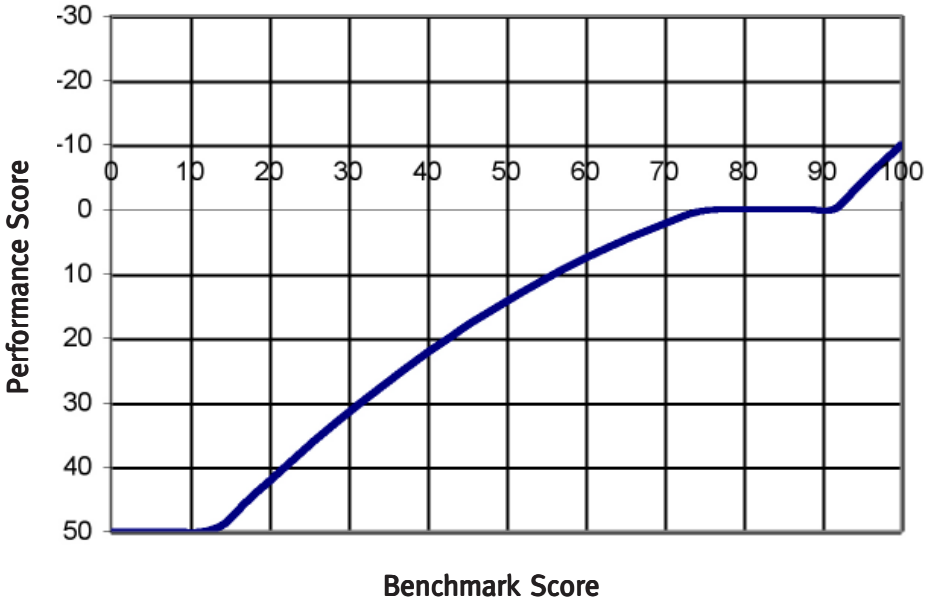
(i) Design



(ii) Construction

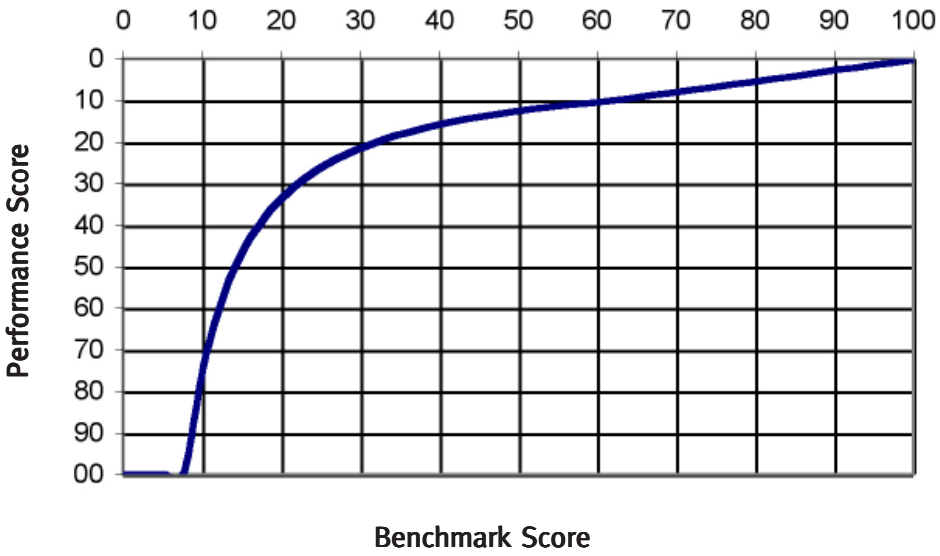


(iii) Project



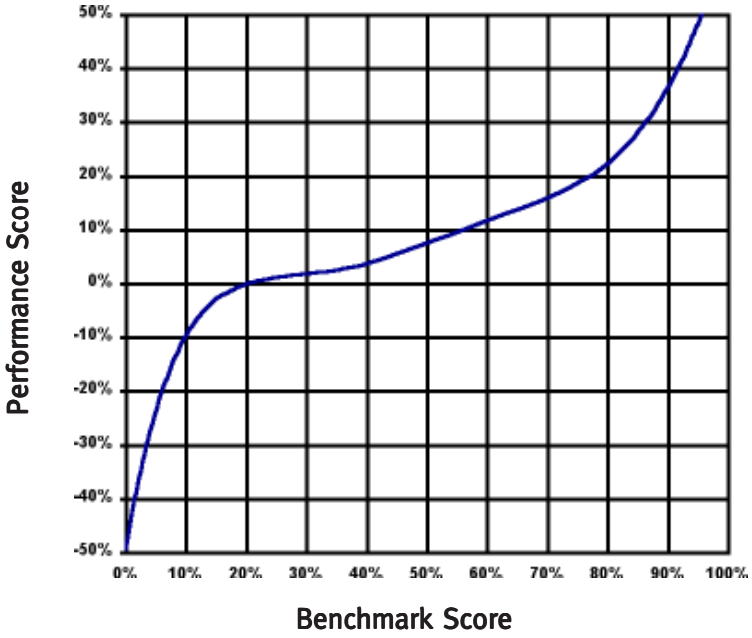
6 Safety LTI

Measures the number of Lost Time Incidents per 200,000 hours worked.



7 *Profitability*

Measures company profit before tax and interest as a percentage of turnover.



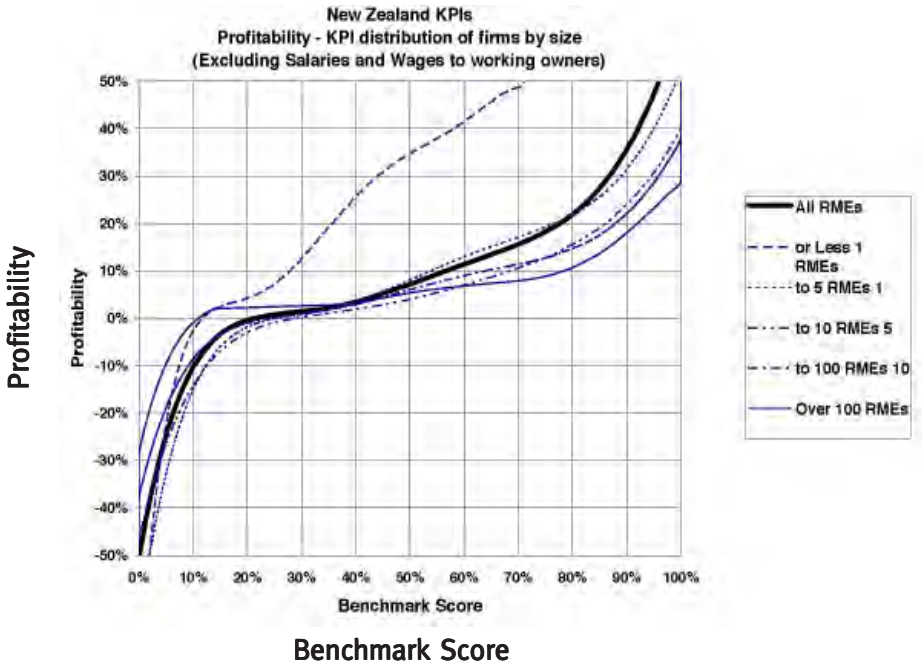
APIs

Profitability – by Size

Measures company profit before tax and interest as a percentage of turnover split into size bands of:

ne 1 RME
over 1 & ne 5 RMEs
over 5 & ne 10 RMEs
over 10 & ne 100 RMEs
over 100 RMEs

NB: RMEs are equivalent to FTEs in previous data sets



Appendix A: KPI data sources

The data sources used in the preparation of these KPIs are shown below.

KPIs	Data Sources
Client Satisfaction – Product	Client Survey carried out by CAENZ/BRANZ/ The Property Council/Local Government New Zealand
Client Satisfaction – Service	Client Survey carried out by CAENZ/BRANZ/ The Property Council/Local Government New Zealand
Defects	Client Survey carried out by CAENZ/BRANZ/ The Property Council/Local Government New Zealand
Predictability Cost	Client Survey carried out by CAENZ/BRANZ/ The Property Council/Local Government New Zealand
Predictability Time	Client Survey carried out by CAENZ/BRANZ/ The Property Council/Local Government New Zealand
Safety	Contractors Survey carried out by Site Safe New Zealand
Profitability	Department of Statistics in a form that represents the outputs

Appendix B: Sample Client Survey Questionnaire

Construction Industry Key Performance Indicators

Return Postal Address:
New Zealand Centre for Advanced Engineering, Private Bag 4800, Christchurch 8140
Fax: 03 364 2069
Online form at http://www.caenz.com/KPI_Survey/KPI_Letter.html

Client Questionnaire

Ideally, it would be a great help if you were able to complete a questionnaire for one finished project in each quarter of 2006 However, if this is not possible, please send details of your latest completed project. For additional copies of this questionnaire, please contact s.caldwell@cae.canterbury.ac.nz or simply photocopy this form and complete for each project. The survey can also be filled out online at www.caenz.com .

1. Contact Name _____

2. Organisation _____

3. Address _____

Postcode _____ **Telephone** _____ **Email** _____

4. What type of organisation are you? *(Please tick one box)*

Central Government ☐ Local Government ☐ Other Public Sector ☐

Private Sector ☐ Other: (please specify) ☐ _____

5. What is your approximate annual spend on? *(exclusive of GST)*

a) New build $ b) Refurbishment $ c) Repair & Maintenance $

6. Approximately how many new projects do you commission each year?

a) New build _____Nr. b) Refurbishment _____Nr. c) Repair & Maintenance _____Nr.

GENERAL

7. Were you involved with a provider of vertical building goods and/or services over the last 24 months?

Yes ☐ No ☐ If yes then please answer Question 8, or go on to Question 12;

Sponsored by:

Supported by

1

8. **Thinking back over the last 24 months, do you think the quality of building work has got better or worse over this time?** *(Please circle one number. Additional comment below)*

Much worse		A little worse		No real change		A little better		Much better	
1	2	3	4	5	6	7	8	9	10

9. **Since 2004 there has been a new building regulatory regime, (Building Act 2004). Were you involved in building prior to this new regime?**

Yes ☐ No ☐ If yes then please answer Question 10, or go on to Question 11;

10. **Do you think the new regime has had an influence on the quality of new building works?** *(Please circle one number)*

Strongly believe no influence		A small influence		Moderate Influence		Considerable influence		Strongly believe a Major Influence	
1	2	3	4	5	6	7	8	9	10

11. **One of the reasons for setting up the new regulatory regime was to provide a balance between the needs of practitioners (i.e. builders, architects, etc) and property owners. Do you think the new regulatory regime has achieved this?**

Yes ☐ No ☐ (Please qualify your answer below – *circle one number only*)

No effect		Small effect		Moderate effect		Considerable effect		Achieved result	
1	2	3	4	5	6	7	8	9	10

Additional Comment

_____

_____

ABOUT THE PROJECT

12. **Project Name/Reference** _____

13. **Project Classification** *(Please tick one box for predominant classification)*

New Build ☐ Refurbishment ☐ Repair & Maintenance ☐

14. **Type of Project**

(e.g. Road, Warehouse, Hospital etc.)

2

15. Project Sector *(Please tick one box)*

Housing:	Public	☐	Private Office	☐	Private Industrial	☐
	Private	☐	Private Retail	☐	Private Commercial Other	☐
Non-Housing Public		☐	Private Leisure	☐	Infrastructure	☐

16. What Contract / Procurement system was used? *(Please tick one box)*

Traditional Lump Sum: without quantities	☐	Design and Build	☐
with quantities	☐	Design Manage Construct	☐
Management Contracting	☐	Other:	☐
Construction Management	☐	(please specify) _____	

17. Was the project let as a main contract or in packages? *(Please tick one box)*

Main Contract ☐ Packages ☐

Note: If project was let in packages, please answer the following questions for the whole project, not individual packages.

18. What was the contractor selection process? *(Please tick one box)*

Single Stage Tendering	☐	Two Stage Tendering	☐	Negotiated	☐
Partnering	☐	Other: (please specify)	☐		

Additional Comment

19. How have you found the statutory approval process in your project.

a) At Central Government Level *(Circle one number)* **(If not applicable tick here)** ☐

Totally dissatisfied		Mostly dissatisfied		Neither satisfied nor dissatisfied			Mostly satisfied		Totally satisfied
1	2	3	4	5	6	7	8	9	10

Additional Comment

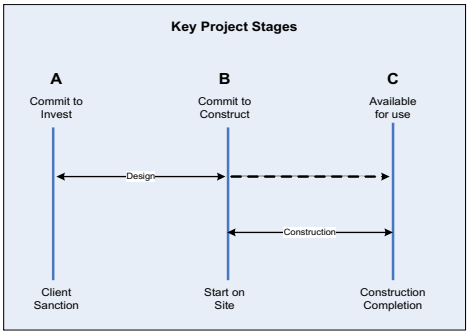
b) At Local Government Level *(Circle one number)* **(If not applicable tick here)** ☐

Totally dissatisfied		Mostly dissatisfied		Neither satisfied nor dissatisfied			Mostly satisfied		Totally satisfied
1	2	3	4	5	6	7	8	9	10

Additional Comment

3

Explanatory note for following questions.



A Commit to Invest
The point at which the client decides to invest in a project for an agreed budget, sets out the business requirements in a client's brief and appoints and authorises the project team to complete the design.

*Early cost advice, feasibility studies, outline planning permission, planning appeals etc would normally be carried out **before** Point A was reached. **At** Point A, the client will be committed to paying for the completed design.*

B Commit to Construct
The point at which the client authorises the project team to start the construction of the project and has made the site available to the constructor.

*The timing of Point B can depend upon the type of procurement method employed . The design will not necessarily be complete at Point B. **At** Point B, the client will be committed to paying for the completed design and the completed product.*

C Available for Use
The point at which the product is available for substantial occupancy or use.

*Point C may be **in advance** of contract completion, for example where ancillary work (eg landscaping) is completed after the product has been put to use. **At** Point C, the product will available for the client to use.*

1. Project Time and Cost Profile - see previous page for guidance

(Please do not fill in shaded areas)

		Date (dd,mm,yy)	Construction Cost $'000	Consultants' Cost $'000
Stage A: Commit to Invest				
14.1	Date of decision for scheme to proceed, anticipated construction cost and anticipated fees A			
14.2	Anticipated start on site date at A			
14.3	Anticipated construction completion date at A			
Stage B: Commit to Construct				
14.4	Construction contract start on site date and construction contract sum B			
14.5	Construction contract date for completion at B			
Stage C: Available for Use				
14.6	Actual construction completion date C, actual construction cost, actual fees			
14.7	Final certificate date (if known)			

* If the actual figure is not known, please insert your best estimate.

NOTE : Estimated is a generic term for the time/cost value at the earlier point. It might be the tendered/contracted time/cost and not actually an estimate. Depends upon the procurement type and contract procedures. Applies to both time and cost.

4

21. How satisfied were you with the finished product? *(please circle one number)*

Totally dissatisfied		Mostly dissatisfied		Neither satisfied nor dissatisfied			Mostly satisfied		Totally satisfied
1	2	3	4	5	6	7	8	9	10

22. At the time of handover, what was the condition of the facility with regard to defects? *(please circle one number)*

Totally defective	Major defects with a major impact on the client			Some defects and some impact on the client		A few defects and no significant impact on the client			Apparently defect free
1	2	3	4	5	6	7	8	9	10

23. How satisfied were you with the service obtained (i.e. how well they actually worked with you): on/from: *(please circle one number)*

a) the overall project (i.e. the construction consultancy team and the main contractor together)

Totally dissatisfied		Mostly dissatisfied		Neither satisfied nor dissatisfied			Mostly satisfied		Totally satisfied
1	2	3	4	5	6	7	8	9	10

b) the construction consultancy team?

Totally dissatisfied		Mostly dissatisfied		Neither satisfied nor dissatisfied			Mostly satisfied		Totally satisfied
1	2	3	4	5	6	7	8	9	10

c) the main contractor?

Totally dissatisfied		Mostly dissatisfied		Neither satisfied nor dissatisfied			Mostly satisfied		Totally satisfied
1	2	3	4	5	6	7	8	9	10

24. Would you use the construction consultancy team again? *(Please tick one box)*

Yes ☐ No ☐

25. Would you use the main contractor again? *(Please tick one box)*

Yes ☐ No ☐

5

Appendix C: Sample contractor Safety Questionnaire

Construction Industry Key Performance Indicators - Safety

Return Postal Address:
New Zealand Centre for Advanced Engineering, Private Bag 4800, Christchurch 8140
Fax: 03 364 2069
Online form at http://www.caenz.com/KPI_Survey/KPI_Letter.html

Contractor Safety Questionnaire

While we would appreciate your providing us with your company details, which, will be kept confidential, we are comfortable with Questions 1through 3 being left blank.

1. Contact Name _____

2. Organisation _____

3. Address _____

Postcode _____ **Telephone** _____ **Email** _____

4. What type of contractor are you? *(Principal activity only - Please tick one box)*

General Construction	☐	Building Construction	☐
House Construction	☐	Residential Building Construction Other	☐
Non-Residential Building Construction	☐	Non-Building Construction	☐
Road and Bridge Construction	☐	Non-Building Construction Other	☐
Construction Trade Services	☐	Site Preparation Services	☐
Building Structure Services	☐	Installation Trade Services	☐
Building Completion Services	☐	Other Construction Services	☐
Other: (please specify)	☐	_____	

5. What was your companies annual turnover on all of its construction activity? $_____

GENERAL

6. Were you a provider of vertical building goods and/or services over the last 24 months?

Yes ☐ No ☐ If yes then please answer Question 8, or go on to Question 11;

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SITE SAFE

1

7. **Thinking back over the last 24 months, do you think the quality of building work has got better or worse over this time?** *(Please circle one number. Additional comment below)*

Much worse		A little worse		No real change		A little better		Much better	
1	2	3	4	5	6	7	8	9	10

8. **Since 2004 there has been a new building regulatory regime, (Building Act 2004). Were you involved in building prior to this new regime?**

Yes ☐ No ☐ If yes then please answer Question 10, or go on to Question 11;

9. **Do you think the new regime has had an influence on the quality of new building works?** *(Please circle one number)*

Strongly believe no influence		A small influence		Moderate Influence		Considerable influence		Strongly believe a Major Influence	
1	2	3	4	5	6	7	8	9	10

10. **One of the reasons for setting up the new regulatory regime was to provide a balance between the needs of practitioners (i.e. builders, architects, etc) and property owners. Do you think the new regulatory regime has achieved this?**

Yes ☐ No ☐ (Please qualify your answer below – *circle one number only*)

No effect		Small effect		Moderate effect		Considerable effect		Achieved result	
1	2	3	4	5	6	7	8	9	10

Additional Comment

Safety – 1st January 2006 – 31st December 2006

11. **Number of lost time injury cases / fatalities for the period**

Lost time injury cases are any work related injury that require days away from work. Do not include the day of injury. Include lost time injury cases / fatalities on all projects in progress in the period. ***(for your company only).***

Please enter total number then break down into over 3 days and under 3 days:.

a) **Total Number** _____ **Nr**

b) **Cases over three days** _____ **Nr** c) **Cases of three days or under** _____ **Nr**

12. **Number of lost days for the period_____Nr**

*Report the number of total lost days from the lost time cases reported above.****(for your company only)***

13. **Number of medical Injury cases for the period_____Nr**

A medical injury is any work related injury that requires professional medical attention. This includes all lost time cases. ***(for your company only)***

14. **Man-hours worked for the period_____Hrs**

Man-hours should include hours worked by all full time equivalent employed on site for your company. Include hours worked on all projects in progress in the period. ***(for your company only)***

2

New Zealand National Construction Industry KPIs 2006

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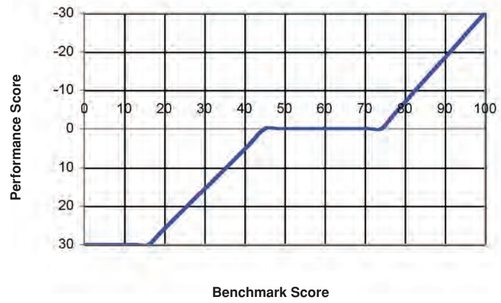
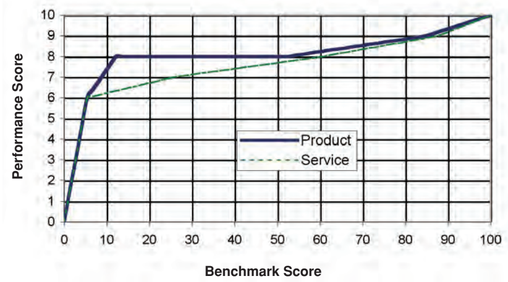
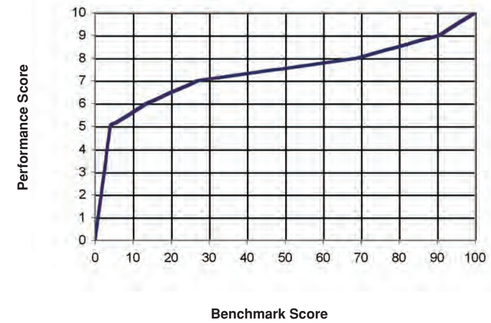
New Zealand KPI
Predictability Construction Costs - Design



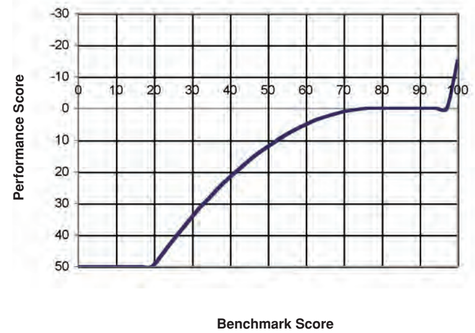
New Zealand KPI
Client Satisfaction - Product & Service



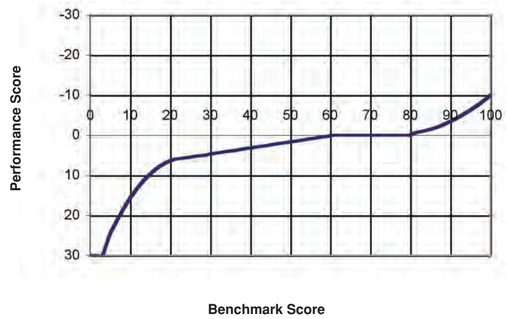
New Zealand KPI
Defects



New Zealand KPI
Predictability Time - Design

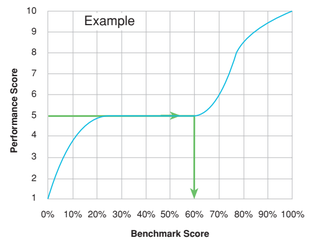


New Zealand KPI
Predictability Cost - Construction



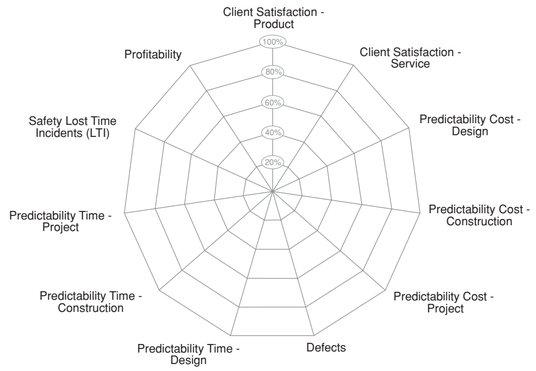
To calculate the project or company benchmark score:

1. Select the appropriate graph.
2. Plot the measured performance for the project or company under consideration on the vertical axis (1).
3. Read across to the performance line (2). If the graph line is intersected where it runs horizontally, follow the graph line to the last point of contact.
4. Read down to the horizontal axis (3). This is the company/project benchmark score out of 100%.
5. Plot the benchmark score on the appropriate axis of the radar chart.
6. Join all plots on the radar chart with a line. In general, the nearer the plotted line is to the outer perimeter of the chart, the higher the overall performance.

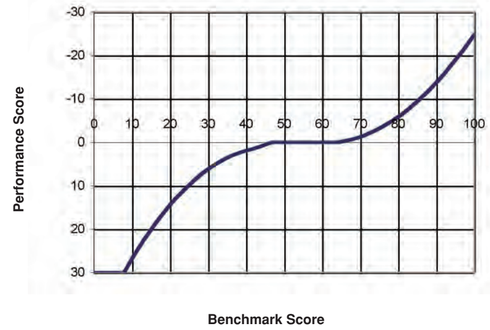


In this example, a performance of 5 is achieved. This equates to a benchmark score of 60%, meaning that 60% of projects or companies are achieving equal or lower performance, and 40% are achieving higher performance.

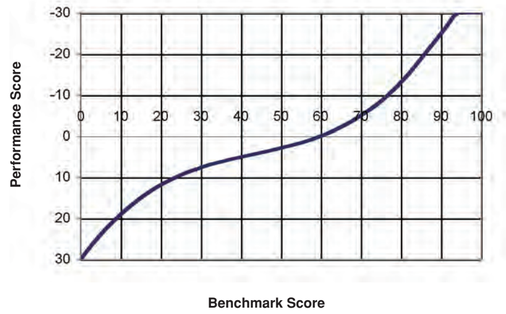
The Radar Chart



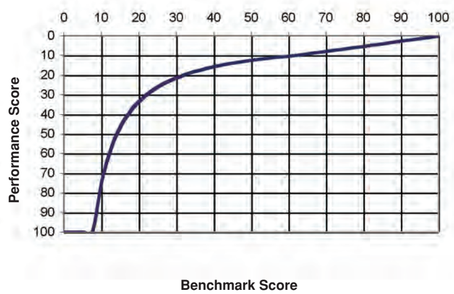
New Zealand KPI
Predictability Time - Construction



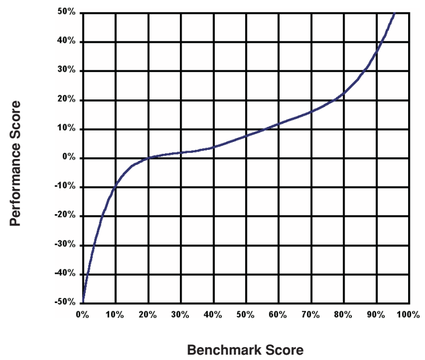
New Zealand KPI
Predictability Cost - Project



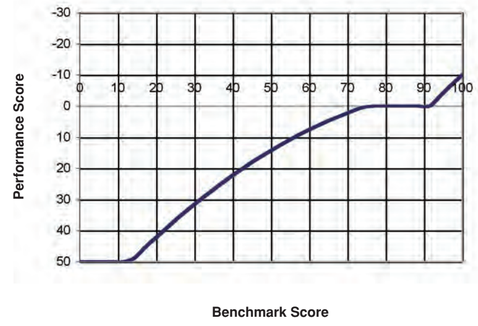
New Zealand KPI
Safety - Lost time incidents per 200,000 hours worked (LTI)

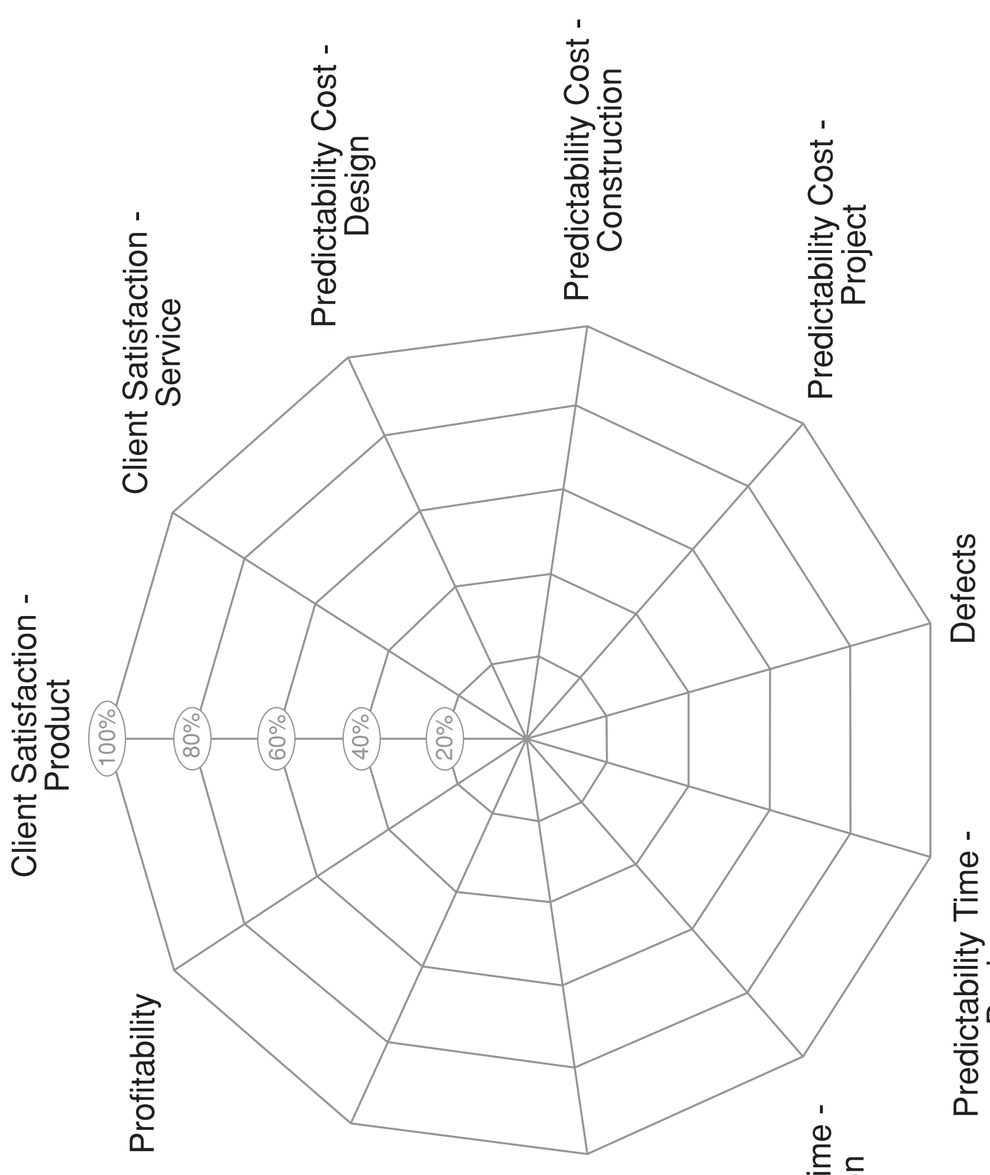


New Zealand KPI
Profitability - all FTEs



New Zealand KPI
Predictability Time - Project





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The New Zealand Construction Industry National Key Performance Indicators

Wallchart

2006 Data