



# Human Resource Management in the Construction Industry - Sustainability Competencies

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## Abstract

While environmental sustainability has been the subject of much debate in the last decade, it was not until recently that attention started to shift towards human resource management as an enabler for sustainability. Yet, this is still a relatively under researched area. Much is still unknown about the role of an individual worker in contributing towards sustainable development. This paper addresses the gap by proposing a framework to measure sustainability competencies of employees within the construction industry sector. As part of the framework, four proficiency levels together with relevant descriptions are defined for a total of eight sustainability competencies. Suggested proficiency levels are then mapped to main construction related jobs based on the framework. An example is also given to illustrate the manner in which competencies should be assessed. This framework is original and of practical use to construction managers and human resource practitioners.

**Keywords:** Sustainability competencies, Human resource management, Construction

## Introduction

There is a lot of ongoing discussion about environmental sustainability particularly since the aftermath of the Kyoto Protocol. Governments worldwide have taken measures to address these issues through global forums and conferences, deliberating on ways to reduce carbon emissions. It is obvious even to the most casual observer that environmental issues tend to dominate the discussion at a socio-political level with very little focus at an individual level. Dahl (2012, p. 17), however, stresses the importance of individual roles in attaining sustainability goals, claiming that 'what happens to the planet is the cumulative result of over 6 billion independent producing and consuming individuals'.

Spooner and Kaine (2010) maintain that traditionally, the focus on human resource management (HRM) is largely around aspects of task domains of the employment relationship such as recruitment, remuneration, employment conditions, training and development. More recently, there is a move towards the recognition of HRM as an enabler to achieve sustainability goals. For example, Wirtenberg et al. (2007) and Harmon et al. (2010) have illustrated the big picture of how HRM can play a role in sustainability management. They highlight that the critical goal for HRM in the next few years is the development of competencies, collaborative strategies and organisational capabilities to support an organisation's sustainability journey'. Wilkinson et al. (2001) discuss the role of human resources in achieving corporate and environmental sustainability. Dunphy and Griffiths (1998) claim that there are commonalities between human and ecological sustainability and both are to a certain extent interdependent.

None of the literature identified tackles the issue of how HRM might be used to build sustainability capabilities. This is especially lacking in the construction industry sector which is well-known for its '3D' image (dirty, difficult, dangerous). According to the Centre for International Economics Canberra and Sydney (2007), 23% of Australia's total greenhouse gas emissions actually come from the energy demand in the construction sector. The breakdown of prominent contributors of emissions within construction are the cement industry (20%), chemicals and petrochemicals (17%), iron and steel industry (16%) and

aluminium/ non-ferrous metals (5%). The CRC Construction Innovation has also highlighted common barriers within the construction industry in Australia such as poor industry image, low levels of education in information and communication of technologies and management, poor employer-employee relations, procurement structures that promote adversarial site relationships and disparate occupational health and safety (OHS) legislation and guidelines across different states (CRC, 2004).

Against this background, it is vital that sustainability capabilities are developed within the construction industry. This paper addresses the gap by proposing a sustainability competency framework applicable to this industry. Project owners, construction managers and HR practitioners would find the proposed framework useful.

## Background

First, some relevant concepts relating to HRM, for example, recruitment and performance management are given in this section. This is followed by an explanation of the link between competency as well as both the recruitment and performance management processes to set the context for the subsequent sections.

## Recruitment and Selection

Recruitment is defined as a process of bringing in the right people who have the potential of making a positive contribution to a particular organisation regardless of whether it is for short term or long term (Bratton and Gold, 2003). Recruitment can be stimulated by the following reasons:

- An employee decides to leave a company due to retirement or better job offer
- Organisational expansion which requires immediate work force
- Changes in global environment requiring different skilled employees

Recruitment can be done either internally or externally. Internal recruitment involves hiring from within an organisation and could have potential benefits. Apart from significant savings from the cost of advertising, it can also act as a source of motivation to the employees who are able to see opportunities for career progression within the company. However, the downside of this is letting go of the opportunity of bringing new experiences and diversity to the organisation (Newell and Shackleton, 2002).

## Performance Management

Performance management has always been a highly debated issue (Storey, 1992). One reason is because of the lack of agreement about its definition. What exactly constitutes performance management? Storey (1992) proposed that performance management 'refers to any designed activity related to the performance of employees', claiming that it was similar to performance –related pay (PRP). Bevan and Thompson (1992) claim that a performance management system includes the following characteristics: clear communication of goals to employee, conducting formal reviews of progress; using the reviews to establish training requirements.

A more recent literature defined performance management as merely a process of assessing an employee's progress towards achieving a company's goals and is perceived as a useful tool in determining rewards and penalties (Loosemore et al., 2003). Performance management had received many criticisms since its proposal. Despite its usefulness, McGregor (1960) criticized its value claiming that it is demotivating and creates a judgmental setting. Even Deming (1982) the quality expert, raised his concern calling appraisal a 'deadly disease' as it opens up a doorway to blame employees for systematic problems which arise in an organisation. Hence, performance appraisal has always been deemed to be the least popular of all the other activities in HRM. Yet, its significance cannot

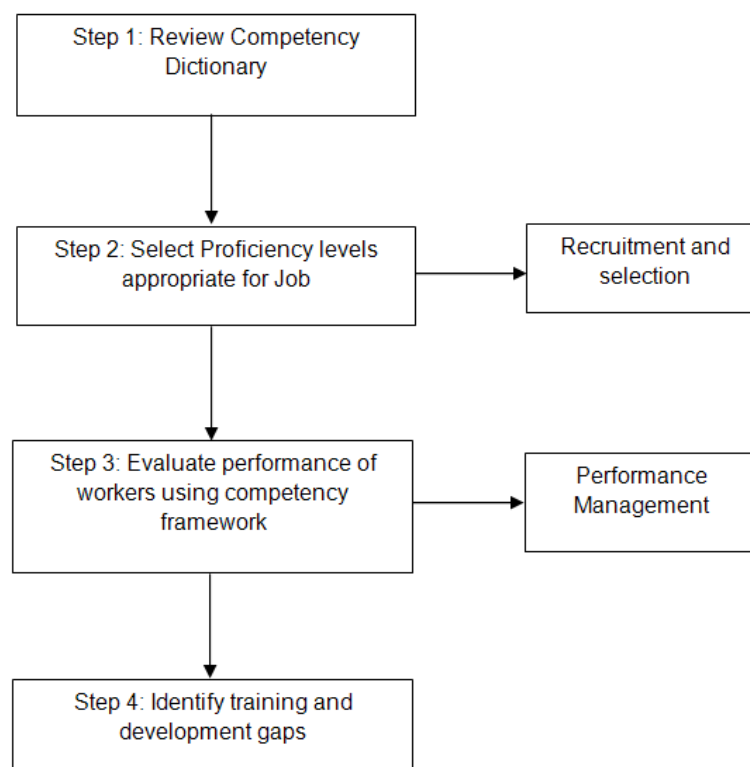
be refuted or diminished for indeed the failure to show any evidence of management control would indicate ineffectiveness (Bratton and Gold, 2003). Lately, the focus of organisations in integrating human resource management together with its business strategies has resulted in companies perceiving performance management as a form of systematic approach towards performance management (Loosemore et al., 2003).

Among the many advantages of performance management which have been identified by Bratton and Gold (2003) are:

- Boost morale and levels of motivation
- Help identify suitable candidates for promotion
- Aid in the setting of organisational goals
- Identify areas which require training and development.

### Linking Competencies with the Recruitment and Performance Management Processes

There is no doubt that competencies are very closely linked to both the recruitment and performance management processes. Four steps are detailed here for the reader. The first step typically involves reviewing the competency dictionary. The competency dictionary consists of descriptions of competency and the various proficiency levels (see Section 3). The second step involves the job design where proficiency or competency levels are selected by the manager or HR practitioner (depending on the requirements of a job). The selected proficiency levels are then used as a basis for guiding the recruitment process where suitable candidates are sourced. The third step involves assessing the performance of an incumbent. The performance of an incumbent (or holder of a particular job) is assessed based on how well they have achieved the required competency level. After the performance management process, gaps in competencies are identified in the fourth step. Gap is referred to as the difference between the actual proficiency level and the required proficiency level for any given competency.



**Figure 1 Steps involved in identifying training gaps for employees**

## Performance Management in Construction Companies

It was reported that PRP is the most popular evaluation technique in the construction sector. PRP focuses wholly on output and process criteria and employees are rewarded based on the achievement of goals (Loosemore et al., 2003). According to Druker and White (1996), one of the major challenges in the construction industry is the capacity to perform efficient PRP systems partly because of the somewhat 'volatile' nature of the construction industry where employees are constantly rotated around different projects. To achieve this, a few methods such as competency-based or skills-based systems have been developed. The distinctive feature among all of them is the nature in which assessment is carried out. Some adopt a qualitative approach through the description of an employee's performance while others adopt a more quantitative approach via an employee performance rating scale.

Yet, to this end, there is hardly any proposal recommending sustainability competencies for employees within the construction industry. 'You can't manage what you don't measure'. Without sustainability competencies, there is simply no indication as to how employees are contributing or working towards the attainment of sustainability goals. The following section in this paper fills this gap accordingly.

### Competency Dictionary

Although, the CRC Construction Innovation (Dingsdag et al., 2006) has published a construction safety competency framework, this is still inadequate. The competencies suggested as part of the framework take on a narrow view and focuses only on health and safety competencies instead of taking on a broader view of sustainability to also include environmental issues. In addition, there are no guidelines as to how these competencies should be measured. This paper addresses existing limitations by proposing a competency dictionary comprising of eight sustainability competencies together with detailed descriptions by proficiency levels.

The four proficiency levels used in the competency dictionary is broadly defined in this paper as follows:

- P1:** Demonstrates basic knowledge/understanding of subject matter
- P2:** Applies knowledge and analyses outcomes stemming from action
- P3:** Manages, develops action plans to mitigate negative impacts
- P4:** Provides advisory services and drives performance based on extensive experience.

Each of these eight sustainability competencies is also mapped to the competencies suggested by CRC Construction Innovation so that the readers can compare them directly (top right hand corner- see Appendix A for explanation of the safety management tasks (SMTs) and Dingsdag et al. (2006) for more detailed elaboration).

Competency 1: Safety auditing			SMT 6
This competency refers to the knowledge and ability to conduct OHS audits or reviews including understanding of OHS management systems, strategies and standards, applicable regulations. It includes application of OHS strategies, processes and risk identification in the development of OHS audit programmes.			
P1	P2	P3	P4
Demonstrates knowledge of OHS management systems, regulatory requirements and their applications.	Evaluates application of OHS strategies and processes, identifies risks and develops relevant audit programmes.	Able to lead scoping, performance, and audit reviews on OHS areas.	Able to provide advice on OHS governance including risk management framework based on established standards and practices.
Activities relating to the proficiency levels			
<ul style="list-style-type: none"> <li>Understands OHS Management System Framework, strategies and its applications/impact to the overall business processes.</li> <li>Understands the OHS regulatory requirements and its application.</li> <li>Understands OHS Standards which includes industrial codes of practices and its application.</li> <li>Understands the organisations key OHS risks and their impact on the business and processes.</li> <li>Demonstrates an understanding of the importance of maintaining a strategic alliance.</li> </ul>	<ul style="list-style-type: none"> <li>Applies the OHS Management System and Strategies to review assignments.</li> <li>Evaluates the application of OHS strategies and processes to ensure that business objectives are met.</li> <li>Applies the OHS regulatory requirements and standards to engagements.</li> <li>Analyses and identifies key OHS risks and develops appropriate audit programmes and tests for immediate superior's review and approval.</li> <li>Maintains a strategic alliance with the various stakeholders under direction of seniors.</li> </ul>	<ul style="list-style-type: none"> <li>Aligns OHS plan to include OHS business strategies.</li> <li>Leads in scoping of OHS reviews based on the knowledge of business, strategy and processes.</li> <li>Leads performance reviews and reviews of compliance to legal framework and standards/codes of practices.</li> <li>Provides recommendations on the implementation of the OHS risk management strategy including their impact on business and processes.</li> <li>Coaches on appropriate problem-solving techniques to address risks and improve controls.</li> <li>Develops, nurtures and maintains a strategic alliance with the various stakeholders.</li> </ul>	<ul style="list-style-type: none"> <li>Generates value-added recommendations to increase OHS contribution to business opportunities, efficiency (cost optimisation), risk reduction and effectiveness.</li> <li>Benchmarks against emerging OHS best practices (strategies).</li> <li>Creates understanding for the need of effective internal control strategies and application of OHS best practices.</li> <li>Provides advice to enhance the OHS risk management framework to adequately identify and address potential or emerging OHS risks and correlation with the business processes.</li> </ul>

Table 1 Safety auditing

Competency 2: Managing environmental aspects, impacts and OHS hazards			SMT 16, 19,22,24,36
This competency is about the ability to identify, assess, eliminate and mitigate significant environmental impacts and OHS hazards.			
P1	P2	P3	P4
Demonstrates the ability to conduct environmental impact/ OHS hazard identification and risk assessment with guidance.	Conducts and validates environmental impact/ OHS hazard identification and risk assessment.	Manages and guides team in identification, risk assessment and mitigation measures concerning environmental impact/ OHD hazards.	Advises on identification assessment and mitigation of environmental impact/ OHS hazard.
Activities relating to the proficiency levels			
<ul style="list-style-type: none"> <li>• Demonstrates understanding and ability to conduct environmental aspect, environmental impact or OHS hazard identification and risk assessment with supervision.</li> <li>• Identifies and proposes mitigation measures for significant environmental aspects, environmental impacts or OHS risks.</li> </ul>	<ul style="list-style-type: none"> <li>• Validates environment aspects, environmental impacts or hazards.</li> <li>• Identifies Environmental aspects and impacts / OHS hazards independently.</li> <li>• Conducts and validates environmental aspect, environmental impact or OHS risk assessment.</li> <li>• Reviews effectiveness of proposed mitigation measures for significant environmental aspects, environmental impacts or OHS risks.</li> </ul>	<ul style="list-style-type: none"> <li>• Manages and leads environmental aspect, environmental impact or OHS hazard identification, assessment, gap analysis and prioritisation initiatives.</li> <li>• Coaches team in all matters relating to OHS environmental aspects, environmental impacts or OHS risks.</li> </ul>	<ul style="list-style-type: none"> <li>• Advises on environmental aspect, environmental impact or OHS hazard identification tools.</li> <li>• Advises on improvements to environmental aspects-impacts / OHS risks assessment.</li> <li>• Strategise and prioritise the implementation of mitigation measures for significant environmental aspects, environmental impacts or OHS Risks.</li> </ul>

**Table 2 Managing environmental aspects, impacts and OHS hazards**



Competency 3: Project Risk Management			SMT 1
This competency focuses on the ability to ensure that project risks are identified and analysed and that appropriate responses are planned, monitored and controlled. Project risk management is a structured process that allows individual risk events and overall project risk to be understood and managed proactively, optimising success by minimising threats and maximising opportunities.			
P1	P2	P3	P4
Learns to apply risk management tools to identify project risks.	Analyses and update risk register with response plan to resolve low impact risks.	Develops and integrates risk management plan with appropriate tools and template to track potential risks.	Advises project team on proactive risk management plan that is in line with organisational policies and procedures to ensure project success.
Activities relating to the proficiency levels			
<ul style="list-style-type: none"> <li>Learns to apply information-gathering techniques for collecting input during risk identification process such as brainstorming, SWOT analysis and interviewing skills.</li> <li>Learns quantitative and qualitative risk analysis techniques.</li> <li>Performs quantitative and qualitative risk analysis based on prescribed guidelines.</li> <li>Monitors and reports risks for assigned tasks.</li> </ul>	<ul style="list-style-type: none"> <li>Participates to document and update risk register containing identified risks, risk analysis findings, and their respective Risk Response Plans.</li> <li>Assists to conduct quantitative and qualitative risk analysis.</li> <li>Monitors risks against Risk Management Plan for assigned activities.</li> <li>Assists to resolve low impact risks by following Risk Management Plan.</li> </ul>	<ul style="list-style-type: none"> <li>Develops Risk Management Plan (including Risk Breakdown Structure) based on Project Scope Statement and Project Management Plan, taking into account environmental factors and process assets of the organisation, size, complexity, and importance of the project.</li> <li>Manages project team in developing and updating a Risk Register summarising potential risks, risk trigger events, and how to manage risks when they occur.</li> <li>Develops tools and templates to track, review and re-evaluate the identified risks to verify whether it has happened.</li> <li>Integrates pro-actively measures for triggers to indicate the presence of an existing or new risk.</li> </ul>	<ul style="list-style-type: none"> <li>Advises on Risk Management Plan and ensure that Risk Management Plan is in line with organisational policies and procedures.</li> <li>Champions periodical reviews of risk register and advises contingency plan if top priority risk happens.</li> <li>Leads project team in performing qualitative and quantitative risk analysis to assess probability of risk occurring and their respective impact.</li> <li>Advises project team on potential risks that could happen based on risks assessment reports.</li> </ul>

Table 3 Project risk management

Competency 4: Safety recognition and reward			SMT 20
This competency refers to the ability to provide recognition and reward to enhance safety performance. Identify individual strengths and development needs and ensures that reward does not encourage hiding or under reporting of incidents/ near misses.			
P1	P2	P3	P4
Have a basic safety level of awareness. Provides suggestions for rewarding routine tasks.	Provides others opportunities for on-the-job training, assesses group training needs. Provides relevant feedback on safety work procedures.	Determines training opportunities and provides formal and informal safety performance feedback. Empowers group towards attainment of safety/environmental goals.	Develops workforce safety acumen and steer resources to support safety development efforts/ honest reporting.
Activities relating to the proficiency levels			
<ul style="list-style-type: none"> <li>• Describes the safety standard that must be delivered.</li> <li>• Aware of safety training activities available for staff.</li> <li>• Takes time to clearly respond to questions when asked.</li> <li>• Prepares job aids to support on-the-job training.</li> <li>• Provides informal feedback and support to others.</li> <li>• Makes safety information available to others on a timely basis.</li> </ul>	<ul style="list-style-type: none"> <li>• Assigns work tasks/projects based on employee's capability taking into account safety issues.</li> <li>• Allocates time to work with team members to define safety goals.</li> <li>• Provides constructive feedback on safety work procedures.</li> <li>• Provides practical advice and guidance on how things could be achieved.</li> </ul>	<ul style="list-style-type: none"> <li>• Readily identifies safety training or developmental needs.</li> <li>• Takes on a role of a mentor.</li> <li>• Initiates dialogue with unit/department employees to develop safety learning plans.</li> <li>• Conducts reviews and debriefings so that individuals learn from past experiences</li> <li>• Highlights that worker's compensation processes reflect the concern the company has for health and wellbeing of employees</li> </ul>	<ul style="list-style-type: none"> <li>• Identifies training needs on the basis of safety skills / knowledge required.</li> <li>• Advocates for measures and safety reward systems based on project team performance.</li> <li>• Delegates significantly complex assignments and create opportunities for safety development and learning.</li> <li>• Ensures that reward does not encourage over reporting of positive performance indicators</li> <li>• Ensures that reward does not encourage hiding or under reporting of incidents.</li> </ul>

Table 4 Safety recognition and reward



Competency 5: Safety/ environmental reporting			SMT 25
This competency refers to understanding of the OHS/environmental processes and procedures related to reporting requirements.			
P1	P2	P3	P4
Demonstrates understanding of environmental/safety standard reporting requirements and able to generate standard reports.	Able to analyse customer reporting requirements and generate ad-hoc reports.	Analyses reporting requirements, and able to provide recommendations for improving report generation.	Able to evaluate areas of weaknesses and drives improvements.
Activities relating to the proficiency levels			
<ul style="list-style-type: none"> <li>• Understands basic standard offerings of reporting for customers.</li> <li>• Able to generate reports based on Standard Operating Procedures and schedule.</li> <li>• Ability to obtain appropriate data or information</li> </ul>	<ul style="list-style-type: none"> <li>• Performs simple analysis of customer reporting requirements.</li> <li>• Able to perform ad-hoc reporting activities without supervision.</li> <li>• Ability to analyse data</li> </ul>	<ul style="list-style-type: none"> <li>• Performs complex analysis of safety reporting requirements.</li> <li>• Provides recommendations for improving process of reporting to both management and employees</li> <li>• Consults with and counsels employees and liaises with management</li> </ul>	<ul style="list-style-type: none"> <li>• Implements and drives improvements to safety reporting</li> <li>• Seeks commitment to process from management/workforces/contractors and subcontractors</li> <li>• Regularly communicates conclusions/results to all relevant parties</li> </ul>

Table 5 Safety/ environmental reporting

<b>Competency 6: Monitoring contractors/subcontractors</b>			SMT 26
This competency refers to the ability to monitor contractors/subcontractors to ensure that all parties are performing up to the standard required by legislation (i.e. environmental or health and safety).			
P1	P2	P3	P4
Demonstrates the basic ability to understand roles of different parties involved.	Analyses and communicates issues which could pose safety/environmental hazards to projects.	Develops recommendation to ensure that safety/environmental performance are on track.	Drives safety/environmental performance in all aspects of work.
Activities relating to the proficiency levels			
<ul style="list-style-type: none"> <li>Understands the roles played by different parties.</li> <li>Have an awareness of OH&amp;S issues and legal requirements relating to specific duty of care of all parties</li> </ul>	<ul style="list-style-type: none"> <li>Able to have meaningful regular communication/discussion with sub contractors on safety performance praising outcomes that have met or exceeded projected outcomes</li> <li>Have meaningful communication/discussion with subcontractors on safety performance outcomes that have not met projected outcomes and negotiation of appropriate remedial action by subcontractor</li> <li>Regular examination of incident notifications/injury/first-aid register that proactively identifies hazards</li> </ul>	<ul style="list-style-type: none"> <li>Able to develop safety management system manual/documents that relates directly to an organisation's OH&amp;S values, policy and procedure</li> <li>Develops basic audit tools that compares projected stated performance standards of subcontractors dependent on the length of contractor engagement.</li> </ul>	<ul style="list-style-type: none"> <li>Implements and drives safe work methods for key construction activities and organisation's safety/environmental management systems</li> <li>Seeks commitment to process from management/workforces/contractors and subcontractors</li> <li>Consistent clarification of required behaviour to contractors and subcontractors</li> </ul>

**Table 6 Monitoring contractors/subcontractors**

<b>Competency 7: Communication</b>			SMT 13,18
This competency refers to the ability to organise and convey OHS/environmental information, views and concepts in a concise and clear manner for a variety of audiences. It involves adopting the appropriate communication approaches to converse and influence others in selecting the best course of action to achieve desired results.			
P1	P2	P3	P4
Demonstrates knowledge and understanding of fundamental communication principles.	Clearly conveys ideas and information to engage audiences and help them retain the message. Uses appropriate methods to collect, compile and distribute information.	Develops communication strategies in order to adopt appropriate styles and channels of communication for different groups. Interprets information and responds appropriately.	Articulates ideas and perspectives with clarity. Advises on communication strategies and promotes continuous improvements of organisational communication.
Activities relating to the proficiency levels			
<ul style="list-style-type: none"> <li>Builds in depth knowledge of nature of projects.</li> <li>Demonstrates an understanding of project communication strategy and where they fit in.</li> <li>Writes clearly, concisely and accurately in plain English all formats.</li> <li>Respond to questions with accurate and complete answers in a logical manner.</li> <li>Use terminology appropriate for the audience.</li> </ul>	<ul style="list-style-type: none"> <li>Able to identify and understand internal and external audience's needs and adapts communication style accordingly.</li> <li>Aware of the organisation's key priorities.</li> <li>Understanding key relationships and the importance of networks for the organisation's communications.</li> <li>Uses appropriate methods to collect, compile and distribute information.</li> <li>Demonstrates the ability to make effective safety toolbox presentations.</li> </ul>	<ul style="list-style-type: none"> <li>Adopts appropriate styles and channels of communication for diverse groups.</li> <li>Able to use persuasion to influence and convey messages clearly and logically.</li> <li>Ensures ideas and perspectives are coherently related to situational needs.</li> <li>Identifies communication problems and initiates process improvements</li> <li>Develop and implement new and/or improved methods of verbal and written communication for the team.</li> </ul>	<ul style="list-style-type: none"> <li>Champions communication skills and uses persuasion to gain commitment.</li> <li>Promotes continuous improvement of organisational communication.</li> <li>Demonstrate flexibility in achieving mutually agreeable solutions.</li> <li>Coach others on communication concepts, approaches and problem resolution.</li> <li>Develop communication strategies in order to present issues with clarity and influences others.</li> <li>Challenges unsafe behaviour/ attitude at any level</li> </ul>

Table 7 Communication

Competency 8: OHS regulatory and management system/ Planning and assessment			SMT 29
This competency focuses on the ability to assess the OHS regulatory and management systems and prioritise action plans to solve operational gaps.			
P1	P2	P3	P4
Demonstrates knowledge and understanding of OHS regulatory and management system.	Coordinates and executes OHS assessments, conducts gap analysis and prioritise action plans.	Manages OHS assessments and recommends possible solutions for gap resolution.	Provides expertise on OHS regulatory and management system requirements, gap analysis and prioritisation.
Activities relating to the proficiency levels			
<ul style="list-style-type: none"> <li>Understands fundamental OHS regulatory and management system requirements.</li> <li>Conducts OHS regulatory and management system gaps analysis and prioritisation with guidance.</li> </ul>	<ul style="list-style-type: none"> <li>Plans OHS assessments based on the regulatory and management system requirements.</li> <li>Conducts OHS regulatory and management system assessment, gap analysis and prioritisation independently.</li> <li>Recommends solutions to address gaps in the OHS regulatory &amp; management system.</li> </ul>	<ul style="list-style-type: none"> <li>Manages the OHS regulatory and management system gaps analysis and prioritisation.</li> <li>Guides the team on OHS regulatory &amp; management system requirements, gap analysis and prioritisation.</li> <li>Validates recommendations to address gaps in the OHS regulatory management system.</li> <li>Develops suitable implementation plans for gaps resolution.</li> </ul>	<ul style="list-style-type: none"> <li>Acts as a subject matter expert on OHS regulatory and management system requirements, gap analysis and prioritisation.</li> <li>Advises the Group/division/business unit on relevant OHS regulatory and management system matters.</li> <li>Ensures implementation plans for OHS regulatory and management system gaps resolution are aligned to the business objectives.</li> </ul>

**Table 8 OHS regulatory and management system/ planning and assessment**

### Mapping Proficiency Levels

The sustainability competency dictionary developed in section 3 was then shared with a working group of 24 construction practitioners. These practitioners had at least 5 years of working experience in the construction industry. They were asked collectively as a group to map the proficiency levels (for the eight sustainability competencies) of 11 jobs related to the construction industry - CEO of a construction company, senior manager of a construction company, construction manager, project manager, engineer, site manager, ESH advisor, regional safety manager, state safety manager, national safety manager and site workers as suggested by Dingsdag et al. (2006). The final result from the mapping exercise is shown in Table 9.

No.	Construction Sustainability Competencies	MD/ CEO/ GM	Senior Manager	Operations/ Construction Manager	Project Manager	Engineer	Site Manager/ Superintendent	Site ESH Advisor	Regional Safety Manager	State Safety Manager	National Safety Manager	Site Workers
1	Safety auditing	P4	P4	P4	P4	P3	P3	P4	P4	P4	P4	P2
2	Managing Environmental Aspects, Impacts and OHS hazards	P4	P4	P4	P4	P3	P2	P3	P3	P4	P4	P1
3	Project Risk Management	P4	P4	P4	P4	P3		P3	P3			
4	Safety Recognition and Reward	P4		P3			P4	P3	P4	P4	P4	
5	Safety/Environmental Reporting			P3	P4	P3	P3	P4				
6	Monitoring Contractors/ Subcontractors			P3		P4	P4					P1
7	Communication	P4	P4	P3	P4	P4	P4	P3	P3	P3	P4	P1
8	OHS Regulatory and Management System Planning		P4	P2	P4	P2	P3	P3	P2	P3	P4	P1

Table 9 Mapping proficiency levels to different construction industry jobs

**Assessment**

This section illustrates the manner in which performance ratings can be given to assess sustainability competencies. Typically, most organisations adopt a 5 point rating scale as shown in Table 10. Consider a site worker taking on the competency safety auditing. The targeted proficiency level for safety auditing is P2 for a site worker. There are four likely scenarios here.

Rating	Description
1	Poor
2	Needs improvement
3	Average
4	Very good
5	Excellent

Table 10 Performance ratings

**Scenario 1:** During the performance management process, if the site worker was rated at P1 (which is one level below the targeted P2 proficiency level) only one sublevel is introduced for the competency assessment. The assessor will be asked to select a ‘pessimistic’ sublevel –since the site worker has failed to master the competency at a P2 proficiency level and is automatically given a rating 1.

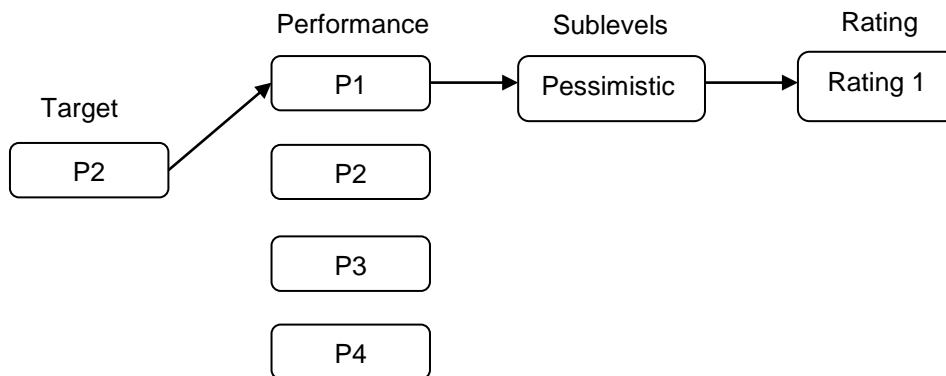


Figure 1 Scenario 1

**Scenario 2:** During the performance management process, if the site worker was rated at P2 (which is same as the targeted P2 proficiency level) two sublevels are further introduced to provide more nuance to the competency assessment. The assessor will be asked to select either ‘most likely’ – if the site worker is deemed to have demonstrated full P2 proficiency level or ‘pessimistic’ – if the site worker has demonstrated his competency at a borderline P2 proficiency level. Depending on the assessor’s selection of the sublevels a final performance rating of either 2 or 3 is given.

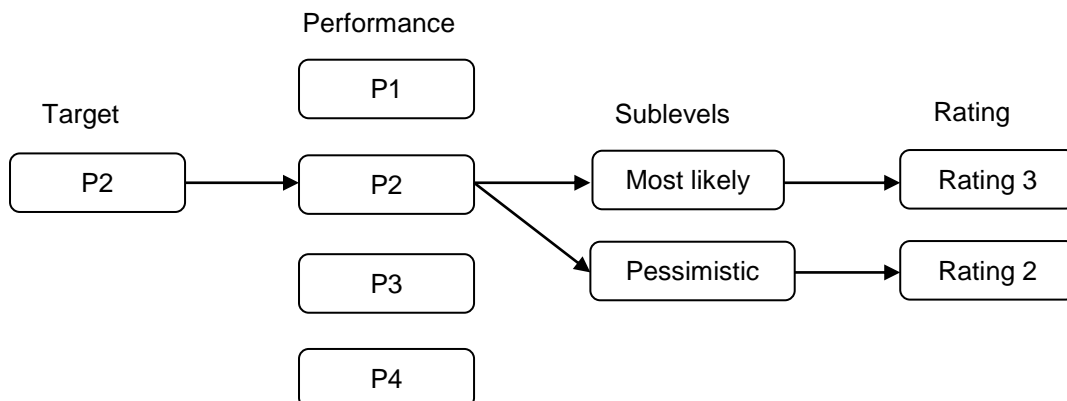


Figure 2 Scenario 2



**Scenario 3:** During the performance management process, if the site worker was rated at P3 (which is one proficiency level above the targeted P2 proficiency level) two sublevels are further introduced to provide more nuance to the competency assessment. The assessor will be asked to select either ‘most likely’ – if the site worker is deemed to have demonstrated full P3 proficiency level or ‘optimistic’- if the site worker has demonstrated his competency at a level slightly higher than a P2 proficiency level but insufficient to achieve a P3 level. Depending on the assessor’s selection of the sublevels a final performance rating of either 4 or 5 is given.

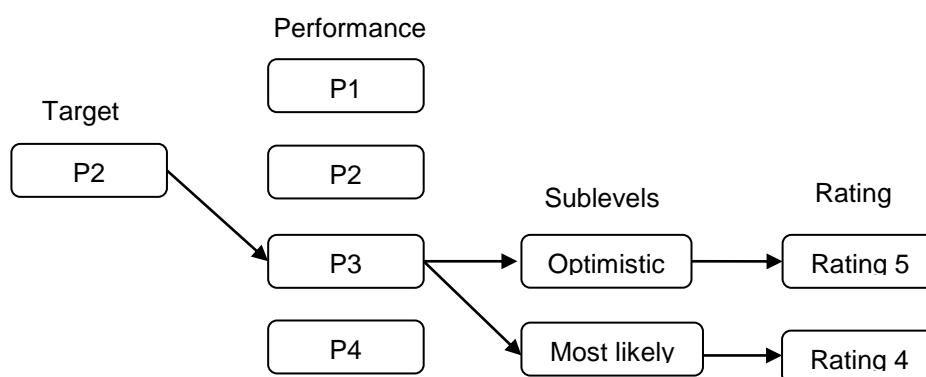


Figure 3 Scenario 3

**Scenario 4:** During the performance management process, if the site worker was rated at P4 (which is two levels above the targeted P2 proficiency level) only one sublevel is introduced for the competency assessment. The assessor will be asked to select an ‘optimistic’ sublevel – since the site worker has demonstrated mastery of a competency above and beyond what is expected at a P2 proficiency level and is automatically given a rating 5.

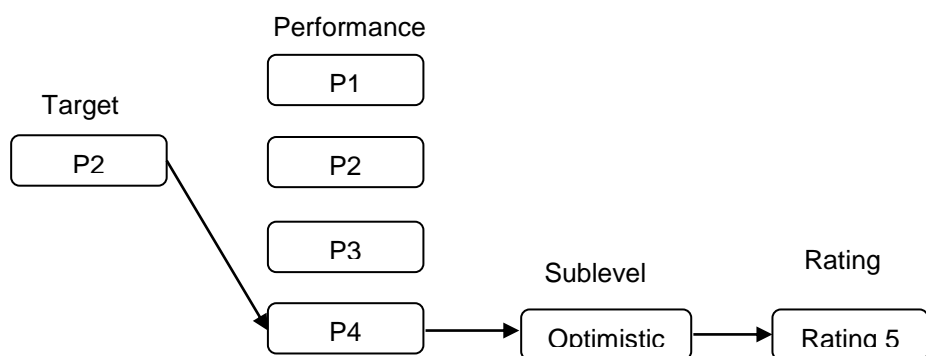


Figure 4 Scenario 4

**Conclusion**

There is already a great deal of academic literature dealing with environmental sustainability. Yet, the role of human resource management towards the attainment of sustainable development is still an underdeveloped area of research. This paper makes an original contribution by proposing a sustainability competency framework applicable to the construction industry. The framework consists of a competency dictionary (eight competencies differentiated at four proficiency levels) and suggestions as to how these competencies can be measured. In addition, the proficiency levels required for different jobs within the construction industry are also mapped.

Future research could possibly look into expanding the sustainability competency framework into other industries apart from construction. The number of participants in a working group can also be increased to further validate the proficiency levels which have been mapped to construction related jobs as shown in Table 9. Based on the recommendation in section 5, HR practitioners may wish to automate the competency assessment through an online platform.

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## Appendix A

### **CRC Construction Innovation Safety Management Tasks (SMTs)**

SMT 1	Carry out project risk assessments
SMT 6	Carry out workplace/task hazard identification, risk assessments and controls
SMT 13	Plan and deliver toolbox talks
SMT 16	Consult on and resolve OH&S issues
SMT 18	Challenge unsafe behaviour/attitude at any level when encountered
SMT 19	Make site visits where a site worker is spoken to directly about OH&S
SMT 20	Recognise and reward people who have positively impacted on OH&S
SMT 22	Carry out formal incident investigations
SMT 24	Carry out formal inspections of workplace and work tasks
SMT 25	Research and prepare reports on OH&S issues, performance and improvement strategies
SMT 26	Monitor sub-contractor activities
SMT 29	Understand and apply general legislative OH&S requirements
SMT 36	Work with staff to solve safety problems