

# Case study: Competency-Related Issues during the Construction Phase

## Introduction:

- This document maps competency-related core tasks during the construction phase and the anticipated professional competencies. The c4SMC prepared this document in consultation with the OBC, AIPM, AIQS, RICS, AIBS, FPAA, and AAC.
- The presented case study at the CoP RT 17 June 2021 was evaluated in the first workshop, from a construction professional eco-system perspective, with facilitation of cross-discipline discourse.
- Tables 3, 4, and 6 reviewed this document in relation to the presented case study.
- This document presents following sections.
  - I. Averaged ranking of the identified issues and competencies in the construction phase of the case study
  - II. The summary of the list of issues identified in the construction phase of the case study, which are in relation to the listed assurance-related core tasks.

## **Note:**

This document is based on comments received from workshop tables 3,4, and 6.

## I. Averaged ranking of the identified issues and competencies during the construction phase of the case study

Stage / Core Tasks	Assurance-related Core Tasks	Relevant Core Competencies (A = Assurance, C = Certification)	Issues	Averaged Rank	
				1 - Not at all Important	2 - Slightly Important
1. Structure: sub and super structure (elements involved in resisting loads/imposed actions including structural resistance of materials and forms of construction)	1.1 Quantity & cost estimation and control	1.1/A&C/1 Construction technology	<ul style="list-style-type: none"> <li>The sequence of construction is not related to design and no sequencing in construction works is the buildability issue.</li> <li>The issue seems to be design team did not review</li> <li>No support to the excavation and adjacent buildings</li> <li>Piling is critical work package</li> </ul>	Issue	3
				Competency	4
		1.1/A&C/2 Measurement, quantification and costing	Issue	3	
			Competency	4	
		1.1/A&C/3 Account management	Issue	3	
	Competency		4		
	1.1/A&C/4 Contract administration/ management	Issue	4		
		Competency	4		
	1.1/A&C/5 Manage budget and costs	Issue	2		
		Competency	3		
	1.2 Material specifications and standards	Issue	3		
		Competency	4		
	1.3 Quality of workmanship and its standards	1.3/A&C/1 Quality management	Comparatively quality is more important than cost, because quality cannot be compromised. Quality, specification and workmanship is what's most important. Then it'll be cost (This is also very important too)	Issue	4
				Competency	4
		1.3/A&C/2 Mandatory and audit inspections	<ul style="list-style-type: none"> <li>Lack of inspection at the site by the Engineer is the major issue. The engineer should have inspected and informed about the issue and come up with an alternative design to remedy the work to be safe and comply with the requirements.</li> <li>Lack of site visit calls out for issues</li> <li>Use registered inspectors, validation and monitoring services</li> </ul>	Issue	4
Competency				4	
2. Enclosure (external glazing/ cladding and doors, windows)	2.1 Quantity & cost estimation and control	2.1/A&C/1 Construction technology	Issue	4	
			Competency	3	
		2.1/A&C/2 Measurement, quantification and costing	Issue	3	
	Competency		3		
	2.1/A&C/3 Account management	Issue	4		
		Competency	2		
2.2 Quality of material specifications, workmanship and standards	2.2/A&C/1 Quality management	Comparatively quality is more important than cost, because quality cannot be compromised. Quality, specification and workmanship is what's most important. Then it'll be cost (This is also very important too)	Issue		
			Competency		
		11.1/C/1 Quality management	Issue		

Stage / Core Tasks	Assurance-related Core Tasks	Relevant Core Competencies (A = Assurance, C = Certification)	Issues	Averaged Rank 1 - Not at all Important 2 - Slightly Important 3 - Important 4 - Fairly Important 5 - Very Important			
				Competency	Issue		
11. Energy efficiency	11.1 Workmanship, standards and testing for the following; <ul style="list-style-type: none"> <li>Fabric (insulation, walls and floors)</li> <li>External glazing</li> <li>Building sealing (windows, doors, exhaust fans, roofs, walls and floors)</li> <li>Air-conditioning and ventilation systems</li> <li>Hot water supply</li> <li>Artificial lighting and power</li> <li>Energy off set provisions (PV systems, battery storage, renewable credits etc.)</li> </ul>		If aspired by a green star building, then it is very important to have inspections	Competency			
		11.1/A&C/2 Mandatory and audit inspections		Issue			
21. Common tasks through the contract period	21.1 Ensuring the safety and well-being of employees, workers and visitors to the site.	21.1/A/1 Health and safety	<ul style="list-style-type: none"> <li>No safety in the design process or construction or sequencing is the major issue.</li> </ul>	Issue	5		
				Competency	5		
	21.2 Ensuring efficient utilisation of all resources.	21.2/A/1 Construction technology and environmental services	<ul style="list-style-type: none"> <li>Support to the excavation and dewatering is required.</li> <li>Architect believes that all competencies are important as we want the building to at least last for 100 years</li> <li>Depending on the profession, the level of expected competency can be different.</li> </ul>	Issue	5		
				Competency	5		
	21.3 Manage and ensure WHS compliance for all activities on the project.	21.3/A/1 Health and safety	<ul style="list-style-type: none"> <li>Ensuring safety during construction is very important. It has become an issue in this project.</li> <li>It depends on how the design is effective, implementing the safety is the responsibility of the builder, health and safety of people who visit the site and also to adjoining sites is very important.</li> </ul>	Issue	5		
				Competency	5		
	21.4 Ensuring the project is delivered on-time and within budget.	21.4/A/1 Work progress management		<ul style="list-style-type: none"> <li>Lack of an efficient project program is the issue</li> <li>Cutting cost is an issue too</li> </ul>	Issue	5	
					Competency	5	
		21.4/A/2 Manage time and schedule				Issue	5
						Competency	5
		21.4/A/3 Manage budget and costs			<ul style="list-style-type: none"> <li>Trustworthiness is also important</li> <li>To identify the defects beforehand (may be an architect/ engineer)</li> <li>QS has to inform the client whether value for money is achieved.</li> <li>The banks request for risk assessment from developers before giving loans now. The solution recommended is to include the requirements of inspections in the funding agreement.</li> </ul> <p>Not having D &amp; C is the main issue. You need someone to have the authority to check independently. The builder will be more into gaining financial benefits. But if it's D&amp;C they will work more collegiately with the design team.</p>	Issue	4
						Competency	4
	21.5 Ensuring the work practice standards and maintain quality control	21.5/A/1 Quality management		<ul style="list-style-type: none"> <li>No consideration of latest conditions or on adjacent site.</li> <li>Conflict of interest</li> </ul>	Issue	5	
					Competency	5	
21.6 Ensuring the continuous compliance with quality assurance	21.6/A/1 Quality management			Issue	5		
				Competency	5		

Stage / Core Tasks	Assurance-related Core Tasks	Relevant Core Competencies (A = Assurance, C = Certification)	Issues	Averaged Rank	
				1 - Not at all Important	2 - Slightly Important
	requirements and manage compliance with Development Approval criteria.				
	21.7 Ensuring the materials and standards specified achieve compliance and agreed in the head contract are procured and provided.	21.7/A/1 Quality management	The services engineer develops 70% of the design. Then contractor gets a sub-contractor and all designs are changed afterwards. Who check the accuracy of that?	Issue	4
				Competency	5
		21.7/A/2 Manage contract and/or procurement		Issue	5
				Competency	5
	21.8 Ensuring the project procurement is undertaken in time to maintain programme	21.8/A/1 Contract Administration		Issue	5
				Competency	5
		21.8/A/2 Construction change management		Issue	5
				Competency	5
	21.9 Ensuring a safe work environment for all on-site personnel and compliance with site WHS requirements.	21.9/A/1 Health and safety		Issue	5
				Competency	5

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## II. The summary of the list of issues identified during the construction phase of the case study

### Note:

Following are comments extracted from workshop (Tables 3,4, and 6) and are in the order of the competencies presented in the original document. The issues listed below are in relation to the listed assurance-related core tasks.

### 1. Structure: sub and super structure (elements involved in resisting loads/imposed actions including structural resistance of materials and forms of construction)

#### 1.1 Quantity & cost estimation and control

- The sequence of construction is not related to design and no sequencing in construction works is the buildability issue.
- The issue seems to be design team did not review
- No support to the excavation and adjacent buildings
- A consultant was not nominated, therefore loss of knowledge
- The appointment of a consultant is helpful.
- Cost-saving by not appointing the consultants could be saved by a client.
- Partial Design and Construction (D&C) employed for the project could be an issue.
- Less support to the structure is an issue, the cost for the item very important
- Piling is critical work package
- In terms of account management, not look in the past, not needed, look into the future
- In terms of managing budget and cost, cheapest and affordable prices may have considered.

#### 1.3 Quality of workmanship and its standards

- Lack of inspection at the site by the Engineer is the major issue. The engineer should have inspected and informed about the issue and come up with an alternative design to remedy the work to be safe and comply with the requirements.
- Lack of site visit calls out for issues.
- Use registered inspectors, validation and monitoring services
- Comparatively quality is more important than cost, because quality cannot be compromised
- Quality, specification and workmanship is what's most important
- Then it'll be cost (This is also very important too)

### 2. Enclosure (external glazing/ cladding and doors, windows)

#### 2.1 Quantity & cost estimation and control

- Details of measurement required
- Account management is not presented due to circumstances

#### 2.2 Quality of material specifications, workmanship and standards

- Comparatively quality is more important than cost, because quality cannot be compromised
- Quality, specification and workmanship is what's most important
- Then it'll be cost (This is also very important too)

### 11. Energy efficiency

- If aspired by a green star building, then it is very important to have inspections

### 21. Common tasks through the contract period

#### 21.1 Ensuring the safety and well-being of employees, workers and visitors to the site.

- No safety in the design process or construction or sequencing is the major issue.

#### 21.2 Ensuring efficient utilisation of all resources.

- Support to the excavation and dewatering is required.
- Architect believes that all competencies are important as we want the building to at least last for 100 years
- Depending on the profession, the level of expected competency can be different.

#### 21.3 Manage and ensure WHS compliance for all activities on the project.

- Ensuring safety during construction is very important. It has become an issue in this project.
- It depends on how the design is effective, implementing the safety is the responsibility of the builder, health and safety of people who visit the site and also to adjoining sites is very important.

#### 21.4 Ensuring the project is delivered on-time and within budget.

- Lack of an efficient project program is the issue
- Cutting cost is an issue too
- Trustworthiness is also important
- To identify the defects beforehand (may be an architect/ engineer)

- QS has to inform the client whether value for money is achieved.
- The banks request for risk assessment from developers before giving loans now. The solution recommended is to include the requirements of inspections in the funding agreement. Not having D & C is the main issue. You need someone to have the authority to check independently. The builder will be more into gaining financial benefits. But if it's D&C they will work more collegiately with the design team.

**21.5 Ensuring the work practice standards and maintain quality control**

- No consideration of latest conditions or on adjacent site.
- Conflict of interest

**21.7 Ensuring the materials and standards specified achieve compliance and agreed in the head contract are procured and provided.**

- The services engineer develops 70% of the design. Then contractor gets a sub-contractor and all designs are changed afterwards. Who check the accuracy of that?