Booklet

CBA Application Instructions

Version 200525

This page has been left blank intentionally

Table of Contents

1.0 Introduction

The Institution of Engineer Papua New Guinea (IEPNG) introduced the Competency Based Assessment (CBA) system in 2019. The process of assessing competency by the institution was new to industry and many needed a standard instruction set on how to complete their application documents and submit for assessing. This booklet has been written to meet this need.

For information about why the CBA exists, please visit the website: http://iepng.org/

2.0 Application Process

There is two (2) types of Applications**:**

Assessment for Admission (AFA) **– only for those applying for membership for the first time.**

Continued Registration Assessment (CRA)

Form Number	Application	Membership Category	Comments
CA01	AFA only	All	Applicant Details – first time application only
CA02	CFA only	All	Applicant Details – all applications after registered for the first time.
CA03	AFA & CFA	Engineers Only*	Competence Self-Assessment
CA04	AFA & CFA	All	Work Experience of last 3 years (or last assessment)
CA05	AFA & CFA	All	CPD records in last 3 years (or last assessment)
CA06	AFA & CFA	Engineers Only*	Two Referees

* includes fellows

3.0 Filling out the forms

Here are some helpful hints about filling out the application forms:

CA01 / CA02

- Ensure the referees have the same wording for the practice area
- Ensure your certificates are certified. Certified transcripts are required if the degree does not qualify with the Washington Accord. https://www.ieagreements.org/accords/washington/
- Ensure you have agreed to the policies and code of ethics (tick the relevant boxes) and ensure you have signed the document

CA03

- Ensure it has references to your work samples.
- Prove your competency in each element in this form.
- It is recommended that form CA03 be filled out after you complete your work samples. It consists of a summary of competencies outlined in your work samples
- Important to read the Forms properly and complete as required – ensure referencing on CA03 follows a structure relating to your work samples (eg. WS1.1 for work sample 1 paragraph 1. Your work samples should have this referencing too).

CA04

- Ensure you only list the last 3 years in CA04. Your CV will contain your entire work history. If you haven't moved in your job for the last 3 years, it is only 1 entry.

CA05

- Ensure you have sufficient hours/points listed for your continual development – for the last 3 years only.
- The standard is 150 hours of CPD – at least 50 hours must be in your area of practice.
- Attach any certificates of development you have attended.

CA06

- This is usually the most delays in the assessment process. The IEPNG office will not pass the applications onto the assessors until your referees have sent your references to the office.
- Referees need to be the ones who send the CA06 form to IEPNG.
- Referencing aspects of your CA03 and work samples by the referee will ensure its authenticity.

4.0 The Work Sample

Work sample should be viewed as a letter to tell the assessors your ***engineering story***. This is the document that the technical assessors use to assess your competency against the twelve (12) Elements in the IEPNG CBA system. It must be about work you have personally been involved in showing your personal contribution. It needs to be written in the first person – it is not a technical report.

The work sample is should only be 2 pages at most (as a guide 600 – 1000 words only)

Only 2 work samples are required (not 2 work samples per element, just 2 all up). The write up should be written to demonstrate your competency in the elements of competency. If 2 samples don't cover all elements write a third work samples for that particular element. For example, if the first 2 samples does not clearly clarify how you were ethical in a project, write a brief work sample that outlines your performance in that project that demonstrates your competency in ethical conduct.

Number the paragraphs in the work sample as follows: WS1.1 denoting the paragraph 1 in Work Sample 1, and WS1.2 denoting paragraph 2 in Work Sample 1.

The structure of the work sample should be as follows:

1. Introduction
    - Dates and duration of the project or appointment you are writing about
    - Name of employing organisation and location of worksite
    - Title of the position you occupied
    - Background, nature and objectives of the overall engineering project
    - Nature of your particular work area
    - An organisation chart highlighting your position
2. Personal Performance
    - Detailed description of the work you performed personally
    - Technical details of the work
    - How you applied your engineering knowledge and skills
    - The tasks delegated to you and how you went about accomplishing them
    - Any particular engineering problems you encountered and how you solved them
    - Strategies you devised, including any original or creative design work
    - How you worked with other team members
3. Summary
    - Your view of the overall project (brief summary)
    - How well the project succeeded in meeting its goals and requirements
    - How your personal role contributed to the project

An example work sample has been given in this document as a guide on what is expected.

5.0 The Competency Elements & The Work Sample

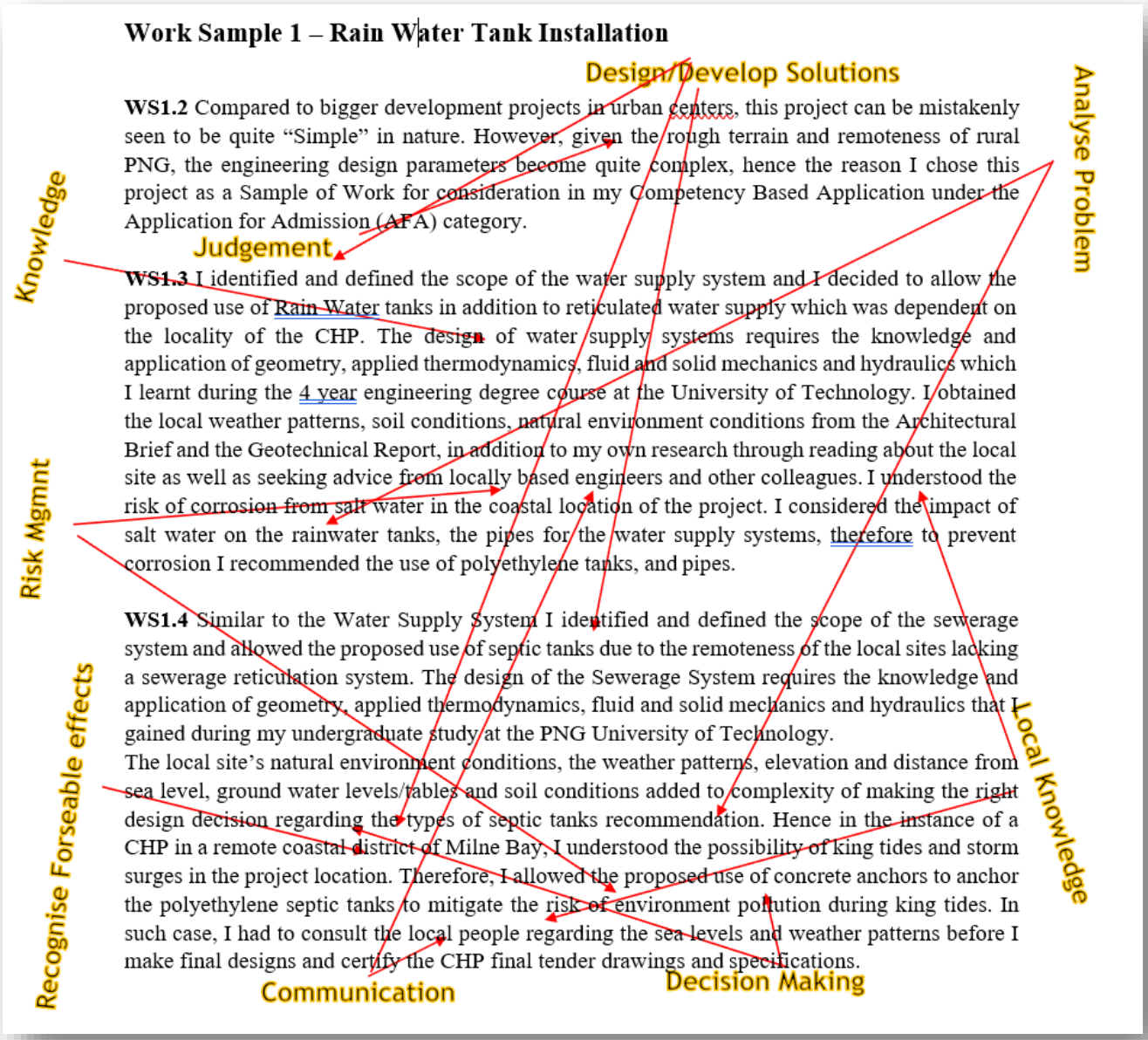
	Competency Element	What Assessors will be looking for?
1	ENGINEERING KNOWLEDGE	Have you got a Washington Accord degree or recognised equivalent qualification or has demonstrated equivalent knowledge and is able to: • Identify, comprehend and apply appropriate engineering knowledge • Work from first principles to make reliable predictions of outcomes • Seek advice, where necessary, to supplement own knowledge and experience • Read literature, comprehend, evaluate and apply new knowledge
2	LOCAL KNOWLEDGE	Are you as an Engineer able to: • Demonstrates an awareness of legal requirements and regulatory issues within the jurisdictions in PNG in which you practice • Demonstrates an awareness of and applies appropriately the special engineering requirements operating within the jurisdictions in PNG in • which you practices.
3	ANALYSE PROBLEMS	Are you as an Engineer able to: • Identify and define the scope of the problem • Investigate and analyse relevant information using quantitative and qualitative techniques • Tests analysis for correctness of results • Conducts any necessary research and reaches substantiated conclusions
4	DESIGN OR DEVELOP SOLUTIONS	Are you as an Engineer able to: • Identify needs, requirements, constraints and performance criteria • Develop concepts and recommendations that were tested against engineering principles • Consults with stakeholders • Evaluate options and selects solution that best matched needs, requirements and criteria • Plans and implements effective, efficient and practical systems or solutions • Evaluates outcomes
5	DECISION MAKING	Are you as an Engineer able to: • Take accountability for your outputs and for those for whom you are responsible for • Accepts responsibility for your engineering activities
6	MANAGEMENT	Are you as an Engineer able to: • Plan, schedule and organises projects to deliver specified outcomes • Apply appropriate quality assurance techniques • Manage resources, including personnel, finance and physical resources • Manage conflicting demands and expectations

7	RISK MANAGEMEN	• Are you as an Engineer able to: • Identify risks • Develop risk management policies, procedures and protocols to manage safety and hazards • Manage risks through 'elimination, minimisation and avoidance techniques'
8	ETHICAL CONDUCT	Are you as an Engineer able to: • Demonstrates understanding of IEPNG and/or PERB codes of ethics • Behaves in accordance with the relevant code of ethics even in difficult circumstances (includes demonstrating an awareness of limits of capability; acting with integrity and honesty and demonstrating self- • management)
9	RECOGNISE FORESEEABLE EFFECTS	Are you as an Engineer able to: • Consider and, where needed, takes into account health and safety compliance issues and impact(s) on those affected by engineering activities • Consider and take into account possible social, cultural and environmental impacts and consults where appropriate • Recognise impact and long-term effects of engineering activities on the environment • Recognise foreseeable effects and where practicable seeks to reduce adverse effects
10	COMMUNICATION	Are you as an Engineer able to: • Use oral and written communication to meet the needs and expectations of your audience • Communicate using a range of media suitable to the audience and context • Treat people with respect • Develop empathy and uses active listening skills when communicating with others • Operate effectively as a team member
11	MAINTAIN CURRENCY	Are you as an Engineer able to: • Demonstrate a commitment to extending and developing knowledge and skills • Participate in education, training, mentoring or other programmes contributing to his/her professional development • Adapt and updates knowledge base in the course of professional practice • Demonstrate collaborative involvement with professional engineers
12	JUDGEMENT	Are you as an Engineer able to: • Demonstrate the ability to identify alternative options • Demonstrate the ability to choose between options and justify decisions • Demonstrate that Peers recognise your ability to exercise sound professional engineering judgement

6.0 Example of a work sample

There are 2 ways to write a work sample:

Example 1 – note the way the yellow marks and red arrows showing how assessor checks elements of competency



Work Sample 1 – Rain Water Tank Installation

Design/Develop Solutions

Analyse Problem

Knowledge

Judgement

WS1.2 Compared to bigger development projects in urban centers, this project can be mistakenly seen to be quite "Simple" in nature. However, given the rough terrain and remoteness of rural PNG, the engineering design parameters become quite complex, hence the reason I chose this project as a Sample of Work for consideration in my Competency Based Application under the Application for Admission (AFA) category.

WS1.3 I identified and defined the scope of the water supply system and I decided to allow the proposed use of Rain Water tanks in addition to reticulated water supply which was dependent on the locality of the CHP. The design of water supply systems requires the knowledge and application of geometry, applied thermodynamics, fluid and solid mechanics and hydraulics which I learnt during the 4 year engineering degree course at the University of Technology. I obtained the local weather patterns, soil conditions, natural environment conditions from the Architectural Brief and the Geotechnical Report, in addition to my own research through reading about the local site as well as seeking advice from locally based engineers and other colleagues. I understood the risk of corrosion from salt water in the coastal location of the project. I considered the impact of salt water on the rainwater tanks, the pipes for the water supply systems, therefore to prevent corrosion I recommended the use of polyethylene tanks, and pipes.

Risk Mgmnt

WS1.4 Similar to the Water Supply System I identified and defined the scope of the sewerage system and allowed the proposed use of septic tanks due to the remoteness of the local sites lacking a sewerage reticulation system. The design of the Sewerage System requires the knowledge and application of geometry, applied thermodynamics, fluid and solid mechanics and hydraulics that I gained during my undergraduate study at the PNG University of Technology.

The local site's natural environment conditions, the weather patterns, elevation and distance from sea level, ground water levels/tables and soil conditions added to complexity of making the right design decision regarding the types of septic tanks recommendation. Hence in the instance of a CHP in a remote coastal district of Milne Bay, I understood the possibility of king tides and storm surges in the project location. Therefore, I allowed the proposed use of concrete anchors to anchor the polyethylene septic tanks to mitigate the risk of environment pollution during king tides. In such case, I had to consult the local people regarding the sea levels and weather patterns before I make final designs and certify the CHP final tender drawings and specifications.

Recognise Forseable effects

Local Knowledge

Communication

Decision Making

Here's another example written with another format:

Work Sample 1 – Rain Water Tank Installation

WS1.1 This project was in 2011 where I worked for myself as an engineer and was asked to design and install a water tank for one of my customers.

WS1.2 Compared to bigger development projects in urban centers, this project can be mistakenly seen to be quite "Simple" in nature. However, given the rough terrain and remoteness of rural PNG, the engineering design parameters become quite complex, hence the reason I chose this project as a Sample of Work for consideration in my Competency Based Application under the Application for Admission (AFA) category.

WS1.3 I identified and defined the scope of the water supply system and I decided to allow the proposed use of Rain Water tanks in addition to reticulated water supply which was dependent on the locality of the CHP. The design of water supply systems requires the knowledge and application of geometry, applied thermodynamics, fluid and solid mechanics and hydraulics which I learnt during the 4 year engineering degree course at the University of Technology. I obtained the local weather patterns, soil conditions, natural environment conditions from the Architectural Brief and the Geotechnical Report, in addition to my own research through reading about the local site as well as seeking advice from locally based engineers and other colleagues. I understood the risk of corrosion from salt water in the coastal location of the project. I considered the impact of salt water on the rainwater tanks, the pipes for the water supply systems, therefore to prevent corrosion I recommended the use of polyethylene tanks, and pipes.

WS1.4 Similar to the Water Supply System I identified and defined the scope of the sewerage system and allowed the proposed use of septic tanks due to the remoteness of the local sites lacking a sewerage reticulation system. The design of the Sewerage System requires the knowledge and application of geometry, applied thermodynamics, fluid and solid mechanics and hydraulics that I gained during my undergraduate study at the PNG University of Technology.
The local site's natural environment conditions, the weather patterns, elevation and distance from sea level, ground water levels/tables and soil conditions added to complexity of making the right design decision regarding the types of septic tanks recommendation. Hence in the instance of a CHP in a remote coastal district of Milne Bay, I understood the possibility of king tides and storm surges in the project location. Therefore, I allowed the proposed use of concrete anchors to anchor the polyethylene septic tanks to mitigate the risk of environment pollution during king tides. In such case, I had to consult the local people regarding the sea levels and weather patterns before I make final designs and certify the CHP final tender drawings and specifications.

7.0 Filling out CA03

This is how you should fill out form CA03, to demonstrate each competency element using your work sample.

ELEMENT ONE – KNOWLEDGE		
PE	Comprehend and apply knowledge of the accepted principles underpinning widely applied good practice in professional engineering (Washington Accord degree level)	Provide annotations to your evidence portfolio (document and page number)
ET	Comprehend and apply knowledge underpinning good practice as an engineering technology practitioner (Sydney Accord degree level)	
ETn	Comprehend and apply detailed knowledge underpinning good practice as an engineering technician (Dublin Accord qualification level)	
PERFORMANCE INDICATORS FOR PROFESSIONAL ENGINEER **Has a Washington Accord degree or recognised equivalent qualification or has demonstrated equivalent knowledge and is able to:**		
i. *Identify, comprehend and apply appropriate engineering knowledge* The design of water supply and sewerage systems requires the knowledge and application of geometry, applied thermodynamics, fluid and solid mechanics and hydraulics which I gained during the 4 year degree course in Mechanical Engineering at the University of Technology.		W1.3
ii. Work from first principles to make reliable predictions of outcomes I obtained data through sampling and research to apply first principles through the application of my knowledge in designing a solution for the rain water tank.		WS1.3
iii. Seek advice, where necessary, to supplement own knowledge and experience I read up about the local site and asked colleagues and their experience for the project to install the rain water tanks.		W1.3
iv. *Read literature, comprehend, evaluate and apply new knowledge*		Click here to enter text.

Document History

Version YYMMDD	Particulars	Reviewers/Approvers
200825	Transferred to new template and sent to assessors for their review	Franz Hemetsberger

THE INSTITUTE OF ENGINEERS
PUA NEW GUINEA INC.

PO Box 881, Waigani
National Capital District
Papua New Guinea
Tel: (675) 3258763
www.iepng.org