

IoWs and Professional Pathways in the Engineering Profession

Presenter:

Dato' Prof. Ir. Dr. Hassan Basri
Board of Engineers Malaysia



Date: 26th November 2021

IoW & Laluan Profesyenal dalam Profesyen Kejuruteraan di Malaysia

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Board of Engineers Malaysia



Date: 26th November 2021

Terjemahan **IoW**

Inspector of Works

Inspektor Kerja

Pemeriksa Kerja

Pemeriksa Tapak (?)

Membership title for engineering technicians: (entry level & professional level):

- BEM**
- Entry Level: **Intern Inspector of Works (IoW)**
 - Professional level: After 2 years experience – **Inspector of Works**
(in the pipeline “Certified Engineering Technician”)
-

- MBOT**
- Entry Level: **Qualified Technician.**
 - Professional level: After 3 years – **Certified Technician**
-

- IEM**
- Entry Level: **Graduate Engineering Technician.**
 - Professional level: After 3 years – **Engineering Technician.**
-

- MySET**
- Entry Level: **Engineering Technician**
 - Professional level: After 3 years – **Professional Engineering Technician**

ECUK

- In the UK

There are four categories of registration:

1. engineering technician (EngTech),

2. ICT technician (ICTTech),

3. incorporated engineer (IEng), and

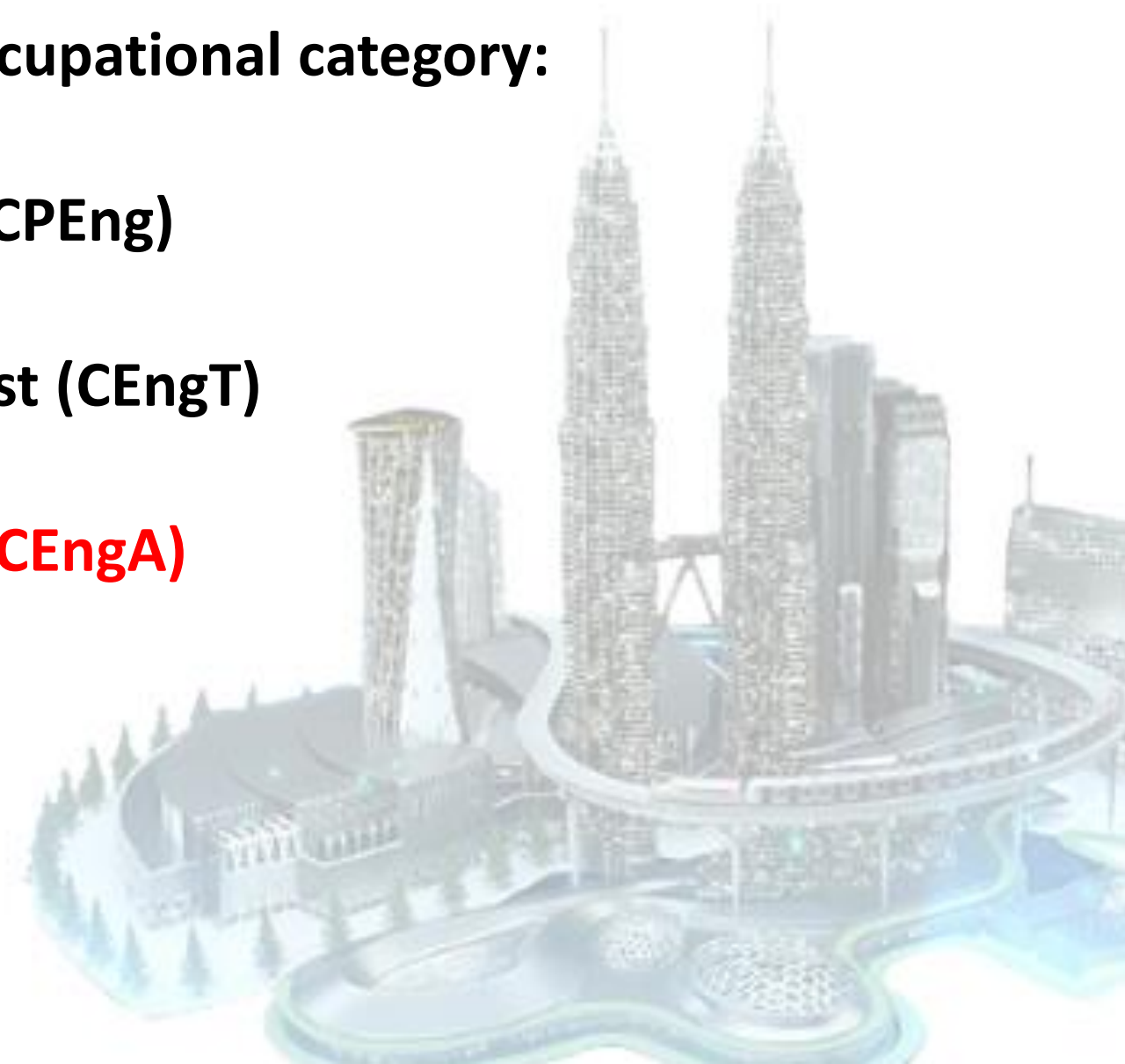
4. chartered engineer (CEng).



Engineers Australia

Chartered Status is open to each occupational category:

- Professional Engineer –
Chartered Professional Engineer (CPEng)
- Engineering Technologist –
Chartered Engineering Technologist (CEngT)
- Engineering Associates –
Chartered Engineering Associate (CEngA)



Canada

- **Certified Engineering Technician**



South Africa (ECSA)

- **Professional Engineering Technician**

ECSA (statutory) registers

- Pr Eng,
- Pr Tech Eng, &
- **Pr. Techni. Eng.**



Outline of Presentation

Educational & Professional Pathways

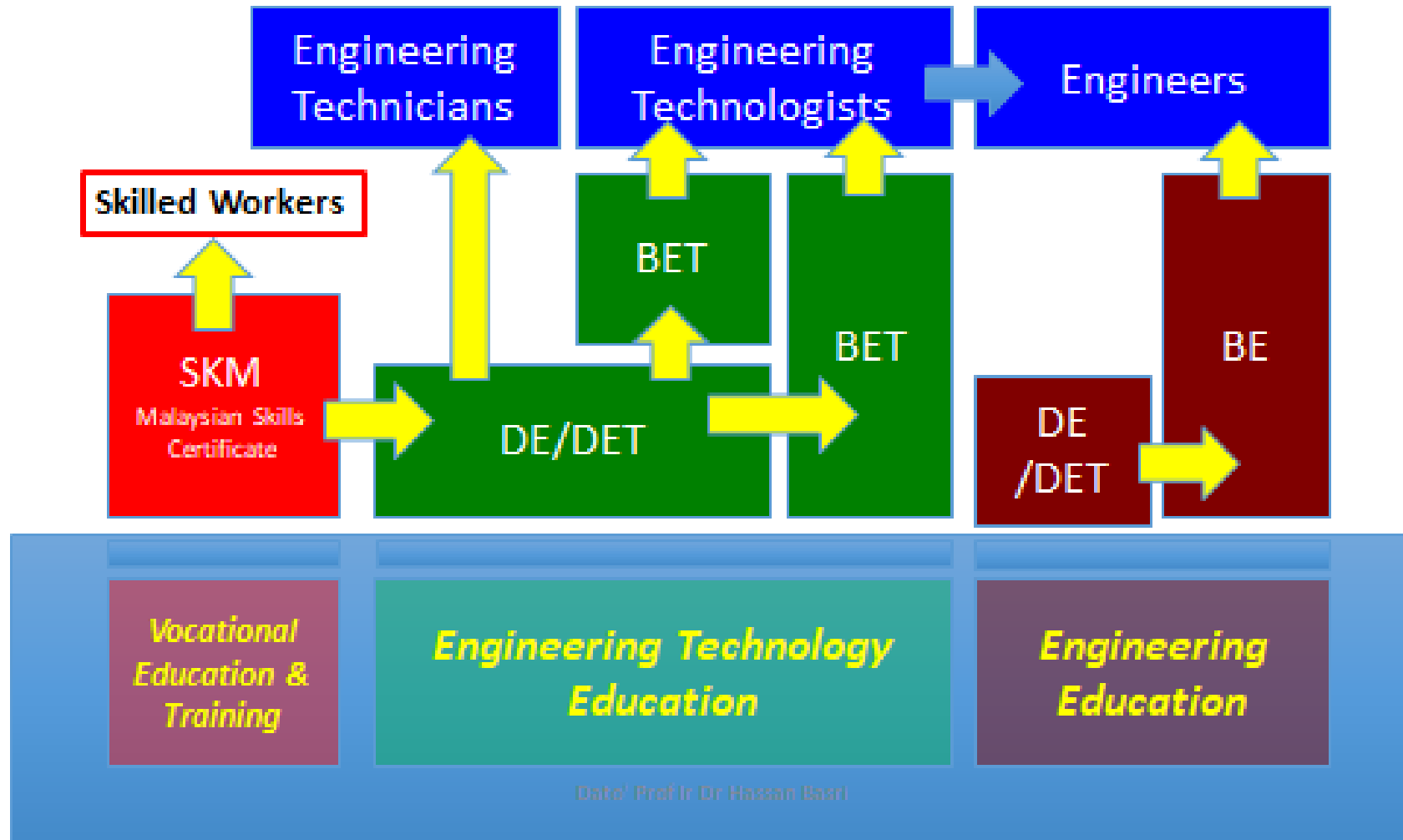
Registration of IoWs (Impact of 2015 REA Amendments)

Benchmarked Against the World's Best

Pathways for the PE & PEPC

Finally - Conclusion

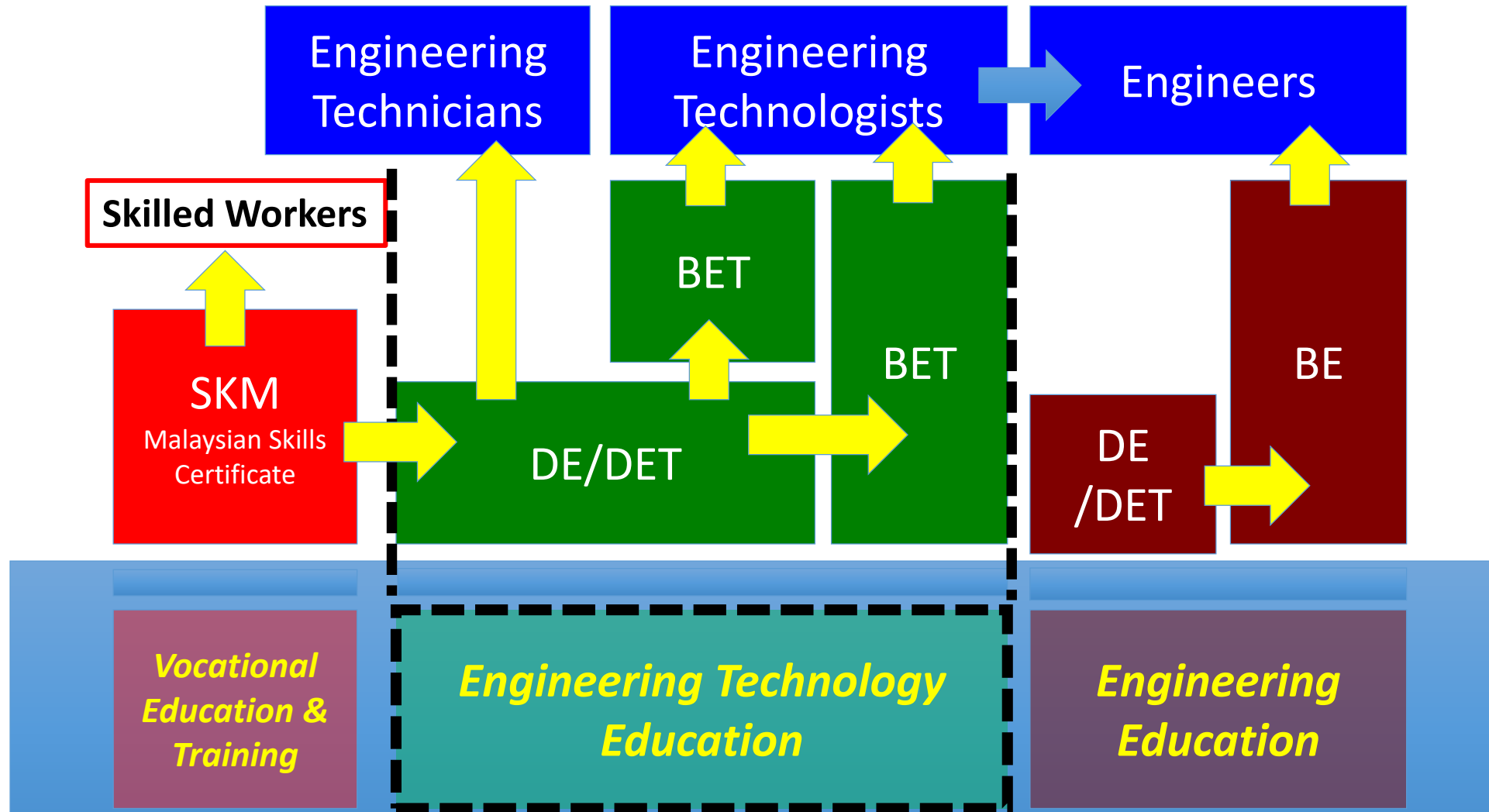
Engineering Team: *Education Pathways*



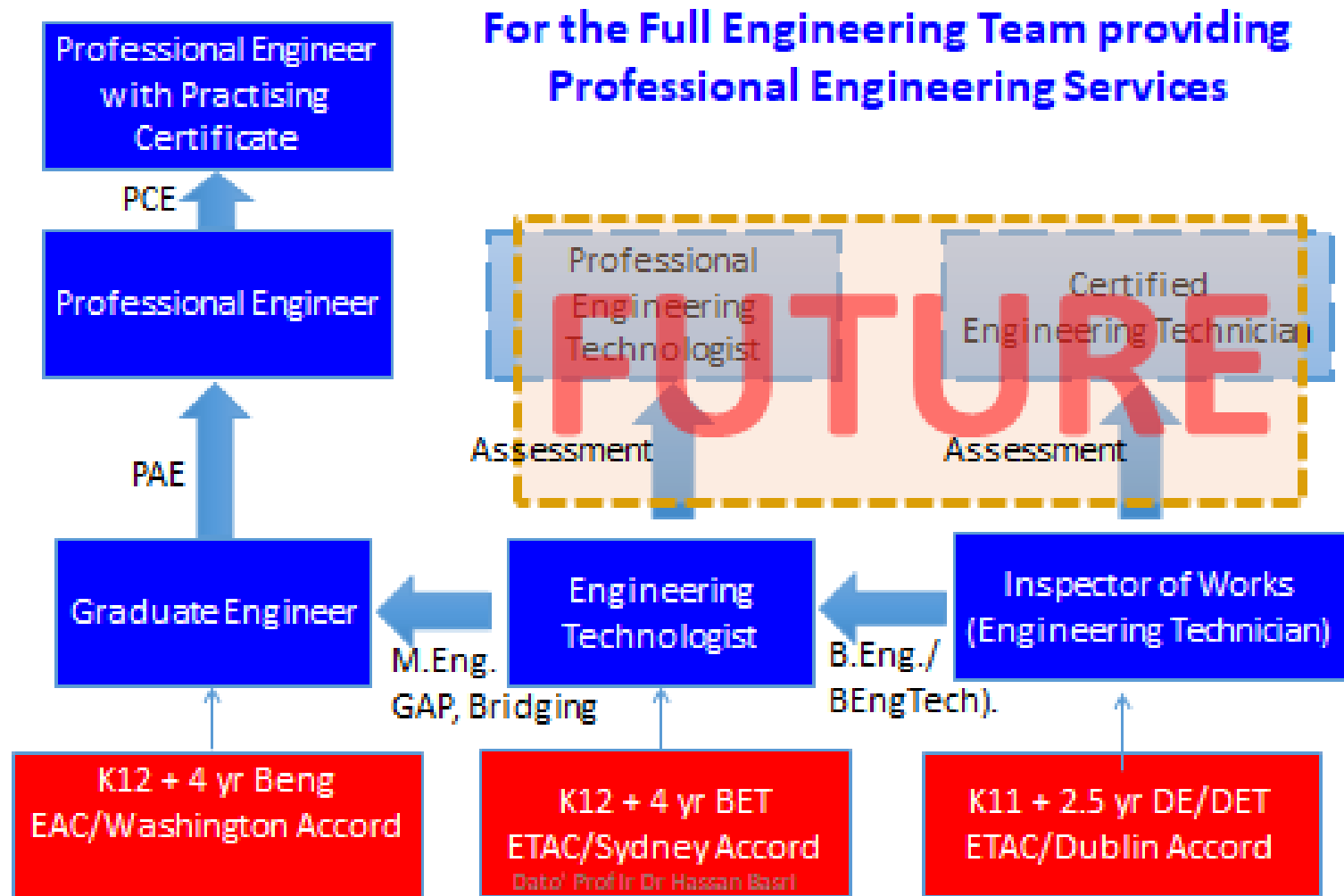
Date: Prof Ir Dr Hassan Basri

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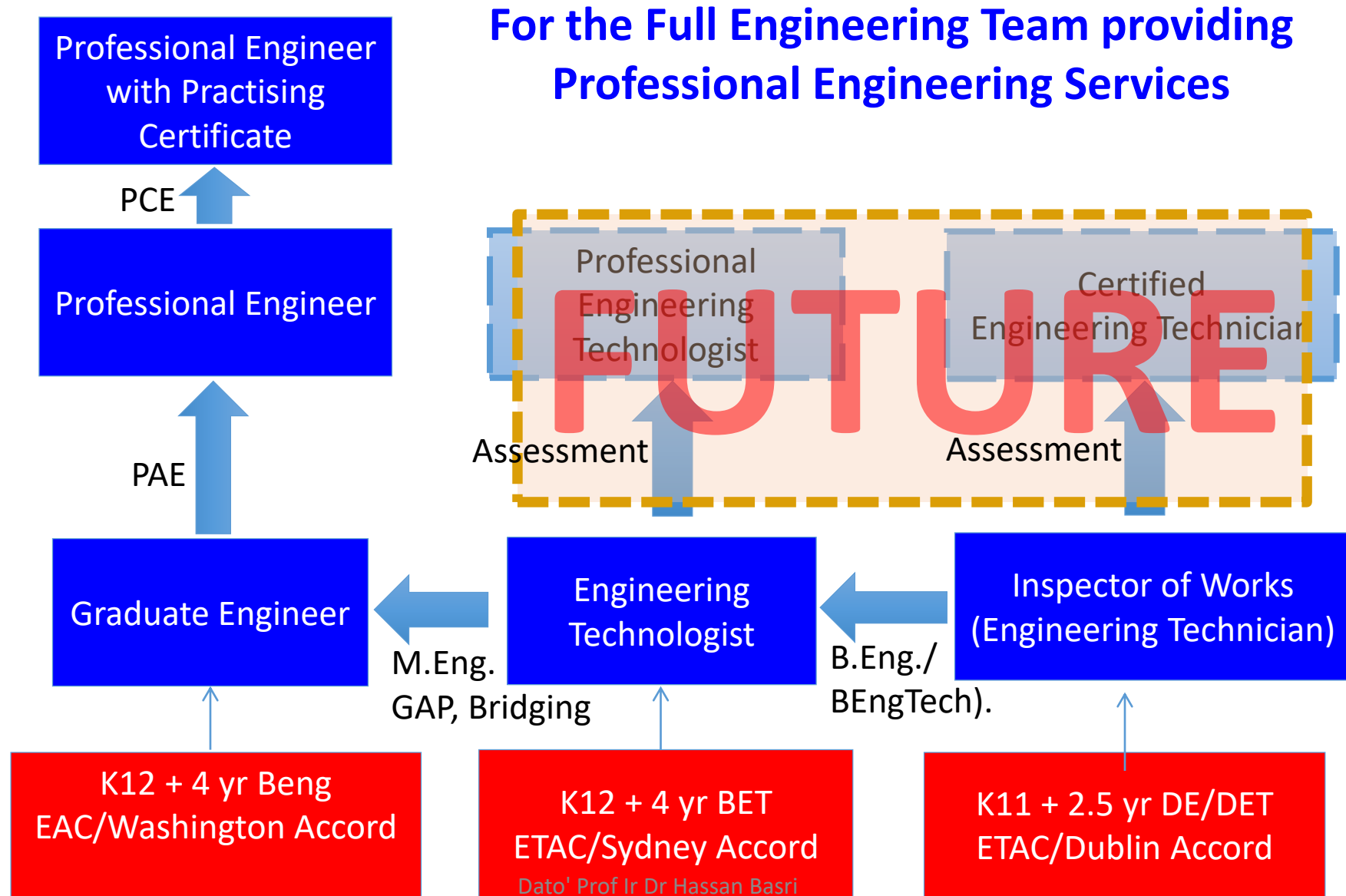
Engineering Team: *Education Pathways*



PROFESSIONAL PATHWAYS



PROFESSIONAL PATHWAYS



Registration of Technicians as Inspectors of Works (IoWs)



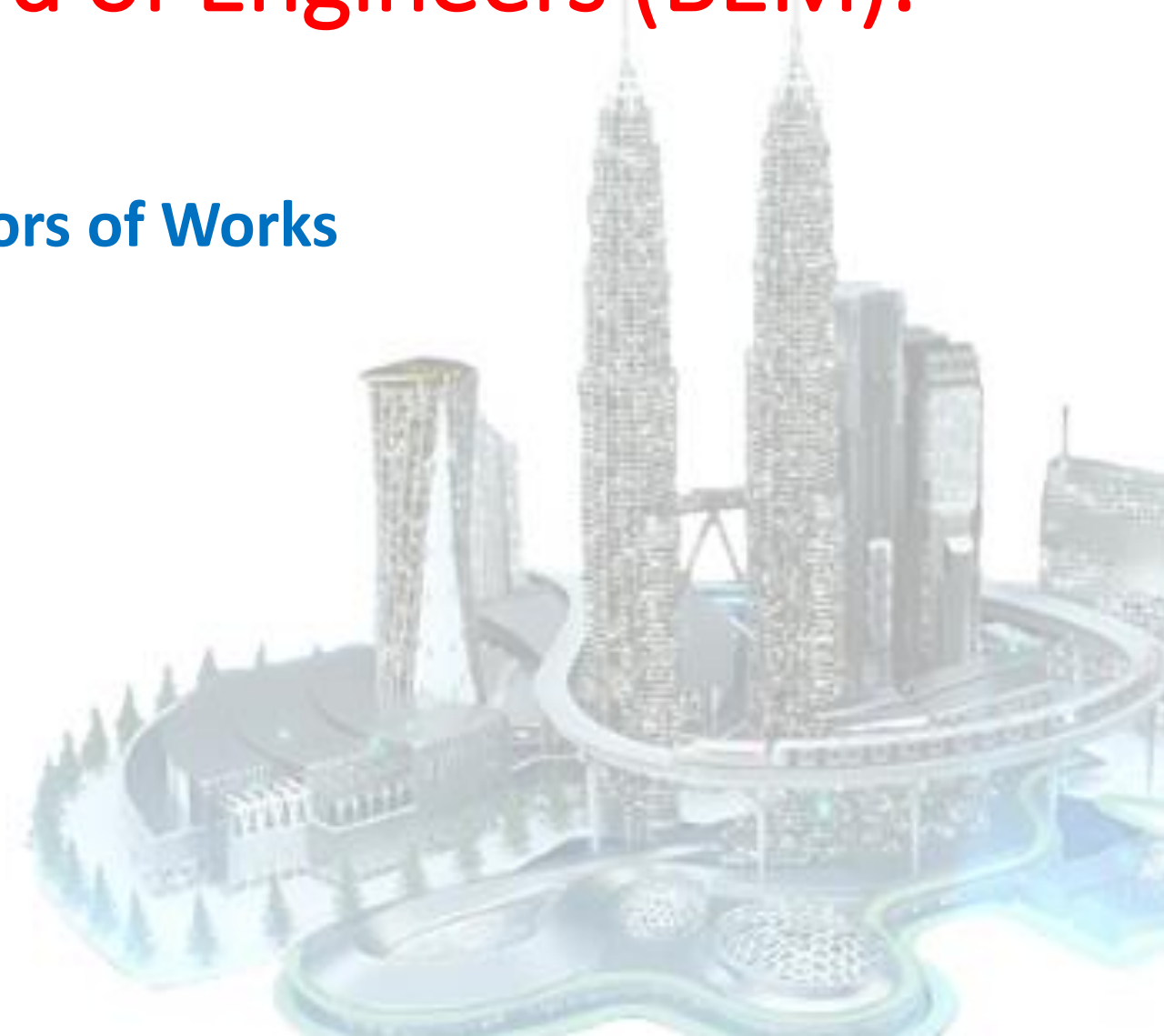
This is the current provision in the REA Amendments 2015.

BEM is planning to formalise the legal registration of engineering technicians.



The Engineering Profession in Malaysia is regulated by the Board of Engineers (BEM):

- **Registration as Engineers,
Engineering Technologists & Inspectors of Works**
- **Ownership & Directorship
of engineering consultancies**





Board of Engineers Malaysia (BEM)

Facilitates the registration of engineers and regulates the professional conduct and practise of registered engineers in order to safeguard the safety and interest of the public.



Institution of Engineers Malaysia (IEM)

A learned institution for practicing engineers in Malaysia. It facilitates networking, technical learning among different groups. Most of its members are graduate and student members.



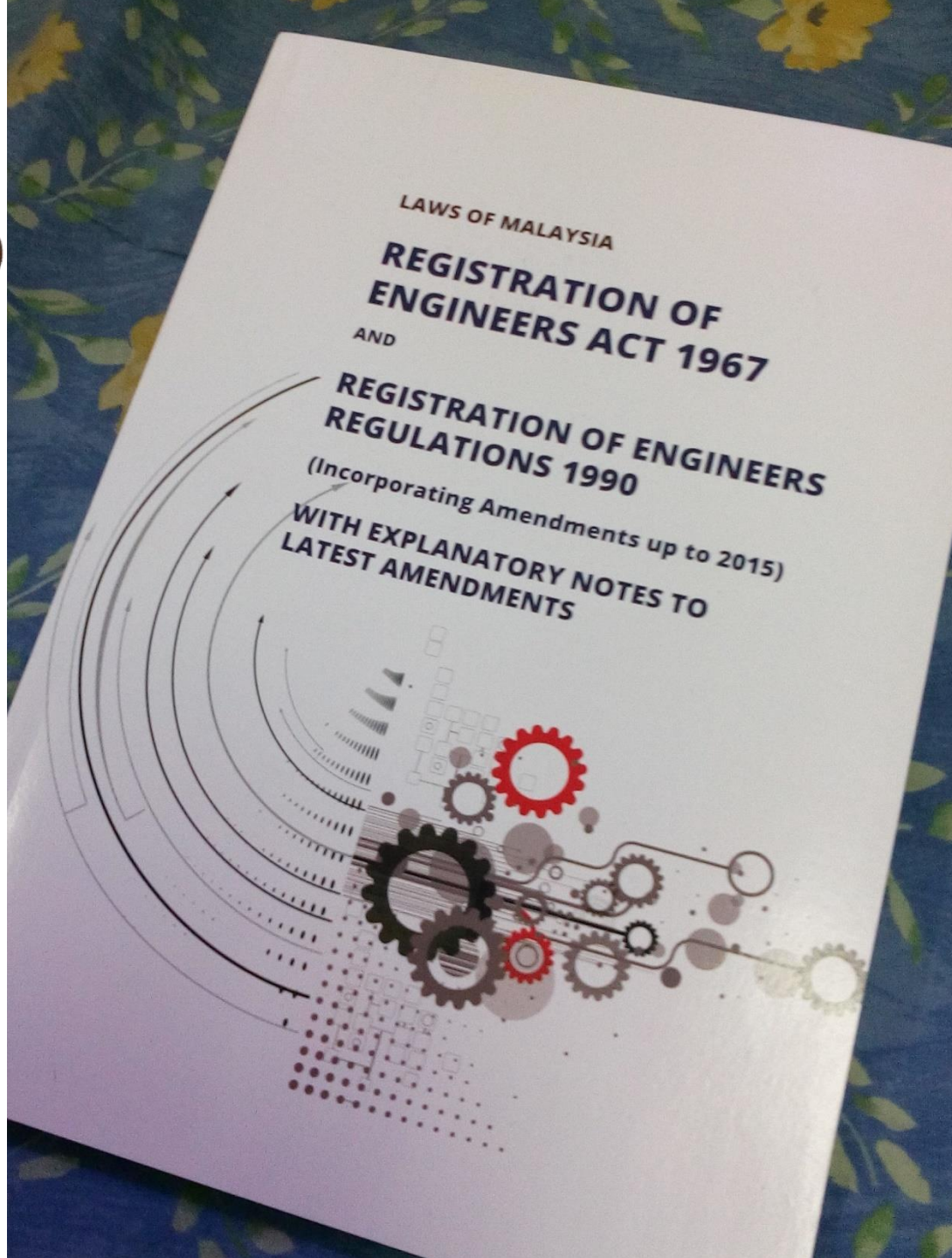
Board of Engineers Malaysia (BEM)

**An independent statutory body
by Act of Parliament**



Board of Engineers Malaysia (BEM)

- Formed in **1972**,
under the **Registration of Engineers Act 1967**.
- Latest Amendments enforced **31st July 2015**
- **BEM's primary role is to safeguard the safety and interest of the public:**
 - to facilitate the registration of Engineers, Engineering Technologists, Inspectors of Works, Engineering Consultancy Practices;
 - to regulate the professional conduct and practice of registered persons.



Available online
at BEM website



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HOME ABOUT US **REGISTRATION** PROFESSIONAL PRACTICE ACT & REGULATIONS INTERNATIONAL MOBILITY RESOURCE CENTRE FAQ CONTACT US

- New Registration**
 - Professional Engineer with Practising Certificate
 - Professional Engineer
 - Accredited Checker
 - Graduate Engineer
 - Engineering Technologist
 - Inspector of Works (IOW)
 - Engineering Consultancy Practices
 - Body Corporate
 - Multi Disciplinary Practice
 - Partnership
 - Sole Proprietor
- Renewal**
 - Professional Engineer with Practising Certificate
 - Professional Engineer
 - Accredited Checker
 - Inspector of Works
 - Engineering Consultancy Practices
- Removal from Registrar**
 - Current Year
 - Archive
- Reinstatement**
 - Professional Engineer with Practising Certificate
 - Professional Engineer
 - Accredited Checker
 - Inspector of Works
 - Engineering Consultancy Practices
- Accreditation**
 - Background
 - List of Accredited Engineering Programmes
 - Programme Accreditation Manuals
 - International Accords & Agreements
- Examination**
 - Professional Assessment Examination
 - Professional Competency Examination
- Training & Education**
 - Continuing Professional Development (CPD)
 - Professional Development Programme (PDP)
 - Accredited Training Provider (ATP)
- BEM Register Directory**
 - Professional Engineer with Practising Certificate
 - Professional Engineer
 - Graduate Engineer
 - Body Corporate
 - Multi Disciplinary Practice
 - Sole Proprietorship
 - Partnership
 - Accredited Checker - Structural
 - Accredited Checker - Geotechnical
 - Engineering Technologist
 - Inspector of Works
- e - Payment**
 - M2U & FPX
 - CIMB Clicks
 - RHBNow
 - PBe
- Online Services**
 - MyBEM Online Registration System
 - E-Bulk Online Registration System
 - BEM Register Directory
 - BEM Online Services Statistics

www.bem.org.my/web/guest/services

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BEM website:
<http://www.bem.org.my/web/guest/home>

Impact of the 2015 Amendments of the REA on the PE



2015 AMENDMENTS *TO REA 1967*

The Engineering Team



REA (1967) & its Regulations - AMENDMENTS 2015

Registers 5 Categories of Registered Persons : *(new in red)*

1. Accredited Checker
2. Professional Engineer with Practising Certificate
3. Professional Engineer
4. Graduate Engineer
5. Engineering Technologist
6. Inspector of Works



BEM now regulates:

THE ENGINEERING TEAM

Accredited Checker

Professional Engineer with Practising Certificate

Professional Engineer

Graduate Engineer

Engineering Technologist

Inspector of Works





Board of Engineers Malaysia

STATISTICS as at 23.11.2021

Registered Persons (**Total: 198,026**)

157,332	Graduate Engineers
10,973	Professional Engineers (PE)
10,643	PEs with Practising Certificate
11,187	Engineering Technologists
7,538 353	Inspectors of Works (IOWs) IOWs (intern)

The mission of BEM & the nation is to increase the number of engineering professionals to reach 320k



Who is the Engineering Technologist?

***- The Practical Oriented
Engineer***

(Discussion for another day)

Registration of Technicians as Inspectors of Works (IoWs)



This is the current provision in the
REA Amendments 2015.

BEM is planning to formalise the legal registration
of engineering technicians.



Registration of IOWs with BEM

- Role of Inspector of Works in the REA –
Assist the Professional Engineer in the supervision of engineering works;

REA 7(2)(ab) “an Inspector of Works (IOW) who is registered with the Board may, subject to section 8, take up employment which requires him to assist the Professional Engineer in the supervision of engineering works”.

- **Mandatory** for IOWs in ECPs (Engineering Consultancy Practices) to be registered with BEM

(under subsection 10(E) REA 1967 (Revised 2015)).

- Branches of Registration –
4 main engineering disciplines
i.e. **Civil, Electrical, Mechanical or Chemical.**



Minimum Qualification of IOW

- **Diploma in Engineering, or in Engineering Technology, accredited by ETAC-BEM;**
- **Foreign qualifications recognised by Dublin Accord;**
- **Any other qualification recognized by BEM**
 - **LAME Cat B - LAME Cat B Without Type Rating (CAAM)**
 - **Marine Engineer Certificate of Competency (CoC)**
 - **JPK Diploma Kemahiran Malaysia (Pengurus Binaan)**



➤ Savings Right provision:

IOWs who were already working under the supervision of a PE prior to **31st Dec 2018**, regardless of qualification have the right to be registered with the Board during the transition period

Diplomas before ETAC accreditation began

- Prior to 1st Feb 2018, Diplomas in Engineering or Engineering Technology accredited by **Malaysian Qualifications Agency (MQA)** or recognized by the Ministry of Higher Education / JPA are accepted.

Diplomas during Transition Period

- After 1st Feb 2018, Diplomas accredited by MQA within the six (6) years maximum from the date of accreditation prior to 1st Feb 2018 are accepted.

Registration of IOW with BEM

- New IOW applicants with **no supervision experience** shall be registered as **Intern IOW** and must work under the supervision of a registered IOW or Engineer/Eng. Technologist on site.
- The role of the Intern IOW is to assist his immediate superior(s) having oversight on him and he is not permitted to certify completion of site works by the Contractor during his internship, which shall be carried out by his superior(s).
- He can then apply to be a registered IOW after having met the following conditions:
 - **Diploma holders** - minimum **2 years** supervision experience
 - **Degree holders** - minimum **1 year** supervision experience



IOWs in Construction Supervision

- For the ECP and/or the PEPC in charge under Section 7B (2) (d) REA 1967 shall ensure that only **registered IOWs** or those **under internship** are deployed to their project sites;
- Failing which the ECP and/or the PEPC shall be liable for **disciplinary action** and to be charged under Section 24 of REA for employment of unregistered IOW(s) to carry out supervision of engineering works on site.
- This should also apply to IOWs seconded over from the **Client** to them.

Renewal of IOW with BEM

- A Certificate of Registration issued to an Inspector of Works shall expire on the **31st December** of the **third year** from the date the certificate of registration is issued.
- The certificate may be renewed triennially (every 3 years) upon payment of **RM30.00** and upon satisfying such conditions as may be determined by the Board.
- The Board may refuse to renew the registration of an Inspector of Works if he/she has failed to satisfy any conditions as determined by the Board.
- **CPD Requirements for IOWs are required for renewal.**

Form H and CPD records for 3 years would need to be submitted for renewal of registration.



BEM Code of Conduct





BEM CODE OF CONDUCT OF ET/IOW

In exercise of the powers conferred by paragraph 4(1)(f) of the REA1967 [Act 38], the Board of Engineers Malaysia hereby determines the **Code of Conduct of registered Person** (Refer BEM Circular No. 001) as stated herein below:

1.1	Registered ET/IOW not to falsify qualification, etc.
1.1.1	A registered ET/IOW shall not falsify his qualifications or permit misrepresentation of his qualifications. He shall not misrepresent or exaggerate his responsibility in or for the subject matter of previous assignments. He shall not misrepresent pertinent facts concerning employers, associates or past accomplishments.
1.1.2	A registered ET shall check with due diligence the accuracy of facts and data before he signs or endorses any statement or claim. He shall not sign on such documents unless, where necessary, he has made qualifications on errors and inaccuracies.
1.1.3	A registered ET/IOW shall respond, within reasonable time, to communication from the Board or any other relevant authority on matters pertaining to his work or registration.
1.1.4	A registered ET/IOW shall undertake assignments only if he is qualified by education and/or experience in the specific technical fields of that assignment in which he is to be involved.



BEM CODE OF CONDUCT OF ET/IOW

1.1	Registered ET/IOW not to falsify qualification, etc.
1.1.5	A registered ET shall sign only those engineering documents that he has prepared or has been prepared under his control.
1.1.6	A registered ET/IOW shall be objective and truthful in making reports, statements and testimonies. He shall include all relevant and pertinent information in such reports, statements, or testimonies, which should bear the date indicating when the information was current.
1.1.7	A registered ET/IOW shall not express publicly technical opinions that are not founded upon his competence and knowledge of the facts in the subject matter.
1.1.8	A registered ET/IOW shall not issue any statement , criticism or argument on technical matters that are inspired or paid for by interested parties, unless he has prefaced his comments by explicitly identifying the interested parties on whose behalf he is speaking and by revealing the existence of any interest he may have in the matter.
1.1.9	A registered ET/IOW shall notify the Board in writing within three (3) months – i) if he is convicted of an offence involving false or negligent certification, fraud or dishonesty in Malaysia or elsewhere; or ii) if he becomes a bankrupt .



BEM CODE OF CONDUCT OF ET/IOW

1.2 Registered ET/IOW to certify work only if he has witnessed or inspected such work, etc.

- 1.2.1 A registered **ET/IOW** shall **keep proper records** of his participation or inspection or witnessing of activities on site including the dates and time, subject-matter, condition of site, weather, etc.
- 1.2.2 A registered **ET/IOW** shall **check or verify with due diligence** the accuracy of facts and data before he signs or endorses any statement or certification. He shall not sign on such documents unless he has witnessed or inspected the carrying out of such work.
- 1.2.3 A registered **ET/IOW** shall **bring to the attention** of the Engineer or Employer at the earliest possible opportunity of any instance where the work or materials used are **not in compliance** with the specifications, drawings or conditions of contract.
- 1.2.4 A registered **ET/IOW** shall **not issue instructions** to the Contractor or give verification or approval to works carried out by the Contractor unless he has been authorized by the Engineer or Employer to do so.
- 1.2.5 A registered **ET/IOW** shall **not reveal facts, data or information** without the prior consent of the Engineer or Employer, past and present, except as authorized or required by law or when the withholding of such information is contrary to the safety, health and interest of the public.
- 1.2.6 A registered Inspector of Works **having knowledge** of any **violation of this Code of Conduct** or any law or regulation shall report thereon to the Engineer or Employer and, where relevant, also to public authorities and cooperate with the Engineer or Employer in furnishing such information or assistance as may be required.



BEM CODE OF CONDUCT OF ET/IOW

1.3	Registered TE/IOW not to accept benefit from more than one party, etc.
1.3.1	A registered ET shall not accept any benefit or compensation , financial or otherwise, from more than one party for professional engineering services on the same project, or for professional engineering services pertaining to the same project, unless the circumstances are fully disclosed and agreed to by all interested parties.
1.3.2	A registered IOW shall not accept any benefit or compensation, financial or otherwise, except from the Engineer or Employer for services pertaining to any project that he is engaged in as an Inspector of Works.
1.3.3	A registered ET/IOW shall disclose all known or potential conflicts of interest that may influence or appear to influence his judgment or the quality of his services, etc.
1.3.4	A registered ET/IOW shall not solicit or accept any consideration, financial or otherwise , directly or indirectly, from outside agents in connection with the work for which he is responsible.



BEM CODE OF CONDUCT OF ET/IOW

1.3	Registered ET/IOW not to accept benefit from more than one party, etc.
1.3.5	A registered ET acting as Advisor or Director of a company or an agency shall not participate in decision with respect to professional engineering services solicited or provided by him or his organization.
1.3.6	A registered IOW shall not abuse the facilities available on site or seek payment for overtime or such services except where such services have been rendered by him.
1.3.7	A registered IOW shall not refer trades or other specialists input or solicit, receive or accept referral fees or commissions from such referral for any project that he is engaged in as an Inspector of Works.



IEM



Code of Conduct

IEM Regulations on Professional Conduct

NOTE: A Code of Professional Conduct designed to cover all eventualities must necessarily be written in general terms expressing broad ethical principles. Almost every case of doubt as to the proper course of action required to conform to the Code of Professional Conduct arises from a conflict between a member's personal interest and his duty to others.

Regulations issued by the Council to interpret the Code indicate the manner in, which members are required to conduct themselves in a number of situations that are frequently encountered. In other situations, members are required to order their conduct in accordance with the principle that, in any conflict between a member's personal interest and fair and honest dealing with other members of the community, his duty to the community must prevail.

The following Regulations on Professional Conduct are made by the Council under Section IX of the Bylaws. In these regulations 'member' means a member of any grade referred to in Section II of the Bylaws, and 'employer' includes 'client'.

1. A member shall at all times take care to ensure that his work and the products of his work constitute no avoidable* danger of death or injury or ill health to any person.
2. A member shall take all reasonable steps to avoid waste of natural resources, damage of the environment, and wasteful damage or destruction of the products of human skill and industry.
3. A member shall take all reasonable steps to maintain and develop his professional competence by attention to new developments in science and engineering relevant to his field of professional activity and, if he is an employer, shall encourage his professional employees to do likewise.
4. A member shall not undertake responsibility as professional engineer which he does not believe himself competent to discharge.
5. A member shall accept personal responsibility for all work done by him or under his supervision or direction, and shall take all reasonable steps to ensure that persons working under his authority are competent to carry out the tasks assigned to them and that they accept personal responsibility for work done under the authority delegated to them.
6. A member called upon to give an opinion in his professional capacity shall to the best of his ability, give an opinion that is objective and reliable.
7. A member whose professional advice is not accepted shall take all reasonable steps to ensure that the person overruling or neglecting his advice is aware of any danger which the member believes may result from such overruling or neglect.
8. A member shall not make any public statement in his capacity as a professional engineer without ensuring that his qualification to make such a statement and any association he may have with any party, which may benefit from his statement are made known to the person or persons to whom it is directed.
9. A member shall not, in self-laudatory language or in any manner derogatory to the dignity of the profession advertise or write articles for publication, nor shall he authorise any such advertisement or article to be written or published by any other person.
10. A member shall not recklessly or maliciously injure or attempt to injure, whether directly or indirectly, the professional reputation, prospects or business of another engineer.
11. A member shall inform his employer in writing of any conflict between his personal interest and faithful service to his employer.
12. A member shall not improperly disclose any information concerning the business of his employer or of any past employer.
13. A member shall not accept remuneration in connection with professional services rendered to his employer other than from his employer or with his employer's consent; nor shall he receive directly or indirectly any royalty, gratuity or commission on any article or process used in or for the purposes of the work in respect of, which he is employed unless or until such royalty, gratuity or commission has been authorised in writing by his employer.
14. A member shall not improperly solicit work as an independent adviser or consultant, either directly or by an agent, nor shall he pay any person, by commission or otherwise, for the introduction of such work.
15. A member acting as an independent adviser or consultant shall not be the medium of payment made on his employer's behalf unless so requested by his employer; nor shall he place contracts or orders in connection with work on, which he is employed, except with the authority of and on behalf of his employer.



(IEA)

Educational & Professional Pathways in Malaysia: Benchmarked Against the World's Best



THE ENGINEERING TEAM

- Entry level qualifications

1. Engineers

WASHINGTON
ACCORD
(2009)

2. Engineering
Technologists

SYDNEY ACCORD
(2018)

Engineering TVET

3. Inspectors of Works
(technicians)

DUBLIN ACCORD
(2018)



INTERNATIONAL
ENGINEERING
ALLIANCE

Seven
constituent
agreements

Washington Accord
Sydney Accord
Dublin Accord

International Professional Engineers Agreement
International Engineering Technologists Agreement
APEC Engineer Agreement

Agreement for International Engineering Technicians

WASHINGTON ACCORD
(2009)

SYDNEY ACCORD
(2018)

DUBLIN ACCORD
(2018)

MULTINATIONAL AGREEMENTS FOR THE MUTUAL RECOGNITION OF ENGINEERING, ENGINEERING TECHNOLOGY & ENGINEERING TECHNICIAN EDUCATION PROGRAMMES

Among signatory countries:

- substantial equivalency of accreditation systems



Washington Accord – Signatory since 2019

Sydney & Dublin Accords – Signatories since 2018

- Accepted as a **Full Signatory** after rigorous peer review by other signatories (by USA, Australia, Hong Kong and Ireland).
- Implication:
Mutual recognition of academic programmes that underpin the educational base for Engineering, Engineering **Technologists** and **Engineering Technicians**.
- The qualifications accredited by signatories are recognised by each other as being **substantially equivalent** for practice of engineering at the appropriate level within the engineering team.

SIGNIFICANCE OF ACCORD MEMBERSHIP

- an endorsement that the engineering education system has demonstrated a **strong, long-term commitment to quality assurance** in producing engineers, engineering technologists & engineering technicians ready for industry practice in the international scene.

Conventional Engineering

EAC Standard

Washington Accord
Equivalency



Engineering TVET

ETAC Standards

Sydney Accord
Equivalency



Dublin Accord
Equivalency



INTERNATIONAL ENGINEERING ALLIANCE (IEA)

EDUCATION ACCORDS

PRACTICE AGREEMENTS

WASHINGTON
ACCORD
(2009)

K-12
4 YEARS

IPEA

International Professional Engineers Agreement
(ENGINEERS MOBILITY FORUM)

APEC ENGINEER

SYDNEY ACCORD
(2018)

K-12
3 YEARS

IETA

International Engineering Technologists Agreement
(ENGINEERING TECHNOLOGISTS MOBILITY FORUM)

DUBLIN ACCORD
(2018)

K-11
2 YEARS

AIET

Agreement for International Engineering
Technicians

Engineering TVET

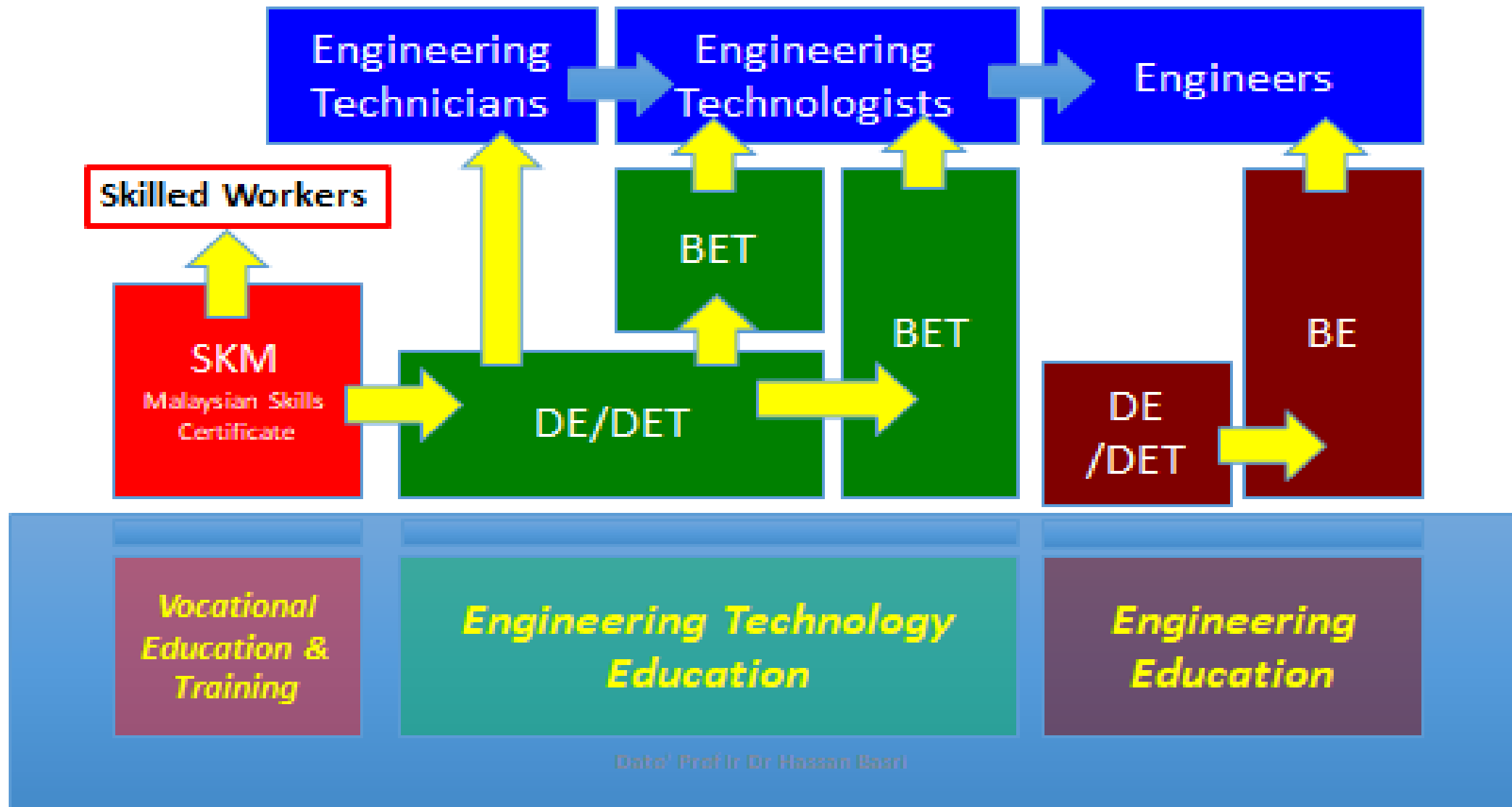
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51



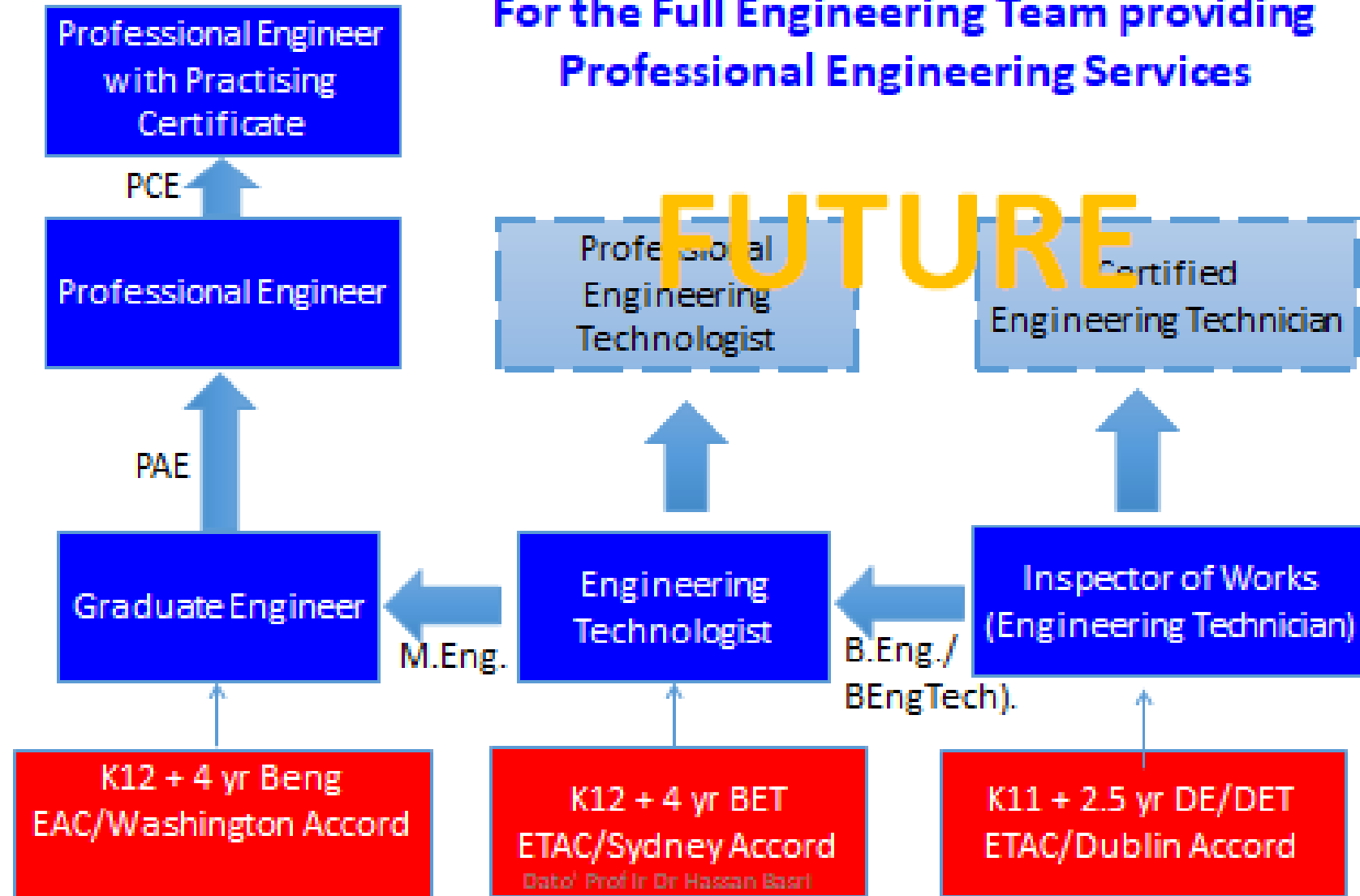


Engineering Team: *Education Pathways*



PROFESSIONAL PATHWAYS

For the Full Engineering Team providing Professional Engineering Services



Educational & Professional Pathways for IoWs in Malaysia:



(IEA)

Benchmarked Against the World's Best





**TERIMA
KASIH
*THANK YOU***

