

REGISTRATION AS ACCREDITED CHECKER

Presented by:

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Member, Accredited Checkers Committee



Session 1: 5th July 2023



**Grand Ballroom,
Le Meridien Hotel, Kota Kinabalu**

Outline of Presentation

REGISTRATION AS BEM ACCREDITED CHECKER

1. BACKGROUND

2. APPLICATION

3.1 GEOTECHNICAL AC

3.2 STRUCTURAL AC

1. BACKGROUND

- Accredited Checkers (AC's) were first established by the Board of Engineers Malaysia (BEM) to enable development on steep hillside (slope greater than 25 degrees) to be independently scrutinised by engineers who had acquired the knowledge and skill to analyse the design in terms of its geotechnical and structural adequacies.
- The need to establish AC engineers started after the Highland Tower Tragedy in 1993.



Highland Tower Collapse, 1993



Taman Hillview Landslide, 2002

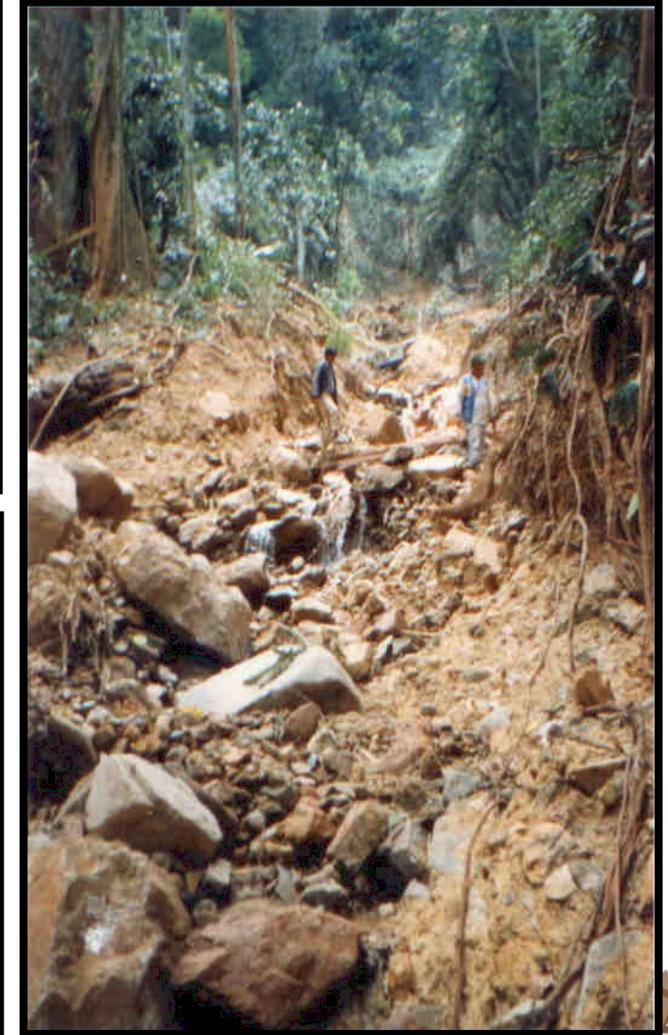


Landslide Kpg. Pasir, 2006



Landslide Bukit Antarabangsa, 2008

Debris Flow Genting Sempah, 1995



Pos Dipang Debris Flow, 1996



NSE Debris Flow near Gua Tempurung, 2004



Bukit Lanjan Rockfall, 2003



Po Shan Road Landslide Hong Kong, 1972



- The need for the increase in the numbers of AC engineers becomes apparent as development has encroached on steep hillside.

Meru Valley, Ipoh



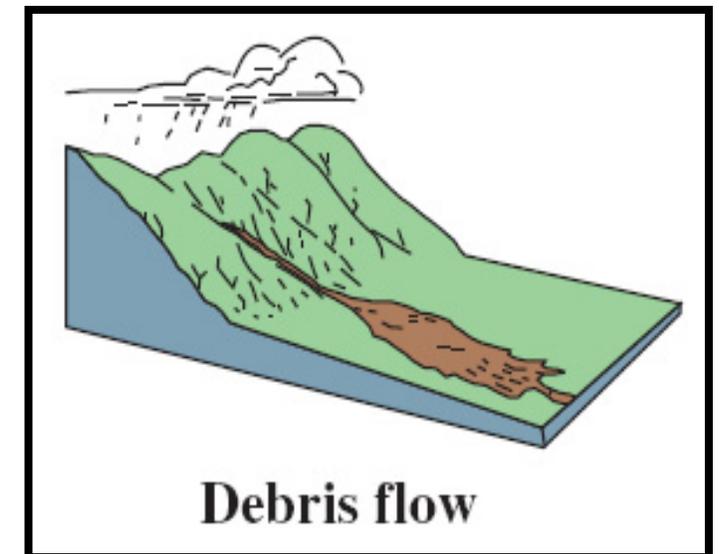
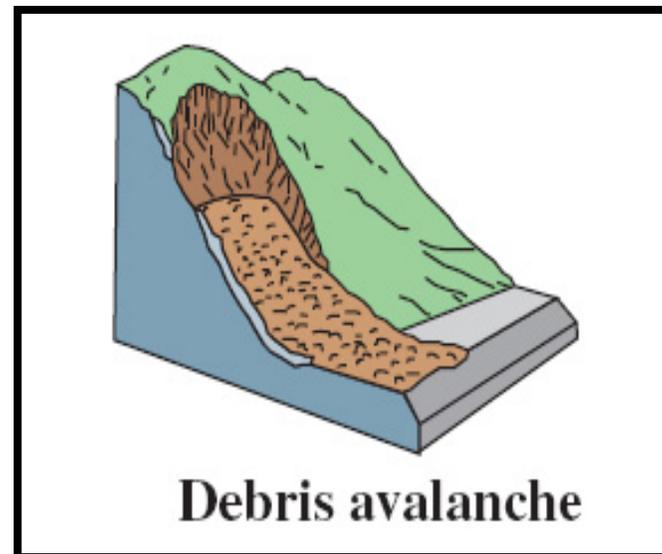
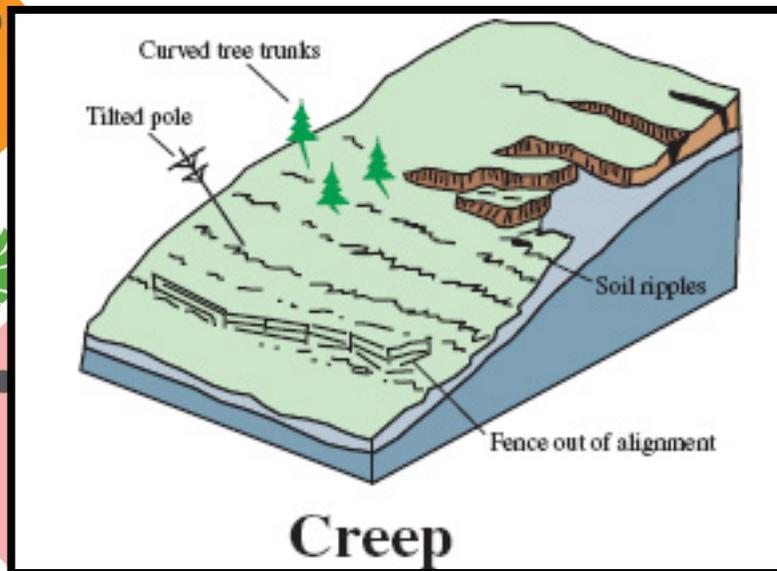
- BEM has the responsibility to ensure that the AC's have acquired the knowledge and skill well above an average engineer through his/her professional career before admission.

EXAMPLES OF SKILLS & EXPERIENCES FOR GEOTECHNICAL AC

- Ability to classify and identify landslides

Rate of movement:

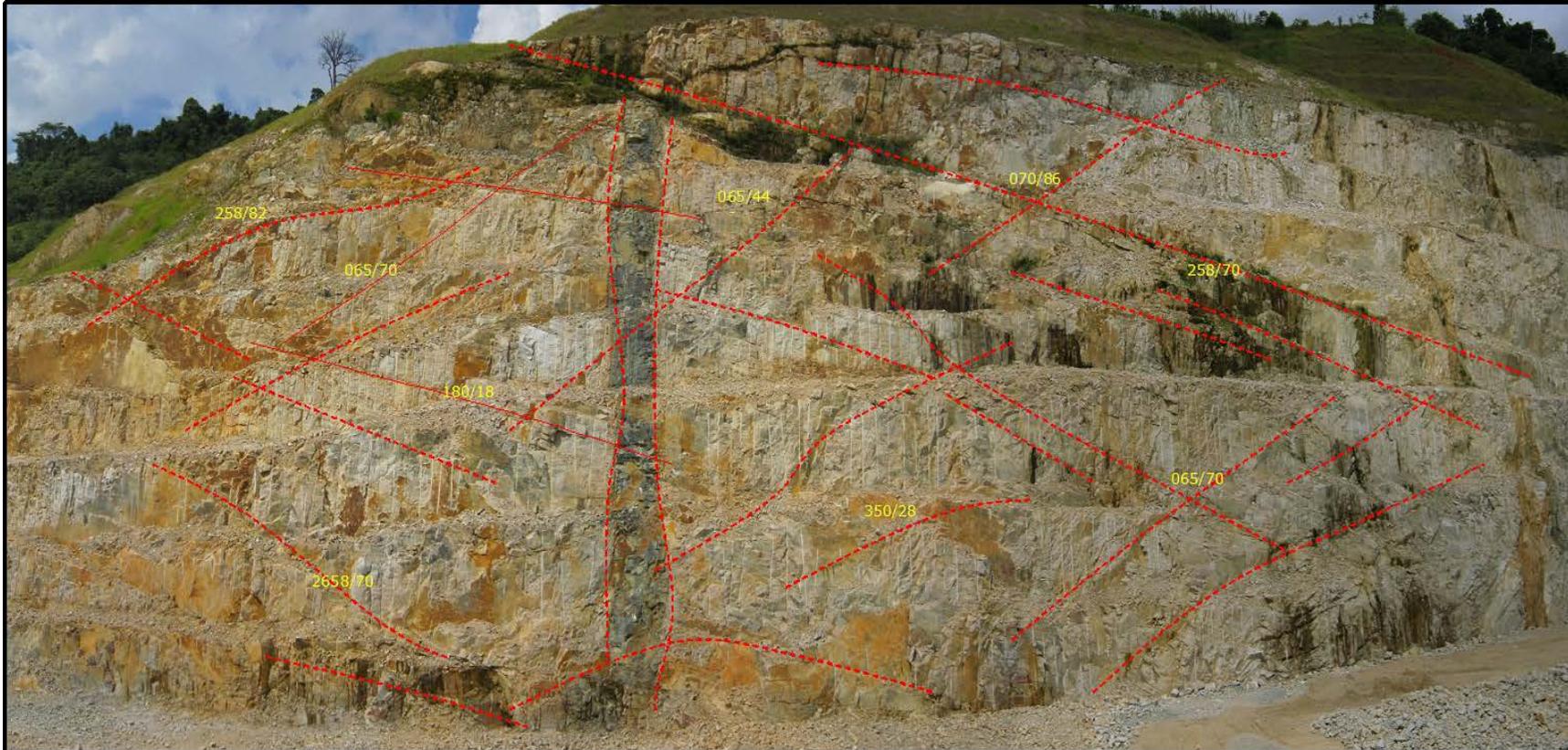
This ranges from very slow creep (mm/yr) to extremely rapid (m/sec).

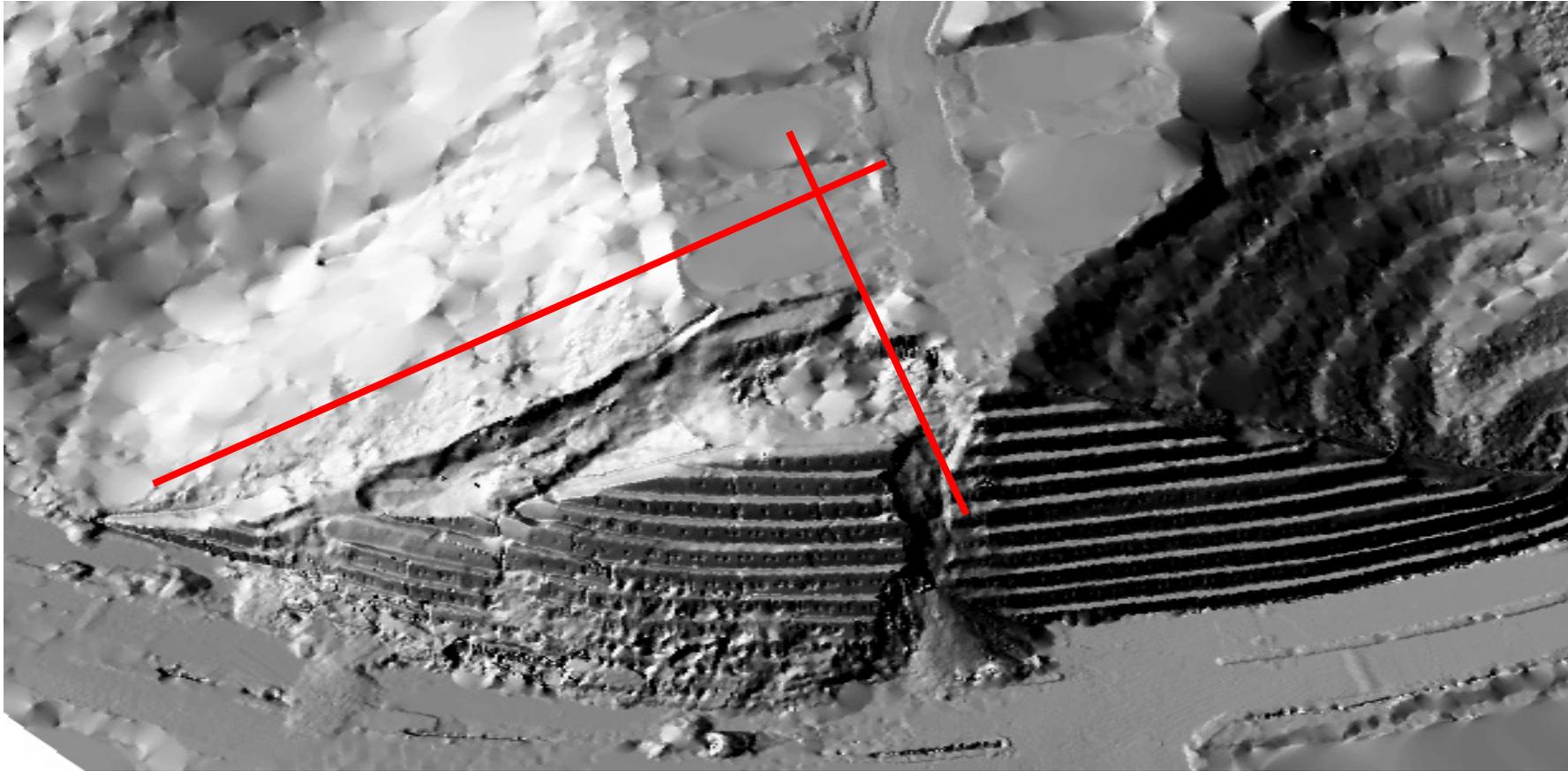


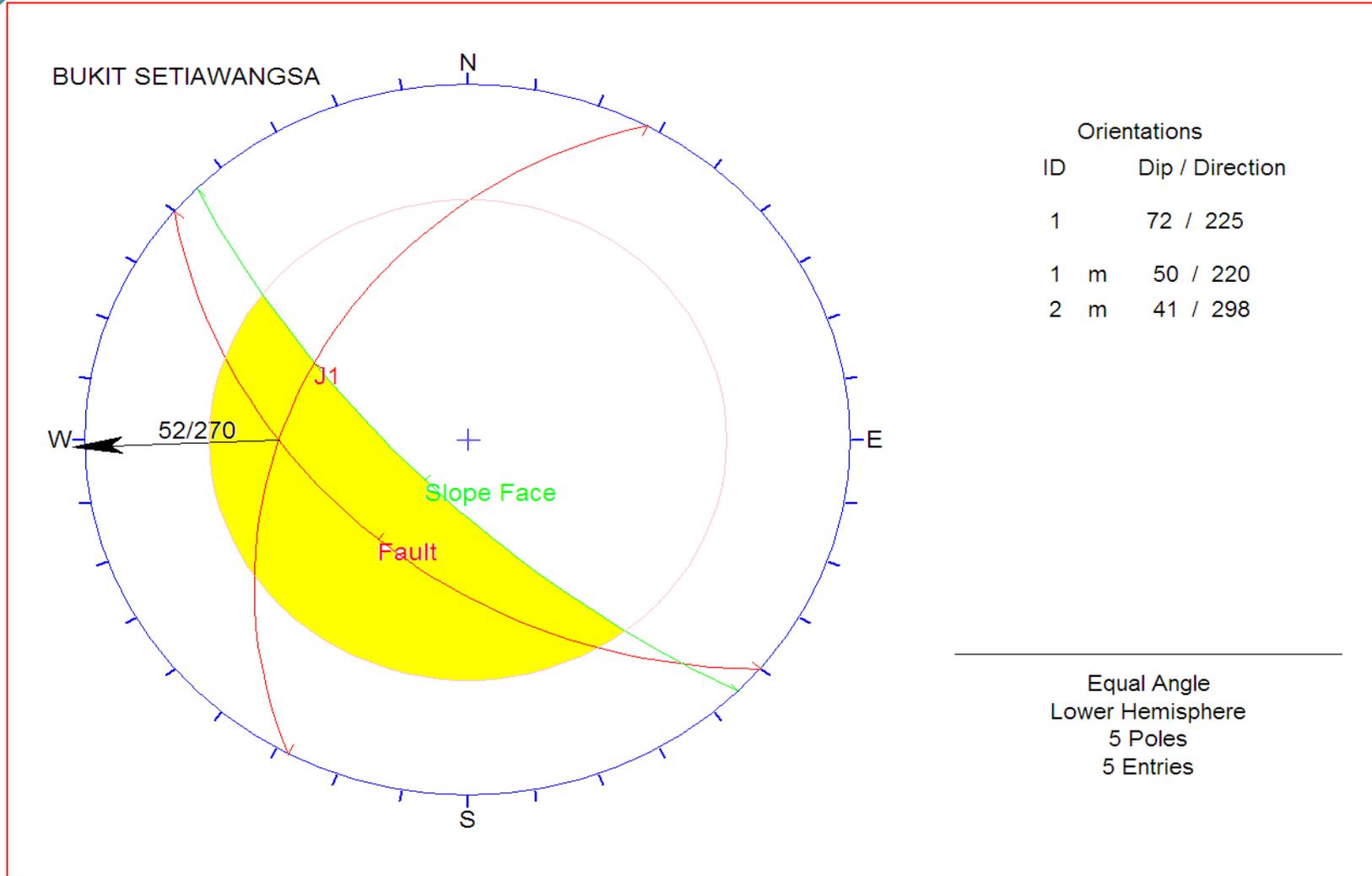
Good knowledge on geology;

1. Geological formation.
2. Geological mapping – skill to measure dip/strike of rocks joints and plotting them on stereonet.
3. Stereonet analysis.

Geological Mapping





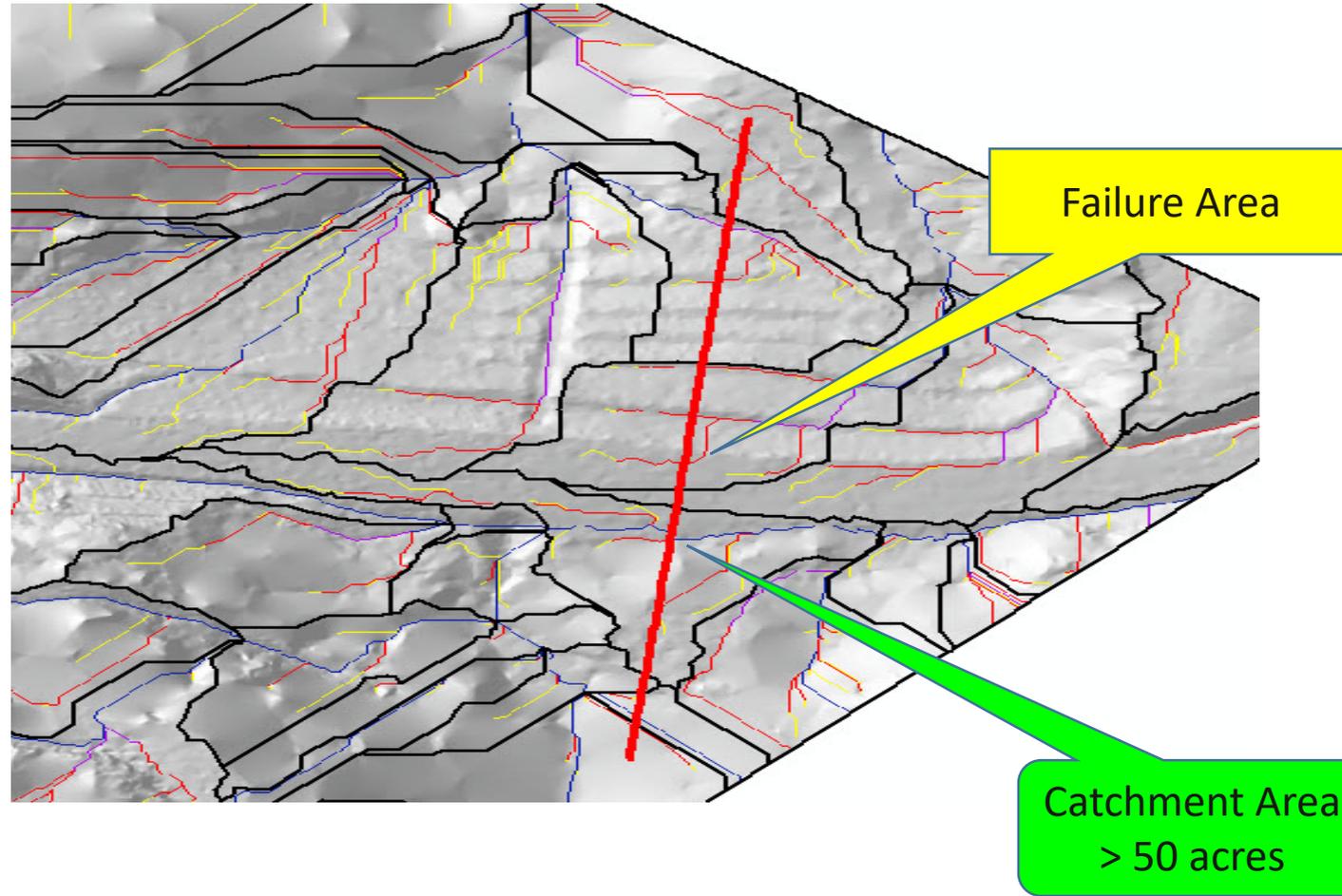


Good knowledge of slope geomorphology & hydrology;

1. Geomorphological mapping to identify features such as erosion, water seepage, vegetation & ground movement.
2. Use of terrain modelling to explain geomorphological features.
3. Use of terrain modelling to predict hydrological conditions.

Flow Accumulation

-  < 500
-  500 - 1000
-  1000 - 5000
-  5000 - 10000
-  > 10000



2. APPLICATION

Application for admission as an AC shall be made to the BEM by filling up the following forms:

1. Form A6
2. Self-Appraisal Form Rev. 3 BEM

Form A6

Rev. No.: 1
 Date: 12.12.2016

FORM A6
 REGISTRATION OF ENGINEERS ACT 1967
 REGISTRATION OF ENGINEERS REGULATIONS 1990

Applicant's
current
passport size
photo

APPLICATION FOR REGISTRATION AS AN ACCREDITED CHECKER
(To be completed by the Applicant in BLOCK LETTERS)

SECTION A (to be filled in by All)

Name:

Gender: Male Date of Birth:

 Female Place of Birth:

Nationality:..... Identification Card No.:

Address in Malaysia (if any):

Tel. No.: Mobile Phone No.: Fax No.:

Postal Address (if different from above):

E-mail Address:

Professional Engineer With Practising Certificate Registration No:

I wish to apply for Accredited Checker Branch:

Structural Geotechnical

SECTION B (to be filled in by Non-Malaysian)

Passport No.: Place of Issue:

Date of Issue: Date of Expiry:

Country of Birth: Nationality:

Address in Country of Origin:

I have been a Permanent Resident of Malaysia since..... Identification Card No. :

SECTION C (to be filled in by Non-Malaysian)

I am a holder of a Work Permit valid from to

PENALTY

Section 24(a) of the Registration of Engineers Act 1967: "Any person, sole proprietorship, partnership or body corporate who procures or attempts to procure registration or a certificate of registration under this Act by knowingly making or producing or causing to be made or produced any false or fraudulent declaration, certificate, application or representation whether in writing or otherwise, shall be guilty of an offence and shall, on conviction, be liable to a fine not exceeding fifty thousand ringgit, or to imprisonment for a term not exceeding three years, or to both."

- 1 -

Self-Appraisal Form Rev. 3 BEM

Rev. No.: 3
Date : 26/11/2010

SELF EVALUATION BY APPLICANT/ASSESSOR

PURPOSE

(i) To ensure and enhance safety and stability of building and structure design especially for hill site developments.

(ii) To prevent structural failures by checking the design of structural and geotechnical engineering works.

EVALUATION

1. Qualifications:	Yes	No.	N/A	Comments (for official use by assessor). * Please use separate sheet for comments
	(to be filled by applicant)			
I wish to be:-	Yes	No		
(i) A Professional Engineer registered with the BEM in the Civil or Structural or geotechnical engineering discipline and specializing in: a. Structural b. Geotechnical	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
2. Experience: The applicant:				
(i) I have at least 10 years' relevant practical experience in the design or construction of buildings	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		Refer to attachment
(ii) I have the ability and standing in the profession, or specialized knowledge or practical experience in civil, structural or geotechnical engineering.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
(iii) I have been engaged in geotechnical or structural design after registration as a Professional Engineer.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
(iv) For a continuous period of 1 year immediately preceding the date of my application, I have the practical experience in the relevant field gained in Malaysia.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
(v) I have much more experience in the structural and geotechnical area than the typical Professional Engineers registered with the Board.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		

Important Notes:

- The applicant have to substantiate all the statements he make.
- Failure to sign the application form, the application will be rejected.
- The Assessor have to give the rating.

Rating: 1 - Poor 2 - Fair 3 - Satisfactory 4 - Good 5 - Excellent

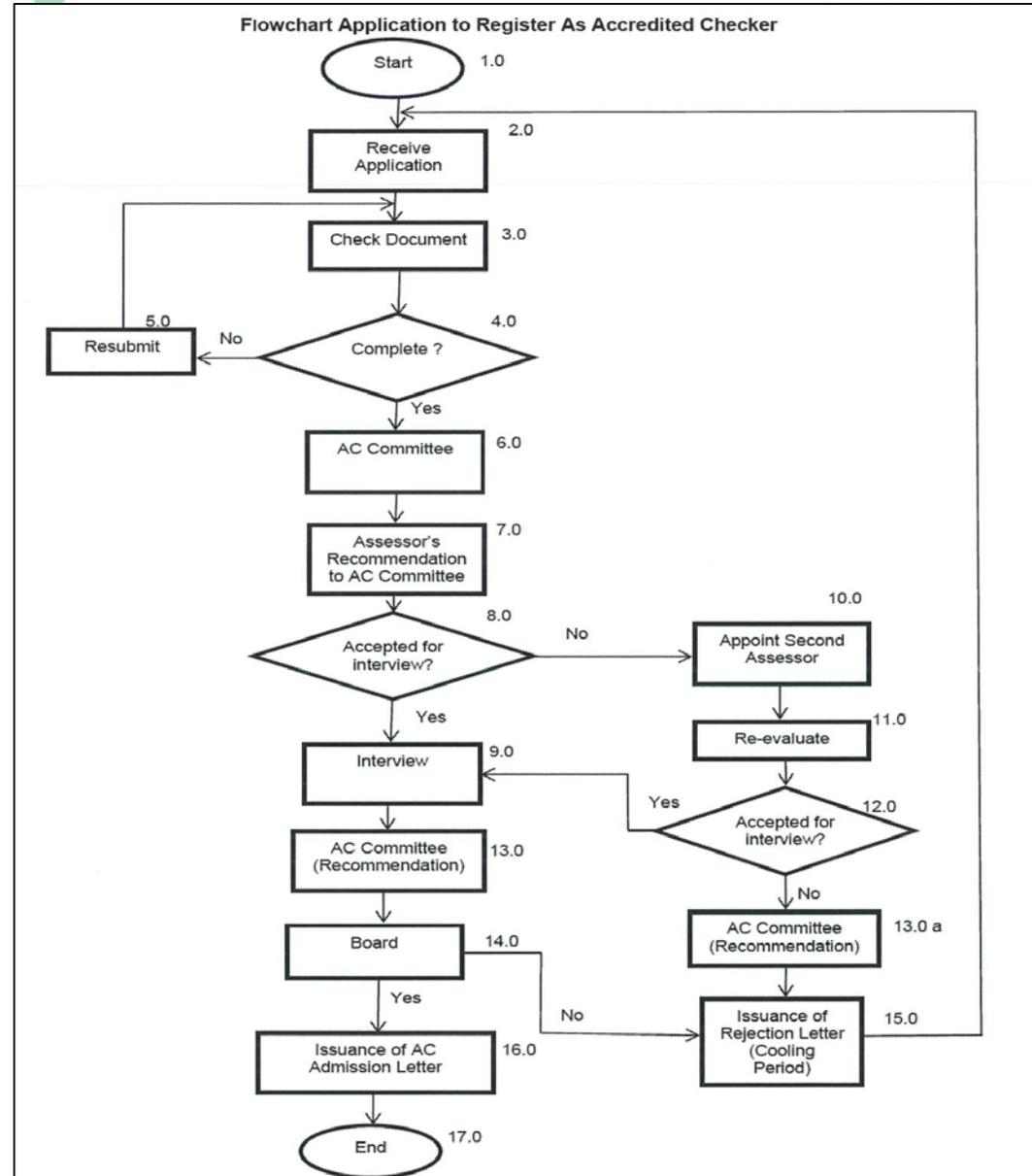
- The Assessor will verify the statement and document submitted
- To indicate N/A if the statement are not applicable

Page 1

Self-Appraisal Form Rev. 3 BEM

3(a). Design or Review Report - for Structural Applicant only:	Yes	No	N/A	Comments
	(to be filled by applicant)			(for official use by assessor). * Please use separate sheet for comments
The applicant is expected to have covered (with substantiations) all the aspects specified in the Tasks Of Accredited Checkers Structural Works (BEM/RD/AC/02) in his/her design or review report:	Yes			
(i) Generally, check on the technical suitability and reliability of the Consultant's structural design with particular reference to the technical adequacy, construction viability, long-term serviceability, and compliance to the legislation, acceptable codes of practice, standards and approved design guides.	1	2	3 4 5	1 2 3 4 5
(ii) Evaluate, analyse and review the structural design in the plans of the building works including its substructure and foundation.	1	2	3 4 5	1 2 3 4 5
(iii) Verify that the key elements of the structure including its substructure and foundation which are being designed are consistent with the layout as shown in the latest building plans and any amendments thereto.	1	2	3 4 5	1 2 3 4 5
(iv) Evaluate, analyse and review the proposed temporary work where it is to be executed for the substructure works and its foundation to ensure that it is practically viable and potential damages to adjoining properties during the construction of the proposed building are minimized and is not endangering public safety.	1	2	3 4 5	N/A
(v) Determine and use the relevant Codes of Practices in the preparation of the structural design in the plans of the building works including its substructure and foundation.	1	2	3 4 5	1 2 3 4 5
(vi) Check the design loading for both gravity loads and lateral loads acting on the structure.	1	2	3 4 5	1 2 3 4 5
(vii) Check the standards and specifications of materials to be used in the building works including its substructure and foundations.	1	2	3 4 5	1 2 3 4 5
(viii) Ascertain the structural design concept including its substructure and foundation and identify the key structural elements to be checked.	1	2	3 4 5	1 2 3 4 5

3(b). Design or Review Report - for Geotechnical Applicant only:	Yes	No	N/A	Comments
	(to be filled by applicant)			(for official use by assessor). * Please use separate sheet for comments
I have covered (with substantiations) all the aspects specified in the Tasks Of Accredited Checkers For Geotechnical Works (BEM/RD/AC/03) in my design or review report:				
(i) I have designed all geotechnical engineering works with particular reference to technical adequacy, constructability, short term and long term safety including that of the adjacent properties, serviceability, and compliance to the relevant legislation, acceptable codes of practice, standards and guidelines.	1	2	3 4 5	1 2 3 4 5
(ii) I have checked the site mapping and topography, geomorphology of the site and adjacent areas.	1	2	3 4 5	1 2 3 4 5
(iii) I have checked the geological implication on the design.	1	2	3 4 5	1 2 3 4 5
(iv) I have checked on the adequacy of the subsurface investigation (S. I.) and laboratory carried out for the proposed development.	1	2	3 4 5	1 2 3 4 5
(v) I have checked interpretation of subsurface investigation (S. I.) and subsoil/rock parameters and groundwater conditions.	1	2	3 4 5	1 2 3 4 5
(vi) I have checked on all assumptions, interpreted and selected design soil/rock parameters and groundwater conditions.	1	2	3 4 5	1 2 3 4 5
(vii) I have checked on geotechnical analyses and designs of Slopes:				
(a) Slope terrain classification: Zoning of slopes at the site and adjacent sites (if there is an influence on the site) into different class in accordance to DOE requirements.	1	2	3 4 5	1 2 3 4 5
(b) Slope stability analyses of existing, natural and engineering cut & fill slopes. Various failure modes shall be checked including relevant surcharge loads and etc.	1	2	3 4 5	1 2 3 4 5
(c) Exposed rock slopes should include detailed rock mapping and kinematic analyses.	1	2	3 4 5	1 2 3 4 5



2.1 PRE-QUALIFICATION

Candidates who wish to submit an application to BEM for AC admission shall possess a Professional Engineer with Practising Certificate (PEPC) and have been Professional Engineers with BEM for more than 10 years.

2.2 ADDITIONAL SUBMITTING DOCUMENTS

All submissions shall be accompanied with:

1. CV.
2. Write-up of not more than 1000 words of relevant experiences in projects undertaken **after PE admission**. Candidates must give detailed account of their **specific involvement, roles and responsibility** in each project **relevant** for this application.
3. AC Examination Project Reports (see Section 3.0).

- Application shall be made for one of the following disciplines,
 1. Geotechnical AC
 2. Structural AC

- The candidate shall, in the application of either discipline, submit 2 (two) reports,
 1. at least one shall be **Compulsory Examination Project Report**
 2. a **Supplementary Examination Project Report.**

- Compulsory and Supplementary Project Reports shall be made exclusively for AC examination and each **shall not** exceed 150 pages.

- **Company report on projects will not be accepted.**
- Computer data printouts **shall not** be included in the report.
- The report shall list the candidate's involvement in the project either in planning, investigation, design processes, construction, instrumentation & monitoring, etc. It is important to highlight the candidate's role & responsibility and scope of works in the project to facilitate examiners in formulating questions for the examination.
- To enhance candidate's chances of passing the AC examination, published technical papers in journals and proceedings of recognised conferences shall be included in the report.

3.1 GEOTECHNICAL AC

- **Compulsory Examination Project Report** shall be made on experiences related to design of slopes greater than 25 meters in height.
- This compulsory submission can also be made on experiences related to retaining wall design greater than 10 meters; walls can be of Reinforced Concrete, Reinforced Earth/Soil, CBP, secant wall (not related to basement design) or any type of Gravity Wall.
- **Supplementary Examination Project Report** can be made on design experiences related to design of basements greater than 2 levels, foundations and ground treatment for embankments greater than 5 meters in height.

- 2 (two) reports shall be produced by the candidate, at least one of which must be a compulsory report.

3.2 STRUCTURAL AC

- **Compulsory Examination Project Report** shall be made on experiences related to design of buildings exceeding 20 storeys with basements not less than 2 levels.
- **Supplementary Examination Project Report** can be made on design experiences related to special structures, e.g. space frame structures, transfer structures etc or buildings that will result in complex interactions with existing buildings.
- 2 (two) reports shall be produced by the candidate, at least one of which must be a compulsory report.

- [AC FAQ's](#)



Q & A

BEM
ROADSHOW
2023

Sabah & Sarawak



BEMEngineers



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THANK YOU



"Committed To Engineering Excellence"

BOARD OF ENGINEERS MALAYSIA

Tingkat 11 & 17, Blok F Ibu Pejabat JKR
Jalan Sultan Salahuddin, 50580 Kuala Lumpur

<http://www.bem.org.my>

enquiry@bem.org.my or complaint@bem.org.my.

Tel: 03-26912090; Fax: 03-26925017

ACCREDITED CHECKERS

FREQUENTLY ASKED QUESTIONS (updated June 2021)

Accredited Checkers and Qualification for Registration

Q1 Why are Accredited Checkers introduced?

A The need for checking of engineering design works has long been recognised. The 1974 Street, Drainage and Building Act already has a provision under Section 70B for 'review' by a second qualified person where the local authority reasonably suspects that defects in the structure of a building under erection may result in failure.

The recent amendment to the Act in 2019 (Act A1588) under section 72(2) has made a provision that any person who intends to erect any building shall cause to be submitted by Principal Submitting Person or Submitting Person (SP) to the local authority or the relevant statutory authority a geotechnical report for erection involving slope with a gradient more than twenty-five degrees and total vertical height more than ten meters which the report shall be verified by an Accredited Checker (AC) registered with the Board of Engineers under the Registration of Engineers Act (REA) 1967 (Act 138).

The introduction of AC in the amended Registration of Engineers Act of 2002 (Revised 2015) is to reinforce the need for public safety in tandem with the rapid advancement in engineering – especially after the collapse of Block 1 of Highland Towers. The AC only cover two areas, namely Structural (e.g. high rise buildings but exclude bridges) and Geotechnical (e.g. mainly slopes and retaining walls). The AC' scope of works is to check the Permanent Works designed by the Submitting Person (Professional Engineer with Practicing Certificate, PEPC)

Q2 What is the role of an Accredited Checker?

A The role of AC is to check, with right competence and specialised knowledge, all aspects of designed Permanent Works by another Professional Engineer with Practicing Certificate (PEPC) (e.g. Submitting Person of the Project) referred to him for checking with particular reference to the stability and safety of the Permanent Works. As such, the AC will have to first receive the design of the Permanent Works (which include analyses, design, drawings and specifications) from the PEPC (Submitting Person) before the AC can carry out the checks. AC shall also highlight any missing or inadequacy in the Permanent Works design to the PEPC (Submitting Person) for him to reconsider in submitting the final design. The AC's scope of works does not include checks on Temporary Works during construction.
<http://www.bem.org.my/circulars/reviewchecking.pdf>

Q3 When was the registration of Accredited Checker introduced?

A "Accredited Checker" was introduced in the amended Registration of Engineers Act of 2002 (Revised 2015). BEM Circular No. 010 "Guideline for Checking / Reviewing the Work of Another Engineer" can be referred.

Q4 Who can apply for registration as an Accredited Checker? Is it open to general practitioners or confined to specialists?

A Registration is open to all Professional Engineers with at least 10 years' experience, who:

- by virtue of his ability and standing in the profession, or specialised knowledge in civil, structural or geotechnical engineering, is adjudged to be deserving of such registration,
- has been engaged in structural or geotechnical design as a Professional Engineer for a period of seven years immediately preceding the date of his application,
- has had continuous relevant practical experience in Malaysia in the year immediately prior to his application.
- has attended and passed the interview conducted by the Accredited Checkers Committee. (BEM/RD/AC/01)

Q5 Is registration of Accredited Checkers for individuals only.

A Yes, it is currently for individuals only who are PEPC.

Q6 What are the fees for accreditation?

A A processing fee of RM 50.00.

A registration fee of RM 200.00.

An annual renewal fee of RM 200.00 for those below 60 years old, and RM100.00 for those above 60.

Q7 Will overseas experience be considered for registration?

A Yes, provided that the applicant has had continuous relevant practical experience in Malaysia in the year immediately prior to his application. (see Q4)

Q8 Can a Professional Engineer be registered as a checker in both structural and geotechnical engineering?

A Yes.

Q9 Registration is currently confined to the Civil, Structural and Geotechnical disciplines. How about the Electricals and Mechanicals?

A Yes, registration is currently confined to PEPC registered in the category of Civil; Structural and Geotechnical only.

The emphasis for AC Structural is on the structural stability and safety of buildings especially high-rise buildings (but exclude bridges). The emphasis for AC Geotechnical is on stability and safety of slopes, retaining structures and deep excavation.

Q10 If a PEPC who are registered with BEM but has worked in overseas for many years, upon return to Malaysia, can he apply for Accredited Checker?

A Based on the Registration Engineers Act (REA), Registration of AC required 10 years working experience and 7 years of solid experience on the engineering discipline relevant to the AC application. Therefore, a PEPC despite working overseas, upon return to Malaysia, he can still apply if he fulfilled the requirements above.

The Role of Accredited Checker

Q11 What are the areas for and scope of work in checking?

A For the time being, checking is confined to the stability and safety of buildings as envisaged in the Government's concern for public safety, in the Uniform Building By-Laws and in the Street, Drainage and Building Act 1974. By default, the scope of checking is confined to the design of Permanent Works only and excludes the Temporary Works during construction.

The areas and scope are given in BEM Circular No. 010 "Checking/Reviewing the Work of Another Engineer". The Table in Section 3.2 of the Circular stated clearly the differences in the scope of works for Checker, Reviewer and Others (*e.g.* Inspection).

Q12 What are the responsibilities of an Accredited Checker?

A An Accredited Checker shall take full responsibility for the integrity, thoroughness and competence of his report and recommendations. (See also Q12 and Q13). Table in Section 3.2 of BEM Circular No. 010 "Checking/Reviewing the Work of Another Engineer" tabulated the scope of works for Checker.

Q13 Is an Accredited Checker responsible for failure arising from his recommendations?

A The Accredited Checker is responsible for his recommendations and findings. Refer to BEM Circular No. 010 "Checking/Reviewing the Work of Another Engineer".

Q14 What are the liabilities of an Accredited Checker?

A Liabilities are implied when an engineer is engaged to undertake a checking assignment. These will be in contract to his client, and in tort to any employer of that client. The AC should know the scope of works that he is undertaking and the liabilities when he undertakes a checking assignment. The Accredited Checker is responsible for his recommendations and findings. Refer to BEM Circular No. 010 “Checking/Reviewing the Work of Another Engineer”.

Q15 What about Professional Indemnity Insurance?

A (i) The AC should realise that when an engineer is engaged to undertake a checking assignment, liabilities are implied. These will be in contract to his client, and in tort to any employer of that client, and
(ii) The AC is recommended to have professional indemnity insurance cover to undertake the work.

Q16 Are Accredited Checker recommendations be considered as ‘second opinion’ and should he be held responsible or liable for them?

A Yes, his recommendations are ‘second opinions’ but he carries the responsibilities and liabilities if his recommendations are adopted by the SP.

Q17 What is the difference between ‘Checking’ and ‘Reviewing’?

A Section 3.2 of BEM Circular No. 010 “Checking/Reviewing the Work of Another Engineer” stated clearly the difference in the scope of works for Checker, Reviewer and Other (e.g. Inspection).

Q18 What is the role of an Accredited Checker during construction stage where many problems may arise?

A In principle the role of AC does not include checking during construction stage. However, the employer can extend the services of the AC to work with the First Engineer during the construction stage for any specified area of the Permanent works.

The scope of AC does not include checking of the Temporary Works design. The Temporary Works are the responsibility of the Contractor and the PEPC engaged to design, endorse and supervise the Temporary Works (PETW) as defined in BEM Guidelines No.001 “The Role and Responsibility of Professional Engineers for Temporary works during Construction Stage”.

Q19 Can an Accredited Checker takes over the work the First Engineer?

A Generally an AC is engaged to check on certain aspect of the works pertaining to the stability and safety of buildings. However, there is no reason why the owner should not have the AC replacing the First Engineer if the owner so desires, provided that, there has been no intervention or supplanting by the AC referring to Regulation 31 of the Registration of Engineers Regulations 1990 (Revised 2015). The 2nd Engineer cannot take over from the 1st Engineer unless he obtains the Letter of Release from the 1st Engineer or he can follow the procedures stated in BEM Circular No. 008 “Procedure for a Registered Engineer or an Engineering Consultancy Practice taking over the work of another Registered Engineer or an Engineering Consultancy Practice”. Please refer to BEM Circular No. 010 “Checking/Reviewing the Work of Another Engineer” Section 4.4.2 which detailed the proper processes.

Q20 When does the work of an Accredited Checker ends?

A It depends on what is AC’s terms of reference and the scope of works of his engagement. In principle, the scope of works ends upon completion of the design checks. However, the employer can extend the services of the AC to work with the First Engineer during the construction stage for the any specified area of the Permanent works where the AC’s role is only to check on these Permanent Works.

Q21 Is an Accredited Checker allowed to make recommendations on design?

A Yes. (BEM Circular No. 010 “Checking/Reviewing the Work of Another Engineer”)

Q22 Can an Accredited Checker undertake both the structural and geotechnical checks in the same project?

A Yes, if he is qualified and registered in both fields.

Q23 Will the work of structural and geotechnical Accredited Checkers overlap - especially on substructural and foundation design?

A The Structural AC scope of works starts from building structure down to the pilecaps. The Geotechnical AC scope of works starts after the pilecaps (foundations e.g. piling, geotechnical bearing capacity, settlement, etc).

Q24 What if the First Engineer does not agree with the recommendations of the Accredited Checker?

A BEM Circular No. 010 “Checking/Reviewing the Work of Another Engineer” Section 4.0 detailed the possible options to be adopted.

Q25 What if an Accredited Checker runs down the work of the First Engineer, with, perhaps, the intention of taking over the project?

A This concern is addressed in detail in Regulation 31 of the Registration of Engineers Regulations 1990 (Revised 2015) on intervention, supplanting and taking over the work of another engineer.

It is also addressed in BEM Circular No. 1/2003 on how an AC should discharge his professional responsibility with integrity and decorum and not injuring the First Engineer in any way.

BEM Circular No. 010 “Checking/Reviewing the Work of Another Engineer” Section 4.2 also prohibit this action. Section 4.5 also detailed the conduct and responsibilities of Checker/Reviewer.

Q26 Should the scope of the work of an Accredited Checker include evaluation of contractor’s temporary works? If it should, what are the respective responsibilities of the Accredited Checker and the First Engineer?

A Considering the importance of temporary works, especially in deep excavation for basement construction in urban areas, the First Engineer should conceptualise the temporary works to decide on the need for an Accredited Checker, and if needed, to have him appointed early. The scope of works for the AC if extended to cover Temporary Works, then it shall be explicitly stated in the scope of works of the Letter of Appointment or Memorandum Of Agreement for what type of Temporary Works that require the AC to check as this is additional scope beyond the normal AC scope of works by default.

BEM Circular No. 010 “Checking/Reviewing the Work of Another Engineer” Section 1.6 stated that the Client may extend the scope of checking to include temporary works during construction.

In some mega projects or complicated projects (e.g. KVMRT), the Contractor does engage the Professional Engineer with Practising Certificate to design, endorse and supervise the Temporary Works (PETW) as defined in BEM Guidelines No.001 “The Role and Responsibility of Professional Engineers for Temporary works during Construction Stage”, in addition, the Contractor under the direction of the Client/Developer also needs to engage Contractor’s ICE (CICE), whose role can also be taken up by AC to check on the design and construction of the Temporary Works designed and supervised by the PETW.

Q27 What are the responsibilities of the Accredited Checker when he has finished his checking of Temporary Works (as extended services) and the contractor submits an alternative design for the temporary works?

A If the AC scope of works has been extended to cover Temporary Works which he has completed and submitted his report, and in the event that alternative temporary works are later proposed by the Contractor, then it entails a different scope of works.

Q28 The Board should set an easy format for Accredited Checkers' reports, instead of leaving it up to them.

A There are already formats for this in BEM/Form/AC/01 for structural works, and BEM/Form/AC/03 for geotechnical works.

Fees

Q29 Is there a scale of fees for Accredited Checkers?

Who is to set the fees?

Are there guidelines for the calculation of fees?

Who is to pay the fees?

A There is as no fixed scale of fees at this moment, general practice on the fees as follows:
(i) on percentage basis – One Third (~33%) of the BEM Scale of Fees for what is to be checked up to design stage. If the scope of works extended to Construction Stage, a minimum of additional 10% of BEM Scale of Fees to be considered which exclude supervision cost (if required) to be reimbursed.
(ii) on time input basis of the personnel involved in the ECP (*e.g.* AC and his supporting engineers and staff)
(iii) on man-month basis of the personnel involved in the ECP (*e.g.* AC and his supporting engineers and staff)
An AC should be able to determine the work and time involved to carry out the scope of work assigned to him and work out what would be a fair and reasonable fee to carry out the works.