Introduction

In this edition, an additional chapter has been introduced, focusing on the current issues in construction industry. For this publication, the focus is on competency in the construction industry. Competency in the construction industry has always been an interesting topic. Over the years, competency has been numerously deliberated particularly on the subject of training, institutions and standards. Beneath the different views and opinions, the government agencies and private stakeholders agreed that a solution is needed to address the issue.

Definition Of Competency

According to Lembaga Pembangunan Industri Pembinaan Malaysia 1994 (Act 520), Section 2(1) the definitions certification and accreditation is stipulated as:

"certification" means a procedure by which the Lembaga (Board) or any person authorised by it gives written assurance that a process, practice or service conforms with specified requirements

"accreditation" means a procedure by which the Lembaga (Board) or any personal authorised by it gives formal recognition that a body or person is competent to carry out a specific task relating to the construction industry

At the same time, no worker can be engaged in the construction without accreditation or registration as construction personnel. CIDB is responsible for the accreditation of construction personnel. Under the Act 520, Section 33A (1) specified that:

“No construction site supervisor or skilled construction worker shall be involved or engaged, or undertake to be involved or engaged as a construction site supervisor or skilled construction worker unless he is accredited and certified by the Lembaga (Board) and holds a valid certificate issued by the Lembaga (Board) under this Act.”

The Construction Industry Development Board of Malaysia (CIDB) proposes to define construction skills’ competency as “the ability of a construction personnel to perform successfully the construction tasks within a certain work-scope in accordance to the required competency standards as specified in the National Occupational Skills Standards (NOSS) or other equivalent competency standards as recognised by CIDB”. This definition need to be discussed further with the construction stakeholders, but for the purpose of this article, this definition will be adopted throughout this document.

Therefore, competency can be summarised as the ability of a personnel to perform tasks in accordance to the competency standards. The competency standards are the benchmarks established by subject-matter experts. In Malaysia, NOSS is applied as the principal reference of competency standards in the construction industry. For this article, competency is referred to level 1 to 3, or semi-skilled and skilled construction personnel. Construction personnel with competencies higher than level 3, such as Project Manager and Construction Safety & Health Officer are not covered in this article.

Development Plan

The Eleventh Malaysian Plan (11MP)

The Eleventh Malaysia Plan (11MP) is a 5-year development plan from 2016 to 2020. It describes the initiative by the government in which all contractors are encouraged to enhance their competency skills by undertaking training and development programmes. Under the 11MP, the construction sector is projected to expand by 10.3% and to contribute about 5.5% to the economy annually until 2020. Additionally, the construction industry employs approximately 1.2 million personnel or 9.5% of Malaysia’s total workforce. The growth in construction industry will be fuelled by the increasing demand from the housing industry as well as the planning and the implementation of the various infrastructural projects such as highways, water dams, sewerage systems, water
networks, power plants, urban transportation systems, ports and airports.

The strategies to enhance knowledge content in the construction industry include enhancing the quality of human capital, accelerating capacity and capability building of Small and Medium Enterprises (SME) contractors. Among key initiatives include fostering greater collaboration between CIDB, construction professional boards and training institutions to develop industry-relevant training modules, establishment of assessment centres and apprenticeship programme.

Construction Industry Transformation Programme (CITP)

Construction Industry Transformation Programme (CITP) was officially launched on 10 September 2015, and is implemented simultaneously along 11MP. It contains 18 initiatives across 4 strategic thrusts, to guide the transformation and continued development of the industry. The long-term plan was a first of its kind, with active participation between the government agencies and private stakeholders. The CITP is monitored by CIDB and highlights the direction of the construction industry under 4 strategic thrusts, and its initiatives. The 4 strategic thrusts are:

1. **Thrust 1: Quality, Safety and Professionalism**
   Ingrain the culture of quality, safety and professionalism into the construction industry.

2. **Thrust 2: Environmental Sustainability**
   Drive Malaysia’s environmentally sustainable construction.

3. **Thrust 3: Productivity**
   Double the industry’s productivity, matched with higher wages.

4. **Thrust 4: Internationalisation**
   Develop Malaysian champions to lead the action locally and globally.

Competency falls under the third initiative, **Productivity Thrust**. Specifically, under Initiative P1: Continue investment in human capital development in construction. This initiative is expanded into sub-initiatives:

- **Initiative P1a: Streamline construction-related training programmes in Malaysia**. According to CITP, Malaysian construction workforce is made-up of “largely low-skilled construction workforce, with the industry highly dependent on low skilled foreign workers. Industry productivity levels is one of the lowest in the economy and as compared with developed economies, with slow uptake on technology and modern practices”. Under CITP, the objective is to double the productivity with the corresponding increase in pay or wages. Part of the plan is to streamline training programmes and functions of TVET in the construction industry.

- **Initiative P1b: Strengthen reach, effectiveness and comprehensiveness of training**. In this regard, the development of Training Map in competency will be made.

A total of 8 key performance indicator (KPI), have been targeted for achievement by 2020. These include:

a) All construction related training programs and institutions are to be streamlined and registered by CIDB by Q4 2018;
b) Top 10 highly demanded skilled trades with training need be analysed, alongside analysis, occupational analysis and training maps by Q4 2018;
c) 5,000 on-the-job apprentices to be produced by Q4 2020;
d) 15,000 supervisory and management personnel (including QA/QC, site safety etc.) to be trained and certified by Q4 2020;
e) 100,000 construction personnel to complete Continuous Professional Development training by Q4 2020;
f) 100,000 construction personnel targeted for graduation in construction related skills and accredited by Q4 2020;
g) 2 assessment centers in major foreign worker source countries established by Q4 2018; and
h) 200 competency related documents completed and 200 trainers undergo train the trainer program by Q4 2020.
CITP recommended a broadening of the reach, effectiveness, and comprehensiveness of training and development for workers, professionals, and personnel in the industry. Key areas of enhancement involve conducting curricular reviews and development of improved curricular and training modules materials; to ensure that content is streamlined and up-to-date with industry development and requirements. Efforts will be made in collaboration with industry experts to increase the quality of trainers and training providers.

The Construction Industry Competency Blueprint (CICB)
The Construction Industry Competency Blueprint (CICB) charts the direction of competency of construction personnel, and is currently being drafted. It is expected that CICB will become the principal guideline for construction industry. In essence, CICB will consist of the following components:

a) The identification of the Construction Industry Occupational Titles (CIOT) in the construction sector. The CIOT are categorised according to the construction works by the subject matter experts. Among the works are Building, Power, Road, Marine/Waterways, Potable Water, Oil & Gas, Railway, ICT, Demolition and Sewerage.

b) The formulation of the Competency Training Map as a reference for the construction personnel to advance or further their existing skills or competence.

c) The review of the existing competency standards and the development of new ones. The competency standards are NOSS or its equivalent as recognised by CIDB.

d) The assessment programmes and the implementations.

e) The internal verification systems.

f) The external verification systems.

g) The training and implementations programmes by the training providers.

h) The certification and implementations programmes by the assessment centres and training providers.

i) The registration and accreditation of competent construction personnel by CIDB.

j) The Competency Management System (CMS).

k) The legal framework to support the assessments' and verifications' procedures.

l) The Competency Advisory Council to monitor the progress and outcomes. There are 2 committees and a forum to present the findings; CITP–IWG & TWG Committee; and CICF. These committees along with subject-matter experts will continue to support and enhance the assessments, verifications and training aspects of the construction industry.

Stage 1

a) The identification of CIOT in the construction industry. A total of 509 CIOT and 10 construction work were identified through industry workshop sessions. These were further categorised by subject-matter experts into Construction Industry Occupational Structures (CIOS).

b) The next step is to develop the Competency Training Map, as targeted in CITP. The map will provide the direction for construction personnel for accreditation as CCP.

Stage 2

a) The review of the existing competency development standards, NOSS. The existing NOSS need to be reviewed by subject matter experts under the guidance of experienced facilitators. There is a necessity for CIDB to develop new competency standards for newly identified CIOT as well.
Development Of Competency

National Occupational Skills Standards (NOSS)
The NOSS document is basically a set of documents with the following items:

a) The CIOT.

b) The description of the CIOT (Details in the scope of work for construction personnel).

c) The step-by-step analysis of the tasks involved in the CIOT.

d) The Construction Industry Occupational Structure (CIOS). The CIOS defines the levels of competency of each trade/specialisation in the construction industry.

e) The specific standards to be certified and accredited as CCP.

With the application of NOSS, assessment centres will be able to design or formulate their own assessment structures. At the same time, NOSS is a valuable aid for training providers to prepare their trainees for the impending and upcoming assessments. In turn, each will complement each other, and would be able to produce their own training pathways, syllabi and training modules for CIOT.

Review of the Existing Construction Related NOSS
There is currently a total of 509 CIOT of existing and new occupations from level 1 to 3. This means that there are 509 NOSS that need to be reviewed or developed by the construction industry's subject matter experts. NOSS will form the basis and the core of all the assessments and training exercises.

A number of construction related NOSS have been developed by CIDB over a period of more than ten years. It is high time for some of these existing NOSS to be reviewed in order to keep them up-to-date. Among the measures to be taken include:

Stage 3

a) TVET can proceed with the training programmes following the set-up of infrastructure for the assessments, internal and external verifications process. These training institutions will follow NOSS competency standard as guidelines in their training programmes.

b) Only the accredited construction personnel will be allowed to work in the construction industry. This will ensure that the quality of workmanship is maintained; wages will increase; as targeted in CITP.

as uncompleted NOSS documents. Currently, CIDB has identified 11 high-impact CIOT with NOSS, to be reviewed as soon as possible.

b) The NOSS assessment system needs to be upgraded in tandem with the training, certification and accreditation procedures. Assessors will be the focal point in evaluating construction personnel.

c) The internal and external verifications systems will be set-up simultaneously, to provide quality assurance in the assessment process. The verification processes will ensure that the assessment process is done in accordance with set procedures.

d) The registration and accreditations of construction personnel under the CMS can be completed. This will be done by the establishment of the assessment, internal and external verification processes.
## Development of Competency

a) The competency assessments, verifications and training programmes of NOSS must also be consistent with CIOT. This will ensure that the construction personnel who are certified from these programmes will be registered or accredited as construction personnel.

b) Update the existing NOSS in order to render them current, relevant and consistent. The new NOSS must also keep up with the new technologies, services and techniques applied in the training discipline.

c) Examine the existing set of NOSS to ensure competency standards are sufficient and cover the requirement of a particular CIOT. The subject matter experts will provide their inputs in deciding whether the competency standards are according to their expectations.

d) The subject matter experts need to check and verify that the existing NOSS for validity and relevance in the construction industry. If proven outdated or irrelevant, NOSS needs to be reviewed for updates.

e) Decide on the standard formats to be utilised. This enables construction personnel to understand the conditions required for competent persons, as well as the requirements to advance their skills.

f) In formulating NOSS, the competency standards must comply with the Principles of the Development of Competency Standards (SMART-VSC) guidelines which state these following rules:

### i. S: Specific

This means the title of the competency standards must be specific. For example, CIOT for bricklayer. It must state clearly bricklayer and not bricklaying, the latter being the work description. The reference word “specific” also means the task stated in the CIOT must detail out the scope of work. CIOT will also be carried over to the training and eventually to the assessments. The competency assessments must be conducted based on the CIOT. Training providers are free to name their training modules, and whether to incorporate CIOT in the modules. Eventually, the construction personnel must state the competency standards they are going to be assessed for.

### ii. M: Measureable

Methods, consistent with requirements of competency standard must be applied in measuring the performance of the construction personnel. A base and competency productivity level must be clearly stipulated. Both will act as reference in assessing the competency of a construction personnel. For example, the competency standards for a bricklayer is to lay 30 bricks per hour. The work will be assessed by the CCA. In order to assess a candidate bricklayer who may be undergoing assessment for level 1, the CCA must be a competent assessor with a level 3 qualification. In addition, the CCA must also be a subject matter expert who has achieved a level 3 qualification in bricklaying.

### iii. A: Achievable

The competency standards must be achievable in a normal work setting by a competent person. Subject-matter experts must be from different backgrounds and experiences to obtain the right formula for the competency standards. The facilitator must be experienced to observe that no party will dominate or control the discussions. Competency standards which is skewed to the interest of a party will be invalid and rejected by construction industry stakeholders.

### iv. R: Realistic

In practice, competency standards must also be realistic. Normal construction personnel must be able to perform the requirements under normal circumstances. The subject matter experts will be able to determine the level deemed to be “realistic” as far as the competency standards are concerned.
v. T: Time-Based

There must be a time limit to perform a certain construction work in the competency standards. As shown in the previous example, a candidate bricklayer is given an hour to achieve the target of 30 bricks within that set time frame. The candidate bricklayer is deemed as COMPETENT (C) if they achieved the target within the specific time period, and is deemed NOT YET COMPETENT (NYC) if they fail to achieve this target within the specified time period. This method of assessment encourages the candidate to identify any shortcomings which they may have experienced during the assessment exercise.

vi. V: Valid

CIDB or other governing authorities must endorse the competency standards to ensure that it is valid and ready to be applied in the industry. Any other competency standards without the endorsement by CIDB or other governing authorities may not valid and should not be used as the basis for training and assessments.

vii. S: Sufficient

The competency standards developed must be sufficient. There must be a set of predetermined standards in the level of proficiency in completing a particular work/task as well as the sufficiency in number of tasks assigned for assessment. Subject matter experts and CCA will be able to decide on the suitable amount of work/ tasks to be assessed.

viii. C: Current

Competency standards should be reviewed after a certain period of time, to maintain their relevance. The competency standards must be current and up-to-date with the upcoming technology.

Technical and Vocational Education and Training (TVET)

Technical and Vocational Education and Training (TVET) are important in the establishment of vocational competencies foundation in Malaysia. They are expected to continue providing support in the development of vocational competency in the Malaysian construction industry. It is vital to mention here that a number of government-run TVET have been providing construction-related training even before the development of NOSS. Among others, TVET is developed with the following objectives:

a) Provide a “second chance” for students who were not “academically-inclined”. Students are encouraged to pursue an alternative career path, where they will be trained in the areas of vocational aspects.

b) Train and certify the students to become skilled workers, and employ their expertise in the development of the country.

TVET faced various challenges as identified under the 11MP:

1. Different sets of accreditation ratings by agencies

There are 2 agencies with different sets of accreditations; The Malaysian Accreditation Agency (MQA) under the Ministry of Higher Learning (MHL); and the Department of Skills Development (DSD) under the Ministry of Human Resources (MOHR). In addition, employers also faced with the problem of selecting the competent candidates since both agencies allege to offer training programmes that meet the required competency standards.

Among the different sets of competencies standards being utilised by TVET are:

a) National Occupational Skills Standards (NOSS) by DSD.

b) Competency standards by American Welding Society (AWS).

c) Competency standards by the American Society of Mechanical Engineers (ASME).
d) Competency standards by Electrical Inspectorate Unit (EIU).
e) Competency standards by the Energy Commission Malaysia (EC).
f) Competency standards by Sustainable Energy Development Authority Malaysia (SEDA Malaysia).
g) Competency standards by Pusat Giatmara.
h) Competency standards by Department of Occupational Safety and Health Malaysia (DOSH).

Each of these regulatory authorities has their own competency standards. This anomaly in TVET programmes create confusion among the construction personnel. Among the proposed solutions to resolve the issues are:

a) Standardisation of the competency standards
   One suggestion is to re-brand the construction related NOSS. For example, NOSS for the construction occupational titles will be re-named the Construction Industry Competency Standards (CICS).

b) Standardisation of NOSS format
   The intention is to standardise the NOSS format. This proposal is aimed at eradicating confusion amongst construction personnel wishing to undergo career advancement via assessments, or training. The standard format will also facilitate cross-references by the relevant authorities and TVET.

c) The adoption of CIOT by TVET and assessment centres
   There is an emphasis for all competency certificates to carry the titles of Construction Industry Occupational Titles (CIOT) and not the names of courses attended. This is to ensure the fulfilment of Schedule 3 of ACT 520 in the registration of construction personnel at CIDB. Often, construction personnel cannot be registered due to ambiguous certification and occupational titles of the courses.

d) Governing body on construction competency
   CIDB will be the exclusive administrator of NOSS for the construction industry. At the same time, CIDB will also be the reference centre on all matters pertaining to the competency and the training aspects of the construction industry.

To ensure smooth implementation on training and competency assessments, CIDB has proposed on the following actions:

a) CIDB will initiate discussions with the other governing bodies to streamline the competency requirement. The other governing bodies include the Department of Occupational Safety & Health (DOSH) and the Energy Commission Malaysia (EC). Competency certification encompassing CIOT could be entrusted solely upon CIDB, with the exception of those under the purview and enforcement of independent regulations by other relevant certification bodies.

b) The competency standards, such as NOSS or other equivalent competency standards will be constantly reviewed. This involve the participation of subject-matter experts from the construction industry to ensure that the competency standards are in line with the expectations of employers. The reviews will ensure that the competency standards remain relevant and updated alongside the industry's current progress.

c) To have a single qualification system adopted by MQA and DSD, as proposed under the 11MP. CIDB will lead and manage the construction industry competency accreditation system which will incorporate a consistent competency standards format. This is also stated in the Lembaga Pembangunan Industri Pembinaan Malaysia Act 1994 (Act 520).
2. No Specialisation Among the TVET

There is no specialisation among the TVET. Currently, the government-run TVET has 8 agencies involved in the competency training for the construction industry. These TVET applies different competency standards. This inconsistency needs potential employers to be convinced on the quality of TVET. This can be done via dispensing information that TVET courses meet construction industry competency standards through the mass media i.e. advertising and promotions as well as, road shows. The insistence of employers on TVET certifications will boost student enrollments and confidence in TVET as the institution of choice in learning, and the construction industry as a career path.

The solution to this inconsistency is to create centres of excellence for the TVET according to their niche areas of expertise. Streamlining the existing TVET will be a priority exercise. Following discussions with TVET, the streamlining exercise will be led and coordinated by CIDB. As of May 2017, CIDB has held several dialogues and discussions with the government-run TVET under the Construction Industry Competency Forum (CICF). A few decisions were made, among others:

a) TVET will provide CIDB with information on their courses being offered.

b) TVET will be advised and guided by CIDB prior to offering their courses to the public. This ensures future courses are in tune with the aspirations detailed in the 11MP and CITP.

c) TVET’s existing hardware, infrastructure as well as the resources such as the number of instructors, equipment, tools and machines for training will be studied by CIDB.

CIDB will liaise with the respective TVET authorities to identify and recommend the optimal solutions on high-impact trades/specialisations. These resources will ascertain the TVET’s capacity and qualification to be recognised as a high-impact trades/specialisations centre.

3. TVET Limited Recognition

There is a limited recognition and low premium placed by the employers on TVET. Employers must put a preference on TVET graduates, as their first-choice workers. Even though TVET has steadily churned graduates, it was not popular among potential students due to its perceived unpopularity among employers. Therefore, efforts must be taken to enhance the reputation of TVET, as the leading body to train skilled construction personnel. The number of students who enrolled in the TVET courses are as at Table 5.1.

<table>
<thead>
<tr>
<th>Certification Agency</th>
<th>Category of Work</th>
<th>Architecture &amp; Building</th>
<th>Civil &amp; Structure</th>
<th>Mechanical &amp; Electrical</th>
<th>Total Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Akademi Binaan Malaysia (ABM)</td>
<td>854</td>
<td>1,220</td>
<td>3,775</td>
<td>5,890</td>
<td></td>
</tr>
<tr>
<td>Kolej Komuniti</td>
<td>1,100</td>
<td>180</td>
<td>2,060</td>
<td>3,340</td>
<td></td>
</tr>
<tr>
<td>Pusat Giatmara</td>
<td>960</td>
<td>80</td>
<td>4,680</td>
<td>5,720</td>
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</tr>
<tr>
<td>Institut Latihan Perindustrian (ILP)</td>
<td>60</td>
<td>-</td>
<td>540</td>
<td>600</td>
<td></td>
</tr>
<tr>
<td>Institut Kemahiran MARA (KMM)</td>
<td>104</td>
<td>-</td>
<td>-</td>
<td>104</td>
<td></td>
</tr>
<tr>
<td>Institut Kemahiran Belia Negara (IKBN)</td>
<td>187</td>
<td>54</td>
<td>420</td>
<td>661</td>
<td></td>
</tr>
<tr>
<td>Pusat Latihan Teknologi Tinggi (ADTEC)</td>
<td>-</td>
<td>-</td>
<td>30</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Persekutuan Pusat Bertauliah JPK Malaysia (FeMac)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>3,265</strong></td>
<td><strong>1,534</strong></td>
<td><strong>11,505</strong></td>
<td><strong>16,304</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: Various

Note: \(^1\) The gross output estimated annually based on previous number of graduates

\(^2\) The data were for students enrolled under skill courses from Level 1 to Level 3.

Potential employers should be convinced on the quality of TVET. This can be done via dispensing information that TVET courses meet construction industry competency standards through the mass media i.e. advertising and promotions as well as, road shows. The insistence of employers on TVET certifications...
will boost student enrollments and confidence in TVET as the
institution of choice in learning, and the construction industry
as a career path.

Under the 11MP, TVET are expected to meet the construction
industry demand with the following improvements:

• Strengthening the governance of TVET for better
  management.
• Enhancing the quality and delivery of TVET programmes
to improve graduate employability.
• Rebranding TVET to increase its attractiveness

Furthermore, there must be a coordinated effort between the
various TVET institutions. This is to ensure that courses are not
blindly duplicated. Otherwise there will be an excess of graduates
in a particular trade resulting in an oversupply. The redundancy
in courses is a waste of resources whereby graduates tend to find
themselves unemployed for long periods of time; only to finally
resort to employment in trades that are outside their expertise.

As part of the Initiative P1 of the CITP, CIDB has embarked on
the initiative to streamline the various TVET. As described by
an excerpt from CITP: “The streamlining and consolidating of
construction-related courses will help eliminate redundancies
and duplications in training offered by providers and will
contribute to the 11MP focus to transform the TEVT sector and
meet industry demand.”

In addition, “CIDB will contribute by enhancing existing
accreditation and certification mechanisms, review and audit
construction-related courses and develop clear training guideline
map, containing and identification matrix of recommended
institute or training providers by training course and specific
skills. CIDB will also lead the establishment of a Technical
Advisory Committee to review training courses in Malaysia and
identify Areas of Expertise for each training provider”

**Efforts On Competency**

**The Assessment Process**

Based on observation, CIDB realised that these “informally-
trained” construction personnel need to be registered or
accredited as competent personnel. “Informal-trained” means
any construction personnel without formal training in attaining
competency certification from government run or, private
training centres. One of the proposed approaches is through an
assessment process. The idea of the assessment is to encourage
the existing construction personnel to be certified and accredited
via available and proper channels; without any obligations to
enroll in courses they are familiar with.

The assessment process is developed to cater for the experienced
construction personnel with some degree of competency,
through the application of minimal resources and over a shorter
duration. Currently, there are many occurrences of employers
entrusting competency-uncertified personnel to carry out
construction works. As far as these employers are concerned,
the existing “informally-trained” construction personnel are
competent. Therefore, the assessment approach ensures existing
construction personnel are properly certified and accredited. At
the same time, the existing construction courses and institutions
are not jeopardised. The existing construction courses were
geared towards younger students who may ought to have more
formal method in learning the trade.

Additionally, this approach has another advantage in which there
is neither time limit nor “cooling-off” period between the time the
candidates took the first and second assessments. Candidates
can schedule for the next level of assessment, subject to the
availability and confirmation by CCA.

1. **Construction Competency Assessors (CCA)**

The knowledge and practical assessments are conducted
according with NOSS specification and procedures. These
assessments are conducted and evaluated by assessors, also
known as the Construction Competency Assessors (CCA).
CCA are subject-matter experts who are competent in their own respective trade, and are appointed, certified and accredited by CIDB.

CCA needs to ensure that candidates understand and comprehend the assessment plan, scope of assessments, areas of competence to be assessed, the location and the time of the assessments. More importantly, candidates must agree on the assessment plan prior to the assessment exercises. The assessment exercise cannot be carried out without the candidates’ agreement on the assessment plan. Without the candidates’ consent, the assessments will be deemed invalid and may not be used as evidence as competency accreditation of construction personnel. Candidates are likely to be instructed to repeat the assessment exercise.

The assessment process will be conducted as follows:

a) The candidate to be assessed for a CIOT will register through the Competency Management System (CMS) Portal or assessment centres.

b) A CCA will be appointed to meet the candidate at a mutually agreed, appointed time and assessment centre. Both the CCA and candidate should agree on the assessment scope and plan. This plan will specify among others, the knowledge and practical tasks that need to be completed. The assessment process must be conducted on a one-to-one basis.

c) Typically, the knowledge test will proceed first. The knowledge tests can be in the form of a written test. For the practical test, CCA will first prepare the materials. The candidate will be required to confirm that the materials or equipment are correct, adequate and in order before agreeing for the practical assessment to be carried out. If the candidate agrees, then the practical test will commence.

d) The CCA will announce the test results to the candidate immediately, i.e. whether they are competent (C) or Not Yet Competent (NYC).

e) The competency certificate will be issued to the candidate by CIDB upon the Construction Competency Internal Verifiers (CCIV) and the Construction Competency External Verifiers (CCEV) consensus with the CCAs’s recommendation.

f) If successful (C), the candidate is then required to register as CCP at CIDB.

g) If Not Yet Competent (NYC), the candidate can obtain advice on areas for improvement from the CCA. CCA will give feedbacks and pointers on the strengths and shortcomings from assessment tests of the candidate. Candidates can schedule another date and time for a repeat assessment. CCA is duty-bound to assist and support the purpose of the candidates to become CCP.

These assessments will help candidates to identify their strengths and shortcomings in performing their chosen construction tasks. Those who failed to meet competency levels required will be motivated to improve their shortcomings, through training courses or gaining more working experiences, for the next assessment.

2. Construction Competent Person (CCP)

The competent construction personnel will be registered as the Construction Competent Person (CCP) once they pass the assessment exercise, and meet all the requirements as laid out in the competency standards. CIDB confirms that the person is now accredited as a competent person in the specific CIOT. Construction personnel will be categorised according to skilled or semi-skilled construction workers as defined in Act 520. This accreditation will enable the CCP to work legitimately in the specific trade of the construction industry.

CCP must be able to demonstrate their competence consistently. Competency does not merely mean an understanding of the theory but also the capability to carry out the specific skills in the working environment. There are three criteria needed in the certification and accreditation process of a CCP.
Those criteria are:

a) Able to comprehend the knowledge of the trades.

b) Able to perform the tasks successfully, utilising the tools and equipment correctly and safely in accordance to NOSS.

c) Convey the right attitude in performing the required tasks.

The right attitude includes:

• The effort to ensure that the work is done accurately and according to the correct sequence.

• The strict adherence of safety and health procedures.

This may involve a certain amount of subjectivity and judgment call by the accredited assessors.

To maintain the acquired competency, CIDB conducts periodic assessments on the CCP. The procedure is to ensure the CCP perform their tasks consistently at all times. It is a well-known fact that CCP certification does not guarantee the CCP will perform assigned tasks at a consistent, competent skilled level, all the time. The periodic assessments will put the awareness in the CCP to perform well so as to maintain their certified status.

3. The Internal and External Verification Process

The quality of the assessment process is assured from the beginning until the end by an internal and external verification processes. The assessment result is subjected to internal verification process, which is carried out by Construction Competency Internal Verifiers (CCIV). The CCIV work in turn, will be verified by Construction Competency External Verifiers (CCEV). This provides quality assurance, substantiating that the procedures and steps are correctly followed during the assessment exercise.

The internal verification is a process whereby the quality assurance of the assessment process is checked by an independent person. The independent person is known as the CCIV and may not be from the same assessment centre. The CCIV is certified, accredited and appointed by CIDB. CCIV are subject-matter expert from the same trade, and had been trained and qualified as both CCA and CCIV. Additionally, CCIV is experts to be in a supervisory/management practitioner employment the construction industry.

CCIV is expected to possess the relevant qualification as determined by CIDB. The CCIV is responsible in ensuring thus verifying that the assessment process has been exercised according to procedures. In the event the procedures are not adhered and proven to be a major non-compliance, CCIV can request for a repeat assessment. In this regard, the construction personnel may be assessed by a different CCA.

The external verification process is another level of quality assurance above the internal verification process. This task of external verification process will be conducted by CCEV who is a CCIV from one of the trades or supervisory/management level. At the same, CCEV do not necessarily came from the same trade or CIOT that is being assessed. In any case, both CCIV and CCEV are required to be practitioners in the construction industry.

4. Construction Industry Occupational Title (CIOT)

The Construction Industry Occupational Titles (CIOT) is a set of industry-related occupational titles, specifically for the construction industry. Originally, National Vocational Training Council (MLVK) used the term “Occupational Titles” (“OT”). However, CIDB has proposed to change the term from “OT” to “CIOT” to reflect its relevance and exclusivity to the construction industry.

CIOT was developed by subject-matter experts in a study to identify all the occupations or trades in in the construction industry. The study was completed in 2016, resulted in the identification and listing of 509 occupations in the construction industry. The listing provides important information not only for the employers, assessment centres and training providers but also to the general public. The listing of the CIOT was also among the components stipulated in the Construction Industry Competency Blueprint (CICB).

The evolution of CIOT is deeply associated to the development of construction-related NOSS. Therefore, it is important to comprehend the history of NOSS in order to understand CIOT.
CIOT with trade/ specialisations that have been identified are as follows:

a) Scaffolders  
b) Welders 3G and 6G  
c) Wireman PW1, PW2, PW3, PW4  
d) Chargeman A0, A1, A4, B0, B1 and B4  
e) Gas Pipe Fitter  
f) Blasters and Painters  
g) Non-Destructive Testing (NDT) Operators  
h) Crane Operators  
i) Plant Operators  
j) Plumbers  
k) Air-Conditioning Installers

CIDB will be initiating the following actions for CIOT:

a) Establishing CIDB’s assessments centres. Instead of providing training, CIDB will be focusing more on assessing, certification and accrediting the competent CCP. Training centres will be industry-driven.  
b) Application of NOSS or other recognised competency standards administered by CIDB.  
c) Reviewing of the existing competency standards to ensure that these documents are updated and current. This exercise will involve the inputs from the subject-matter experts.  
d) Revision of existing assessment process by updates and improvisation whenever necessary.  
e) Training and converting the current batches of ABM instructors into CCA.  
f) Training the instructors of ABM to understand, comprehend and impart the information on the requirement of NOSS and other competency standards. These standards may be incorporated in their assessment processes as well as training modules.

The Competency Training Map

Currently, there is no specific “map” or chart to guide the students on a career path in the construction industry. Due to the absence of such guides, students typically take up courses following the advice from family and friends. Often, these advisors are also clueless on the types and levels of construction industry occupations. Graduates are also in the dark on their career advancement, upon completion of their construction industry courses.

In addressing this issue, the Competency Training Map is being formulated to assist graduates to make the choice best suited to their interest, talents and capabilities. The Training Map provides a reference level-to-level career or competency path. The Competency Training Map describes the specific trades/ specialisations for construction personnel. The map also provides training providers with the direction and guidelines to design and implement their own training programmes. The Competency Training Map illustrates the available routes for a candidates to become Construction Competent Person (CCP) in a chosen field or trade. The main idea is to provide the CCP candidate with a means to trace their current progress and their potential of higher competency levels.

As stated on Initiative P1, “This will culminate in the synthesis of a development map for students to navigate the path toward a successful career in construction. The map will consist of various courses that act as ‘checkpoints’ to chart the path towards a particular skilled trade or goal. The map will help to identify any gaps in training and development offered and it will also highlight any courses that are duplicated ineffectively.”

In the CITP, this Competency Training Map is described as... “for students to navigate the path toward a successful career in construction. The map will consist of various courses that act as ‘checkpoints’ to chart the path towards a particular skilled trade or goal. This map will help to identify any gaps in training and development offered and it will also highlight any courses that are duplicated ineffectively. The identification of gaps with the target end-state will serve as an indicator for which new courses need to be developed, enhanced, reduced or eliminated in order to enhance the comprehensiveness of training and capability-building in the industry.”
1. **Formulation of the Competency Training Map**

These approaches were taken into account in the development and formulation of the Competency Training Map:

a) For the existing CIOT, the task analysis and the work instructions of the NOSS will be studied. The tasks of the CIOT is compared with other CIOT to look for similarities, and subsequently included in the Competency Training Map.

b) For new CIOT, NOSS needs to be developed and studied for each CIOT. The next step is to compare similar tasks for that particular CIOT and other CIOT. This will involve a massive exercise but it is worth the time and expense.

2. **Competency Management System (CMS)**

The Competency Management System (CMS) is a tool utilised to enhance the Competency Training Map and provides a database of the skills, particularly the levels and expertise obtained by the construction personnel. The CMS system also includes the registration of training centres and the programmes nationwide. This database will provide construction personnel the means to track their progress and the path to advance their skills.

3. **Vertical and Horizontal Progressions**

*Figure 5.1 | Vertical and Horizontal Progressions*

The Competency Training Map clearly state the competency direction for the construction personnel. The vertical progression basically proceeds on an ascending level of competency within the specific line of occupation. Each level requires the assessment process. For example, construction personnel who is interested to become a CCP Tubular Scaffolder will begin from the lowest level, level 1. Upon successfully completed level 1 Tubular Scaffolder assessment process, the construction personnel are certified as CCP Tubular Scaffolder and join the workforce. Subsequently, the construction personnel can obtain a higher competency level of Tubular Scaffolder to level 2 and 3. This is in effect is the Vertical Progression.

For the horizontal progression, the progress is from left to right on the linear level of competency. This means that construction personnel who has obtained level 1 Tubular Scaffolder has the option to undergo the Prefabricated Scaffolding level 1. If the construction personnel qualified as a CCP Prefabricated Scaffolder level 1, they can proceed to pursue the System Formwork Installer Level 1 (Figure 5.1). The construction personnel may be exempted for some competency elements that are common in all the CIOT. For example, construction personnel who has obtained the CCP Tubular Scaffolding may be given the competency credits in the assessment for Prefabricated Scaffolding. This is because the *Segregation of Defective Materials* section for both CIOT has the same competency elements in the NOSS document.
Therefore, construction personnel can proceed in the vertical or horizontal progressions to enhance their competency. Construction personnel can either pursue the competency skills through the formal or informal channels. Formal channel entails registering in formal courses at TVET and private training institutions. Otherwise, construction personnel could learn the necessary skills by gaining practical experiences at the construction site hence the informal method. There is no hard and fast rule that states the learning process must be from the training centres. This is the learning flexibility that is available to all construction personnel aspiring to be a CCP.

Akademi Binaan of Malaysia

Akademi Binaan of Malaysia (ABM) are CIDB's training arm and was established in 1997. These training centres are situated in strategic regional locations to facilitate access by youths and construction personnel, to attend construction related courses.

There are currently 6 ABM throughout Malaysia:

a) ABM Wilayah Utara in Sintok, Kedah
b) ABM Wilayah Tengah in W.P. Kuala Lumpur
c) ABM Wilayah Selatan in Johor Bahru, Johor
d) ABM Wilayah Timur in Jenagor, Terengganu
e) ABM Sarawak, Kuching, Sarawak
f) ABM Sabah, Kota Kinabalu, Sabah

The functions of the ABM are as follows:

- To provide systematic and organised construction skill courses, carried out by competent trainers.
- To produce more local skilled and semi-skilled construction workers and reducing the dependency on foreign labours.
- To produce a productive workforce with a high level of awareness for safety, quality and efficiency.

These ABM offer a wide range of courses, covering more than 60 trades/ specialisations. These includes building (civil to mechanical engineering); welding; plant operations; drafting; and Non-Destructive Testing (NDT) among others. Apart from training activities, these ABM also offer skills accreditation through the assessment process, customised training programmes and safety & health induction programmes.

Since its establishment, ABM has undergone various improvisations to remain relevant in the construction industry. Change made include revision of training modules, the delivery of training as well as the assessment methods. One of the major changes currently in progress is the transformation of ABM into assessment centres. Once completed, training will be led and undertaken by training providers. This will stimulate and propagate the training industry and help popularise training programmes for the construction industry.

Conclusion

In terms of competency, the plans are already in motion and being executed progressively. CITP has already been launched and is being implemented. Initiatives such as CICB and the Competency Training Map are currently being drafted. Mechanisms will be set-up to monitor the implementation of these initiatives. Based on the feedbacks from CICB and the Competency Training Map initiatives, adjustments will be made progressively until the objectives are achieved. It is vital that the system is professionally administered, and implemented with integrity to assure the local and international construction fraternity. Among the continuous efforts taken by CIDB are:

MARKETING & AWARENESS EFFORTS

The construction industry has always been perceived as a Dirty, Dangerous and Difficult (3-Ds) sector. In view of this perception, CIDB with the cooperation of the construction stakeholders has actively embarked on a number of initiatives and programmes to improve the image of the construction industry in Malaysia. One of the initiatives is to increase the awareness via media coverage in television interviews, newspaper articles, website content and active engagement in the social media. The challenge is to
change the perception by showing that the construction industry is well regulated with safe working environment and attractive remuneration for qualified personnel. CIDB will continuously support the launch of more Construction Clubs in secondary schools. Technical support will be provided to encourage the younger generation to consider a career in the construction industry. Apprenticeship programmes in corporate bodies will be expanded, with monitoring by CIDB. Incentives such as the CCD points will be given to participating construction companies.

INTERNATIONAL COLLABORATIONS AND CERTIFICATIONS

Collaboration with City & Guilds of the United Kingdom (C&G) and The Business and Educational Business Council (BTEC) of the United Kingdom will add value to CIDB's competency certifications and accreditation. The collaboration with these international parties will enable CCP to work in other countries, where both international qualifications are accepted and recognised. These recognitions in their qualifications will ensure that CCP will be employable internationally.

Training Map are currently being drafted. Mechanisms will be set-up to monitor the implementation of these initiatives. Based on the feedbacks from the CICB and the Competency Training Map initiatives, adjustments will be done progressively until the objectives are achieved.

The future of the construction industry is bright with the cooperation of construction stakeholders. They are serious to ensure the competency systems are properly and professionally administered. It is essential that these competency quality systems must be implemented and conducted with integrity. The quality system is important to provide confidence in the local and foreign construction community.