



Manpower Update Report

Building, Civil Engineering and
Built Environment Industries

2021

Building, Civil Engineering and
Built Environment Training Board

ACKNOWLEDGEMENT

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Introduction

Background

The Building, Civil Engineering and Built Environment Training Board (BCETB) of the Vocational Training Council (VTC) is appointed by the Government of the HKSAR. According to its Terms of Reference, the BCETB is responsible for determining manpower demand of the Industries, assessing whether the manpower supply matches manpower demand, and recommending to the VTC the development of vocational and professional education and training (VPET) facilities to meet the assessed training needs.

A new approach for collecting manpower information is adopted to enhance the effectiveness and better reflect the dynamics of the manpower situation in the various industries.

Under the new approach, one full manpower survey is conducted every four years, and this is supplemented by two manpower updates. The BCETB completed its latest manpower survey in 2017. Two manpower updates were conducted in 2020 and 2021.

The manpower information update comprises:

- (a) a focus group meeting getting the views of Industries experts on the latest developments in the Industries, manpower and training needs, and recruitment difficulties, and measures to tackle the challenges the Industries faces; and
- (b) desk research analysing job advertisements including qualifications, experience and skills required by the principal jobs in the Building, Civil Engineering and Built Environment (BCE) Industries

Objectives

The objectives of the manpower update are:

- (i) to examine the latest trends and developments of the Industries;
- (ii) to explore the job market situation and training needs;
- (iii) to identify the recruitment challenges; and
- (iv) to recommend measures to meet the training needs and to ease the problem of manpower shortage.

Methodology

Overview

With reference to the 2017 full manpower survey of the BCE Industries, this update report aims to provide qualitative descriptions of the recent development of the Industries through focus group meeting, supplemented by making reference to some quantitative data of recruitment advertisements from desk research.

Focus Group Meeting

The focus group members are representatives from eleven sectors of the BCE industries, including 1. Building and Civil Engineering Sites, 2. New Building Site Contractor, 3. Electrical and Mechanical Contractor, 4. Decoration, Repair and Maintenance Contractor, 5. Architect, 6. Surveyor, 7 Engineer, 8 Major Estate Developer, 9. Tertiary Institution, 10. Vocational and Skills Training Course Provider and 11. Government Department.

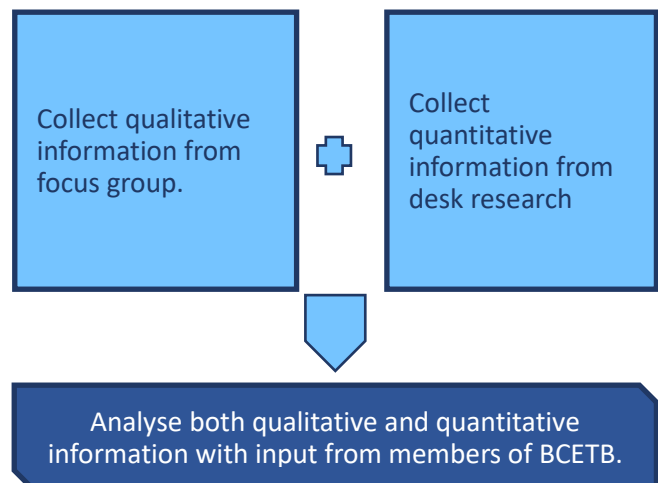
The focus group meetings were conducted on 28 and 29 October 2020 with discussion on topics selected by the Working Party on Manpower Survey of the BCETB. The discussions at the meeting were recorded and transcribed to facilitate analysis.

Desk Research

Manpower information covering the period between November 2019 and October 2020 was collected through desk research by quarter. An employment information system was developed to capture the relevant recruitment data from major online recruitment portals. Some 21,000 recruitment records were collected during the research period and served as indicative information of the job market trend. The list of related companies under the Hong Kong Standard Industrial Classification was mapped to remove duplicated records.

Data Analysis

The analysis consists of the following three steps:



Limitations

As this is not a full manpower survey, the findings and recommendations of the focus group meeting are more qualitative in nature and the report focuses mainly on the manpower trends. The information of job advertisements was collected from major recruitment websites and the

Labour Department. Other channels, such as head hunting for managerial positions, were not covered. Since the data collected is a snapshot of a particular period without reference to any historical data, this can serve as reference information supplementary to the findings of focus group meetings.

Findings

Factors Affecting the Development of the Industries

Requirement to use electronic inspection and monitoring system

To enhance the effectiveness and efficiency of site supervision, it is mandatory for contractors to use the Digital Works Supervision System (DWSS) with electronic inspection forms for site management and defect reporting in all public projects to enhance efficiency, safety and quality performance.

Some contractors opined that it certainly would enhance the efficiencies to record those defective items and the subsequent maintenance work in construction site. However, it would require the contractors to invest in the required software and the subsequent training for smooth implementation of the system.

Trend of using Modular Integrated Construction (MiC) in Construction projects

MiC projects are first of all driven by the Government that the off-site manufacturing for on-site assembly methodology might reduce the construction time and labour cost as well as being more environmentally friendly. Appropriate to be implemented in public projects where standardised building design is required but not in private residential projects where uniqueness and layout design are emphasised to be the selling point. It is required to arrange more training for the relevant construction workers and support from the Government to provide incentives to encourage the private sector to implement this new methodology

The methodology should be used with Design for Manufacture and Assembly (DfMA) approach such that construction wastes could be minimised.

Impact of Coronavirus Disease 2019 (COVID-19)

The Covid-19 pandemic slowed down the construction projects in the beginning of the year 2020, especially for the repair and maintenance projects as the construction workers were reluctant to enter the premises to carry out the required maintenance work.

It urged for various industry stakeholders to achieve the common goal of completing the quality projects within the time constraint.

In addition, the contractors were urged to review the supply chain by sourcing other materials as substitutes from the Mainland China and other overseas countries in order to complete the construction projects on time. In the first two quarters of 2020, some projects had to be delayed due to the shortage of construction materials that contributed to a high unemployment rate.

Implementation of Building Information Modelling (BIM)

Training for specialised streams of BIM professionals (such as Architecture, Quantity Surveying, Structural Engineering and Electrical and Mechanical Engineering) would be necessary to strengthen the knowledge of professionals of specific disciplines to apply the required BIM techniques in their areas.

The implementation of BIM had encountered some barriers that the frontline workers were not able to use the BIM models to carry out their manual works, and they probably need the supervision of the qualified site supervisors equipped with the BIM techniques to guide them to prepare the construction materials at sites according to the BIM models.

Moreover, the cost of BIM software is high and is rather not affordable for small and medium enterprises (SMEs) as it is considered to be monopolised by the software vendors and the functional specifications are too restricted.

On the other hand, some of the companies had used the tool for asset management that recorded the information of the E&M machineries for maintenance and it is anticipated that more companies would use the tool to monitor real time parameters for E&M maintenance.

Manpower Demand

Focus Group

With reference to the trends and development of the sector, views of the focus group on the anticipated changes in manpower demand were collected.

Principal jobs especially related to BIM, site supervision and repair and maintenance are considered to be in high demand.

Relevant job titles are as follows:

Professional / Technologist :

- BIM related professionals especially BIM Modeler and BIM Manager
- Architect

Technician :

- Draughtsman
- Clerk of Works
- Inspector of Works

Skilled Worker:

- Bricklayer
- Tiler
- Plasterer
- Plumber
- General Welder

General Worker:

- Precast Installation Labourer

In addition, Focus Group members also emphasised the importance of requiring qualified site supervisors to inspect the quality of construction works to ensure conformity with contracts, drawings, specifications and workmanship standards and relevant legislation that are in demand in construction sites.

Desk Research

Out of the relevant recruitment advertisements captured in desk research, the following top five principal jobs with the highest number of recruitment advertisements were identified:

Professional/ Technologist

- Quantity Surveyor
- Building Services Engineer
- Civil Engineer
- Interior Designer
- Safety Officer

Technician

- Architectural Technician / Draughtsman
- Site Foreman
- Building Services Technician
- Electrical Engineering Technician
- Project Coordinator

Skilled and Semi-skilled Worker

- Plant and Equipment Operator (Hoist and Crane)
- General Welder
- Carpenter (Formwork)
- Plumber
- Drainlayer

General Worker

- Labourer
- Chainman
- Excavator
- Concreting Labourer

Training Needs

Focus Group

Focus group members considered the following skills are essential for employees in the Building, Civil Engineering and Built Environment sector:

BIM training in specialised streams

Members are of the view to strengthen the training of BIM in specialised streams. In particular, it is preferred to encourage professionals of specific areas to take up the appropriate training for acquiring the required BIM skills so as to enable them to incorporate their professional knowledge in model building to facilitate the subsequent implementation.

Specialised Technical Skills

Members opined that the specialised technical skills should be acquired by attending training courses, seminars and webinars organised by the related trade associations, Construction Industry Council (CIC) and Nano and Advanced Materials Institute etc., especially for those graduates who joined the industry in recent years as the course curriculum in tertiary institutions are usually general in nature that they need to pick up the technical skills in depth.

Mastering craftsmanship

The industry should encourage experienced and skilled workers to develop themselves into masters of specific craftsmanship with assistance from industry stakeholders in order to gain recognition with prestigious images from the industry. Alike those master craftsmen in Germany or other overseas countries, these skills master deserved respect of their industries and more reasonable compensation.

Pre-employment and in-service training

For pre-employment training, essential skills recommended included ethics, integrity, mindset of professionalism in specific jobs and safety as well as knowledge in BIM.

Regarding in-service training, the skills should include :

- construction safety
- site supervision
- air conditioning design and maintenance
- handling skill in the use of R32 freezer
- New Engineering Contract and
- Training in Smart City, especially analysing techniques of data collected

Desk Research

In addition, new technologies/ emerging skills and related job titles identified from some 21,000 advertisements are summarised in the following table.

New Technologies/ Emerging Skills	Related Job Titles
Building Information Modelling	<ul style="list-style-type: none"> • Assistant BIM engineer • Assistant environmental consultant • Assistant project BIM manager • BIM coordinator
Reuse and Recycling of Construction Waste	<ul style="list-style-type: none"> • Environmental engineer • Senior environmental consultant
Green Building and related certifications	<ul style="list-style-type: none"> • Assistant engineer - sustainability • Assistant environmental engineer • Consultant/ assistant consultant - green building
Modular Integrated Construction Method	<ul style="list-style-type: none"> • Experienced site architects • Facade design engineer
DFMA	<ul style="list-style-type: none"> • Assistant resident structural engineer • BIM manager • Senior BIM engineer
IOT	<ul style="list-style-type: none"> • BIM manager • Engineer (building services) • Resident project engineer
Digital Works Supervision System	<ul style="list-style-type: none"> • Assistant quantity surveyor • Construction manager/ site agent/ works manager
Traffic Engineering	<ul style="list-style-type: none"> • Assistant engineer • Assistant inspector of works • BIM modeler / draftsman

It is anticipated these emerging skills are required by the employers to develop new products / services to meet the requirement of existing and potential customers. Therefore, the professionals who possess these skills are in demand in the Industries.

Recruitment Challenges

Due to the keen competition of the market, some employers have experienced difficulties in the recruitment process. The difficulties are summarised and related to some of the following factors:

High demand for BIM talents

BIM related talents are in demand in the construction industry and the need for the experienced employees with the skills continues to grow vigorously. Employers are competing for the talents with higher salaries, which might result in high turnover and most of the SMEs would most likely encounter difficulties in recruiting those talents.

Demand for skilled workers

It is difficult to recruit those skilled workers such as plasterers and bricklayers as they usually work under adverse environment. The recruitment challenge is more severe as the CIC had postponed their training for 4 months under the impact of the COVID-19 pandemic.

In addition, MiC related workers needed to be trained up to handle the new construction methods using the pre-cast materials. Corresponding site supervisors are also needed to ensure the quality of the joints connecting various pre-cast and pre-fabricated components.

Maintenance workers

Demand for maintenance workers with multiple skills is strong as there are a lot of repair and maintenance projects in the market every year.

Attracting young people

Members opined that attractive salary, good professional image and career prospect and job security were the factors attracting the young talents to join the industry. Moreover, opportunities for training in new technologies, supervision and guidance for the new recruits are considered to be important to arouse their interest in joining the sector.

In addition, enhanced communication to the parents for promoting the sector with a safe environment and good professional image is paramount to stimulate their interests to develop their careers in the sector.

RECOMMENDATIONS

To meet the future development of the Industries, it is considered essential for the government, education institutions and employers to provide suitable training opportunities to the employees in the following areas:

Government

The government should continue to take the lead to apply the new regulations with the use of new technologies and methodologies in public works projects and strengthen her communication with industry practitioners and relevant trade associations in rolling out new regulations such that the industry would be well prepared for human resource planning in both training and recruitment.

In the process, the government should take a more proactive role in soliciting views from the relevant trade associations in order to adopt the new technologies in local market gradually and smoothly. In particular, the government should consolidate views from the industry stakeholders for the implementation of MiC in the local market as it might affect the demand for some skilled workers in future.

In order to facilitate the smooth transition, it is suggested that a consortium comprising the government bureau, technology vendors and industry practitioners would be formed to discuss the implementation of the new technologies in a practical and effective approach.

The government should encourage the industry practitioners to acquire the new technologies related to the sector by providing funding to subsidise their relevant training.

In addition, the government should consider providing more support for the industry to facilitate wider implementation of the new technologies, e.g. funding subsidy or facilitation measures under regulatory regime.

Industries

Relevant stakeholders of the Industries should continue their best efforts to promote the construction industry, with young engineers and professionals visiting primary and secondary schools to deliver message of a promising career prospect with clear progression pathway.

A good professional image and high level of job security should be conveyed to the potential young entrants as well as their parents. This will help to raise their awareness on how their contribution relates to the development of Hong Kong and arouse their interest in developing careers in the sector.

The Industry should collaborate with the government to promote the professional image of masters of specific craftsmanship with promising career and wages comparable with professionals in the sector.

Education Institutions

The education institutions should collaborate with technical vendors to organise some training courses related to operating and fine-tuning techniques of use of the automation tools such as robotics to facilitate handling the tedious manual operation such as painting, spraying and heavy weight transportation, etc.

Moreover, they should consider to organise training courses to train up qualified maintenance workers with multiple skills to handle the various maintenance works that are in demand by the industry.

They should collaborate with the trade associations to organise upgrading courses and webinars to in-service practitioners to upgrade their technical knowledge and skills in latest development of new technologies (e.g. Artificial Intelligence, IoT and Big Data, etc.) and legal regulations related to the sector.

In addition, training courses in the use of BIM for asset management should be organised to meet the demand that more companies would use it for E&M maintenance. More importantly, various education institutions should work together to train up BIM talents to meet the market demand.

Employers

Employers should make use of the subsidised funding from the Government such as the Construction Innovation and Technology Fund and the CIC Research and Technology Development Fund to encourage their employees to keep abreast of the latest development of the industry as well as to upgrade their technical skills to apply those technologies in their construction projects.

Employers should also try their best to attract young entrants by offering attractive salary and package with job security as well as good recognition of their performance. Moreover, guidance and supervision from mentors in the workplace can certainly reduce their anxieties in their first few years of adaptation and retain the talents from leaving the sector.

Employees

Employees should enhance their competitiveness by taking initiatives to upgrade their knowledge and skills in both technical and legal regulation related to the industry. Working in the construction industry with a lot of interaction with various stakeholders, they should also improve their communication skills with employers and customers and establish a good working attitude with professionalism.

Employees are encouraged to make good use of subsidies provided by different schemes of Government for lifelong learning and career development such as the VTC Vplus Subsidy Scheme for upgrading the in-service practitioners in the creative and engineering industries.