



# Manpower Update Report

Building, Civil Engineering and  
Built Environment Industries

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# 2020

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Building, Civil Engineering and  
Built Environment Training Board

# ACKNOWLEDGEMENT

The Building, Civil Engineering and Built Environment Training Board would like to express its gratitude to the members of the focus group for their valuable time and insights on the manpower situation in the Building, Civil Engineering and Built Environment Industries. Special thanks go to the CPJobs and CTgoodjobs which shared with us their database of job vacancies. The views of focus group members and information from major recruitment websites formed an integral part of this report.

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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 should be conducted in 2020 and 2021.

The 2020 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.

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# 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 TEN 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, and 10. Government Department.

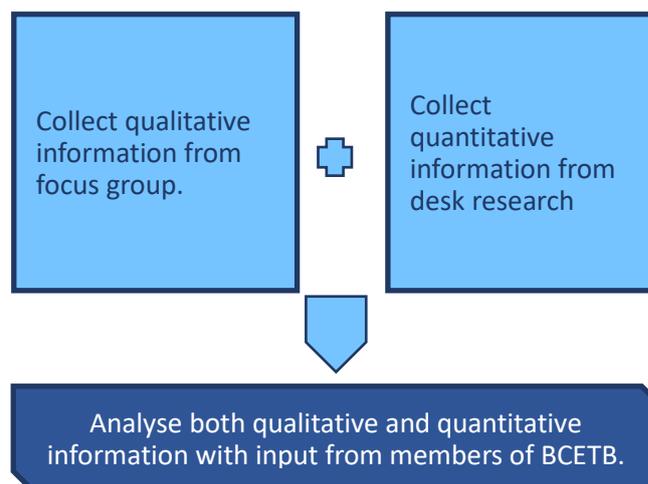
The focus group meeting was conducted on 25 October 2019 with discussion on topics selected by the Working Party on Manpower Survey of the BCETB. The discussions at the meeting were recorded and transcribed to facilitate analysis.

## Desk Research

Manpower information covering the period between Quarter 3 of 2018 and Quarter 2 of 2019 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 5,800 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 meeting. In addition, the Training Board will take into account the influence of the recent outbreak of COVID-19 and social and political crisis in the next manpower update to formulate the medium and long term recommendations to the industries.

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# Findings

## Factors Affecting the Development of the Industries

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### New approaches adopted in design and construction

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The mandatory practice that Building Information Modelling (BIM) must be used in all capital works projects with a budget of HK\$30 million or more has signified a positive step for the Industries to move towards greater reliance on technologies. Off-site construction using Design for Manufacture and Assembly (DfMA) and Modular Integrated Construction (MIC) has also appeared as an emerging trend, with the hope to uplift productivity and performance in regard to safety, quality and sustainability with reduced cost.

As a result, manpower demands have surged, especially at the levels of management, professional and technical staff, and the Industries was facing a burning issue with recruitment.

Views from the private sector opined that off-site construction methods might not be suitable for every project in Hong Kong: not only was MIC and pre-fabrication more

costly than traditional methods but it was also difficult to accommodate these in local property sites which were relatively small and required speedy adaptation to reflect immediate market needs. Estate Developers' concern about the quality of modular produced has been another barrier to adopting such new technologies in construction.

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### More Stringent Regulations

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More stringent regulations in various areas of construction have been introduced by the government over the years in the areas of safety inspection, environmental regulations and site supervision. The new legislation on Security of Payment (SOP) is foreseen to increase manpower to handle paper work related to payments.

New regulations, often involving new responsibilities, skills and knowledge, have imposed further pressure on the workforce, especially when these regulations are launched at a fairly fast pace, while training and manpower supply are lagging behind.

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## **Challenge in Resource Planning and Sourcing as a Result of Wage Dynamics**

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It is common for construction workers to be idle between construction projects but become highly demanded when multiple capital works projects or large private sector developments are launched at the same time leading to the request for higher wages.

Such wage dynamics might pose a big challenge for contractors in resource planning and sourcing with a cramming schedule of public works that also reinforced the perception of uncertainty in job security.

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## **Difficulty in Workforce Development because Over-paced Regulatory Changes**

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The construction Industries had been developing too fast to an extent that the quality of work was jeopardised.

The fast-moving characteristic of the Industries is also seen to have narrowed opportunities to develop future workforce. It takes time for new entrants to learn and accumulate experience, and for mentors to guide and coach. Yet, the rapid work pace has left no room for new entrants to learn well or develop a sense of ownership.

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## **Excessive Checks and Supervision**

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Repetitive checks and supervision had been encouraged by existing regulations, to an extent that some checks were overdone and wasted valuable manpower. Streamlining of such checks and supervision over construction processes is seen as necessary.

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# Manpower Demand

## Manpower shortage at all grades

With new manpower demands created by new construction approaches, technologies and changes in regulations as well as fluctuation of construction demand, the Industries has been facing continuous labour shortage at all grades in recent years.

## Aging issue with frontline workforce

The average age of the frontline workforce has been increasing. According to the statistics published by the Construction Industry Council, the median age of skilled workers had climbed to over 50 years old, much higher than the median age at 43 years old of Hong Kong's overall workforce.

## Declining enrolments for construction-related programmes

The enrolment rate of education programmes in construction-related disciplines has seen a noticeable decline in recent years, including degree programmes in civil engineering, structural engineering, surveying, engineering and architecture. For sub-degree levels, such as associate degree and higher diploma programmes, the enrolment rate had declined.

In line with the Hong Kong's professional accreditation and University Grants Committee (UGC) policies, student quotas for construction-related disciplines in universities have been cut short because

of the decrease in enrolment rates. This expectedly further deteriorates the shortage of professional grade manpower in future.

To ease the situation, many companies have relied on global recruitment of talents from Malaysia, Singapore and Australia as well as Greater Bay Area so as to further leverage on regional resources as a manpower solution.

## Deteriorating quality of workers

While the manpower shortage was recognised as a major challenge to the Industries, even more pressing was a noticeable decline in the quality workers. Some of the newly licensed workers were lacking in necessary experience and skills that were expected from their qualifications. As companies have difficulties in coping with project overload, further brush-up training can hardly be offered internally.

## Vacancies in Demand

As new legislation and stricter regulations in various areas of construction, such as safety, environment, site supervision, etc. have created more requirements on skills, knowledge and experience, the Industries has also seen difficulty in filling vacancies for certain job titles/ grades, in particular:

- Technical Officer Grade Staff
- Resident Site Staff
- BIM Coordinators and Managers
- Safety Officers and Supervisors
- Environmental Officers and Managers

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# Training Needs

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## Focus Group

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### Greater emphasis and coverage of BIM and new technologies in training

Coverage of BIM training offered by territory institutions to both designers and end users need to be strengthened and specialised, and should aim to cultivate collaboration between the two.

Given the prevalence of BIM applications in public works, members agreed that specialised streams for BIM professionals (such as Architecture, Quantity Surveying, Structural Engineering and Electrical and Mechanical Engineering) would be necessary. This calls for a change of mindset to regard BIM far more than a technical drafting module for draughtsman or for the sake of meeting government policy requirements, but regards its applications in facilitating informed decision making during the construction cycle, from early conception to demolition.

### Brushing-up training on basic and technical skills

Training from external bodies focused primarily on meeting legal requirements, for instance, in the areas of environment and safety. They should enhance the basic and technical skills, which would have immediate impact on work performance.

### Bridging courses to qualify staff as Technical Officer Grade Staff

Training that helps to bridge the qualification gaps of workers who have attained qualifications below higher diploma and Technical Officer Grade Staff, within the legal requirements is necessary.

### Alternative training format

Training institutions may consider the format of job attachment. For instance, students who have completed the first year of academic training can attach to companies to work as trainees, enjoying regular payments and potential promotion opportunities. Such attachment programmes would be more attractive to students of technical background; and government subsidies would be necessary to encourage employers to participate in these schemes.

### Coverage on relevant government ordinances related to construction management and practices

In view of increasing regulatory changes, the need to strengthen coverage of relevant government ordinances especially related to construction management and practices is deemed necessary in the training programmes.

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## Working Party

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In addition, the Working Party is of the view that more certified training for arboricultural professionals should be organised by the course providers.

## Desk Research

In addition, new technologies/ emerging skills and related job titles identified from some 5,800 advertisements are summarised in the following table.

<b>New Technologies/ Emerging Skills</b>	<b>Professional/Technologist Level</b>	<b>Technician Level</b>
Building Information Modelling	<ul style="list-style-type: none"> <li>• BIM manager</li> </ul>	<ul style="list-style-type: none"> <li>• BIM modeler</li> <li>• senior cad draftsman</li> <li>• BIM coordinator</li> <li>• Technical Officer</li> </ul>
Reuse and Recycling of Construction Waste	<ul style="list-style-type: none"> <li>• Environmental consultant</li> <li>• Remediation services project engineer</li> </ul>	
Green Building and related certifications	<ul style="list-style-type: none"> <li>• Environmental consultant</li> <li>• Environmental engineer</li> <li>• Sustainability consultant</li> <li>• Sustainability engineer</li> </ul>	
Modular Integrated Construction Method	<ul style="list-style-type: none"> <li>• Facade engineer</li> <li>• Facade consultant</li> <li>• Quantity surveyor</li> <li>• Project manager</li> <li>• Site engineer</li> </ul>	<ul style="list-style-type: none"> <li>• Lead estimator</li> <li>• Safety officer</li> <li>• Project coordinator</li> </ul>
DfMA	<ul style="list-style-type: none"> <li>• BIM manager</li> </ul>	
IoT	<ul style="list-style-type: none"> <li>• BIM manager</li> <li>• Solution architect</li> <li>• Engineer</li> </ul>	
Traffic Engineering	<ul style="list-style-type: none"> <li>• Traffic engineer</li> <li>• Architect</li> <li>• Quantity surveyor</li> <li>• Civil engineer</li> <li>• Construction manager</li> </ul>	<ul style="list-style-type: none"> <li>• Safety supervisor</li> <li>• Environmental supervisor</li> <li>• Resident clerk of works</li> </ul>

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.

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# 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:

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## Low respect for a construction career

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The importance of changing some long-held perception of the Industries in order to attract young talents to join the workforce and encourage the private sector to invest in people was observed. In some western countries, technical careers are perceived to be a professional career to be proud of and a promising path to settle in and develop lifelong. This contrasts to a low respect for a construction career among local young people as reflected by their unwillingness to stay in technical positions and declining interest to join the construction workforce. Measures to revamp the image in order to create relevancy to the young generation remains a critical task for the long-term development of the Industries.

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## Retention issue with technical officer grade staff

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A shortage in the supply of Technical Officer Grade staff with higher diploma qualification had been observed. As most young people nowadays are no longer satisfied with the qualification of higher diploma, they will leave their Technical Officer Grade post for more

promising and professional paths once these young people attain degree qualification.

Some Technically Competent Person have to station in Mainland China on a full-time basis responsible for off-site prefabrication projects. As there is a short supply of technical personnel, some companies have tried to resolve the manpower shortage by promoting those with more work experience in the Industries but lower academic qualifications.

On-site supervisors and Resident Site Staff who are responsible for quality assurance at construction sites are also highly demanded with the increasing number of construction projects.

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## On-going shortage of professional grade staff

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A retirement wave of professional grade staff and hence a looming succession issue was noted. With bigger demand for BIM and other professional talents, shortage in professional grade staff will become more serious.

The integration of BIM components in construction-related disciplines and related courses remain very limited. While construction designers may not be well equipped with BIM applications, users like engineering staff also lack in-depth knowledge to communicate with the designers to perform their execution and supervision roles.

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# 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 and students in the following areas:

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## Government

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The government should enhance the transparency of public works planning as well as relevant regulatory changes, with closer communication with industry practitioners such that both parties will be better informed and prepared from the perspective of human resource planning, training and recruitment.

In proposing new regulations, the government should take a more proactive role in facilitating consultation or idea exchange between the government bureaus and departments as well as trade associations such that feedback from the industry can be timely reflected in the government's policies.

The government may explore the feasibility of leveraging regional resource from other countries as a short-term measure to ease the shortage of BIM talents, such as reviewing the qualification recognition mechanism amongst different countries while strengthening its investment in nurturing local BIM talents.

Regarding excessive checks and supervision, the government may work with the Industries in streamlining potentially redundant and obsolete requirements at policy and legal levels, while maintaining the quality of project delivery that meets with international standards.

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## Industries

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The Industries should provide a clear picture of the long term pathways available to the young generation, such as the channels to improve skills and knowledge to move up the career ladder, or experiences required at different stages to pursue senior posts.

The Industries may also explore the feasibility to digitalise site management as a way to reduce frontline supervision manpower. This may include deployment of field data capture technologies, progress monitoring, compliance checking and inspection as well as site safety management.

Relevant stakeholders should continue the efforts to promote the construction industry, for example, with young engineers and architects visiting primary and secondary schools to deliver message of a promising career prospect. This will help to raise awareness on how it relates to the development of Hong Kong and create a sense of relevance and pride among the younger generation. Again, promotions should target not only to students but also parents for greater public awareness of the promising career paths of the industries.

The Industries should collaborate with the government to develop incentive schemes that will motivate companies to offer job attachment opportunities to interns, or provide internal training to fresh graduates.

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## Education Institutions

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Training institutions should review the current coverage on BIM education and other technologies in their curriculums. There is a pressing need to consider specialised BIM-related streams in the training course meeting the Industries' needs.

Course providers may consider involving Industries partners in identifying specific training needs of technical and supervisory roles. This includes exploring viable training paths to bridge the gaps and upgrade

the skill sets of general workforce to Technical officer grade level.

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## Employers

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Employers should maintain their commitment to organise job fairs and career talks in tertiary institutions in order to promote the Industries image, introduce the diversified career paths relevant to young people and change some long-held perceptions of the construction industries.

Employers should also cultivate a mindset to put people development at a higher priority along with company success. Attracting young entrants by offering clear and promising career development opportunities and internal training; providing alternative work arrangements that allow talents to rotate across the company to gain regional or international exposure should be explored.

Employers should also support students' exposure to field during their institutional training, which contributes directly to a quality talent pool in the long term (e.g. flexible working hours to attend training courses).

For less adequately supported training by external bodies, companies can consider providing brush-up training courses with consultation with course providers of in-services training courses.

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## Graduates and Employees

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For graduates and employees who intend to develop a career in the industries, seminars, job fairs and internships offer valuable opportunities to build a foundation for a successful career and learn about workplace culture. These will assist to minimise any unrealistic expectation about the job and the working environment after on-boarding.

To enhance their marketability in a dynamic Industries, graduates/employees should upgrade their practical skills continuously through skill enhancement courses provided by their employers or external bodies.