

# CITFDIGEST



CITF 建造業  
創科基金

融匯科技 創建香港 WE INNOVATE, WE BUILD

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## 「建造業創新及科技基金」專題研討會 CITF Symposia 2019



創新科技是未來城市建設的重要關鍵。建造業議會(議會)一直透過舉辦不同活動，提升業界對創新建造技術的認識。適逢政府成立十億元「建造業創新及科技基金」一週年，議會在2019年10月和11月舉辦了一系列「建造業創新及科技基金」的專題研討會，包括「建築信息模擬全接觸」、「智慧建築研討會暨基金創科廊開幕禮」和「匯聚·建造創科人才研討會」。

專題研討會旨在匯集建造業的朋友，透過工程項目介紹、產品展示和經驗分享，讓他們可較深入地瞭解創新科技如何能提高生產力、提升建造質量、改善工地安全，並減輕對環境的影響。

在2019年11月5日舉辦的「智慧建築研討會暨基金創科廊開幕禮」是活動亮點之一，共有130多位參加者出席。建造業創新及科技基金管理委員會主席陳志超工程師主持了基金創科廊的開幕禮，並在其歡迎詞中鼓勵參加者勇於採納創新科技。三名成功申請基金的承建商(分別是金門建築有限公司、利基建築有限公司和新世界建築有限公司)也分享了自動化、工業化和數碼化的創新技術怎樣協助他們推展工程項目。研討會結束前，議會亦分享了有關申請基金資助的實用貼士。

專題研討會為業界持份者提供了一個示範作用，不單讓他們能了解創新的建造方法和技術，還可親身試用最新產品，以及與不同範疇的專家交流意見。期待在日後的研討會中見到你！

Innovation and technology are the key to delivering infrastructure of tomorrow. To enable industry stakeholders to better understand the latest construction innovations, the Construction Industry Council (the Council) has been organising industry events from time to time. In commemoration of the first anniversary of the Government's \$1 billion Construction Innovation and Technology Fund (CITF), the Council held a series of thematic sharing sessions under the CITF Symposia 2019 in October and November 2019, comprising the CITF x BIM Gear-up Symposium, the CITF Smart Construction Symposium and Opening Ceremony of CITF Gallery and the CITF Talent Connect Symposium.

The Symposia, through showcasing projects to product demonstrations to experience sharing sessions, have successfully brought the industry together. Participants could gain insights into how conducive the cutting edge technologies and their real-life application are to boosting productivity, uplifting quality, enhancing site safety and mitigating environmental impacts.

One of the highlights is the CITF Smart Construction Symposium and Opening Ceremony of CITF Gallery on 5 November 2019, attended by some 130 participants. Ir CHAN Chi-chiu, Chairman of the Management Committee of CITF, officiated the Opening Ceremony of the CITF Gallery and encouraged participants to embrace innovation in his welcoming remarks. Three successful CITF applicants, namely Gammon Construction Limited, Build King Holdings Limited and New World Construction Company Limited also shared how the advent of automation, industrialisation and digitisation benefited their projects. Practical tips on funding application were also given at the end of the Symposium.

The CITF Symposia 2019 have provided good examples for industry stakeholders to see how innovations and technologies work, acquire hands-on experience of the latest products as well as connect with experts on specific subjects. Look forward to seeing you in future Symposia!



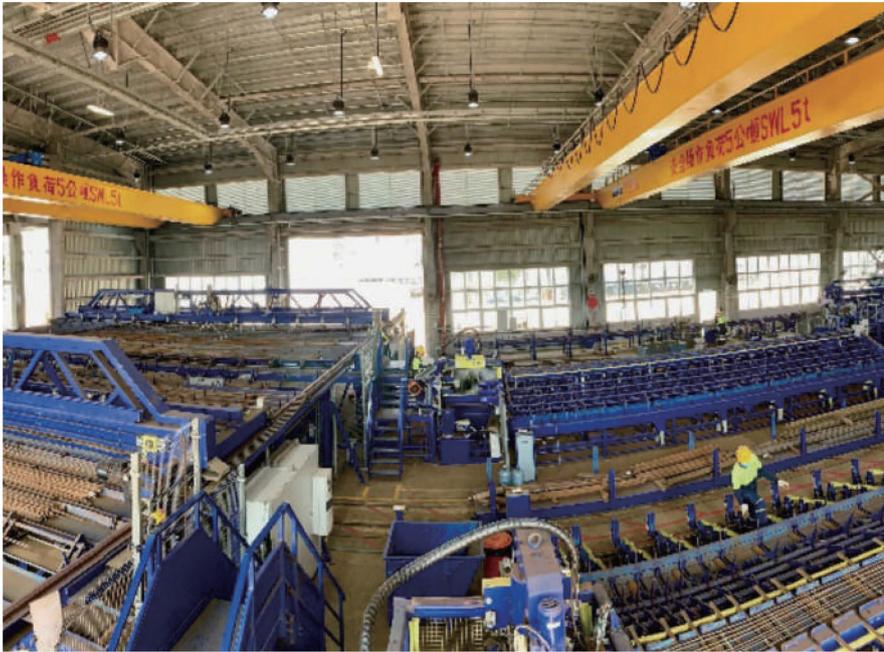
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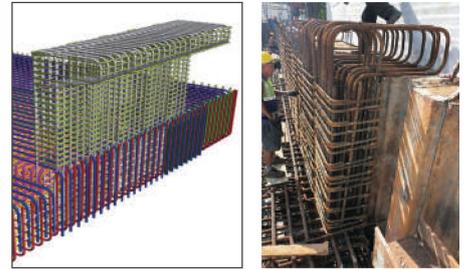
CONSTRUCTION INDUSTRY COUNCIL  
建造業議會

## 採用預製鋼筋組件 提升質量與安全

### Quality and Safety Enhancement through Use of Prefabricated Rebar Products



自動化鋼筋預製工場 Automated rebar prefabrication yard



以建築信息模擬技術配合自動生產預製鋼筋組件  
Automated prefabricated rebar production using  
Building Information Modelling



鋼筋預製工場工序 Rebar processing

你知道嗎？「建造業創新及科技基金」(基金)正為預製鋼筋組件提供每公噸200元的資助。至今，基金已批核三十多個申請，資助金額逾二千萬元。

採用預製鋼筋組件的建造方法能夠提高生產效率、提升建造質量、改善施工安全及減少原材料的耗損。有鑒於此，世界各地的建造業已經廣泛採用高度自動化的工場所生產的預製鋼筋組件。為推廣此技術，政府在2016年首次編訂「認可鋼筋預製工場名冊」。目前，認可工場數目已增加至四間，而所有認可工場均須符合嚴格的技術、品質保證及誠信要求。現時這四間認可工場的總產能足夠供應本港約百分之十五的鋼筋需求。

自基金推出至2019年10月，四間認可工場的產量已經超出2018年總和的一倍有多。這日益增長的需求，反映本地建造業界對使用場外預製鋼筋組件的接納程度，正在不斷地提高。

政府正致力推廣使用場外預製鋼筋組件，並選出22個工務工程項目先行先試，規定項目內七成以上的鋼筋需採用場外預製鋼筋組件。與此同時，政府亦與建造業議會合作，安排相關講座及訓練、制定標準和技術指引，以及探索應用軟件優化工作流程，方便業界採用此技術。

為了進一步推廣此技術，現時基金的資助金額已增加一倍至每公噸200元，每個項目的資助上限更大幅由80萬元增加至300萬元。相信在基金的大力推動下，未來場外預製鋼筋組件會繼續穩步發展。

坐言起行，立刻申請！

Are you aware that the Construction Innovation and Technology Fund (CITF) is subsidising the use of prefabricated rebar products at a grant of \$200 per tonne? Up to now, CITF has approved over 30 applications involving over \$20 million in total!

Prefabricated rebar products, produced by highly automated rebar prefabrication yard, enhances productivity, uplifts built quality, improves construction safety and reduces material wastage. Recognising such benefits, its use has become more and more popular in many countries. With a view to encouraging a wider application of steel rebar products locally, the government set up the List of Approved Steel Reinforcing Bar Prefabrication Yards in 2016. Currently, there are four approved yards. All of them have to operate in strict compliance with stringent technical, quality assurance and probity requirements. At present, these four yards can cater for about 15% of rebar demand for reinforced concrete in Hong Kong.

As of October 2019, the total rebar production from these 4 yards has already been more than double of the annual production in 2018. The demand boom reflects that the local construction industry is getting more receptive to the use of prefabricated rebar products.

The government is keen to promote the use of off-site prefabricated rebar and has selected 22 pilot works projects, of which the contractors are required to apply a minimum of 70% prefabricated rebar products. The government is also collaborating with the Construction Industry Council to arrange relevant seminars and training courses, formulate standards and technical guidelines and explore how to use software to improve the workflow so as to facilitate the adoption of this technology in the industry.

To encourage wider adoption of this technology, the subsidy level from CITF has been doubled to \$200 per tonne with the project ceiling uplifted from \$0.8 million to \$3 million. The strong support of CITF is expected to help accelerate the development of off-site prefabricated rebar products.

**Quick grasp the chance! Apply now!**

## 數碼測量 無可限量

### Surveying beyond Limits - 3D Laser Scanner FARO Focus<sup>s</sup> 350

在建造業，時間就是一切。我們時刻要與時間競賽，爭分奪秒地把工程完成。三維激光掃描儀的面世對於我們行業來說確實是一個喜訊。

#### 運作原理

三維激光掃描技術是一種先進高精度立體掃描技術，通過記錄和分析激光反射的角度和距離，便能測量到物體的尺寸和空間關係。三維激光可在一瞬間掃描位於數百米外的物體，準確地將物體的三維坐標轉化為可以直接處理的數碼數據。

#### 測量好幫手

在建造業創新及科技基金的資助下，我們購置了FARO Focus<sup>s</sup> 350來記錄兩個建築工程項目的工地實況。FARO Focus<sup>s</sup> 350備有350米的掃描範圍和防水防塵功能，是功能強大的測量工具，可以在室外和複雜多變的環境下使用。除了玻璃、水和其他透明材料以外，它可以測量記錄幾乎所有物料數以百萬計的三維坐標點，能夠準確及有效地查看工地的實際情況，尤其適用於一些人手難以觸及的位置。

**與傳統測量相比，FARO Focus<sup>s</sup> 350可提供兩大長處：快速和準確。**

#### 快速

不論工地的尺寸，三維激光掃描儀都能讓我們在短短十多分鐘內完成工地的測量工作。在一個建築工程項目中，我們使用它去測量有蓋行人道結構，由於相關測量數據可再轉換至建築信息模擬模型(BIM)，讓我們更進一步加快工作進度。

#### 準確

藉著尖端的激光技術，FARO Focus<sup>s</sup> 350實地測量的誤差能縮減至一厘米以內。我們在另一個管道工程項目中使用了這項技術，測量埋在地下九米深的800毫米渠管的走線和水平。激光掃描儀的精準度在檢查管道的準確性方面發揮了很大的作用，並節省了大量原本用以進行豎井測量作業的人力資源。

激光掃描儀所帶來的效率和精準度對建造業有莫大裨益。我們預料在基金的推動下，建造業將會更廣泛地應用掃描儀！

新福港(土木)有限公司



三維激光掃描儀在工地的使用情況  
Use of laser scanner on site

“Time is king” – in the construction industry, no one doubts that we are all working against the clock. The emergence of 3D laser scanners is indeed a welcome news for our industry.

#### How it Works

3D laser scanning is a method of high-accuracy mapping that uses laser beams to capture the dimensions and spatial relationships of physical objects. It works by recording angles and distances through analysis of laser light reflections. 3D lasers can scan objects up to several hundred meters in the blink of an eye and output digitised records with a high level of accuracy.

#### How it Helps

With the funding support from CITF, we have deployed FARO Focus<sup>s</sup> 350 in documenting the site conditions in two of our construction projects. The FARO Focus<sup>s</sup> 350, equipped with a 350-meter scanning range and anti-intrusion features, is a powerful surveying tool in outdoor application and challenging conditions. It can record a million points with 3D coordinates of almost all kinds of materials except glass, water and other transparent materials. This allows us to see exactly the actual conditions of the sites, thus helping us to work smarter at locations where access or man-entry is difficult.

**As compared to traditional total station, FARO Focus<sup>s</sup> 350 offers two key benefits: Speedy and Accurate.**

#### Speedy

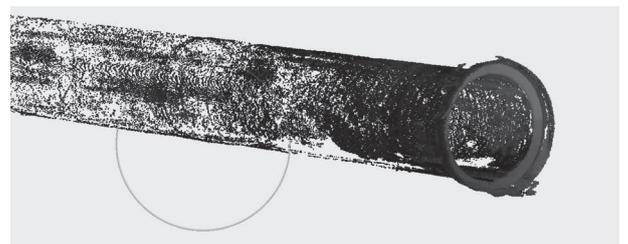
This 3D laser scanner enables us to survey a project site, regardless of its size and height, in just a few minutes. We adopted it in measuring the as-built structure of covered walkway in one of our projects. Its convertibility in BIM model further accelerates the work progress.

#### Accurate

The cutting-edge laser technology makes the on-site measurement of physical objects accurate to within 1cm. We have engaged FARO Focus<sup>s</sup> 350 in another project to measure the as built alignment and level of 800-diameter jacking pipes which were buried 9-meter below ground. The high accuracy of laser scanner gives us a big hand in checking the conformance of pipes and saving much manpower from going down the deep shaft to do the surveying.

The use of laser scanning is instrumental to the construction industry. Given its efficiency and accuracy, we envisage a much wider adoption of the scanners with the boost of CITF!

#### Sun Fook Kong (Civil) Limited



掃描物體 – 地下九米深的喉管  
Scanned object – pipe buried 9-meter below ground

## 矯捷如猴 平滑如絲 Agile as Monkey and Smooth as Silk

牆壁批盪工序滯後？不用擔心，「突破第八代自動批盪機」(TUPO 8批盪機)可以提供協助，追趕進度。這台自動批盪機不單可加快牆身批盪工序，還可由單人操作，其內置作業系統亦能確保牆面批盪平滑均勻，質量穩定，並依據工程要求的批盪厚薄程度自動施工。

我們致力尋求創新和尖端的技術方案，以提高建造質量、安全水平和效率。TUPO 8批盪機於第44屆日內瓦國際發明展中奪得金獎，它不僅將批盪工序自動化，還提高了施工質量，改善工地安全。

### 效率，安全和質量

TUPO 8批盪機是最先進的自動批盪機之一，它每天可以批盪約500至750平方米的牆身，大大超越人手批盪每天約30-60平方米的產量。與傳統的泥水批盪方法相比，此設備除可提高批盪速度之外，還可在更寬闊的牆身上施工，提高生產力之餘，亦同時減少建材的耗費。TUPO 8批盪機能遙控操作，可靈活攀升地面以上5米高的牆身，進行批盪，省卻搭建工作平台的時間，減少高空工作的需要。由於人手批盪的質量難免受工人的技術水平影響而有所參差，自動批盪機的面世，有助整個建造過程可維持平穩的施工水平，令施工程序更具成本效益及更安全！

「突破第八代自動批盪機」已經獲基金列入預先批核名單。請立即行動，向基金申請，體驗TUPO 8批盪機所帶來的效率、質量和安全性。

保華建業

Running late of wall furnishing? Fear not, for TUPO 8 Automatic Wall Plastering Machine (TUPO 8) can help you catch up with the tight schedule. While helping to advance the wall surface works is about the least of its abilities, the automated plastering machine is also a one-man-operated device making perfect alignment, stable wall surface quality and customised plastering options possible.

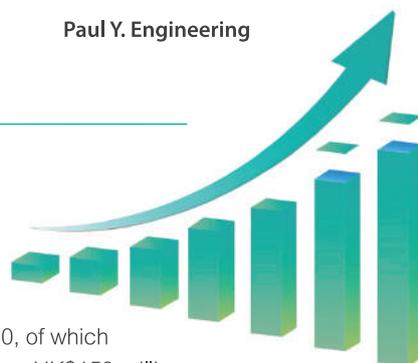
We are dedicated to pursuing innovative and cutting edge technological solutions to enhance efficiency, quality and safety in construction. The TUPO 8 secured a Gold Medal at the 44th International Exhibition of Inventions of Geneva. Not only does this award-winning machine automate wall plastering process, it also enhances work quality and improves site safety.

### Efficiency, Quality & Safety

As one of the most advanced wall plastering machines, TUPO 8 can plaster around 500-750 square metres (sqm) of wall per day vis-à-vis the manual plastering output at around 30-60 sqm per day. On top of its speed, TUPO 8 can work on a wider surface than conventional plastering method while simultaneously increase productivity with reduced material waste. TUPO 8 can be operated remotely and agilely for walls up to a height of 5 metres above ground, saving time in erecting the working platform and reducing the need of working-at-height. With the aid of automated plastering machine, a uniform standard of smooth and stable plastering can be adopted throughout the construction process. The presence of TUPO 8 makes plastering of wall surface less workmanship-dependent, more cost effective, and safer!

TUPO 8 Automatic Wall Plastering Machine is on the CITF pre-approved list. Act now to apply for CITF to yield the benefits of the efficiency, quality and safety of TUPO 8.

Paul Y. Engineering



## 「建造業創新及科技基金」申請數字節節上升 CITF application figure is rising

由2018年10月至今已收到逾一千份申請，當中七百多份申請已經成功獲批，總資助額逾港幣一億五千三百萬元。

Counting from October 2018, the application number has reached more than 1,000, of which over 700 applications have been approved. The funding grant amounts to more than HK\$153 million.



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