



CITF DIGEST

融匯科技 創建香港 WE INNOVATE, WE BUILD

<https://www.citf.cic.hk> CITF 建造業創新及科技基金 [citf.cic.hk](https://www.citf.cic.hk) 二零一九年九月 SEP 2019 / 第一期 ISSUE 1

歡迎辭 | Welcoming Message

創科導航 共建香港

世界正處於第四次工業革命，而建造業須要立刻追趕其他先進行業，多採用創新科技。為了鼓勵建造業更廣泛採用新科技，摒棄固有思維，香港特別行政區政府成立了10億元的建造業創新及科技基金，支援業界走向自動化、工業化和數碼化，從而提升生產力、建造質素、工地安全及環保效益。

「創新」不應限於硬體的應用，人才培訓亦不容忽視。因此，基金除了支援科技應用，亦會資助業界人員參與先進建築科技的相關課程及活動，促進業界和大專學生掌握科技應用的能力。

基金由2018年10月推行至今年8月底，業界的反應非常正面。我們共收到817份申請，其中506份申請已獲批，資助金額總數超過一億港元。受資助的項目包括建築信息模擬技術(BIM)、組裝合成建築法(MiC)、預製鋼筋組件，以及先進建造科技如鐳射掃描技術、物聯網感測器等。我們鼓勵業界繼續踴躍申請基金，使更多工程項目受惠。

預料未來五年，香港每年的建造工程量會增至三千億元，這將大大考驗我們建造業的承載能力。面對建造成本持續高昂、前線人員老化的挑戰，我們一直鼓勵業界跳出以人力為主的運作框架，積極應用創新科技。我們冀望基金的成立可將新思維、新技術帶到建造業，協助行業轉型革新，攀上另一個高峰。

發展局常任秘書長(工務) 林世雄, JP



Build Hong Kong with Innovation and Technology

Amid the sweeping tide of the fourth industrial revolution, the construction sector needs to embrace innovative technologies to catch up with other advanced industries. To encourage a widespread application of new technologies in the construction industry, the Government of the Hong Kong Special Administrative Region has set up a HK\$1 billion Construction Innovation and Technology Fund ("CITF") to help boost productivity, uplift quality, improve site safety and enhance environmental performance via automation, industrialisation and digitisation.

"Innovation" should not be limited to acquisitions of hardware, and talent development is equally important. In addition to supporting technology adoption, CITF will invest in nurturing tertiary students and industry practitioners to attend trainings on innovative construction technologies to better equip and develop our manpower in harnessing technology.

Since the establishment of CITF in October 2018, the fund has been very well received by the industry. Up to August this year, we received a total of 817 applications, of which 506 applications have been approved and the funding grant amounts to more than HK\$100 million. Funded items include Building Information Modelling (BIM), Modular Integrated Construction (MiC), prefabricated steel components, and advanced construction technologies such as laser scanning technology and IoT sensors. We encourage the industry to continue leveraging CITF to benefit more projects.

It is expected that the annual total construction output will increase to more than HK\$300 billion per annum over the next five years, which will greatly stretch the capacity of our construction industry. In the face of the challenges of high construction costs and ageing workforce, we have been encouraging the industry to switch from the labour-intensive operations to actively apply innovative technologies in construction projects. We hope that the establishment of CITF will bring new thinking and new technologies to the construction industry, helping the industry to transform, innovate and reach new heights.

S H LAM, JP
Permanent Secretary for Development (Works)



發展局
Development Bureau



CONSTRUCTION INDUSTRY COUNCIL
建造業議會

申請數字

Application figure

由2018年10月至今已收到800多份申請，500多份申請已經成功獲批。
Counting from October 2018, the application number has reached more than 800 and 500 applications have been approved.

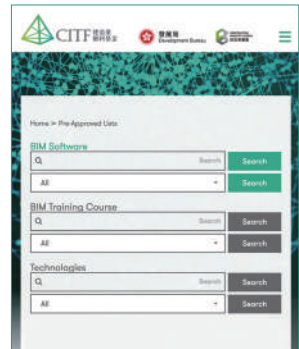


「預先批核名單」大大縮減了審批申請時間

Pre-approved List reduces the time of application vetting significantly

基金申請者可在預先批核名單內300多個項目中，選擇一個或多個建築信息模擬軟件、建築信息模擬培訓課程或科技產品，提交其基金申請。在收妥完整申請資料後，申請「預先批核名單」項目一般於30個曆日內獲通知申請結果；而申請「非預先批核名單」項目則一般於60個曆日內獲通知申請結果。

The Pre-approved List has now included more than 300 items of BIM software, BIM training courses and technologies, among which applicants can submit funding application for one or multiple items. In general, successful applicants will be notified of application result within 30 calendar days for Pre-approved list items and within 60 calendar days for non-Pre-approved List items, both upon receipt of required information.



基金申請三步

Application in 3 easy steps

第1步

商業登記證 (BR)
周年申報表 (NAR1)
銀行月結單 (Bank Statement)

準備好文件開設帳戶
Prepare documents to create an account

第2步

申請類別

I. 建築信息模擬 II. 創新建築科技
III. 組裝合成建築法 IV. 人力發展
V. 預製鋼筋

選擇申請項目
Select type of application

第3步

上傳申請表

按 提交，完成
Press "Submit", then done

基金申請資格

Eligibility for application

繳付徵款的承建商
Construction Levy-paying Contractors

註冊專門行業承造商及註冊分包商
Registered Specialist Trade Contractors and Registered Subcontractors

顧問
Consultants



設於 Megabox 辦事處的「建造業創科基金諮詢站」悉心為有興趣申請者提供一對一諮詢服務。
The CITF Advisory Station at the office in MegaBox provides one-to-one guidance on CITF applications.



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金門建築有限公司
建築助理項目經理郭慧超
Gammon Assistant Project Manager
Cecilia Kwok

推動新時代工程的「新法寶」

Opening "a new door" for implementation of new technology

來得及時

建造業正致力解決包括超支、工期延誤和勞動
力短缺等問題。建造業創新及科技基金(下稱
“基金”)推出得非常及時。

我們最近成功獲基金資助在一個建築項目上
使用Converge混凝土強度傳感器系統。代表
金門建築有限公司申請資助的建築助理項目
經理郭慧超(Cecilia)形容基金是推動新時代
工程的一項「新法寶」。“工程通常很難預留
資金去嘗試新技術，但有了這筆資助，我們
現在可以做到。”Cecilia說。“之前金門幾個
工地都對Converge做了一些小型的測試。
結果顯示，與傳統的壓磚測試相比，每次澆築
混凝土的過程可減省多達一天的時間，從而
可以提早移除模板/工作架，以及進行預
應力鋼筋拉張的過程。生產力因而顯著提高，
對工程項目推進有莫大幫助。”

Converge 混凝土強度傳感器的運作原理

以往，監測混凝土抗壓強度是要到工地先收集混凝土磚樣本，
再把樣本送到實驗室進行測試。此方法既耗費人手，又不能取得
實時數據，效率較低。再者，實驗室的環境與工地現場混凝土
環境有所不同，樣本保存在實驗室攝氏27度的水箱中，而工地
溫度則可高達攝氏40至50度。而且，準備樣本的過程亦難免會
有人為錯誤，所以實驗室結果顯示的混凝土強度與工地現場的
混凝土強度，往往存在誤差。

Converge透過雲端技術監測混凝土的溫度，為業界提供了低成本、
易於使用的方法來監測混凝土強度。該系統由四部分組成(傳感
器、數據傳輸盒、轉發器和網上平台)，傳感器收集的數據可通過
專用的網上平台輸送到雲端，監測各方不但可下載和分析即時
數據，還可隨時從網上提取過往的數據，進行比較，確保質量。
與傳統的混凝土強度測試相比，Converge可讓業界不需再用人手
收集，下載和分析數據，節省了不少施工時間。



Converge 溫度傳感器綁在鋼筋及
嵌入混凝土澆築中，並透過無線數據
傳輸盒將數據傳送到雲端
A wireless node to transmit data from the
Converge temperature sensor tied to the
rebar and to be embedded in concrete



即時混凝土溫度及強度數據可顯示於
任何手提裝置上
Real-time concrete temperature and
strength data accessible by any mobile
device

更廣泛的裨益業界

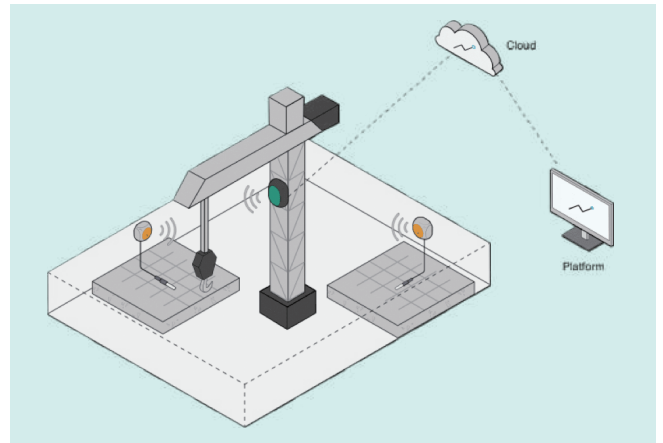
我們希望Converge會更為業界所採用。“當發展商和顧問公司
看到Converge所帶來的效益時，我們很有信心這項科技將會被
業界廣為接納。我們首先要做的便是讓人們知道Converge這種
新技術的好處。”

金門建築有限公司

Concrete Evidence

The CITF comes at a pivotal time, as the construction industry strives to
address issues such as cost and programme overruns coupled with a
shrinking workforce.

With the financial support from CITF, Gammon Construction Limited has
recently implemented the Converge system of concrete strength
sensors in a building project. Gammon Assistant Project Manager Cecilia
Kwok, who initiated the funding application, described the CITF as
opening “a new door”. “It’s often difficult to secure funding for
implementation of new technology. But with this funding, we can now
do it,” said Cecilia. “Test results of the Converge system on other
Gammon sites show that it can save up to one day per pour of concrete
compared with traditional cube monitoring. The time saved enables
earlier removal of formwork/falsework and stressing of prestressed
tendons. This significant improvement in productivity will greatly
benefit the project.”



How the technology works

In the past, we had to collect cube samples and send them to a lab for
testing to monitor the compressive strength of concrete. The inaccura-
cies and lack of real-time data made this method inefficient. The
differences in temperature in standard labs and construction sites -
samples are kept at 27 °C water tanks in the lab while in-situ tempera-
tures can reach up to 40 – 50 °C, combined with inevitable human errors
in sample preparation and compaction, also add to the deviation of
compressive strength test results if compared with that of the in-situ
concrete.

Converge, tapping into the wireless and cloud-based technologies to
monitor real-time concrete temperature, provides a low cost and
user-friendly way to deduce the compressive strength. The system
consists of four parts - sensor, node, hub and platform. With the aid of
cloud technology, real-time data can be analysed and visualised via a
dedicated platform. Accessibility to historical data also makes record
tracking feasible, which facilitates quality assurance. Valuable
man-hours on collecting, downloading and analyzing data can be
saved, leading to significant time saving.

Wider impact

We hope to gain more support for Converge in the future. “We are
confident that there will be wider acceptance of Converge as the clients
and consultants will be convinced by its promising result. And the very
first step is to bring this new technology to their knowledge.”

Gammon Construction Limited

創新科技正在改變行業的運作模式

Innovative technology is changing industry's mode of operation

建造業創新及科技基金鼓勵業內人士利用創新建築方法及科技。這些技術所帶來的好處，如促進生產力和提高效率，正在改革行業的運作模式。而機械人技術正是其中一種建築新技術。

Brokk生產的遙控拆卸機器人是其中之一，它的重量由500公斤(比手持式工具快500-600%)到5噸(擁有相當於25噸重的挖掘機一樣的效能)不等，輕巧結實，便於運輸。

Brokk是世界領先的遙控拆卸機器人製造商。自1976年以來，公司已為建築，水泥，採礦，金屬加工，隧道和核工業工程研發拆除和維修方案。除此之外，Brokk亦為世界各地的特殊拆除項目提供不同種類的解決方案。

安全、高效、多功能和環保

以往，拆卸工作比較倚重人手。遠程控制的Brokk不僅加快了工程進度及生產力，還可以讓操作員遠離危險的區域，避開振動、有害的廢氣和極炎熱的工作環境，提升工作安全。

Brokk拆卸機器人用途廣泛，配備三曲臂結構。全方位的臂展角度和穩定性，有助提高精準度。其電動摩打產生的噪音相對較低，並且不會排出廢氣。

現在Brokk已經獲基金列入預先批核名單。業界可以向CITF申請，在工程項目中使用。

高仕洋行有限公司



The CITF encourages industry players to tap into the strength of construction technologies, which are reshaping the industry's operations with productivity and efficiency gain, among other benefits. One of the construction technological frontiers is the construction robotics.

One of them is the remote-controlled demolition robots produced by Brokk, ranging from the 500kg Brokk (which gets job done 500-600 % faster than with handheld tools) to a five-ton Brokk (as powerful as a 25-ton excavator), still it is surprisingly compact and lightweight, and therefore can be transported easily.

Brokk is the world's leading manufacturer of remote-controlled demolition robots. Since 1976 the company has developed demolition and maintenance solutions for the construction, cement, mining, metal process, tunnel and the nuclear industry, as well as a variety of demolition solutions for special assignments and projects worldwide.

Safe, Efficient, Versatile & Environmentally Friendly

Demolition at works sites used to rely heavily on manual workforce. The remote-controlled Brokk not only brings along quick deployment and high productivity, but also prevents workers from the risks of harmful vibrations, fumes and extremely-hot environment, and enables the operator to control them from a safe distance.

Brokk demolition robots are versatile, equipped with a three-arm system allowing impressive reach and power in all directions, providing maximum precision and accuracy. Its power-packed electric motor only generates low noise and emits no exhausted fumes.

Now that Brokk is on the CITF pre-approved list, industry practitioners can apply to the CITF to engage this demolition robot in construction projects.

C.Crossfield & Co. Ltd

預告UPC MING 2019



28-29/10 建築信息模擬全接觸
CITF x BIM Gear-up Symposium

5-15/11 基金創科廊
CITF Gallery

5/11 智慧建築研討會暨基金創科廊開幕禮
CITF Smart Construction Symposium cum CITF Gallery

15/11 滙聚•建造創科人才研討會
CITF Talent Connect Symposium



17-20/12 2019 建造業創新博覽會
Construction Innovation Expo

請瀏覽基金網站，臉書及Instagram所公佈的最新活動詳情。
For details, please visit CITF website, Facebook and Instagram.