Driving the future of smart construction through innovation and technology

推動創新科技應用　引領智慧建築未來

Adhering to the belief of "Building Homes with Heart", SHKP is committed to developing high-quality properties while continuously innovating to enhance service quality. Under the vertical integration management strategy, the Group's construction division, Sanfield (Management) Limited, has actively pioneered construction research and development over the years, introducing and developing cutting-edge innovative technologies that enhance safety and efficiency, setting a benchmark for smart construction that balances safety, efficiency and sustainability.

- Contribute to the industry by achieving breakthroughs
- Promote automated construction to improve efficiency and quality
- Improve construction safety and reduce accidents
- Boost economic efficiency to create greater value for the Group and society
- Achieve smart site management and spearhead the upgrading and transformation of the industry

Advancing construction technologies to achieve five major goals

As rapid technological advancements reshape various industries, the construction sector faces new challenges. In response, SCIL-Sanfield Construction Innovations Limited and Lighthouse Inno-Lab Limited were established to develop innovative construction technology solutions for achieving five core objectives:

In recent years, Sanfield has achieved continuous success in technological innovation, integrating advanced technologies including the Internet of Things (IoT), artificial intelligence (AI) and big data into its projects. These initiatives have enabled smarter, more convenient and energy-efficient site management, which not only enhances safety and efficiency but also earns recognition from the industry. Sanfield remains committed to collaborating with its industry peers to contribute to transforming Hong Kong into a liveable, smart, and environmentally friendly metropolis.

新地秉持「以心建家」的理念，致力發展優質物業，更不斷創新以提升服務品質。集團旗下建築部門新輝（建築管理）有限公司，多年來配合集團「一條龍」的垂直管理模式，積極開拓建築研發領域，引入和發展創新科技，全面提升建築安全與施工效率，為業界樹立了一個兼顧安全、高效、環保的智慧工地典範。

推動建築創科　實現五大目標

科技急速發展，改變各行各業的生態，建築行業亦迎來不少新挑戰。新輝有見及此，特別成立了新輝建築創科有限公司和Lighthouse Inno-Lab Limited，專門研發建築創新科技解決方案，力求實現五大目標，分別是：

- 突破行業界限，為業界作出貢獻
- 推動自動化建築，提升施工效率與品質
- 提升建築安全，減少工地意外發生
- 提升經濟效益，為集團與社會創造更多價值
- 實現智能工地管理，引領行業升級轉型

近年新輝在創科發展不斷取得成果，多個研發項目引入物聯網（IoT）、人工智能（AI）及大數據等先進技術，並在轄下工地廣泛應用，配合安全而嚴謹的施工系統，實現更智慧、更便捷、更節能的工地管理，提升工地安全和施工效率，成效獲得業界認可。新輝會持續與同業交流和合作，共同為建設香港成為宜居、智慧和環保之都作出貢獻。

Achieving industry breakthroughs: Hong Kong's first smart scaffolding monitoring system, TIE.Ai

突破行業界限　全港首個智能棚架監測系統TIE.Ai

Scaffolding is a critical part of the construction process. But traditional safety inspections rely on manual checks, which are time consuming and labour intensive. Hong Kong's first smart scaffolding monitoring system, TIE.Ai developed by Sanfield Construction Innovations, leverages AI, IoT and precision sensors to enable real-time monitoring, addressing the inefficiencies and delays of traditional manual inspections and significantly improving construction site safety.

TIE.Ai provides real-time monitoring of bamboo, metal and mixed scaffolds, featuring precise tilt detection, tension monitoring, and wall tie tamper-detection sensors. It also comes with a mobile app that provides reports using 3D visualization and Building Information Modelling (BIM). Unaffected by weather or time constraints, the system operates 24/7 and is capable of detecting risks that may go undetected during manual inspections.

TIE.Ai has been piloted at the Group's residential project in Kwu Tung North and has earned recognition from construction professionals, scaffolding experts and trade unions.

棚架是建築工程的重要一環。過往棚架的安全監察倚賴人手巡查，花費不少時間和人力。由新輝建築創科自主研發的全港首個智能棚架監測系統TIE.Ai，結合人工智能、物聯網與精密傳感技術，實時監測棚架，解決傳統人工巡查效率低、隱患發現滯後的缺點，顯著提升工地安全。

TIE.Ai適用於竹棚、金屬棚及混合棚架，透過感應器實時監測並分析棚架的拉猛狀態、傾斜度以及受力狀況，以及透過手機應用程式，提供具備可視化3D模型數據及建築信息模擬（BIM）整合功能的報告，及時作出預警或發出警報。系統不受天氣影響及時間限制，全天候偵測肉眼難以察覺的潛在風險。

TIE.Ai已於集團新界古洞北住宅項目率先試行，獲建造業專業人士、棚架專家及工會的廣泛認可與高度肯定，進一步推動香港建造業在安全創新上持續邁進。

Promoting automated construction: Precast Partition Installation Robot

推動自動化建築　預製板安裝機器人

The Precast Partition Installation Robot, developed by Sanfield Construction Innovation, leverages advanced technologies from different fields to achieve the smart installation of precast concrete panels.

The robot features a specialized robotic arm and gripper system to achieve multi-axis synchronous control, allowing operators to precisely adjust the arm for grasping and positioning panels at complex angles. This makes lifting and installing precast panels safe, efficient and precise. In addition, the robot is equipped with LiDAR and visual recognition systems, enabling real-time scanning of the construction environment and the generation of 3D spatial models. This ensures safe distances from surrounding structures and helps avoid collisions. The robot is also applicable in high-altitude and confined spaces where manual operations are challenging.

The robot not only facilitates the development of automated construction, but also improves the working environment. This helps encourage young talent to join the profession, thereby enhancing sustainability of the industy.

新輝建築創科自主研發「預製板安裝機器人」，融合多個領域的創新技術，實現了建築施工中預製混凝土板的智慧化安裝。

該機器人核心設計在於特殊的機械臂及抓手系統，實現多軸同步控制。操作員可準確調節機械手臂姿態，完成複雜角度的板材抓取與定位，讓提舉及安裝預製板的工序變得安全、高效及精準。此外，機器人配備光學雷達與視覺辨識系統，能即時掃描施工環境並產生三維空間模型，確保作業過程中與周邊結構保持安全距離，避免碰撞風險，更可應用在高空、狹窄空間等人工難以操作的場景。

該機器人不僅推動自動化建築發展，而且有助改善工作環境，對吸引更多年輕人入行、提升行業的可持續性亦有所幫助。

The Precast Partition Installation Robot wins a merit award at the Construction Robot Competition and Exhibition
預製板安裝機器人在建築機械人比賽暨展覽中榮獲優異獎

Enhancing operational safety: Unmanned Tower Crane System
提升作業安全　遙控智能天秤系統

AI-powered hook monitoring camera
AI驅動吊運監控鏡頭

Provides clear images of lifting zone, identifies ground workers and automatically generates virtual danger zones
提供清晰的吊運區影像，識別地面工作人員，並自動生成危險區域

AI Lift Smart Hook
AI Lift智能吊鈎

Utilizes LiDAR and high-precision positioning to detect the contours of lifted objects and monitor their height above ground; Triggers audible and visual warnings to alert ground workers
利用激光雷達和高精度定位，識別吊運重物輪廓及偵測離地高度，並配備聲光警示地面工作人員

Lighthouse Inno-Lab has developed its flagship product—the Unmanned Tower Crane (UMTC) System—transforming traditional on-site crane operations by enabling remote and smart control. The system provides operators with optimal lifting routes and precise lifting angles, significantly improving operational efficiency.

The most advanced component in the entire system is the “AI Lift” Tower Crane Lifting Monitoring System. Integrating an AI-powered hook-monitoring camera, smart hooks and a cabin monitor, AI Lift delivers automated pre-emptive warnings, accurate hazardous zone detection and timely notifications. When personnel are detected within the hoisting zone during lifting operations, AI Lift triggers audible and visual warnings. Operators in the cabin can view ground conditions and receive warnings via the monitor, effectively preventing accidents.

The UMTC system shone at the inaugural Construction Robot Competition and Exhibition organized by the Construction Industry Council, winning a Champion of Innovation award. In addition, as an approved solution under the Construction Innovation and Technology Fund, AI Lift has enabled numerous project sites to secure the Safe Smart Site System (4S) Label, raising the bar for safety and operational excellence in tower crane lifting.

Cabin Monitor
駕艙螢幕

Enables operators to clearly view the lifting area and receive warnings
駕艙配置螢幕，操作人員可清晰看見吊運區情況，並收到警示

由Lighthouse Inno-Lab自主研發的旗艦產品 — 遙控智能天秤系統，將傳統的天秤現場駕駛轉為遙距智能操控，為操作員提供最佳吊運路線建議及精準吊運角度控制功能，大大提升工作效益。

整套系統中，以「AI Lift」智能吊鈎部分發展最為成熟。AI Lift透過整合AI驅動吊運監控鏡頭、智能吊鈎及駕艙螢幕，提供自動預警、危險區域偵測及多重警報功能。起吊重物時當有人處於吊運區內，智能吊鈎會產生聲光警示，駕艙內的操作人員亦能透過螢幕上看見地面狀況及收到警示，有效預防吊運期間的人為意外。

遙控智能天秤系統在建築業議會舉辦的「建築機械人比賽暨展覽」中脫穎而出，榮獲「創新之星」大獎。此外，AI Lift獲建造業創科基金納入預先批核名單項目，成功協助多個工地取得安全智慧工地系統(4S)標籤，顯著提升吊運作業安全。

Boosting economic efficiency: temporary steel structure aerial work platform
提升經濟效益　臨時鋼結構高空工作台

Exceptional high-altitude construction capabilities are essential for creating a vibrant city skyline. During the construction of the Group's residential project Cullinan Sky in the city centre of Kai Tak, the construction team was required to build work platforms to support the building of residential units on higher floors, sky gardens and refuge floors. The platforms were suspended above lower-floor units at a height of approximately 28 storeys and in between five buildings. Traditional methods for constructing these platforms were time-consuming and costly, often offering limited support for subsequent exterior wall construction. Moreover, they posed safety risks for personnel working at height.

In light of these challenges, Sanfield adopted a safer, more efficient and practical "temporary steel structure aerial work platform". To set up this platform, the team utilised a precise lifting system to hoist large, pre-fabricated steel components to the designated floors. The system featured a segmented cantilever beam design, facilitating installation and safe dismantling in confined high-altitude spaces. This solution saved a significant amount of time and costs, reduced the risks associated with high-altitude operations, and facilitated subsequent exterior wall installations, achieving a win-win outcome in terms of both technical and cost benefits.

要築起繁華的天際線，建築團隊需要擁有高水平的高空施工能力。新輝在興建啟德城中心住宅項目天璽．天的過程中，為了建造高層住宅單位、空中花園及避難層，團隊需在約28層樓的高處、五座樓宇的夾縫之間建造工作台。惟傳統方法不僅耗時兼成本高，難以配合建造後續外牆工程的需要，工友在高空作業時更存在安全風險。

為克服這些挑戰，新輝引入更安全、高效且實用性強的「臨時鋼結構高空工作台」。團隊利用精密的吊升系統，將預製的大型鋼結構組件吊運至指定樓層，並採用有利於高空狹窄空間作業的分段式懸臂樑設計，方便在高空進行安裝與後續安全拆除。這方案節省了大量時間與成本，降低了高空作業的風險，為後續外牆飾面安裝提供便利，展現了技術與經濟效益上的雙贏。

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Achieving smart site management: Advanced Confined Space Safety Monitoring System
實現智能工地管理　全功能密閉空間無線監測系統

Confined space operations have long been considered high-risk endeavours. Sanfield Construction Innovation developed the "SCIL CS900", an advanced confined space safety monitoring system, which leverages long-range (LoRa) technology and wireless networks to achieve real-time monitoring and emergency response in confined spaces. The SCIL CS900 system includes a portable station, a gas monitor, a high-definition camera and a smart watch. It is capable of detecting six gases and monitoring temperature, humidity, PM2.5, wind speed and water level. This allows workers inside and outside confined spaces to access gas data and live footage in real time. In an emergency, workers can trigger an audible and visual alarm with a single click and send instant notifications via WhatsApp, enhancing safety during confined space operations.

密閉空間作業長期以來被視為高風險工作。新輝建築創科研發全功能密閉空間無線監測系統「SCIL CS900」，利用遠程（LoRa）技術和無線網絡，實現密閉空間的實時監控與應急響應。SCIL CS900系統包括便攜機站、氣體監測儀、高清鏡頭與智能手錶，支持檢測六種氣體，並能監控溫度、濕度、PM2.5、風速和水位，讓在密閉空間內外的工人均可隨時查看氣體數據與現場影片。在緊急情況下，工人可一鍵觸發聲光警報，並通過WhatsApp立即發送通知，加強對密閉空間作業工人的安全保障。