

Webinar

Fatal Zone Management and Control Measures

People-Plant Interface (PPI)
&
Fatal Zone Management
by
Client-Contractor Collaboration

人機分隔及致命地帶管理
業主及承建商
雙管齊下

Mr. Vincent KWOK

Manager, Safety

Airport Authority Hong Kong

Mr. Matthew LAU

Project Manager

BUCG-CCCL Joint Venture



About Three-runway System





Three-runway System



Third Runway Passenger Building and 57 parking positions

Floor area: 283,000 sq m

Building a new passenger building with more than 280,000 square metres of floor area, a total of 57 new parking positions (frontal: 34, remote: 23) and an apron. When completed, there will be 173 passenger aircraft parking positions (frontal: 112, remote: 61) at HKIA.



New Automated People Mover system

Top speed: 80 km/h

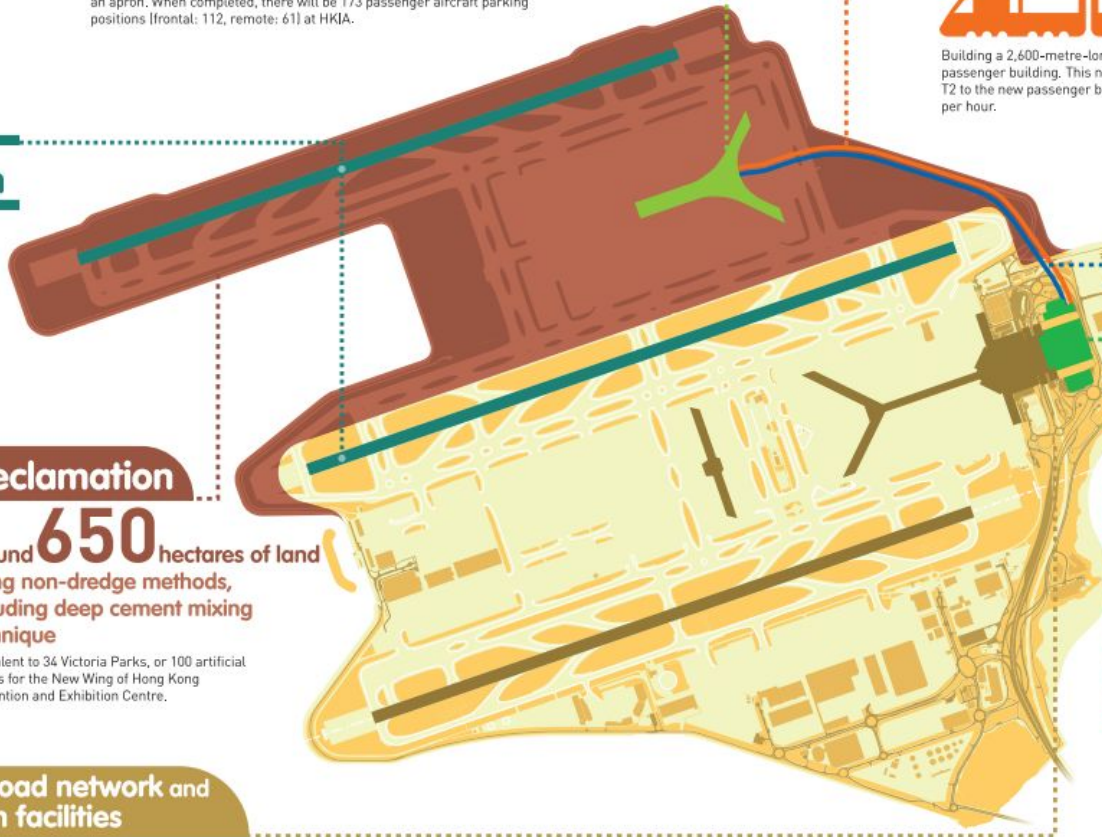


Building a 2,600-metre-long new APM system connecting T2 with the new passenger building. This new APM system takes 2.5 minutes to travel from T2 to the new passenger building. It can transport up to 10,800 passengers per hour.

New runway

← 3,800m

Building a 3,800-metre-long new runway and its supporting taxiway systems. The existing north runway will also be reconfigured.



New Baggage Handling System



Baggage transport speed: 7-10 m/sec



Building a new baggage handling system linking T2 with the new passenger building.



Reclamation

Around 650 hectares of land
Using non-dredge methods, including deep cement mixing technique

Equivalent to 34 Victoria Parks, or 100 artificial islands for the New Wing of Hong Kong Convention and Exhibition Centre.

Comprehensive road network and transportation facilities



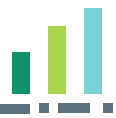
Expansion of Terminal 2



Providing arrivals, departures and full-fledged passenger services

The expanded T2 and new passenger building will be able to serve 30 million additional passengers annually as stated in the HKIA Master Plan 2030.





[Video Link](#)





Project 3408 – Third Runway Concourse and Apron Works



Project scope of works:

- Third Runway Concourse (T2C) complete with vent shaft blocks, fixed link bridges and aircraft loading bridges;
- 36 fully serviced aircraft frontal stands, 21 fully serviced remote stands, 6 un-serviced remote stands and associated taxilanes and apron areas;
- Two cross-field taxiways east of the T2C;
- Ancillary Buildings;
- Specified sections of the Eastern Vehicular Tunnel (EVT) structure
- Associated infrastructure works

[Video Link](#)





Fatal Incident related to PPI & Fatal Zone



冒雨施工 乖仔命喪

一名廿五歲的燒焊男工人，冒雨在進行打樁工程的校舍擴建地盤工作時，不幸被一部挖泥機意外重擊胸口，當場吐血重傷昏迷，送院搶救近三小時後不治。

9 May 2014

地盤雜工遭吊臂機夾死

一名男工人在一地盤工作期間，意外遭一部流動式吊臂起重機夾到，他被夾困於起重機尾部與圍欄之間，頓時動彈不得，工友見狀大驚報警。

13 Jan 2020

水泥廠電工 捲田螺車底 亡

中年男電工午膳後步行返回油塘的水泥廠開工，期間一輛田螺車駛入廠房，意外把他撞倒並捲入車底。

14 Dec 2022

Tai Po
(Construction Site)

Airport Island
(Traffic Road)

Kai Tak
(Construction Site)

Tuen Mun
(Construction Site)

Quarry Bay
(Construction Site)

Yau Tong
(Batching Plant)

9 Dec 2013

21 Jan 2019

14 Apr 2021

天降噸重鋼管 燒焊工爆頭亡

地盤焊工進行燒焊工作時，一條逾噸重的米長巨型鋼管，在吊運途中突然下墜，他冷不防鋼管從天而降，頭部被直接擊中，當場爆頭慘死。

機場航天城洗街車輾斃女工

一名地盤女雜工，於赤鱗角機場一間興建中的酒店地盤外，遭一輛倒車中的洗街車撞倒並捲入車底，頭部遭車輾輾過重創，消防趕至現場把她救出，惜女事主已返魂乏術。

吊臂車甩鏈 3.6噸鐵板飛墜 砸斃地盤工

工人操作吊臂貨車吊運5塊共重近3.6噸的巨型鐵板時，用以網繫的鐵鏈突然鬆脫，鐵板猶如泰山壓頂飛散而落，砸中一名男工人，他連同鐵板翻跌落車，趴臥地面奄奄一息，送院證實傷重不治。



三跑人機

要分ZONE

PPI VBear in Mind



家庭安全三跑道「我們承諾」做得到
VCommit Happy Family Happy Safety



Airport Authority Hong Kong Third Runway Division (TRD)



Safety Particular Specification



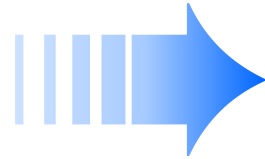
TRD Safety Particular Specification



AIRPORT AUTHORITY
HONG KONG

**GENERAL
SPECIFICATION**

Issue 9
(July 2016)



Appendix H2 Particular Specification – Health and Safety
Contract xxxx

APPENDIX H2

**PARTICULAR
SPECIFICATION**

HEALTH and SAFETY

CONTRACT xxxx

(April 2019)

Appendix H2 (20200630) Page 1 of 120

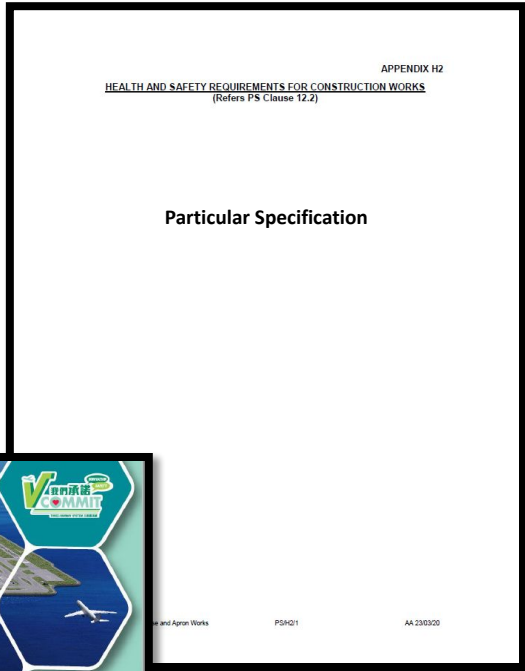
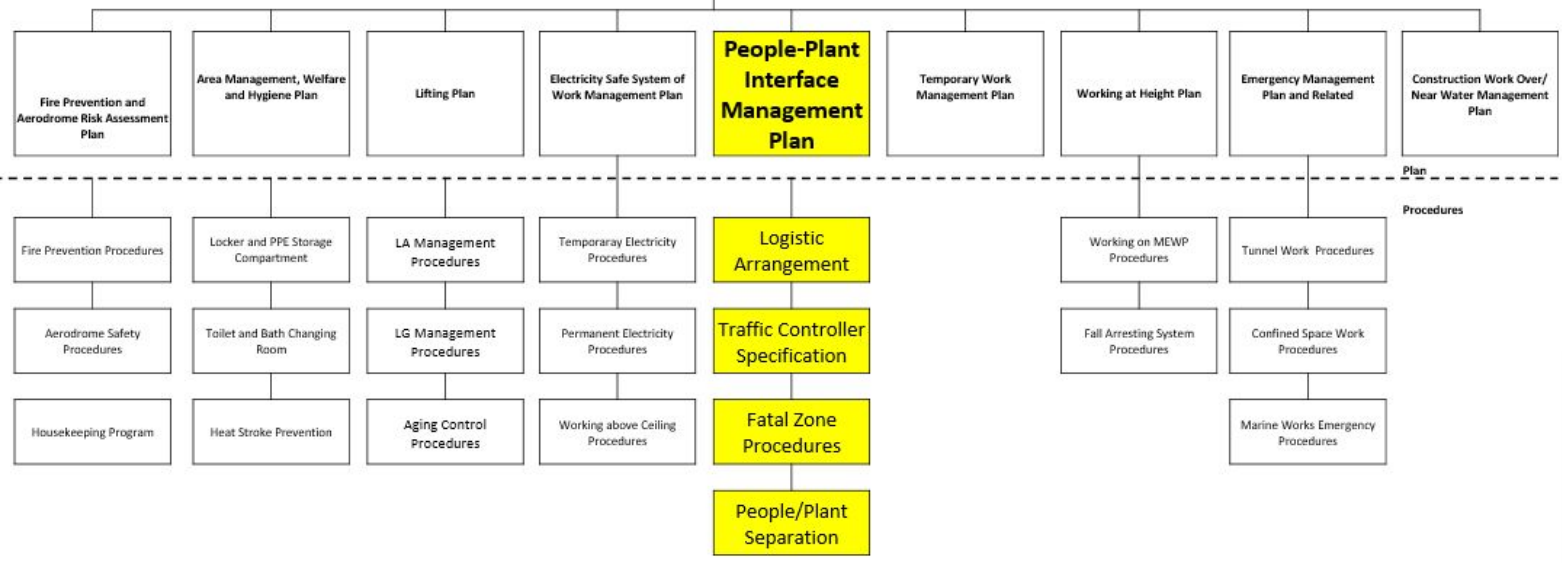
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同航
Same Boat Same Goal

TRD Safety Management Manual Hierarchy

Project Health and Safety Management Manual



Hierarchy

Project Health and Safety Management Manual

Plan E

People-Plant Interface Management Plan

P.S. Requirements

PS Briefing Pack (PPI)

Client to explain the contract requirement and expectation to Contractor's key personnel



People - Plant - Interface Management (1.14.1.1)

1.14.1.1.1 Risk assessment on People-Plant-Interface within the site

ID No.	Market Segment	Rating of Public Interface	Risk Level	Recommended Control measures	Required training and PPE	Action by	Residual Risk
0001	Public	High	High	Public presence of the site should be minimized. All site workers should be instructed to control the health and safety of the public. All site workers should be instructed to control the health and safety of the public. All site workers should be instructed to control the health and safety of the public.	Site Safety Officer	Site Safety Officer	High
0002	Public	Medium	Medium	Public presence of the site should be minimized. All site workers should be instructed to control the health and safety of the public. All site workers should be instructed to control the health and safety of the public. All site workers should be instructed to control the health and safety of the public.	Site Safety Officer	Site Safety Officer	Medium

People - Plant - Interface Management (1.14.1.1)

1.14.1.1.2 The exits and entrances to public roadways/walkways should be well planned to minimize potential hazards and any inconvenience to both public and workers.

People - Plant - Interface Management (1.14.1.1)

1.14.1.1.6 Areas with slewing plants and risk of falling objects are identified as Fatal Zones which should be demarcated with red and continuous barriers to alert nearby workers. For congested area that workers will be posed imminent risk of entrapment, interlocking barriers are required. No person, including Traffic Controller, shall be allowed to enter a Fatal Zone during plant operation.

1.14.1.1 People – Plant – Interface Management

1.14.1.1.1 The Contractor shall prepare a People-Plant-Interface Plan and submit to the Project Manager for review without objection. *People-Plant-Interface Plan*

The People-Plant-Interface plan shall include but not be limited to:

- Risk assessment on People-Plant-Interface within the site
- Updated Site Layout Plan showing:
 - Planned pedestrian and vehicle traffic routes
 - Crossing points
 - Locations where Traffic Controller are required
 - Fixed mirrors
- Reversing vehicles management
- Plant-People segregation arrangement

Modes of communication between drivers or operators and Traffic Controller

The People-Plant-Interface plan shall be updated on monthly basis and submitted to Project Manager for review without objection.

1.14.1.1.2 The exits and entrances to public roadways/walkways should be well planned to minimize potential hazards and any inconvenience to both public and workers. *Entrances and Exits*

1.14.1.1.3 Pedestrian walkways shall be non-slippery and free from obstructions. Acceptable surfaces include: *Ground Conditions of Walkway*

- Concrete / cement
- Planking / pallets
- Rock fillings
- Other types of surfaces shall be submitted to Project Manager for review without objection.

The minimal width of walkway is 650mm. *Width of Walkway*

Safe access with secure handrails shall be provided to different levels; step ladders/ stairs shall be provided whenever practicable. *Access to different levels*



Project 3408 Planning & Standardization





Project 3408 (EVT) Site Logistic Plan



EVT 工地佈局圖 LAYOUT PLAN



Beijing Urban Construction Group Company Limited & Chevalier (Construction) Company Limited Joint Venture (BCJV)

Three Runway System Project - C3408 Third Runway Concourse and Apron Work

People-Plant Interface Management Plan (EVT) Nov 2021

Issue No.:	C	Revision No.:	C	Effective Date:	03 rd Nov 2021
Prepared By:		Endorsed By:		Approved By:	
	Mr. Kay Cheung Registered Safety Officer		Mr. Jimmy Ng Safety Manager		Mr. Du Feng Project Director

Weekly Site Logistic Review Meeting



Submitted to TRD for Review and Consent



香港機場標準化手冊 3408 項目安全及環保圖集

合約編號：3408 香港國際機場三跑道客運大樓和站坪工程



Plant Safety Devices

北約編號：3408 香港國際機場三跑道客運大樓和站坪工程

安全設施 ☆★



※ 警示尾燈不少於 600 毫米

北約編號：3408 香港國際機場三跑道客運大樓和站坪工程

在操作期間和操作後處理工廠和人員 ☆★

※ 操作期間



- ※ 用柵欄隔開，以防止其他人士（包括交通管理員）進入工作區域。
- ※ 應指派一名曾接受足夠訓練的交通管理員。
- ※ 控制移動機械的運行。

※ 操作後



- ※ 無人值守的負荷轉移機械，鎖匙不能留在表面。



6.1.8 Crossing Point

- Crossing point should be display on the Site Layout Plan
- Crossing point should be mark on the road
- Pushing door to the walkway
- Pull door to the roadway

Pedestrian Crossing Point

北京城建-其士聯盟 合約編號: 3408 香港國際機場三跑道客運大樓和站坪工程

交通督導員 ☆☆

- ※ 被指派控制移動機械的運作。
- ※ 每個致命區域至少部署一個。

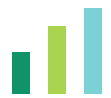
※ 指揮棒

強制裝備

- ※ 穿一件容易識別的反光背心。
- ※ 上面用中英文寫著“交通督導員”。
- ※ LED 指揮棒和哨子 (電子哨子優先)

Uniform and Equipment for Traffic Controller





Specific Training & Assessment

Contract 3408
Third Runway Concourse and Apron Works
Specific Safety Training Course
Traffic Controller

專項安全培訓
交通督導員

Safety Hints 安全要點

Traffic Controller (Slewing Plant) PPE
交通督導員裝備

- 1 Walkie-Talkie 對講機
- 2 Orange Helmet 橙色安全帽
Orange Reflective Vest with Silver Band with Bilingual "Traffic Controller" Wording 橙底銀間反光衣 並貼上 "交通督導員" 字句
- 3 Whistle 哨子
- 4 Baton 指揮棒

Align Hand Signal of Traffic Controller





Project 3408 On-Site Implementation





Site Traffic Control

Haul Road & Pedestrian Access Separation

Speed Limit Sign with solar light lamp

Pedestrian Crossing Gate

Warning Banner





People-Plant Control

Separation of Heavy Plant & Excavation Zone



Designated Traffic Controller





Plant Fatal Zone

Red Barrier for Fatal Zone Identification



Safe and Convenient Man Access



Eye Catching Warning Banner





Lifting Fatal Zone

Fatal Zone and Lookout Man for Plant Movement



Rigger T-stick to practice "Hands Off"



3-3-3
Safe Lifting Practice



TRD VCommit Safety Incentive Scheme



TRD VCommit Safety Incentive Scheme

- ✓ Explore local and international innovative safety technology
- ✓ Direct connection with suppliers with factory visit
- ✓ Provide platform for pilot scheme in 3RS projects and fully subsidized by TRD
- ✓ Act as supporting organization of suppliers when applying CITF pre-approved products
- ✓ Top-up subsidizing sub-contractors and contractors to **COST FREE**
- ✓ Review performance of the innovative devices and feedback to the suppliers
- ✓ **Till Jan 2023 : 8 Innovation on the Incentive list**



VCommit Safety Incentive Scheme



AI 360 Degree Camera



鷹網智能監測系統資助計劃 360 DEGREE CAMERA INCENTIVE SCHEME

Save them from fatal zone
消除致命地帶的危害



CITF Item codes PA20-073 I-Vision Smart Monitoring System 5.0



主要功能
MAJOR FUNCTION

- 獨特的AI人體檢測技術
Unique AI human-detection technology
- 利用雷達偵測周遭障礙物
Obstacle detection by Radar technology
- 提供360度組合閉路電視視圖
Provide a 360 degree combined CCTV view
- 通過警報識別裝置附近的移動物體
Recognize moving object with alert alarm
- 從1米到2米的距離檢查所有角度
All Angle Distance Checking From 1m to 2m
- 相機捕捉低光照條件：0.3 LUX
Capture low light condition at 0.3 Lux

費用全免

100% FREE

資助條件...

AS LONG AS...
安裝系統後於三跑地盤使用最少六個月
MIN. 6-MONTH USAGE IN TRD AFTER INSTALLATION



適合挖泥機、履帶式起重機、壓實機、推土機
及輪胎式液壓伸縮吊臂起重機
FOR EXCAVATOR, CRAWLER CRANE, CRAWLER LOADER,
ROLLER AND WHEELED TELESCOPIC MOBILE CRANE

80% CITF



20% TRD



FOR BOTH CONTRACTORS AND SUBCONTRACTORS

掃描二維碼了解詳情
SCAN QR CODE FOR MORE

VCommit WhatsApp: 6377 8310

VCommit Email: TRDVCommit@hkaiport.com

家庭安全 三跑道 「我們承諾，做得到」
VCommit • Happy Family • Happy Safety



20%



CITF
建造業創科基金

CITF Pre-approved Product

80%

Applied to Excavator and Mobile Crane



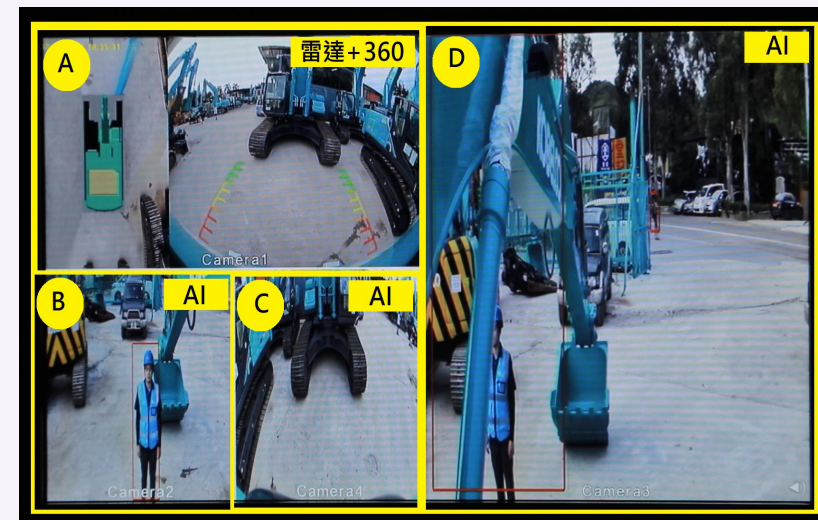
Radar Obstacle

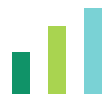


AI Human



Superimpose Imaging Technology (4 cameras into 1 image)





Blok Cam Monitoring System

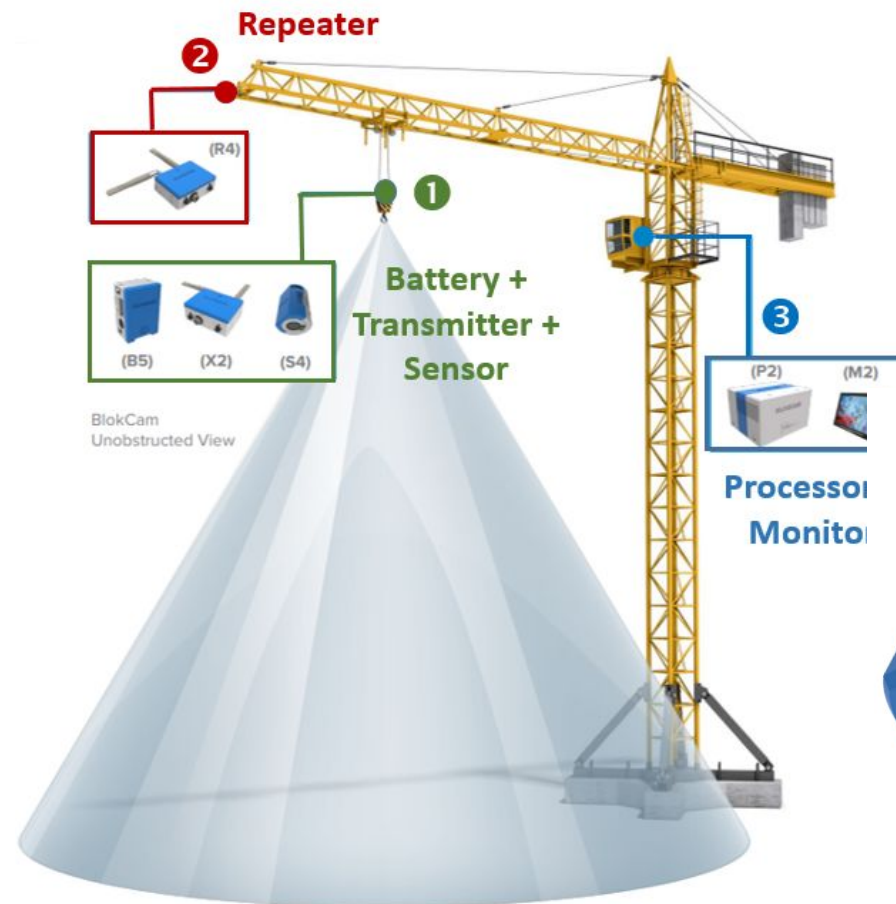


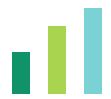
TRD 100% subsidized for some pilot projects

Acts as supporting organisation for CITF pre-approved product

What is Blok Cam?

- ✓ Wireless camera system
- ✓ Transmit video and sound to the screen of Operator's Cabin
- ✓ Allow operator see and hear the load and surroundings
- ✓ Reduce the "Blind Lift" especially in the level difference situation
- ✓ Divided into 2 types:
 1. X2 Camera System (for Tower Cranes)
 2. M3 Camera System (for Mobile Cranes)





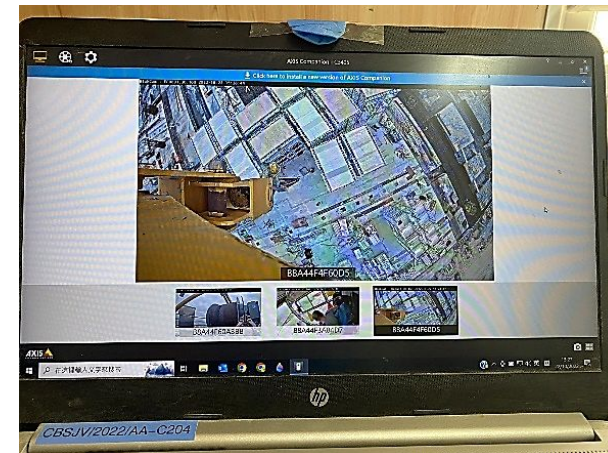
Blok Cam Monitoring System



Blok Cam Installation at 3RS worksite



Screen inside tower crane operator's Cabin



Screen at Contractor's Office



30%



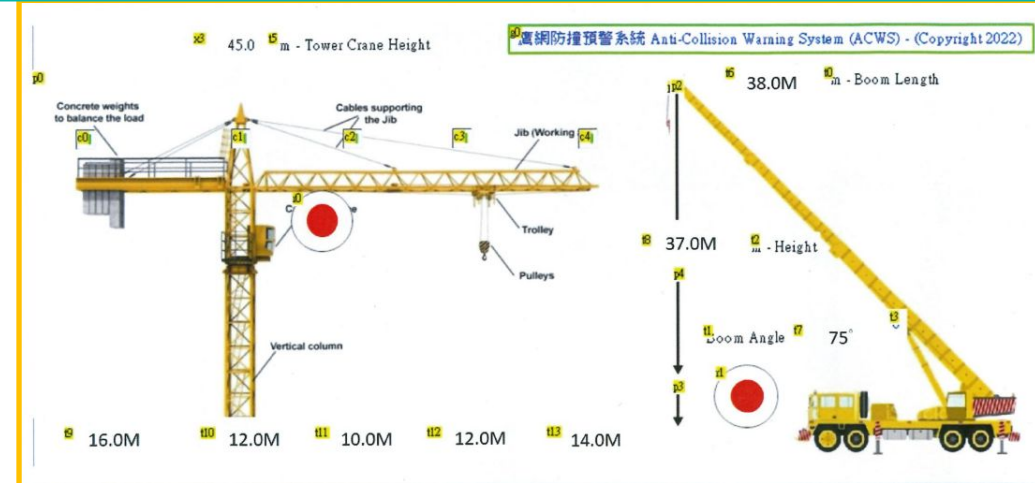
70%

Anti-Collision (Tower Crane/Mobile Crane)



Anti-Collision System Between Tower Crane and Mobile Crane

- ✓ Proactive anti-collision alert to crane operators
- ✓ Use 4G LoRa Gateway thus do not require mobile network
- ✓ 3D Coordinate Accuracy ~20cm, much better than GPS
- ✓ Able to connect to unlimited number of cranes
- ✓ SMS alert to designated numbers
- ✓ IP67 Rating for outdoor application
- ✓ TRD fully subsidized for some pilot projects





Project 3408 Implementation of Innovative Technology





360 Camera for Moving Plants



- 3D bird's eye view through AI 360° camera installed around the plant
- AI function to distinguish moving object and stationery object to reduce nuisance alarm
- Advance alert to operator for moving object enter the fatal zone
- 11 plants installed and good feedback from operators
- More to be installed for Excavators, Crawler cranes and Bulldozers
- **Zero cost from subcontractor (CITF 80% and TRD 20% subsidize)**



New Air Traffic Control Tower (NAT)
Tallest building of 3RS Projects

- 3408 enrolled as Pilot Project for Blok Cam Wireless Camera
- **TRD Approved and fully subsidized**
- Installed at Tower Crane at NAT
- Operator's Cabin is ~100m from the ground
- Blok Cam install at Lifting hook
- Installation and Testing in progress
- Target to roll out in Feb 2023

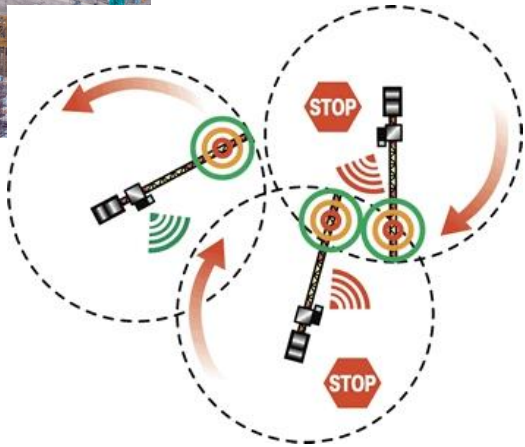
Expectation

- ✓ Operator get better views of loading point
- ✓ Avoid Blind Spot during lifting
- ✓ Enhance communication between lifting team



Anti-collision System for Tower Crane

Anti-collision System (Tower Cranes) LD Code of Practice requirements



COP Requirement to prevent cranes from collision via computerized signals between Tower Cranes

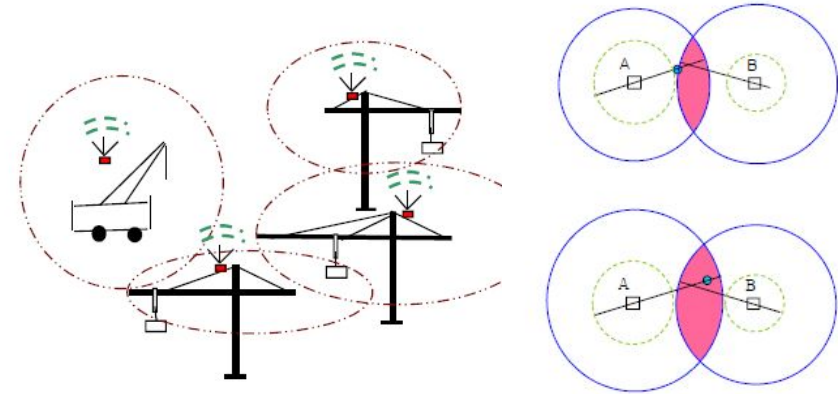
Anti-collision (Tower Cranes/Mobile Cranes) 3408 Innovation

移动式吊车设置						
基站	X	Y	GPS模式	使能 <input checked="" type="checkbox"/>	经度	纬度
1	0.00	0.00			103.00099915	30.00099915
2	385.58	0.00			103.00499725	30.00099945
3	0.00	445.24			103.00099945	30.00499916

基站	X	Y	UWB模式	使能 <input checked="" type="checkbox"/>	经度: 103.00299835
1	0.00	0.00			纬度: 103.00299835
2	385.58	0.00			X: 192.79
3	0.00	445.24			Y: 222.62



Design
In Progress



- ✓ Real-time monitoring cranes' moving parts
- ✓ Slow down the Tower Crane
- ✓ Alert crane operator
- ✓ Fully Supported by Tower Crane supplier



TRD Internal Safety Assurance System

VCommit Independent Safety Assessment (VISA)



Deep Dive
Focus on Real Guy
and System Compliance



Objective of VISA



Concern from the LD

01

Echo Labour Department recommendation for Independent Safety Assessment of Contractors' SMS

Focused Area

02

Not a general assessment, assess the weak point of the contractors' safety management system

Assure System Effectiveness

03

Conform to Legal & Contractual Safety Requirements and Best Practices

Evaluation

04

Reliability, Effectiveness & Efficiency for Contractors' Safety Management System

Pay For Safety

05

One of the Assessment Tools for Pay for Safety Scheme for contracts under New PS Safety.

No Score

Traffic Light Rating System



- 14 days Pre-assessment
- +
- 1 day Assessment
- Day end PPT Key Findings
- + Formal Report in 5 days
- Appeal System

Improvement plan to submit within 7 days


- TRD PM to Close out Report (**RED** to close out by Director)

VISA Activity in One Day (AM Session)

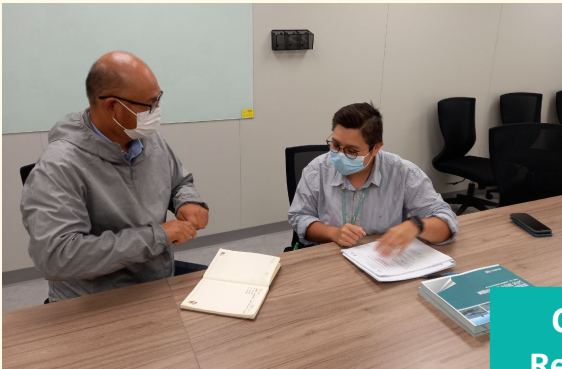
Activity	Participants
Opening Meeting	Contractor's Representative (CR), Operation In-Charge (OIC), Approved Safety Personnel (ASP)
Management Staff Interview	ASP, OIC and related staff (if required)
Document Examination	ASP, OIC and related staff (if required)
Lunch	Auditors go back office for lunch
On Site Assessment and Key Person Interview	OIC, ASP
Document verification	ASP
Preparation of Closing Meeting	--
Closing Meeting	CR, OIC, ASP



Management Staff Interview and Document Examination





Project In-charge



Contractor's Representative

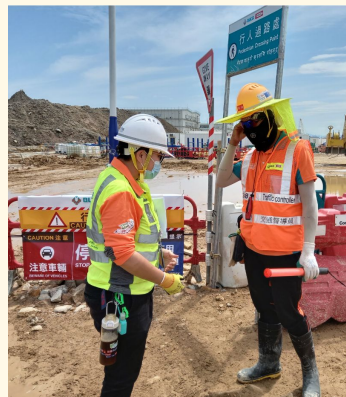
VISA Activity in One Day (PM Session)

Activity	Participants
 Opening Meeting	Contractor's Representative (CR), Operation In-Charge (OIC), Approved Safety Personnel (ASP)
Management Staff Interview	ASP, OIC and related staff (if required)
Document Examination	ASP, OIC and related staff (if required)
Lunch	Auditors go back office for lunch
On Site Assessment and Key Person Interview	OIC, ASP
Document verification	ASP
Preparation of Closing Meeting	--
 Closing Meeting	CR, OIC, ASP

On Site Assessment & Document Verification



Key Person Interview





VISA Activity in One Day (Closing)

Activity	Participants
Opening Meeting	Contractor's Representative (CR), Operation In-Charge (OIC), Approved Safety Personnel (ASP)
Management Staff Interview	ASP, OIC and related staff (if required)
Document Examination	ASP, OIC and related staff (if required)
Lunch	Auditors go back office for lunch
On Site Assessment and Key Person Interview	OIC, ASP
Document verification	ASP
Preparation of Closing Meeting	--
Closing Meeting	CR, OIC, ASP

Closing Meeting Presentation

VCommit Independent Safety Assessment (VISA)

Contract: 3408
BUCG-CCCL Joint Venture
Third Runway Concourse and Apron Works

Focused Area:
People-Plant Interface and Excavation

Lead Assessor: Kennis HO
Assessor: Mark CHAN

Assessment Date: 18 May 2022

Closing Meeting

Prepare within 1 Hour



Closing Meeting

Fully Support by Contractor and TRD Management



Overall VISA Rating System



Overall VISA Rating	Criteria	Verifying Closure of VISA items
Red	<ol style="list-style-type: none"> Safety System <u>Break Down</u> or <u>Imminent Danger</u> to life <u>Lost of Control</u> environment <u>Immediate Top Management Follow-Up Action</u> is required 	Executive Director
Yellow High	<ol style="list-style-type: none"> Safety <u>System Failure</u> or <u>Potential for an accident</u> <u>Ineffective Control</u> Environment <u>Immediate Management Follow-Up Action</u> is required 	Project Manager
Yellow Low	<ol style="list-style-type: none"> <u>Slippage</u> in Safety System or threat of injury <u>Important Control</u> Deficiencies is required <u>Immediate Operation Head Follow-Up Action</u> is required 	Project Manager Representative
Green	<ol style="list-style-type: none"> <u>Safety System</u> is in place in general. Control System <u>Functioning Effectively</u> Management action may be recommended to <u>further enhance the achievement.</u> 	Senior Project Engineer & TRD Safety



Client-Contractor Collaboration Approach 業主及承建商 - 雙管齊下



PPI & Fatal Zone Management

♥ THE END ♥

家庭 安全 三跑道
「我們承諾」做得到

VCommit

Happy Family Happy Safety

