

# Innovative ideas for a safer workplace

These companies have developed technological breakthroughs to help minimise accidents at work

BY JO-ANN HUANG

**A**s Singapore grapples with manpower shortages and increased economic activity across all business sectors, companies need to get creative in how they prevent workplace mishaps.

Some firms have come up with innovative solutions, such as devices to assist with heavy lifting, or robots that perform tasks at height, in order to keep their workers safe.

The annual Workplace Safety and Health (WSH) Awards, presented by the WSH Council, lauds public and private sector organisations for going above and beyond in their efforts to boost workplace safety.

Here are a few winners of this year's WSH Innovation Award, which recognises nifty solutions to workplace safety issues.

## CASE STUDY #1

### Kwan Yong Construction 3D modelling software cuts work-at-height risks

Building a bridge can be a dangerous affair – construction workers are working at height for a prolonged period of time, risking injury from falling.

To prevent falls, Kwan Yong Construction designed the Integrated Modular Link Bridge, which uses pre-cast parts and pre-installed safety barricades.

These bridges were installed at Kempas Residences, a public housing Build-To-Order development project that comprises four towers.

Located in Serangoon Road, the four residential towers are built linearly with two link bridges connecting each pair of residential towers at the eighth and 30th storey.

The original method of construction was to



Kwan Yong Construction designed the Integrated Modular Link Bridge, which uses pre-cast parts and pre-installed safety barricades that can be assembled on the ground to minimise risks of falling from height. PHOTO: KWAN YONG CONSTRUCTION

install each link bridge at the respective floors, where five pre-cast components would be installed above ground.

"Most of the building time will be spent at height during installation, concreting and other associated architectural works," says Mr Gerald Chai, Kwan Yong's work and safety health officer.

Using 3D modelling software, Kwan Yong designed an innovative method which uses only two pre-cast modules to build each link bridge.

With the integration of the pre-cast beams and planks, Kwan Yong was able to build most of the link bridges at the ground floor.

Furthermore, Kwan Yong was able to pre-install barricades on the link bridge at ground level, in order to prevent falls.

This was not possible if the original method was used, says Mr Chai, as the barricades could be installed only after all pre-cast components had been assembled.

Other than boosting workplace safety, the Integrated Modular Link Bridge cuts construction time to just half a day, from seven days previously.

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## About the WSH INNOVATION AWARDS

This award recognises the best WSH Innovations across various industries, where teams have implemented innovative solutions to improve safety and health standards in their workplaces.



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CASE STUDY #2

Illumina

Leave the heavy lifting to these machines

Illumina, a global leader in DNA sequencing and array-based technologies, designed two weight-bearing machines that take the heavy lifting out of its manufacturing processes.

Named Project Elevate, these machines lift and place the XYZ sub-assembly, a crucial piece of equipment in the manufacturing of the NextSeq 1000/2000, Illumina's newest high throughput genome sequencer.

Prior to Project Elevate, the 17.5kg XYZ sub-assembly required two people to lift from one place to another, and for as many as 25 times a day.

Project Elevate comprises two machines – the mobile lifter, which can be wheeled to transport the XYZ to any location in the manufacturing facility, and the integrated workstation's new built-in mechanism, which lifts the XYZ to different areas of the workstation.

Mr Cheah Ji Shin, manager of manufacturing engineering at Illumina Singapore, says Project Elevate allows anyone to move the XYZ sub-assembly from place to place, regardless of his physical strength.

"By eliminating the need to use strenuous force, it enables our female employees to do the work that normally can be done only by male employees," he says.



Illumina's Project Elevate features two weight-bearing machines that take over the heavy lifting for its lab workers. PHOTO: ILLUMINA

CASE STUDY #3

PSA

'Extra eyes' that monitor container transport



One innovation that PSA uses is the Chassis Lift Protection System that uses video analytics technology to make it safer for haulier drivers when transporting containers. PHOTO: PSA

It's all in a day's work for haulier drivers who transport containers to and from Singapore's ports.

When the containers are returned, PSA Corporation deploys automated yard cranes to move the container from the chassis of the haulier to the port's yard.

The chassis' twistlocks must be fully unlocked if the container is to be picked up by the automated yard cranes.

These yard cranes allow a remote crane operator to supervise the operation of multiple cranes at once.

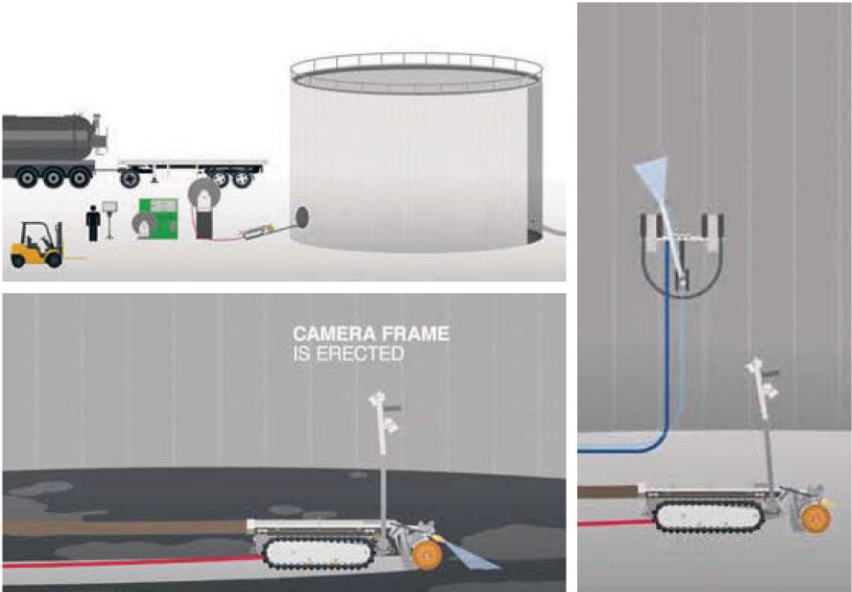
PSA uses laser-scanning technology and video analytics (VA), enabled by a network of optical cameras, to ensure the safety of the haulier drivers.

One of these VA safety features is the Chassis Lift Protection System (CLPS).

It uses VA technology to prevent the chassis from being lifted up by the automated yard cranes with the container, in the event that the twistlocks are not fully unlocked, the CLPS uses VA technology to prevent the chassis – which is connected to the trailer truck – from being lifted up with the container.

When the CLPS detects such an occurrence, the job would be instantly halted and handed over to the remote crane operator to manually intervene.

"The additional VA solution enhances the safety of the automated yard operations," says Mr Nicholas Alexander Chowdhurie, executive service engineer at PSA Corporation.



The robot Amanda is able to climb inside a storage tank for cleaning and maintenance purposes. IMAGES: CYC

CASE STUDY #4

CYC

Robots that scale great heights

Simone is no ordinary robot – she can climb walls using her specially designed wheels, made to grip a wall's textured surface.

She can also save lives – as an automatic blaster and painter, she replaces a human operator, removing the risk of injuries, or even deaths, from climbing 20m-tall storage tanks.

Simone is the creation of CYC International, a home-grown company that specialises in the maintenance of buildings and oil and gas assets.

The company uses and modifies robots that are used in its cleaning and maintenance services. For instance, it has a robot named Amanda that cleans the insides of oil storage tanks.

Mr Danny Chua, the owner of CYC, turned to automation to tackle manpower constraints and escalating labour costs.

But more importantly, CYC's robots

are meant to eliminate the human risk factors altogether, especially in potentially dangerous situations such as working at height.

The robots are operated by CYC's blasting and painting workers, who have been retrained to control them remotely.

Such operations are essential for oil storage tanks in Singapore's humid and rainy weather, says Mr Chua. The moisture in the air causes rust to set in quickly, which corrodes the tanks.

Simone uses a pneumatic system to power her blasting and painting functions. And she has magnets in her wheels, which allow her to stick to the vertical wall surface.

She also has an arm that can grip different types of nozzles – one for blasting, the other for painting. The interchangeable nozzles are connected to conventional blasting and painting tanks.

"While the robot moves, it has the ability to swing the arm left and right, simulating what a human would do when blasting and painting," says Mr Chua.



CASE STUDY #5

**KEPPEL LOGISTICS**

**Motion sensor alarm helps prevent accidents**

A busy warehouse sees the movement of thousands of goods daily. With forklifts ferrying heavy pallet cargo through aisles and around blind spots, forklift drivers and workers risk colliding into one another if they are not careful.

To avoid such accidents, Keppel Logistics, a subsidiary of global logistics firm Geodis, developed the System for Collision Avoidance and Pedestrian Detection (Scaped), an in-house monitoring system that alerts forklift drivers to potential obstacles.

Keppel Logistics created Scaped as an alternative and improvement to existing collision avoidance solutions, says Ms Selina Hui, senior manager of strategic operations at Keppel Logistics.

"Some of the solutions are limited in capabilities, such as response rate and obstacle identification, which can hinder detection of potential hazards in a timely manner," she adds.

Scaped uses computer vision, which is a type of artificial intelligence that enables computers to glean data from digital images and videos.

Scaped is a two-part system that operates independently of each other: the first is the Material Handling Equipment (MHE) Unit. Mounted on forklifts, the unit uses an algorithm that helps detect people behind the forklift.

The second component is the Birdseye Unit, which has high-resolution, wide-angle video cameras mounted on ceilings.

When implemented, the unit tracks moving objects such as warehouse personnel and forklifts around junctions or corners with potential blind spots.

"When implemented, Scaped will alert the (forklift) operator when a person is in the forklift path, so as to avoid collision," says Ms Hui.

"Additionally, Scaped also alerts warehouse users and forklift operators to each other's presence before they can see each other, minimising potential collisions due to blind spots," she adds.



Keppel Logistics developed Scaped to alert forklift drivers of potential obstacles.  
PHOTO: KEPPEL LOGISTICS

CASE STUDY #6

**NUS**

**App keeps campuses Covid-19-safe**

The National University of Singapore (NUS) has three campuses in Kent Ridge, Bukit Timah and Outram, with over 52,000 staff and students flocking to the premises on any one day, five to six days a week.

The highly porous nature of the campuses meant that enforcing safe distancing measures during the Covid-19 pandemic posed significant challenges to NUS' risk management team.

For instance, how would NUS prevent overcrowding in communal areas, such as canteens? Or implement contact tracing when students or staff catch Covid-19?

To address these challenges, the university created uNivUS: Pandemic Suite, a one-stop digital platform and app.

uNivUS is a joint effort by the NUS Office of Risk Management and Compliance as well as NUS Information Technology.

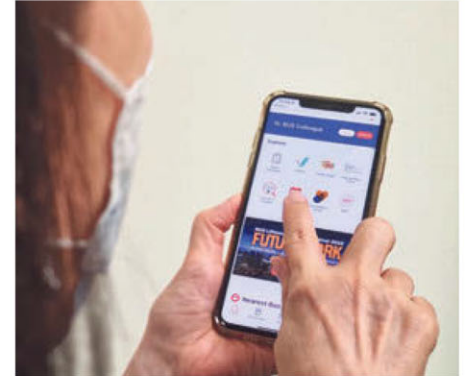
The digital platform is mandatory on all campuses and has multiple features.

One of these is to eliminate manned checkpoints for TraceTogether-SafeEntry (TT-SE). It automates TT-SE check-ins to buildings based on the connection to NUS Wi-Fi points.

"Based on the automated check-ins, the app is able to track occupation density of buildings and this can help prevent overcrowding," says Dr Peck Thian Guan, senior director at the university's Office of Risk Management and Compliance.

uNivUS consists of two parts: the mobile app, which provides a suite of features to the end user, and Safety Engine.

The app allows users to upload their vaccination records, Fast and Easy Test (FET) results and health declarations. This



uNivUS: Pandemic Suite automates TraceTogether-SafeEntry check-ins to buildings based on the connection to NUS Wi-Fi points. PHOTO: NUS

information generates an individual "Safety Profile" of the user in real time.

To ensure that in-person classes are held safely, faculty members can use the app's dashboards to check if students have tested negative for Covid-19, or if they are subjected to Ministry of Health's Covid-19 health protocols.

The Safety Engine makes up the second part of uNivUS. It comprises Wi-Fi network analysis to monitor building density, data analytics, as well as artificial intelligence tools for FET results detection.

The Safety Engine also houses alert modules that notify users of high-density areas.

"A system of alerts and notifications is in place to trigger manual intervention in exigency situations," says Ms Tan Shui-Min, chief information technology officer at NUS.

uNivUS has enabled NUS to keep occupancy levels across all three campuses below 50 per cent when safe management measures were in place, adds Dr Peck.

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# Recognising the best practices in workplace health and safety

Congratulations to all winners of the WSH Awards 2022

## WSH DEVELOPER AWARDS 2022

- **Keppel Land Limited**

## WSH INNOVATION AWARDS 2022

- **CY Innovator**  
User Friendly Stick
- **CYC International Pte Ltd**  
Automated Tank Blasting and Painting (Simone)
- **HL New T-Frame**  
New T-Frame Ladder Lock
- **SG Instrument Manufacturing**  
Elevate
- **DPX**  
System for Collision Avoidance and Pedestrian Detection (SCAPED)
- **The Infra Team**  
Robotic S.G.V
- **Kallang Whampoa C58 Project Team**  
Integrated Modular Link Bridge
- **NUS IT + OSHE**  
uNivUS: Pandemic Suite
- **PEC LTD (Singapore Chemical Plant)**  
Hydraulic TLE End Cap Remover
- **PSASG - PSA Singapore**  
Haulier Automation & Video Analytics (HA & VA)
- **ME TECH INSTINCT**  
Safe Track Installation
- **FLC Digital-Ready Workshop Team**  
Digital-ready Workshop

## SAFETY AND HEALTH AWARD RECOGNITION FOR PROJECTS (SHARP) 2022

- **Asiabuild Construction Pte. Ltd.**  
Residential Development at 1 Draycott Park
- **BHCC Construction Pte. Ltd.**  
HDB PNC8- Northshore Trio

- **CES Engineering & Construction Pte. Ltd.**  
Marsiling Grove, Woodlands NIC25
- **CES\_SDC Pte. Ltd.**  
Contract J107 - Design and Construction of JW1, JW2 and Viaduct for Jurong Region Line
- **China Communications Construction Company Limited (Singapore Branch)**
  - Intra Airside Road Connection at Singapore Changi Airport
  - JRL J106 - D & B JS8 Boon Lay Station & Viaduct
- **China Construction Realty Co. Pte. Ltd**  
Matilda Sundeck Punggol West Contract 39
- **China Construction-Straits LLP**  
Singapore Institute of Technology Campus at Punggol North (Plot 1)
- **China Harbour (Singapore) Engineering Company Pte. Ltd.**  
Proposed Erection of Integrated Waste Management Facility (IWMF) And Ancillary Buildings
- **China Jingye Engineering Corporation Limited (Singapore Branch)**
  - T311 - Bedok South Station and Tunnels
  - Mandai Rainforest Park North
- **China Railway First Group Co., Ltd. Singapore Branch**
  - Contract N108 - Design & Construction of North South Corridor (Tunnel)
  - Contract 885 - Construction of Prince Edward Station and Tunnels for Circle Line 6
- **China State Construction Engineering Corporation Limited Singapore Branch**  
Tuas Water Reclamation Plant Contract 3A
- **Chip Eng Seng Contractors (1988) Pte Ltd**
  - Woodleigh Glen
  - Fernvale Dew (SENGKANG N4C40)
  - Fernvale Dew (SENGKANG N4C39)
- **CKR Contract Services Pte. Ltd.**  
Punggol North C15
- **Dyna-Mac Engineering Services Pte Ltd**
  - NOV- KG DWN Development Project
  - FPSO Prosperity Topsides Modules Fabrication
  - GOLAR GIMI FLNG Fabrication of Pipe Rack

- **Ed. Zublin Ag, Singapore Branch**
  - Design and Construction of Sewer Tunnels for the Deep Tunnel Sewerage System Phase 2 Project - Contract T-07
  - Construction of Link Sewers for the DTSS Phase 2 Project Schedule III Contract 3 (Jalan Buruh/Jurong Port Road)
  - Construction of Link Sewers for DTSS Phase 2 Project: LK11C2 (Commonwealth Avenue/ Toh Tuck/ Boon Lay Way/ International Business Park)
- **Expand Construction Pte Ltd**
  - Project D2012-00180-020 Construction of Buildings, Piers Widening, A&A Works at Changi East
  - Punggol North C11 & 12 (Punggol Point Crown) : HDB Public Housing, Contract No. D/307/19
  - Mandai Stormwater & Boardwalk (Package G) at Mandai Lake Road
  - 230KV/66KV Electrical Sub-Station for Integrated Waste Management Facility at 71A Tuas Nexus Drive
- **Exyte Singapore Pte. Ltd.**  
Pfizer API Expansion Project
- **Fortis Construction Pte Ltd**  
Singapore Data Center (SGA)
- **Gammon Pte. Limited**  
Construction for the Redevelopment of North-South Link Precinct, Sentosa
- **GS Engineering & Construction Corp.**  
Integrated Train Testing Centre
- **Guan Ho Construction Co (Pte) Ltd**  
Building Works at Tengah Park District Contract 7 ( TOTAL: 1148 Dwelling units )
- **Hai Leck Engineering (Private) Limited**  
Shell-Bukom Maintenance Project
- **Hai Leck Engineering (Private) Limited**  
NESTE Singapore Expansion Project
- **Hwa Seng Builder Pte Ltd**
  - Construction of Viaduct From TPE to PIE (Westbound) and Upper Changi Road East
  - Commuter and Road Infrastructure Works At Hillview, Dairy Farm and Tuas Area
  - Design and Build of a vehicular bridge, at-grade roads and other associated works at Pulau Punggol Barat

- **Hyundai Engineering & Construction Co. Ltd**
  - Contract N115 - Design & Construction of North South Corridor (viaduct) Between Woodlands Ave 10 & Admiralty Road West
  - SP Labrador Project BC1
- **Jia Yi Construction Pte. Ltd.**  
Bidadari C10-C12 - Woodleigh Hillside
- **Kay Lim Construction & Trading Pte Ltd**
  - PEC49- Waterway Sunrise I
  - Tampines N6 C8-C10 - Tampines GreenVerge
  - Yishun N4 C20 - Forest Spring @ Yishun
- **Keppel Offshore & Marine - New Builds Division**
  - ØRSTED Greater Changhua 1 and 2a Offshore Substation Topsides and Jackets
  - "DolWin5 High Voltage Direct Current (HVDC) Offshore Platform"
  - PROSPERITY FPSO
  - VOX ALEXIA Dual Fuel Powered Trailing Suction Hopper Dredger
  - VOX APOLONIA Dual Fuel Powered Trailing Suction Hopper Dredger
  - "BOLD TERN Wind Turbine Installation Vessel"
- **Kimly Construction Private Limited**  
Meyer Mansion
- **KTC Civil Engineering & Construction Pte Ltd**
  - Advance Infrastructure Works at Bulim (Phase 2)
  - Contract CR1080 - Sewer and Water Diversion Works (Package C)
  - Contract CR1078 - Sewer and Water Diversion Works (Package A)
  - Contract T312 - Construction of Sungei Bedok Station and Tunnels for Thomson-East Coast Line
- **Kuan Aik Hong Construction Pte Ltd**  
Proposed addition and alteration to existing buildings and proposed development of Jurong Lake Gardens central and east
- **Leighton Contractors (Asia) Limited (Singapore Branch)**  
Design and Construction of Sewer Tunnels for DTSS Phase 2 Project - T-09
- **Leighton Yongnam Joint Venture**  
Contract N103 - Design and Construction of North-South Corridor (Tunnel) Between Kampong Java Road & Suffolk Walk
- **Lendlease Singapore Pte. Ltd.**  
MSD Keytruda and Vaccine Packaging Project
- **Lian Soon Construction Pte Ltd**
  - NUS SDE 3 & 1
  - NUS PGPR
- **Linde GMBH Branch Office Singapore**  
SINGAPORE LINDE UPGRADE PROJECT (SLUP)
- **Obayashi Singapore Private Limited**
  - Mandai Project - Package B
  - SIN06
- **PEC Ltd.**
  - CRISP Mechanical
  - CRISP OM&S Tankage
  - PEC JUR (MBM) Plant Maintenance
  - PEC-SYM Maintenance
  - Singapore Chemical Plant (Maintenance)
  - Singapore Chemical Plant (Project)
  - SLU Pipeline Phase II Project



■ **Penta-Bachy Joint Venture**  
N105 Design and Construction of North-South Corridor Tunnels between Novena Rise and Suffolk Walk

■ **Penta-Ocean Construction Company, Limited**  
Contract T232, Construction of Station, Tunnels and CIQ Building for RTS Link

■ **POKB JV**  
Design and Construction of Sewer Tunnels for the Deep Tunnel Sewerage System Phase 2 Project - Contract T-08

■ **Precise Development Pte. Ltd.**  
• HDB - Punggol North C14 (Punggol Point Cove)  
• HDB - Contract D/136/20 - Tengah Town Infrastructure

■ **Raffles Quay Asset Management Pte Ltd**  
• Marina Bay Financial Centre Tower 1, 2 and Marina Bay Link Mall  
• One Raffles Quay  
• Marina Bay Financial Centre Tower 3

■ **Rotary Engineering Pte. Ltd.**  
Shell Bukom - Liquid Sulphur Tank Project

■ **Santarli Construction Pte. Ltd.**  
LTA Contract 9088 - Design, Construction, Operation & Maintenance of Marina East Staging Ground

■ **Sembcorp Marine Admiralty Yard**  
• Energean Power FPSO - Hull Works  
• KARMOL LNGT Powership Asia - FSRU Conversion  
• Navy Vessel - Maintenance & Upgrades  
• Navy Vessel 1 - Life Extension  
• Navy Vessel 2 - Life Extension  
• FSO Prem Pride - Life Extension & Upgrades  
• M-Class Fleet Reliquefaction Upgrade Projects  
• Energean Power FPSO - Topsides & LQ Integration Works  
• Tyra Redevelopment Project - Wellheads Fabrication  
• Deep Driller 5 - Repair, Refit & Upgrading Project  
• Whale FPU - Fabrication of Blocks & Outfitting

■ **Sembcorp Marine Tuas Boulevard Yard**  
• Armada Sterling V  
• Armada Sterling V - PC Module  
• Deepwater Atlas  
• Deepwater Titan  
• Johan Castberg FPSO  
• Brassavola  
• Hella  
• Dragsvik  
• Leikanger  
• Vito FPU  
• Whale FPU

■ **Shanghai Tunnel Engineering Co (Singapore) Pte Ltd**  
• DTSS Phase 2 Project - Contract T-11  
• LTA T316  
• Construction of Katong Park Station and Bored Tunnels for Thomson East Coast Line  
• Contract N109A  
• Jurong Region Line MRT J102

■ **Sim Lian Construction Co. (Pte.) Ltd.**  
Bukit Panjang N6 C13&14 (Senja Valley)

■ **Ssangyong Engineering & Construction Co Ltd**  
Contract N111 Design and Construction of

North-South Corridor (Tunnel and Viaduct) between Ang Mo Kio Ave 9 to Sungei Seletar

■ **Ssangyong-Hyundai Joint Venture**  
• Contract T308  
• North-South Corridor Contract N102

■ **ST Engineering Ltd.**  
• Contract T260 - Thomson-East Coast Line Communications System  
• Contract T256 - Thomson-East Coast Line Maintenance Management System  
• Contract T261 - Thomson-East Coast Line Mobile Phone Network Coverage  
• Contract 860E - Circle Line Renewal and Stage 6 Communications System  
• Contract 830G - Control Systems for Circle Line Stage 6 & Kim Chuan Depot Extension (KCDE)  
• Contract 960A - Communications System for Downtown Line 3 Extension

■ **Straits Construction Singapore Private Limited**  
• Digital Realty's SIN12 Data Center  
• Parc Central Residences  
• Ki Residences  
• Parc Canberra EC  
• Tengah Plantation Contract 3

■ **Takenaka Corporation**  
Proposed Additions & Alterations To Existing Changi Airport Terminal 2 Project

■ **Teambuild Engineering & Construction Pte. Ltd.**  
• Building Works at Sengkang Neighbourhood 4 Contract 31  
• Building Works at Punggol North Contract 5  
• Building Works at Yishun Neighbourhood 3 Contract 26  
• Building Works at Tengah Garden Contract 5

■ **Tiong Seng - Dongah Joint Venture**  
Contract T220 - Great World Station and Tunnels for Thomson East Coast Line

■ **Tiong Seng Civil Engineering (Private) Limited**  
Sloane Residences

■ **Tiong Seng Contractors (Private) Limited**  
• Hyll on Holland  
• Outward Bound Singapore @ Coney Island  
• JTC Space@AMK  
• Murnane Pipeline Project Package 5

■ **Unison Construction Pte. Ltd.**  
19 Nassim

■ **Unison Construction Pte. Ltd.**  
Amber Park

■ **Vico Construction Pte. Ltd.**  
Tampines Green Opal BTO Project

■ **Woh Hup-STEC JV**  
T310 - Construction of Bayshore Station and Tunnels for Thomson - East Coast Line

■ **Wood Group International Services Pte Ltd**  
• FEP Wave 1 Project  
• Symphony Project

■ **Worley Engineering Singapore Pte. Ltd.**  
BASF Vega Project

■ **Zheng Keng Engineering & Construction Pte Ltd**  
DE133 Proposed New Erection of A 5-Storey Bus Depot At Sengkang West Avenue

#### WSH AWARDS FOR SUPERVISORS 2022

■ **Chin Ying Tian**  
NatSteel Holdings Pte. Ltd.

■ **Dinesh S/O Tangavelu**  
Straits Construction Singapore

■ **Kok Hon Kuan**  
Kok and Chan Marine Services Pte. Ltd.

■ **Kwok Soon Ting**  
Hongrong Engineering Pte Ltd

■ **Mohammad Nazri Bin Hossain**  
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■ **Raju Ravichandran**  
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■ **Rupen Dutta**  
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■ **Sebastian Koh Chee Yang**  
Jurong Port Pte Ltd

■ **Vadivelan Sibanyanam**  
ENGIE Services Singapore Pte. Ltd.

■ **Wong Joo Kit**  
SMRT TEL Pte. Ltd.

#### WSH PERFORMANCE AWARDS 2022

##### Excellence

■ Bintai Kindenko Pte Limited

■ Petrochemical Corporation of Singapore (Private) Limited

■ Plant General Services Pte. Ltd.

##### Gold

■ Ed. Zublin Ag, Singapore Branch

■ Lendlease Singapore Pte. Ltd.

■ Moderna Homes Pte. Ltd.

■ Testing Inspection & Solution Pte. Ltd.

■ Wood Group International Services Pte Ltd

##### Silver

■ Altrad Services Singapore Pte. Ltd.

■ Amgen Singapore Manufacturing Pte. Ltd.

■ ARLANXEO Singapore Pte Ltd

■ Asiabuild Construction Pte. Ltd.

■ BBR Construction Systems Pte Ltd

■ BDP (Asia Pacific) Pte. Ltd.

■ BHCC Construction Pte. Ltd.

■ Carrier Transcold Pte. Ltd.

■ CBRE GWS Pte. Ltd.

■ CES\_SDC Pte. Ltd.

■ China Harbour (Singapore) Engineering Company Pte. Ltd.

■ Chip Eng Seng Contractors (1988) Pte Ltd

■ CKM&T International Pte. Ltd.

■ ENGIE Property Services Pte. Ltd.

■ Gammon Construction And Engineering Pte. Ltd.

■ Gammon Pte. Limited

■ GSK Biologicals

■ Heraeus Photovoltaics Singapore Pte. Ltd.

■ Hwa Seng Builder Pte Ltd

■ Infineum Singapore LLP

■ Jia Yi Construction Pte. Ltd.

■ Kay Lim Construction & Trading Pte Ltd

■ Keppel DHCS Pte. Ltd.

■ Keppel Offshore & Marine New Builds Division

■ Kuan Aik Hong Construction Pte Ltd

■ Kurihara Kogyo Co., Ltd.

■ Leighton Contractors (Asia) Limited (Singapore Branch)

■ Lendlease Retail Pte. Ltd.

■ Lum Chang Interior Pte. Ltd.

■ Megastone Holdings Pte Ltd

■ Micron Semiconductor Asia Operations Pte. Ltd.

■ NCS Communications Engineering Pte. Ltd.

■ Nishimatsu Construction Co., Ltd.

■ Obayashi Singapore Private Limited

■ Plant Electrical Instrumentation Pte Ltd

■ Raffles Quay Asset Management Pte Ltd

■ Rockwell Automation Asia Pacific

■ Business Center Pte. Ltd.

■ Rotary Electrical & Instrumentation Pte. Ltd.

■ Rotary Engineering Pte. Ltd.

■ Rotary IMC Pte Ltd

■ Rotary Mechanical And Construction Company (Private) Limited

■ Samwoh Corporation Pte Ltd

■ Santarli Construction Pte. Ltd.

■ Sembcorp Marine Integrated Yard - Pandan (PPL Shipyard Pte Ltd)

■ Sembcorp Marine Offshore Platforms Pte. Ltd.

■ Shanghai Tunnel Engineering Co (Singapore) Pte Ltd

■ Singapore Telecommunications Limited

■ Ssangyong Engineering & Construction Co Ltd

■ UG M&E Pte. Ltd.

■ Unison Construction Pte. Ltd.

■ Vetco Gray Pte. Ltd.

■ Worley Engineering Singapore Pte. Ltd.

#### WSH OFFICER AWARDS 2022

■ **Muhammad Azry Tay @ Tay Choon Kiat**  
Hwa Seng Builder Pte Ltd

■ **Ting Seng Kwong Melvin**  
ST Engineering Advanced Material Engineering Pte. Ltd.

#### CULTURE OF ACCEPTANCE, RESPECT AND EMPATHY (CARE) AWARDS 2022

■ AAVC - Animal & Avian Veterinary Clinic

■ Yishun Health

■ ARLANXEO Singapore Pte Ltd

■ ENGIE Services Singapore Pte Ltd

■ Halliburton (Hal Completions Mfg Pte Ltd)

■ Lendlease Singapore Pte. Ltd.

■ Singapore Management University

■ Wee Chwee Huat Scaffolding & Construction Pte Ltd