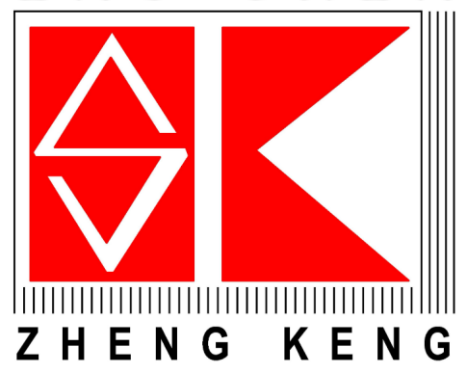


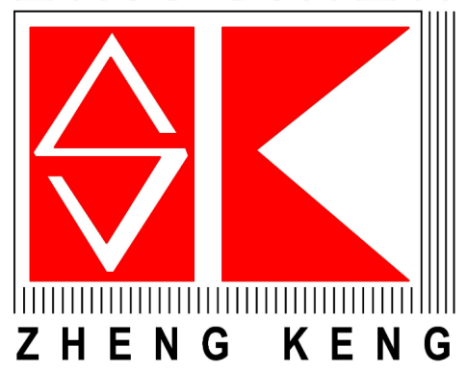


Our Approach to Effective Fall Prevention and Protection Practices

**Work at Height Symposium 2024
19 March 2024**

**Francis Ung
Project Director
Zheng Keng Engineering & Construction Pte Ltd**





Contents of Sharing

1. Company Introduction and Current Projects

2. Our Current Work at Height Activities

3. Top Management Commitment

4. Our Approach to Effective Fall Prevention and Fall Protection

5. Sharing of Work at Height Safety Video

1. Company Introduction and Our Current Projects



LTA - Sengkang West Bus Depot



MOHH - Serangoon Polyclinic



MOHH - Punggol Field Nursing Home

2. Our Current Work at Height Activities

Example of work at height activities include;

- Use of mobile elevated work platforms
- RC structural works
- External wall panels installation
- Working on scaffolds
- Use of platform ladders



3. Top Management Commitment

Commitment to WSH include but not limited to

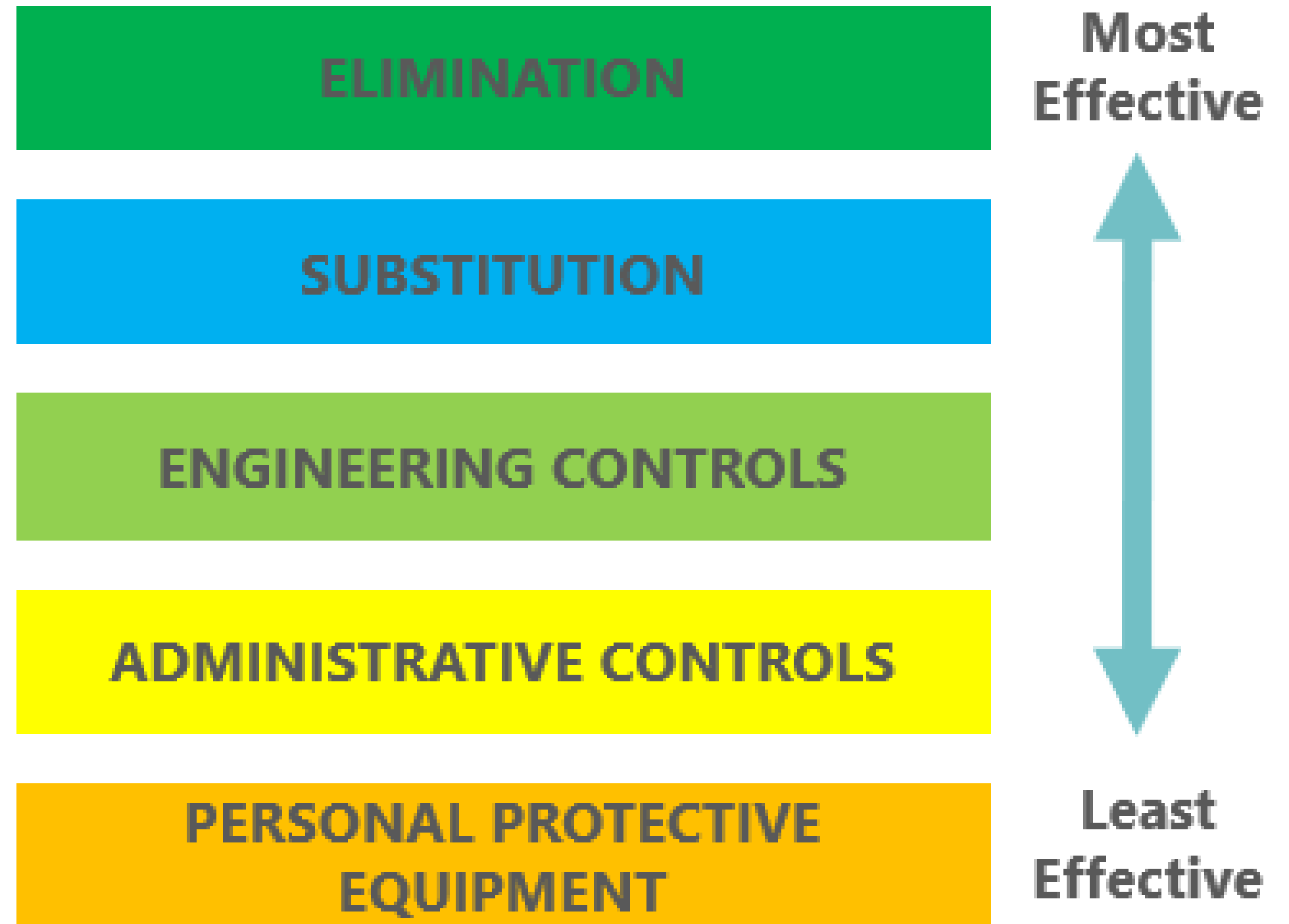
- Conduct regular review of risk assessment and fall protection measures with sub-contractors
- Conducting regular site inspection to 'Walk-The-Talk'
- Regularly lead and conduct safety timeouts



4. Our Approach to Effective Fall Prevention and Fall Protection

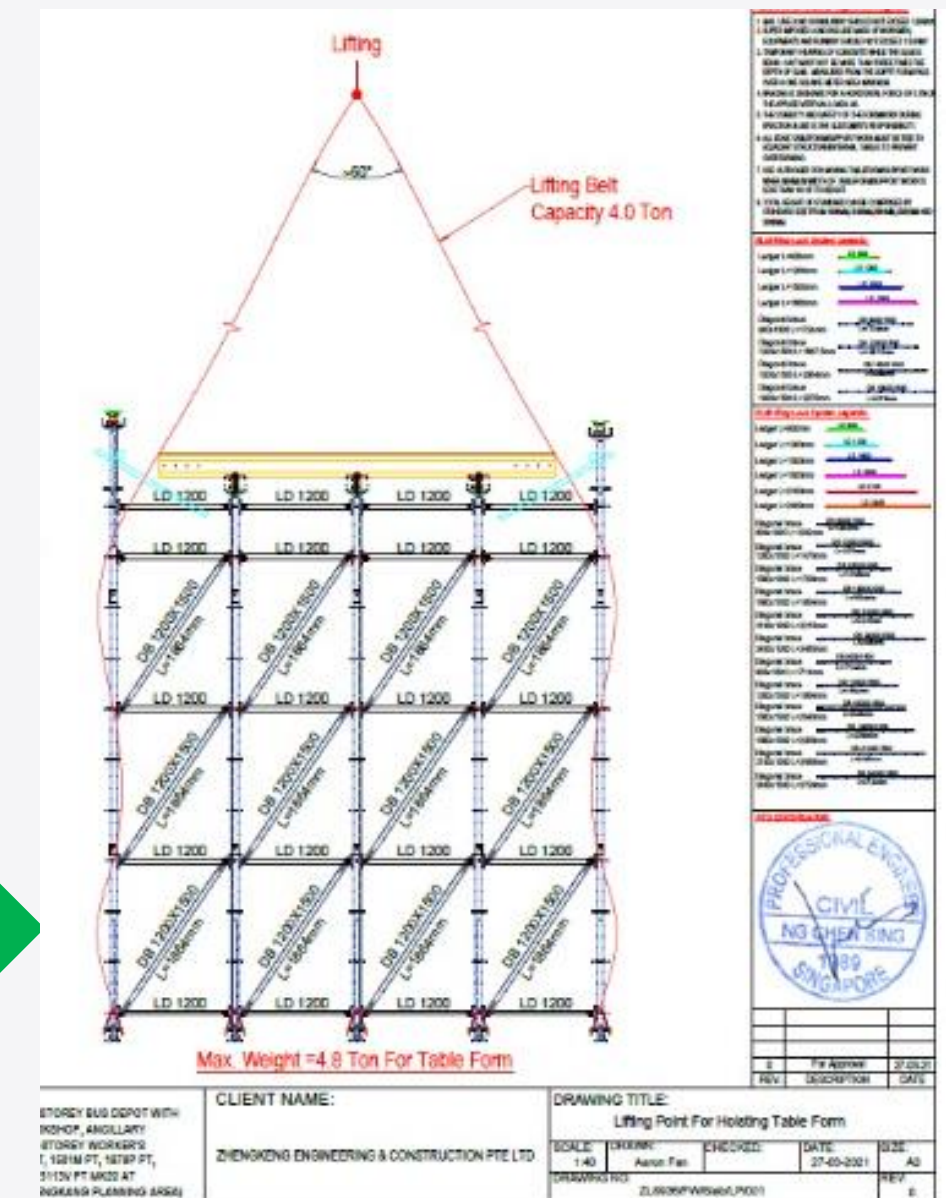
Hierarchy of Control

- Pre-work review of work processes to study feasibility of upstream risk controls for working at height
- Target at reducing all risks to As Low As Reasonably Practicable (ALARP)



Hierarchy of Control

➤ **Un-rigging of LGs at bottom of frames**



Substitution Control

Adopt safer work at height method

- Use of MEWPs to reduce risk of working at height for internal and external works
- Reduced risk for workers as compared to use of scaffolds



Substitution Control

Adopt safer work at height method

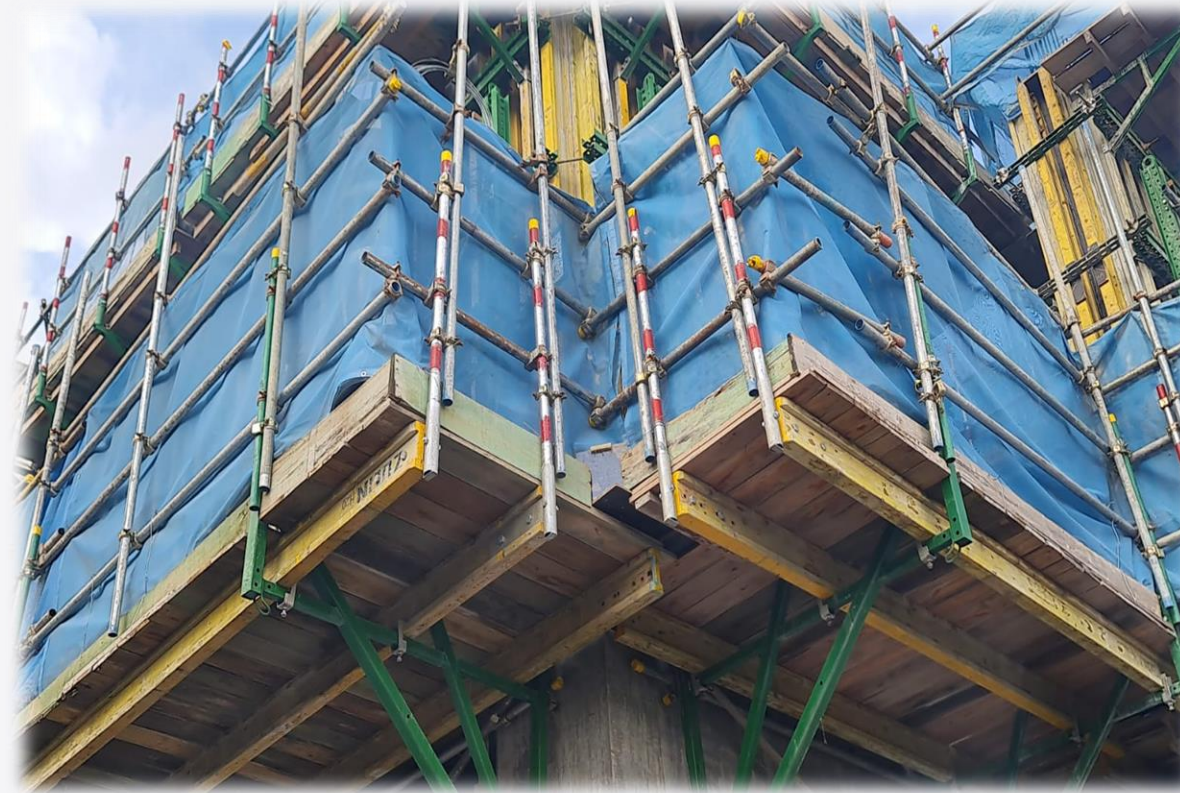
- Use of hollow core slab installation to replace conventional slab construction
- Reduced area of formwork construction
- Reduced number of workers working at height



Engineering Control

Effective protection to open sides

- PE design for edge guardrails
- Installation of guardrails (mid and top rail) with safety netting, toe board and warning signages



Administrative Controls

Adoption of 30-30-30 safety observation techniques by

1. Observing workplace for 30 seconds
2. Observing 30m in surrounding areas
3. Check 30m above
 - Issuance of personal cards to keep workers reminded at all times

30-30-30 OBSERVATION TECHNIQUE



Observe Your workplace **-30 secs**
உங்கள் பணியிடத்தை
கண்காணிக்கவும் **-30** விநாடிகள்.
আপনার কর্মক্ষেত্র **30** সেকেন্ড পর্যবেক্ষণ করুন
用**30**秒来排查工作场所的安全情况。

Look at Your Surrounding- **30m**
உங்கள் சுற்றுப்புறத்தைப் பாருங்கள்- **30 மீ**
আপনার আশেপাশের 30 মিটারের দিকে তাকান
观察**30**米以内所在的安全隐患。

Check Above You- **30m**
மேலே பாருங்கள் - **30 மீ**
আপনার **30** মিটার উপরে দেখুন করুন
察头上**30**米以内所在的安全隐患。



Administrative Controls

Conduct of regular Safety Timeouts including;

- Conduct of STO after occurrence of FFH incidents from other worksites (eg WSH alerts) as lesson learnt
- Conduct of weekly STO for targeted work at height activities
- Conduct of STO for specific trades at 30%/60%/90% work progress of high risk activities



Administrative Controls

Conduct of regular WAH trainings

- Targeted at increasing competency and awareness of workers
- Conduct of regular trade specific training to cover related risk of working at height



Administrative Controls

Conduct of WSH Inspections and Audits

- Regular inspection and supervision of work at height activities by WSH team
- Regular cross-site inspections and thematic exercise on Working at Height
- Engage external independent WSH auditor for monthly audits



Administrative Controls

Conduct of regular RA reviews through

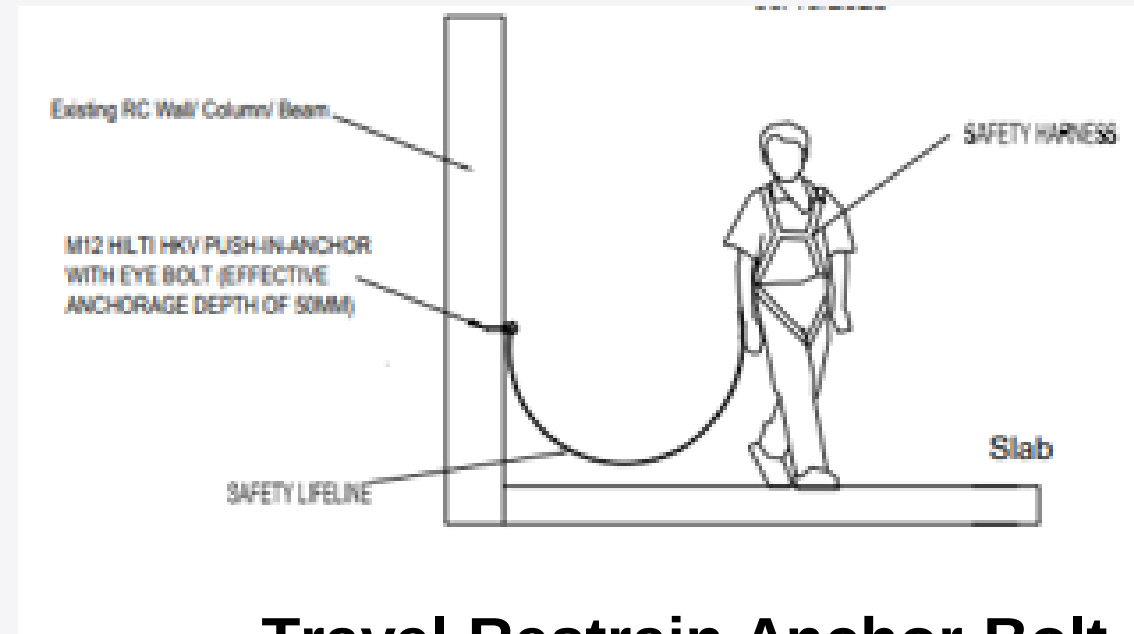
- Regular risk assessment workshops with subcontractors
- Activity Based Safety Improvement System (ABSIS) video to review with subcontractors on any gaps and further improvement to the safe work procedure



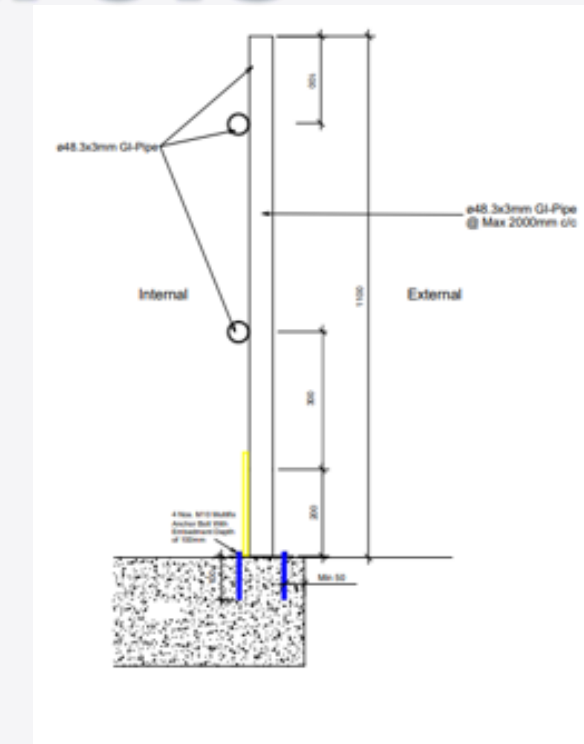
Administrative Controls

PE Designs for work at height provisions such as

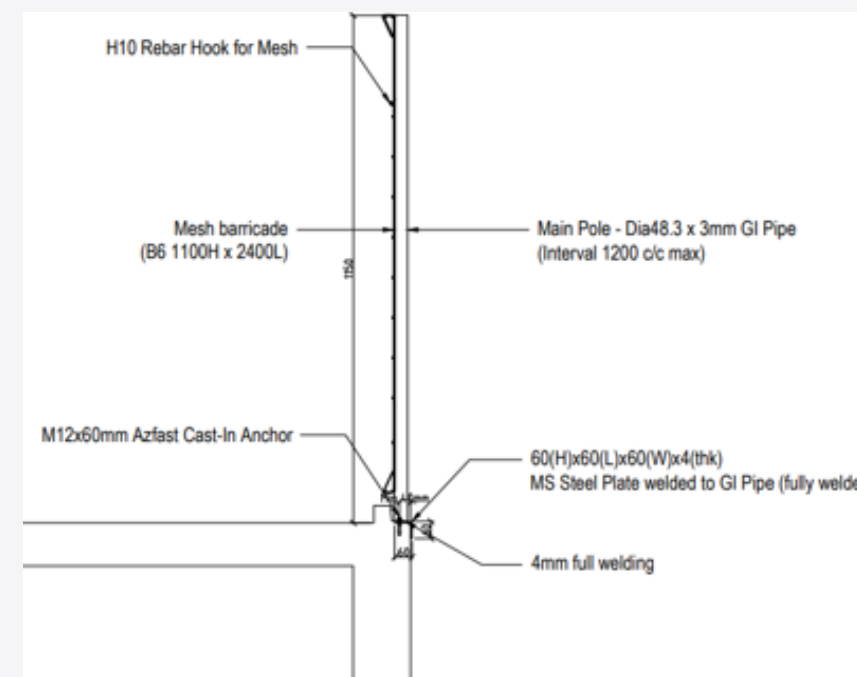
- Travel Restrain Anchor Bolt
- Temporary Safety Guardrails
- Temporary Mesh Barricade
- Wire Rope Horizontal Lifeline
- Issuance of Certificate of Supervision after installation



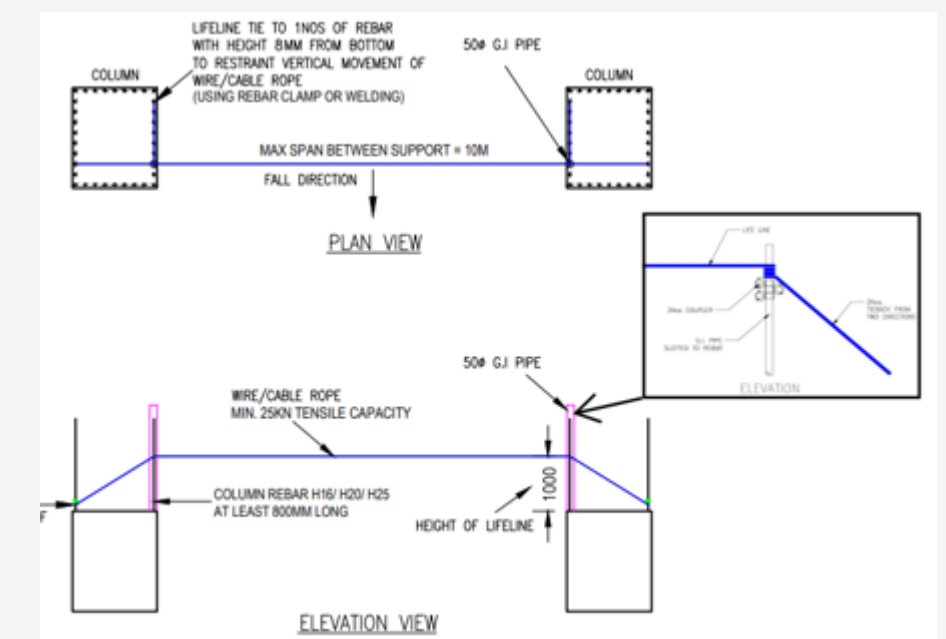
Travel Restrain Anchor Bolt



Temporary Safety Guardrails



Temporary Mesh Barricade



Wire Rope Horizontal Lifeline

Administrative Controls

Heat stress management measures

- Hourly measurement and communication of WBGT readings
- 10 minutes of water break for workers for every hour of work
- Daily twice tool box meetings with water parades (Morning and after lunch)



11:18 VoLTE 4G 96%

PGFNH Heat management
Chrys, Francis Ung, Mahmood Zk, Parivallal...

Today

Parivallal
Heat stress monitoring
Date: 06/02/2024
Time: 08:05 am
WBGT reading: 28.9 degree Celsius
Risk level: low

热应力监测
日期: 06/02/2024
时间: 08:05pm
WBGT读数: 28.9 摄氏度
风险等级: 低

வெப்ப அழுத்த அவதானிப்பு:
திகதி: 06/02/2024
நேரம்: 08:05 மணி
வெப்பநிலை: 28.9 பாகை
செல்சியஸ்
ஆபத்து அளவை: குறைவு 08:07

Parivallal
HEAT STRESS MANAGEMENT FRAMEWORK

WET BULB GLOBE TEMPERATURE (°C)		
LOW ≤ 21 °C	MODERATE 21 to 25.9 °C	HIGH ≥ 26 °C
1) Hourly WBGT temperature measurement. 2) Hydration at all times. 3) Wear lighter clothing. 4) Daily twice tool box meeting with water parades. 5) Minimum 5 minutes water break at 1-hourly intervals. 6) Train and educate workforce on heat stress and how to identify signs and symptoms of heat stress. 7) Provide clean drinking facilities and shaded rest areas with fans.	1) Hourly WBGT temperature measurement. 2) Hydration at all times. 3) Wear lighter clothing. 4) Daily twice tool box meeting with water parades. 5) 10 minutes water break at 1-hourly intervals. 6) Train and educate workforce on heat stress and how to identify signs and symptoms of heat stress. 7) Provide clean drinking facilities and shaded rest areas with fans.	1) Hourly WBGT temperature measurement. 2) Hydration at all times. 3) Wear lighter clothing. 4) Daily twice tool box meeting with water parades. 5) 15 minutes water break at hourly intervals. 6) Close supervision and monitoring to identify anyone with heat stress symptoms. 7) Heavily manual work to cooler parts of the day, e.g. earlier parts of morning or late afternoon. 8) Availability of more rest areas for workers to increase travelling distances.

Notes:
Emergency response and first aid procedures on standby at all times. 08:07

Heat stress monitoring
Date: 06/02/2024

Message

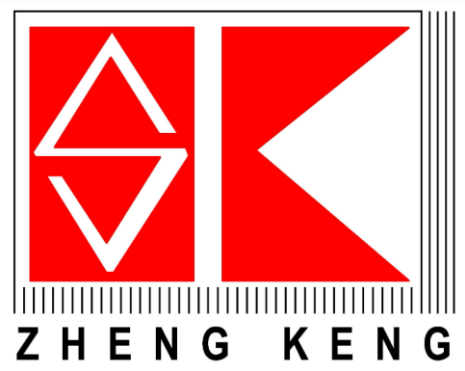
Administrative Controls

Reducing work at height risk through caring for our workers

- Daily health declaration (twice per day) to ensure workers are healthy and fit prior to work
- Organise annual health screenings by external health vendors
- Conducting quarterly in-house basic health parameters check for workers

6 Steps to Conduct a Toolbox Meeting 施工前安全会议 6 步骤				
Step 1: Are you fit to work today? 第一步：今天的身体状况适合工作吗？				
Assess worker's fitness to work for the day or shift. All Workers should be physically and medically fit to carry out all the tasks assigned to them. 在开工前，评估员工的身体状况。员工的身体状况必须能够胜任他们需要完成的工作。		Tick if applicable 相应的打勾		Remark 备注
		Yes 是	No 否	
	1. Drunk test 醉酒测试 Have the worker to walk in a straight line, heel-to-toe for 6 steps. If he is not able to do so, it may suggest that he is not fit for work or might be under the influence of alcohol. 确保员工能按照脚跟对脚尖的方式沿一条直线行走 6 步。如果员工不能完成此项目，有可能他的身体状况不佳或受到酒精影响。			
	2. Body temperature test 体温测试 Workers with temperatures above 37 C may indicate that they are unwell and hence unfit for the day / shift's duties. 员工们的体温在 37 C 以上，可能表示他们身体不适，并不适合执行任何工作。			
	3. Health declaration 申报身体状况 Ask any worker who feels unwell or on medication. Assess his ability to carry out his task for the day. 询问员工是否感到身体不适或正在服用药物。评估员工们的身体状况能胜任他们需要完成的工作。			





Administrative Controls

Reporting Saves Lives

- Near Miss Reporting
- Reporting unsafe acts / conditions
- Feedback / suggestions for continuous improvement

ZHENG KENG

Zheng Keng Engineering and Construction Pte Ltd

Employee Feedback Form

This feedback form is open to all staffs and workers. It is a voluntary & confidential reporting system that provides a channel for reporting safety incident (s) / infringement (s), which if left unchecked, could lead to an accident. This form will be reported directly to the top management. Your report is **CONFIDENTIAL** and will be treated with the strictest confidence by the management.

<https://form.jotform.com/231448156394461>

ZHENG KENG

English (US)

Safety Feedback Form 安全反馈表 Sự an toàn Mẫu phản hồi

This form will be submitted to the top management of Zheng Keng Engineering & Construction Pte Ltd. Your information will be kept confidential. 此表格将提交给 Zheng Keng Engineering Pte Ltd 的最高管

PPE Controls

Fall Protection Equipment

- Use of Self Retractable Lifelines for work near open side, where guardrail provision is not feasible
- Anchorage of safety harness on PE-designed lifelines
- Regular inspection and maintenance regime of fall protection equipment



Safe Use of Ladders

Safety measures include;

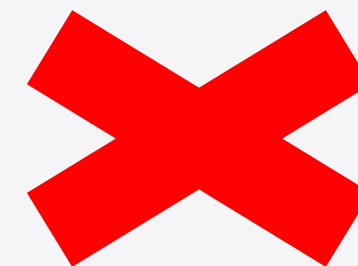
- Use of only platform ladder instead of A-frame ladder and vertical access ladder
- Pre-inspection of all ladders by WSH Department before issuance of ladder tag



Platform Ladder



Vertical Access Ladder



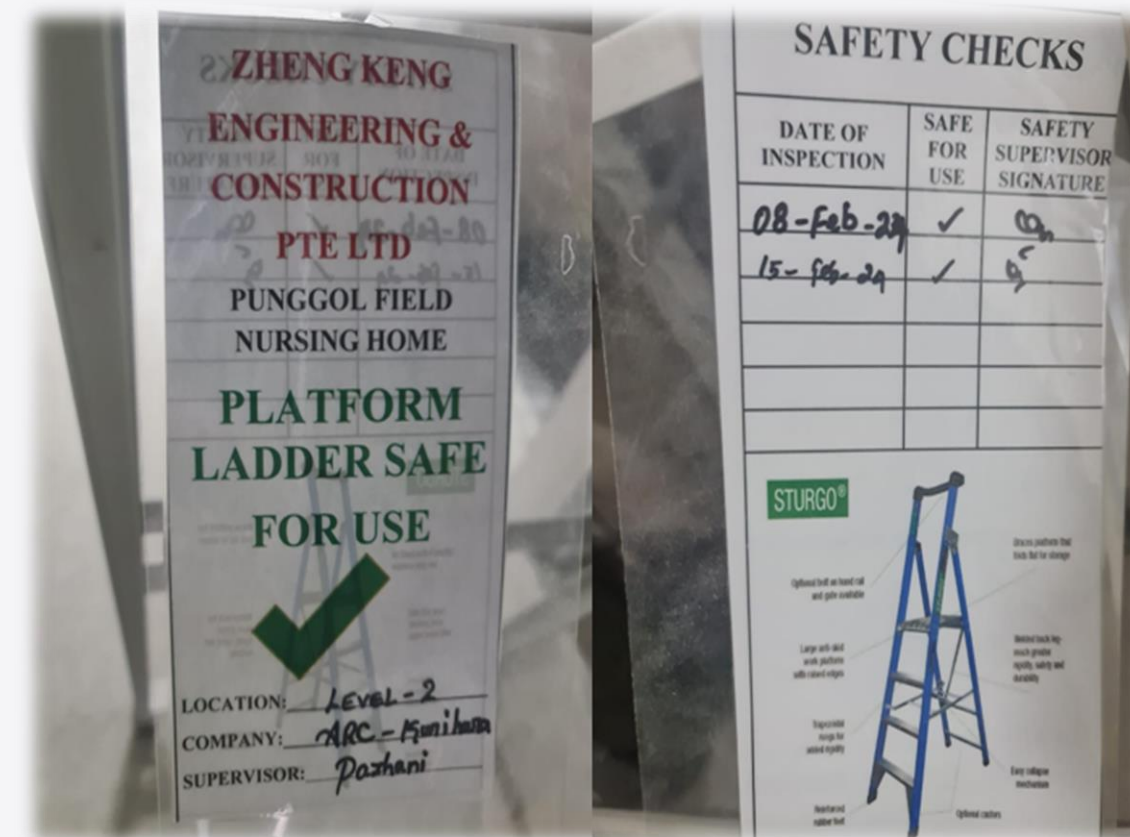
A-Frame Ladder



Safe Use of Ladders

Safety measures include;

- Training on safe use of platform ladder
- Adoption of buddy system
- Daily visual inspection by users
- Weekly inspection and updating of ladder tag by WAH supervisors



Adoption of WSH Technologies

Simulator Training for MEWPs operator

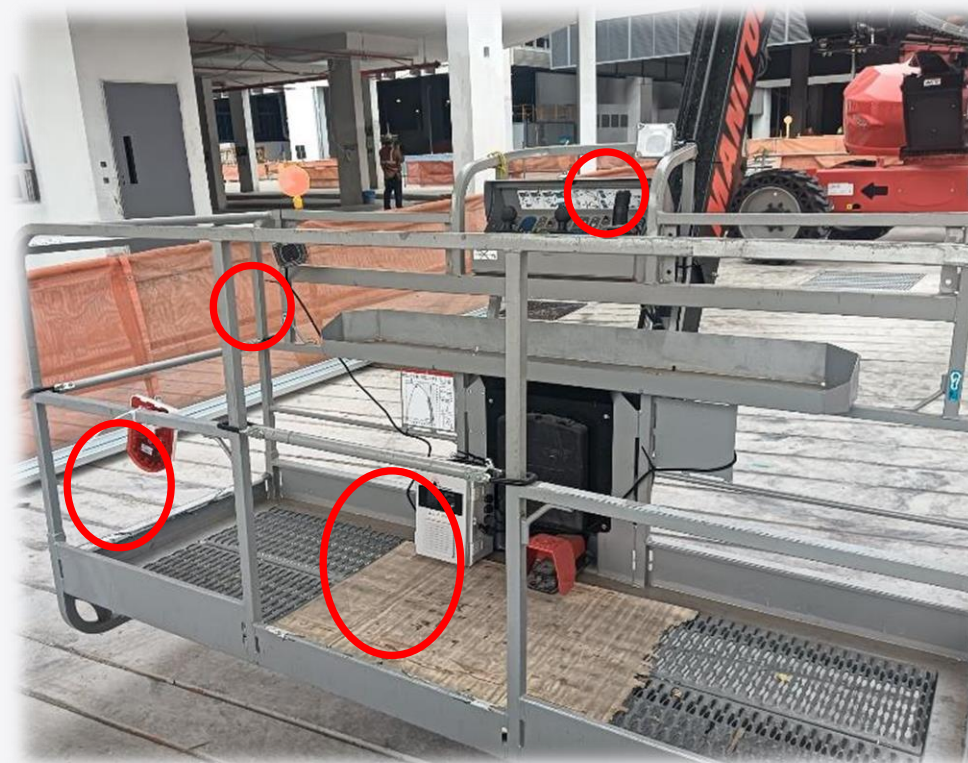
- Use of VR (Virtual Reality) simulator training for MEWP operators
- Enhance operator's competency in situational awareness and in operating the machinery



Adoption of WSH Technologies

Use of WSH Technologies on MEWPs

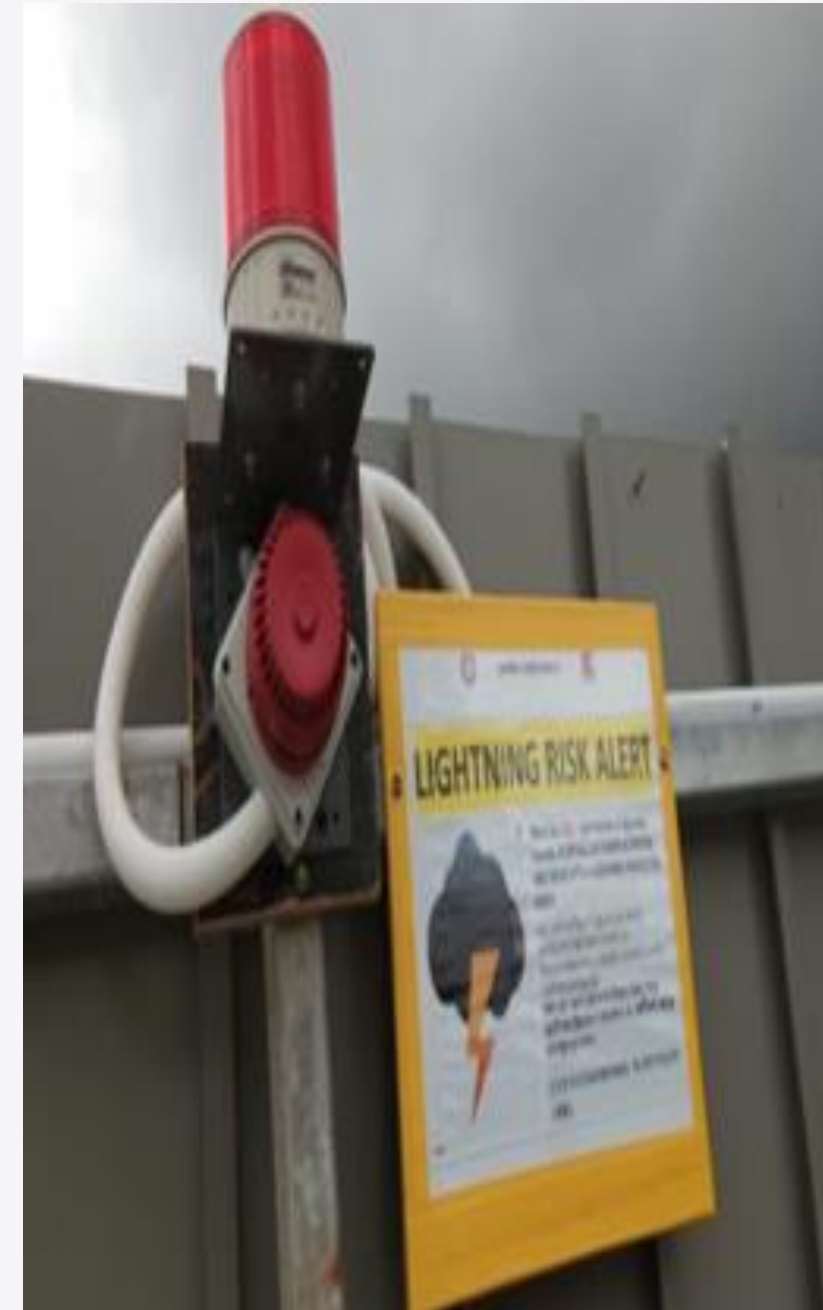
- **MEWP EQSS Overwatch** to stop equipment immediately upon detection of crushing and unsafe behavior of operator
- **MEWP Safety Surveillance Service** (with siren alarm, sensor and video analytics) to detect operator's unsafe behavior and alerting through mobile app



Adoption of WSH Technologies

Automated Lightning Risk Alert System

- Reduces falling from height risk through automated alerts in lightning risk
- Alert workers to stop work at height activities and seek shelter

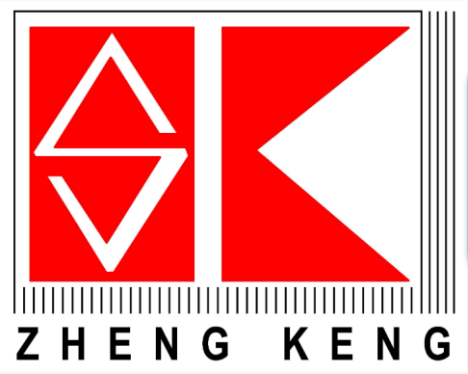


Adoption of WSH Technologies

Work at Height surveillance through CCTV and Video Analytics

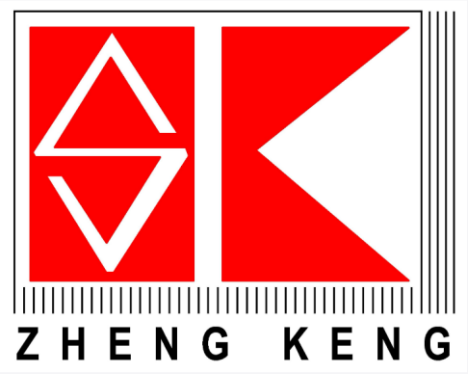
- Active monitoring of site's work at height activities through surveillance cameras
- Allow immediate actions to be taken if unsafe act / condition spotted





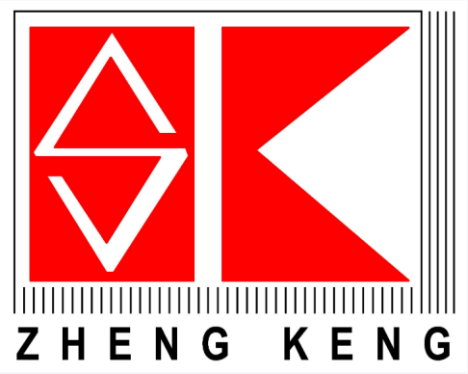
5. Sharing of Work at Height Safety Video





ZERO
FALLS

Together, We Target Zero Falls



THANK YOU