LESSONS LEARNT FROM WORK-SITE INCIDENT AT TANJUNG BUNGAH

Ir. Liew Shaw Shong
Duration: 26 days within 6 months

Personnel Involved: 28 witnesses including 6 experts from local and overseas.
The Report & Commission Outcome

REPORT OF THE COMMISSION OF ENQUIRY
INTO THE WORK-SITE INCIDENT
AT TANJUNG BUNGAH
IN THE STATE OF PENANG

22nd July 2019

Legends:
- Liable
- Not Liable
Ir. Khoo K. T. of Perunding KAA Sdn Bhd
Initial design: Inadequate (Global) and unsafe (Local) -> ‘blind-folded’
Site incident: 2 minors + 1 major landslips
Responsible Parties

First Slip 8th August 2016 (1st Slip)

Instability During Soil Nail Installation 5th May 2017 - (2nd Slip)

Slope Instability with Damage to Gunite and Soil Nails (3rd Slip) 11 July 2017
What factors contributed to these landslips?
15 negligent acts were identified!

1. Overlooked Hillsite Guideline - Not applicable for temporary slope?
2. Commenced work w/o RE - For 1 year
3. Remote control supervision (via messaging apps)
4. No calculation for slope cutting
5. Further excavation from RL18.3m to RL14.65m w/o calculation.
15 negligent acts were identified!

6. Underestimate GW level

Contour Plan of Anticipated Dry-Season Groundwater Levels
Negligence

15 negligent acts were identified!

7. No review on design after each landslip!
8. Slow in response to crisis - Ir Khoo took couple months to look for cheapest slope strengthening work from contractor!
9. Reduction of 87 soil nail to 49 soil nails w/o calculation!
10. Strengthen slope with adding 6 more nails w/o calculation!
15 negligent acts were identified!

11. No pull-out test for installed soil nails
12. Decision making ➔ Commercialism > Professionalism!
13. Allow contractor to excavate 2.7m for pilecap, cut slope become more unsafe!
14. Failed to protect workers in soil nail installation
15. Never making sure workers staying away from partially failed-slope.

Soil nailing working from top to bottom!!
First Slip on 8.8.2016 → Quotation 362 soil nails → Revised to 87 soil nails → Further reduced to 49 soil nails → Install soil nails → Soil nails failed on 11.7.2017 → Remedial work start

30 weeks! → 12 weeks!
Relict Joints

Relict Joint Dominant landslide

Predominantly sub-horizontal

Persistent

Extensive + thick infill

Consist weaker clay layer material

No evidence of presence of these 4 requisite factors
1. No shoring for 2.7m pilecap excavation
2. Installed sheet piles
3. Sheet Pile Displacement and Slope Movement in July 2017

Ir. Victor Ong (One Smart)
Design Engineer for D&B Piling Works

What he did wrong?

To Sign Form G3 even without supervise the works!

Never check or design on method of constructing pilecap

Failed to supervise the execution of works he designed

Can this be allowed?
1. Choongcons was pleaded guilty to a charge under section 12(2)(b) of the Occupational Safety & Health Act 1994

2. DOSH should promptly issue a Prohibition notice after the visit!!!

Choongcons

What they did wrong?

Negligent in taking care of workers safety even though safety officer sounded alarm unsafe slope

DOSH

Received memo from Choongcons' safety officer

Attending site visit and issue an Improvement Notice
Taman Sri Bunga Sdn Bhd (Developer)

Not liable

More mindful on site safety and not insist that cost minimization
Commission’s Recommendations

Disciplinary Actions from BEM

Ir. Khoo K T

Criminal investigation by PDRM

Disciplinary Actions from BEM

Ir. Victor Ong C W
Commission’s Recommendations

MBPP

- Independent Checker with AC for slope project
- Draw up and enforce policy ➔ No work allowed w/o RE
- Spot Check to construction site
- Devise and implement GIS
- Review criteria for issuance of Stop Work Order
- Revisit ‘Safety Guideline for Hillsite Development 2012’

BEM

- Enforce stricter guideline for temporary works
- Study into root cause of failure due to temp. work
- Stipulate severe penalties to failure due to temp. work
- Study into root cause of failure due to temp. work
Commission’s Recommendations

General

- All project shall engage PM with safety knowledge
- Safety officer empower to raise safety issue in any meeting
- Safety office to report to SI directly
- All meetings must be audio recorded
Regular site visit is a MUST!!

Site team/supervisor informs Project Engineer immediately for site irregularities.

Stand firm on **SAFETY** when dealing with cost issue.

**SAFETY** shall be treated with **URGENCY**.

Site reconnaissance before detail design stage
4,000 years ago, King Hammurabi of Babylon, Mesopotamia, laid out the first sets of construction laws, designed to align the incentives of builder and occupant to ensure that builders created safe homes:

- If a builder builds a house for a man and does not make its construction firm, and the house which he has built collapses and causes the death of the owner of the house, that builder shall be put to death.

- If it causes the death of the son of the owner of the house, they shall put to death a son of that builder.

- If it causes the death of a slave of the owner of the house, he shall give to the owner of the house a slave of equal value.

- If it destroys property, he shall restore whatever it destroyed, and because he did not make the house which he builds firm and it collapsed, he shall rebuild the house which collapsed at his own expense.

- If a builder builds a house for a man and does not make its construction meet the requirements and a wall falls in, that builder shall strengthen the wall at his own expense.

Ancient laws emphasise on Permanent Works!
OSHCIM Guidelines for Designers

Modern laws cover both Permanent Works and Temporary Works!
Thanks for your patience & attention