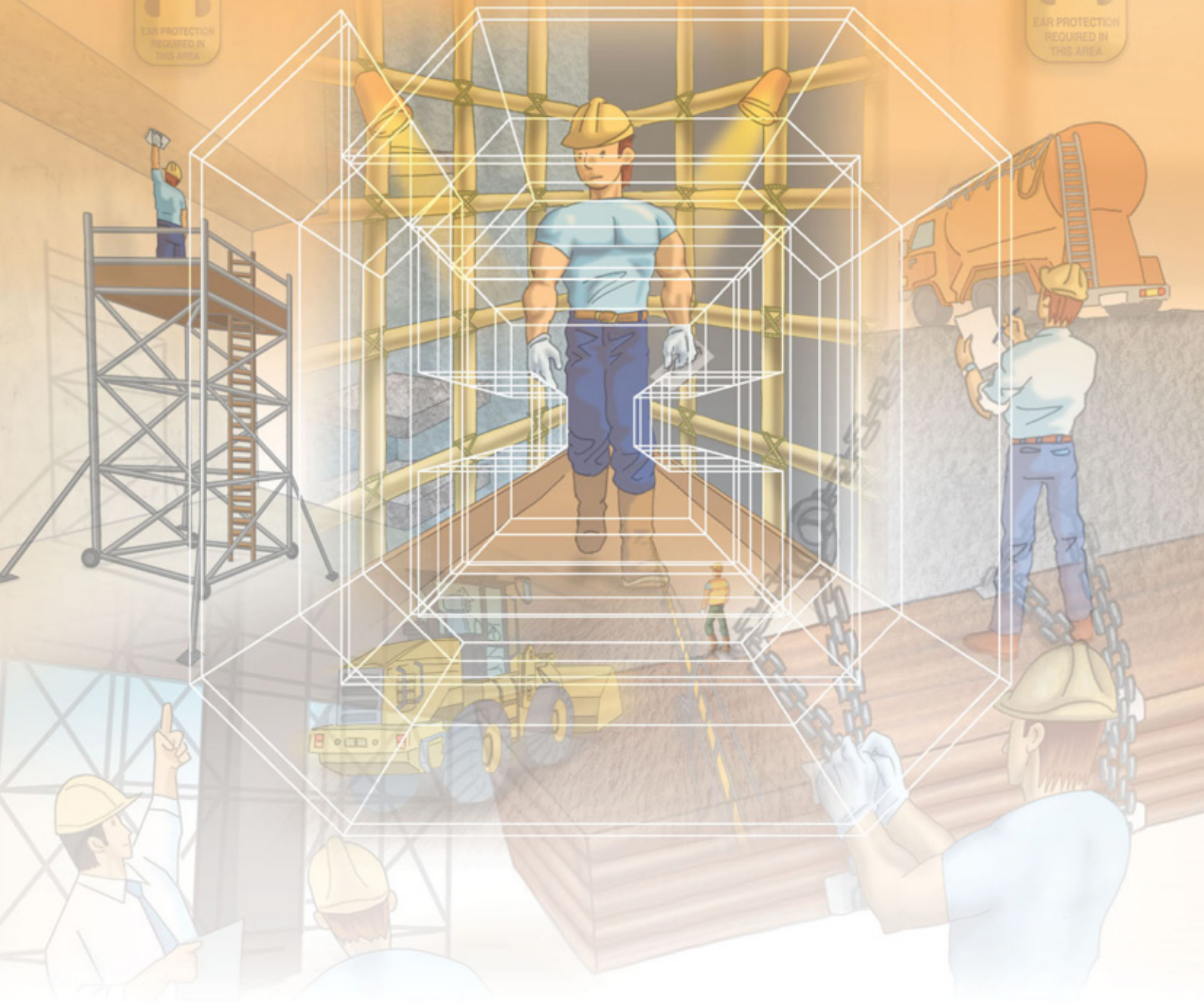
An Analysis on Occupational Fatalities - Casebook Volume No. 2



Occupational Safety and Health Branch
Labour Department

Occupational Safety & Health Council

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FOREWORD

Workplace accidents are not just causing sufferings to victims, and their families. They also incur costs arising from work stoppage, insurance claims, medical and rehabilitation expenses.

It is recognized that most workplace accidents are preventable. Very often, the scenarios and causes have common phenomena. Unless the causes of workplace accidents are properly understood, lessons will not be learned and suitable improvements will not be made to secure the future safety and health protection of those who may be affected by a work activity. The responsible persons of workplaces need to understand why events happened, and act to make sure that they do not happen again.

This casebook gathers a collection of fatal accident at work cases edited in a way for experience sharing on accident prevention. It aims at providing precious lessons to those who are exposed to work activity and the management personnel, as well as case studies for safety training institutes.

Occupational Safety and Health Branch
Labour Department
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A worker sustained fatal injury during unloading work at a building demolition site

Scenario

Hoarding erection work was in progress on a construction site where a building was to be demolished. The work was conducted by a sub-contractor. The deceased person (D/P) was a worker employed by the sub-contractor.

On the day of the accident, hoarding materials were delivered to the site by a crane lorry. At about 4:30 p.m., the third truck of materials, including two piles of metal plates and a bundle of U-channels, were delivered to the site. The D/P, two co-workers and a crane operator were responsible for unloading the materials from the lorry to the ground.

The workers unloaded the bundle of U-channels first. The U-channels of cross-section 13cm x 6.5cm were of various lengths. The weight of the bundle of U-channels was about 1.5 tonnes. The loading platform of the lorry was 7m long x 2m wide and 1.25m above the ground. The two piles of metal plates, each 2m long x 1m wide x 0.5m high in size, with sleepers underneath, occupied the right side (the driver's side) of the loading platform. Some sleepers protruded out from the metal plates. The loading platform was a little wet as it had been raining on that day. During the lifting operation, the wooden fences at the side of the loading platform had been lowered to facilitate the operation.

The D/P was working on the loading platform of the lorry to assist the unloading operation. After he had rigged the bundle of U-channels, a co-worker climbed up the loading platform to assist him in guiding the movement of U-channels. Another co-worker staying on the ground was preparing to untie the bundle of U-channels.

When the lifting operation was ready, D/P gave hand signal to the crane operator who then operated the crane to lift the bundle of U-channels away from the loading platform to the ground. The D/P was staying on the loading platform near the end of the lorry. Shortly afterwards, the co-worker on the loading platform and the crane operator heard somebody's shouts and the D/P was found lying on the ground near the end of the lorry. The D/P was rushed to hospital for treatment but he was certified dead on the same day.

Case Analysis

During the lifting work, the crane operator had clear and unrestricted view between the loading platform and the ground where the bundle of U-channels would be unloaded. The load was safely lifted away from the platform.

Nobody witnessed what exactly had happened to the D/P at the material time of the accident. However, based on the circumstances, it was probable that the D/P, for some reasons unknown, fell 1.25m from the loading platform down to the ground and sustained fatal injury.

Lessons to learn

(a) Before any lifting operation begins, workers should leave the loading platform and stay away from the lifting path of the load;

(b) Guide rope should be attached to the load being lifted and controlled by a worker at a suitable distance so as to prevent any undue movement of the load.

A cleaning worker fell with a collapsed mobile metal scaffold

Scenario

On the day of the accident, the deceased person (D/P) and a co-worker were responsible for cleaning the ceiling of the podium of a residential block. The ceiling was about 8.3m high from the floor of the podium. A mobile metal scaffold was erected by other workers to facilitate the work.

At the material time of the accident, while the D/P was cleaning the ceiling on a working platform at the top of the scaffold, fitful gust of wind suddenly caused the scaffold to topple. The lower part of the scaffold struck against a parapet wall of the podium. The top layer of the scaffold dislodged from the lower part and fell to the promenade below the podium. The D/P fell out from the working platform and his head struck against the floor of the promenade. He sustained fatal injury in the fall.

Case Analysis

The mobile scaffold was a 3-layered (with bottom, middle and top frames assembled together) metal scaffold. Each layer was about 2.3m high. The end of each frame was secured together by metal sleeve couplers. The height of the scaffold was about 7.2m with base area 1.93m x 0.72m. Hence, the height to the least base dimension ratio of the scaffold was not satisfactory for stability.

The scaffold consisted of the main frames, castors, horizontal bracings and diagonal bracings. The diagonal bracings were provided for each layer, and for connecting the middle and bottom layers, but not for linking with the top layer. Hence, the scaffold was not effectively braced.

A piece of board of dimensions 1.8m x 0.6m x 8mm thick was put at a level of about 6.5m high to form a working platform. Horizontal members at a height ranging from 0.46m to 0.68m were erected around the working platform. The horizontal members above the working platform were too low to act as guardrails. There was no toe-board on the working platform.

The scaffold did not have stabilizer, nor was it tied to any structure for stability. Furthermore, for the four castors of the scaffold, only the locking devices of three of them were engaged.

On the day before the accident, typhoon signal No.8 was hoisted. The scaffold was erected on the day of the accident by other workers after all typhoon signals were lowered.

There was no safety information, training, instruction and supervision given to the workers relating to working at height with the use of high mobile metal scaffold. They did not know how to install stabilizer to the scaffold. Eventually, no stabilizer was installed even though the assembly took only a few minutes.

The scaffold was not effectively braced, suitably assembled in accordance with the height to least base dimension ratio, adequately stabilized or secured. Movement of worker on the platform together with gust of wind appearing at the time of the accident contributed to the collapse of the scaffold.

Lessons to learn

A safe system of work shall be developed and implemented in connection with the use of any mobile metal scaffold for cleaning work outside a building. The system aims to ensure that the scaffold is in safe working order and to prevent the workers working on it from falling from height. It should include:

(a) Provision of a suitable scaffold and a working platform with particular attention to the following:

- The height to the least base dimension ratio of the scaffold should not be greater than 3.
- When the scaffold is used outdoor, it should be tied to the building it is serving.
- When the scaffold is used in a location exposed to high winds, the wind forces should be considered and the scaffold should be restrained by kentledge or guys.
- The scaffold should be effectively braced to ensure its stability.
- Every side of the working platform of the scaffold should be provided with suitable guard-rails. The height of the top guard-rail should be between 900mm and 1150mm above the working platform. The height of the intermediate guard-rail should be between 450mm and 600mm above the working platform.
- Every side of the working platform should be provided with toe-board of a minimum height of 200mm.
- The scaffold together with the working platform should be inspected and certified safe by a competent person before use.

(b) Provision of appropriate and sufficient safety training, information, supervision and instruction to the workers working on the scaffold.

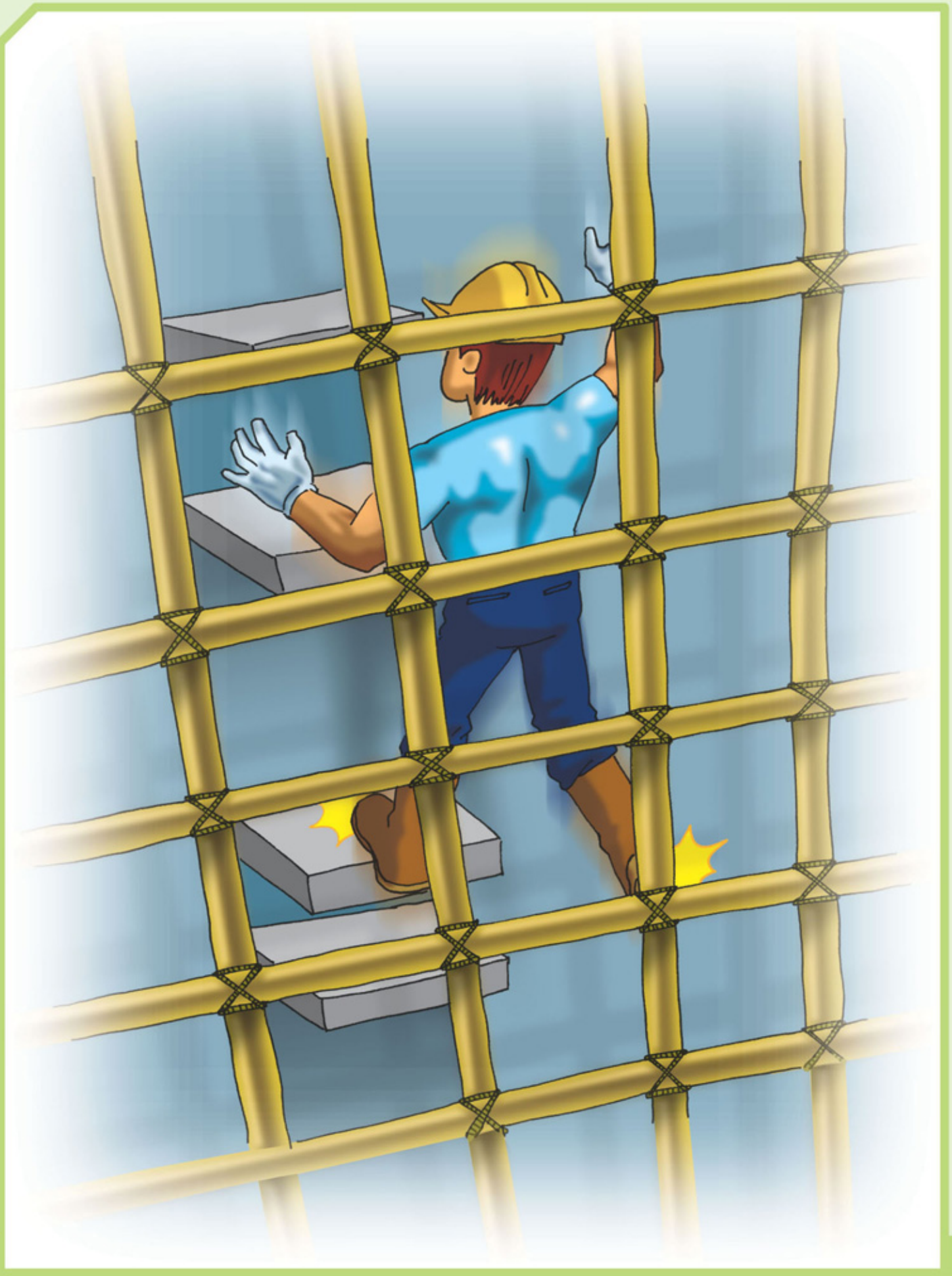
(c) A monitoring system should be developed, implemented and maintained to supervise and ensure the safety performance of the workers.

A worker plunged to death from 13/F of a building under construction in an evening

Scenario

Throughout the day of the accident, concreting work was carried out to the floor slab on the 15/F of a building under construction. The last skip of concrete was unloaded at around 7:30 p.m.. Various gangs of worker were working on that floor. Activities carried out included: distributing the concrete to different locations of the floor, smoothing the laid concrete, dismantling the concrete skip and platform, transporting material by a tower crane. The deceased person (D/P) was a labourer employed by a sub-contractor, responsible for smoothing the laid concrete with trowel.

Before the accident, the D/P climbed out to the bamboo scaffold at the external wall of the building from the floor edge of the 15/F and climbed down to the 13/F level, adjacent to a bay window. (Note: There was no 14/F designated to the building.) Resting one leg on a ledger and another on the external wall formwork, the D/P smoothed the concrete on the ledge of the bay window with a trowel. After working thereon for some time, the D/P somehow fell down onto the canopy on the 1/F. The D/P sustained fatal injury in the fall.



Case Analysis

The bamboo scaffold at the external wall where the D/P was working on was a single-row bamboo scaffold, erected at a distance of 600 mm away from the external wall.

There was no plank placed on this bamboo scaffold to serve as working platform for the D/P to work there.

The lighting condition at the external wall where the accident happened was very poor. The only lighting provided was ten spotlights installed on the jib of a tower crane above the building. Sometimes, the tower crane slewed around over floor slab for other operations.

The D/P was wearing a waist type safety belt but there was no independent lifeline or other anchorage for attachment of the safety belt.

As the external wall of the 13/F was inadequately lit and there was no working platform provided on the single row bamboo scaffold, the D/P had to work in the dark and at the same time, keep balance of the body on the scaffold. It was likely that the D/P might have lost balance in the course of work and fell.

Lessons to learn

(a) Suitable working platform for worker performing concrete smoothing work at the external wall of the building should be provided and properly maintained.

(b) Suitable and adequate safe access to and egress from the working place at the external wall should be provided and properly maintained.

(c) Every working place and the approach to such place should be adequately and suitably lit.

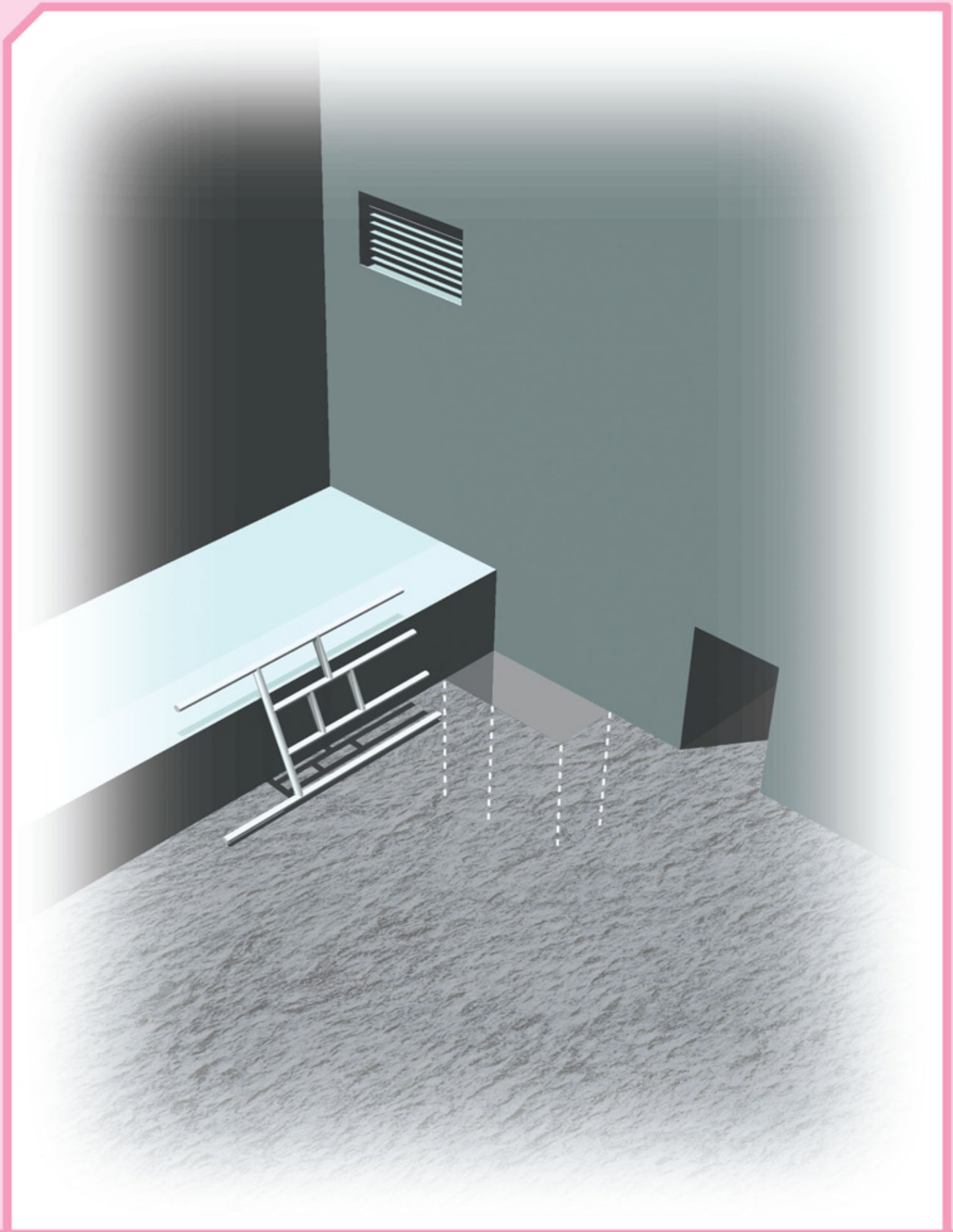
A worker suspected to have fallen into a floor opening on the 1/F of a building under construction

Scenario

The deceased person (D/P) was a site foreman of a subcontractor responsible for brick laying work on a building site.

One day, the D/P was told by a foreman of the main contractor to seal up the crevice in a partition wall of a ventilation duct chamber on the 1/F of the building. The crevice had been formed after the installation of a louver. The duct chamber had a floor opening leading into a vertical shaft that passed through the G/F and terminated at the floor of the basement. Entrance was provided on the G/F and the basement for gaining access to the vertical shaft.

On the day of the accident, the D/P and a co-worker worked on the 1/F for brick laying. Later in the day, the D/P told his co-worker that he was going to seal up the crevice at a staircase. At the end of that day, the D/P's clothing was still left in the changing room. That aroused the suspicion of a worker in the following day. A search for the D/P was therefore conducted. Eventually, the D/P's body was found at the bottom of the vertical shaft in the basement.



Case Analysis

On the 1/F, a wooden board was found near the entrance of the duct chamber. It was believed that the board should have been used to prevent entry but somehow it was removed. Inside the duct chamber, there was a floor opening of about 0.7 m x 1.7 m at the right side of the entrance. This was the opening of the vertical shaft that led to the basement 14 m below where the dead body of the D/P was found. The floor opening was not protected against fall of person.

There was a raised concrete stage of 1380mm high by the side of the floor opening inside the 1/F duct chamber. The crevice to be sealed up was 1510 mm above the stage. A metal scaffold component of 1080 mm wide and 1500 mm high was leaning against the stage. This scaffold component might have been used for access to the stage.

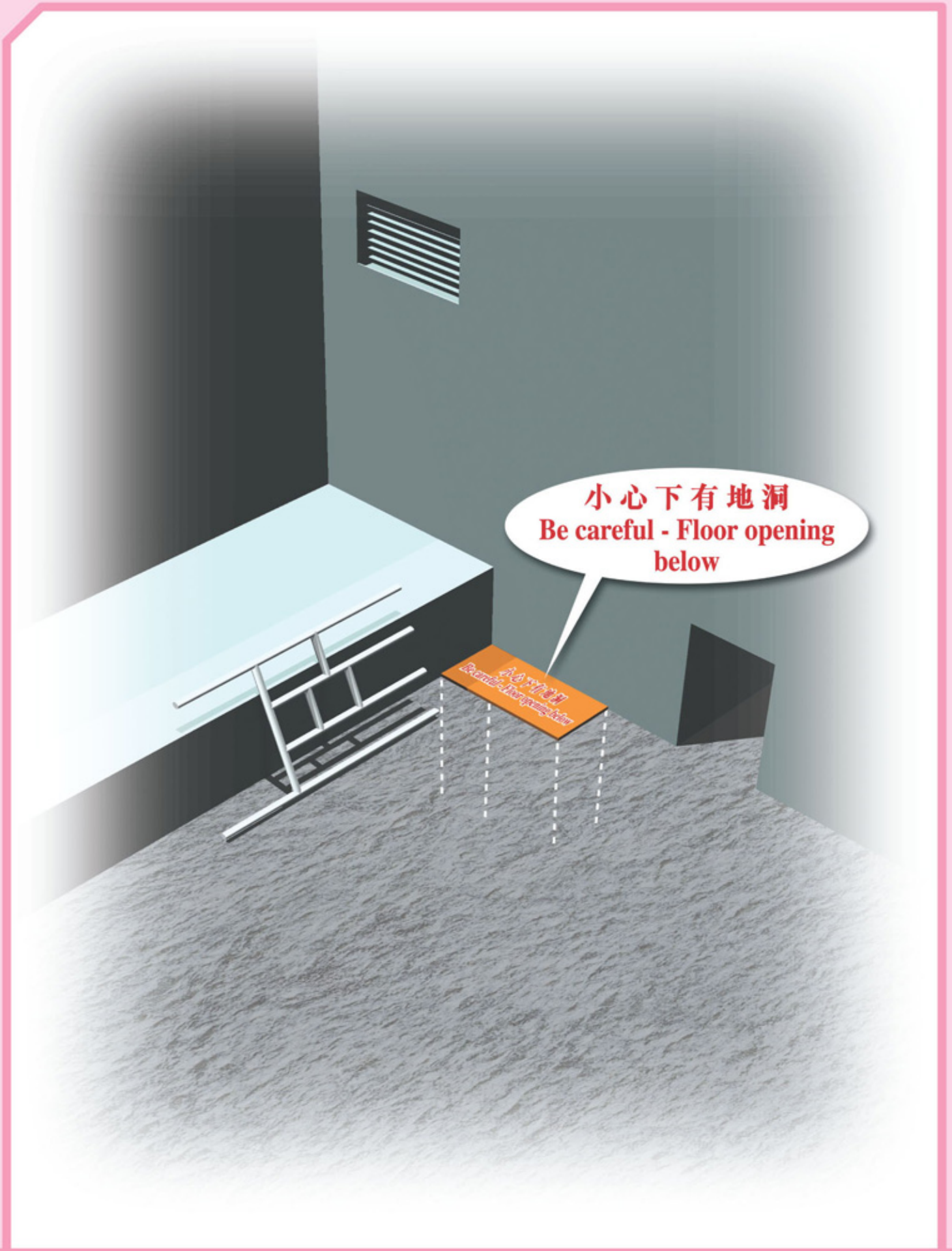
No eyewitness could confirm what the D/P was actually doing prior to the accident. Judging from the circumstantial evidences, it was believed that the D/P might have entered the 1/F duct chamber, probably for preparing the sealing up work. Somehow, he fell through the vertical shaft 14 metres to the basement.

Lessons to learn

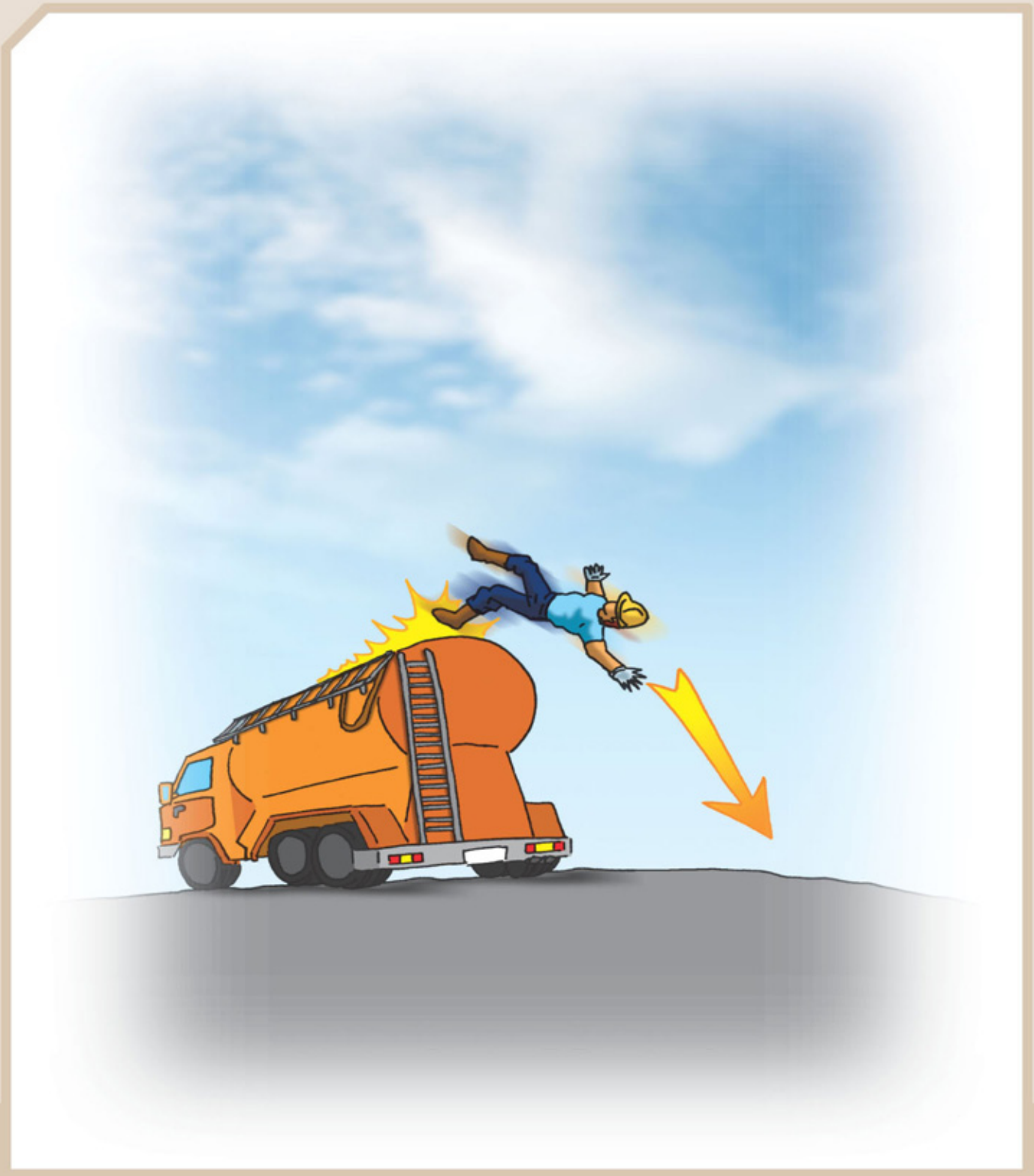
(a) If any work inside the duct chamber is required, the floor opening has to be properly fenced or covered against fall before the work commences.

(b) A safe system of work should be developed and implemented, including proper authorization for entry into a place where falling hazard exists.

(c) Suitable and sufficient training, information, instruction and supervision should be provided to ensure the work could be completed safely.


小心下有地洞
Be careful - Floor opening below

A driver fell from the top of a cement tanker at a concrete batching plant



Scenario

The deceased person (D/P) was a driver employed by a concrete supplier. The job of the D/P was to drive a cement tanker, load the tanker with cement or pulverized fuel ash and deliver it to various concrete batching plants. His duty also included maintaining the cement tanker clean.

The cement tanker consisted of a tractor and a tank trailer (8.9m (L) x 2.4m (W) x 3.55m (H)). The tank trailer had a cylindrical tank situated on its top for carriage of cement. The top of the cement tanker had a walkway at each lateral side. Each walkway was equipped with a foldable guardrail. The top guardrail was 1 m high whilst the intermediate guardrail was 470 mm high. However, no guardrail was provided at the front and rear ends. The top of the cement tanker was 3.5 m from the ground. A vertical metal ladder of 2630 mm long and 360 mm wide leading to the top of the cement tanker was installed at the rear end of the tanker.

On the day of the accident, the D/P delivered a tank of cement to a concrete batching plant of the company. At the plant, apart from unloading the cement, the D/P also cleaned the cement tanker by a water hose while standing on the ground. The accident happened at about 10 minutes after such cleaning work started. D/P was seen falling down from the rear top of the cement tanker to the ground. He fell 3.5m and sustained fatal injury. However, no eyewitness could tell why the D/P went up to the top of the cement tanker, nor did any eyewitness see what he was doing. It was believed that the D/P was cleaning the top of the cement tanker at that moment, with the guardrails of the walkway un-erected.

Case Analysis

The concrete batching plant was not equipped with automatic sprinkler system, nor proper working platform for cleaning of a cement tanker. In order to clean the top of cement tankers, the practice of cement tanker drivers was to climb up the rear ladder to the top of the tanker with a water hose.

While a cement tanker driver was working on the top of the cement

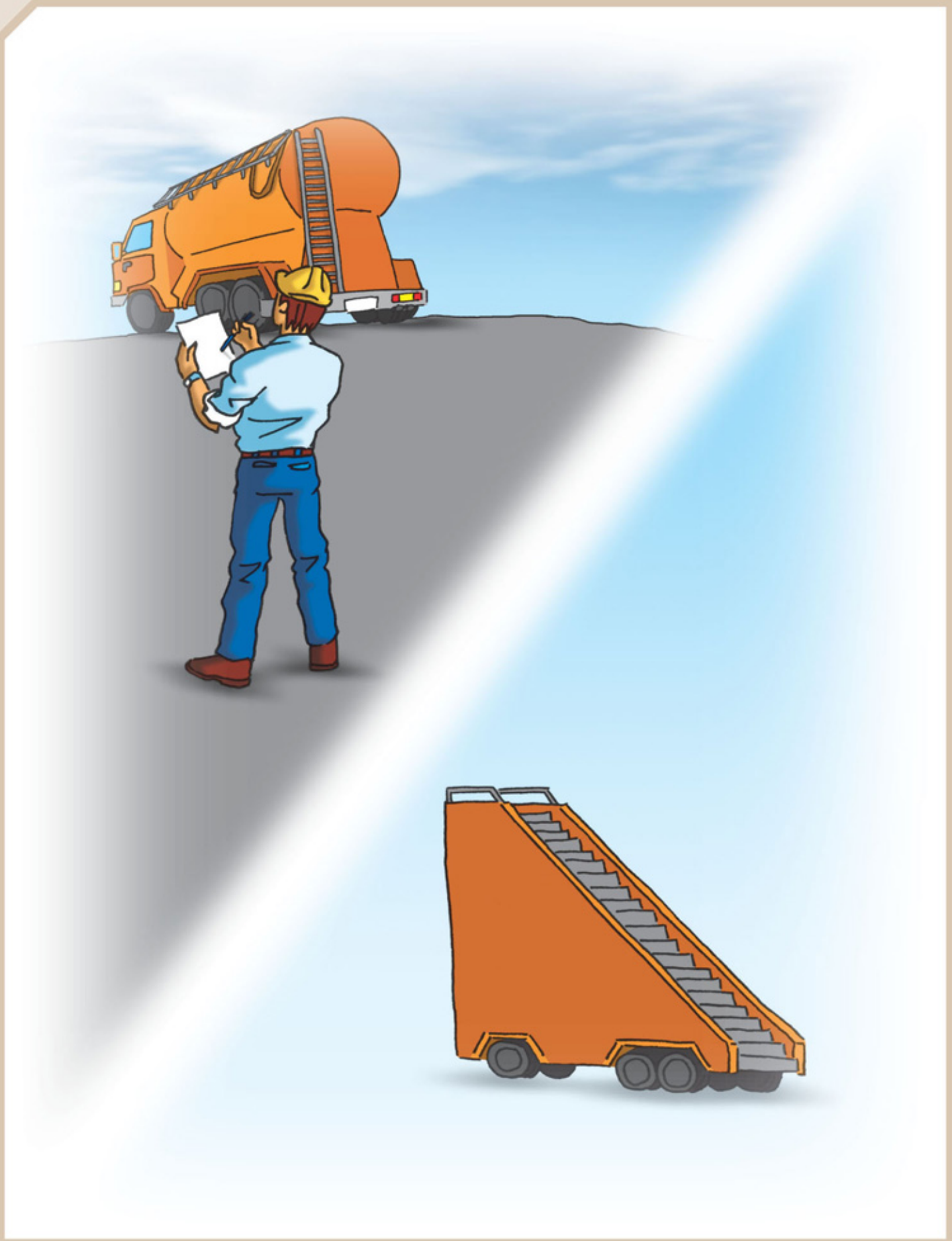
tanker, he should have been protected from falling from the sides by the foldable guardrails had they been properly erected. However, falling hazard still existed at the front and rear ends at the top of the cement tanker where no guardrail was available. Furthermore, falling hazard also existed when a cement tanker driver was climbing on the rear ladder in particular with one hand carrying a water hose, since no fall arresting equipment was provided.

Apart from cleaning of cement tankers, cement tanker drivers would also perform other duties on the top of cement tankers, such as taking cement sample and dealing with emergency situations. However, no safe procedure had been developed for such work, nor was there any documentation about the relevant precautionary measures. Moreover, cement tanker drivers had not been provided with any information, instruction, supervision and training about safe working on the top of cement tankers.

Lessons to learn

Worker must be prohibited from working on the top of a cement tanker unless a safe system of work has been established and adopted. The safe system of work should include:

(a) The carrying out of a risk assessment for working on the top of the tanker;
(b) The development and implementation of safe procedures for relevant work;
(c) The provision and maintenance of suitable guardrails on the top of the cement tanker to prevent persons working thereon from falling;
(d) The provision and maintenance of suitable means of access to and egress from the top of the cement tanker;
(e) The provision, maintenance and use of suitable fall arresting equipment and anchorage where necessary;
(f) The provision of training, information, instruction and supervision to the worker in relation to safety at work on the top of the cement tanker.



Two workers struck by wooden boards that fell during a lifting operation on a construction site

Scenario

A construction site was undergoing superstructure construction of three multi-storeyed buildings. On the day of the accident, construction of one of the buildings had reached 13/F level and formwork of the floor slab of 14/F was in progress. Early in the morning, workers of the formwork sub-contractor were delivering some wooden boards to the 14/F from the ground floor by a tower crane. There was a bar-bending yard located on the open ground outside the buildings and seven bar-bending workers were working there.

A formwork worker was responsible for rigging the wooden boards. The wooden boards were rigged to a stack by double choker hitch method using a double-legged metal chain sling. One end of the sling was hung on the hook of the crane through a metal ring. Each leg of the sling encircled the stack of wooden boards once and then anchored back to the sling itself by a latch hook. In the course of the lifting operation, the stack of wooden boards would pass over the bar-bending yard.

At the material time of the accident, the lifting of a stack of wooden boards (48 boards of overall size 1830 mm (L) x 930 mm (W) x 965 mm (H) and 965 kg in weight) was in progress. While the stack was being hoisted past the bar-bending yard, it suddenly detached from one of the chain slings. The whole stack fell down from height to the bar-bending yard. Two bar-bending workers working on the yard were fatally struck by the falling wooden boards.

Case Analysis

The seven bar-bending workers working on the bar-bending yard had not been instructed to keep away from the moving path of the stack. They were not aware of the lifting operation. The working environment was noisy and they did not hear the siren of the crane even though the crane operator had sounded the siren three times before lifting.

No damage or defect was found on the metal chain slings. The latch hooks of the sling were in normal condition and their locking mechanisms could work properly. Workers had to close the latch hooks properly in order to actuate the locking mechanisms. Since the latch hooks could appear to have been locked, they should check them with hands on each occasion. However, the rigging worker only conducted a visual check.

The choker hitch formed by each metal chain sling could not completely grip the wooden boards which were loosely gathered. Besides, the wooden boards had been used before and some of them had even deformed with nails and debris on the surfaces. They might slip or displace during lifting when there were no other means to tighten them up.

It was believed that the stack of wooden boards detached at the material time of the accident because the latch hook of a leg of the metal chain sling had not been fully locked. In the course of the lifting, the latch hook detached from the sling due to the swaying motion of the wooden boards. Consequently, the wooden boards scattered and fell.

Lessons to learn

(a) The wooden boards should be adequately secured before lifting. Suitable receptacle could be used to contain them to prevent slipping or displacement.

(b) A safe system of work for lifting of wooden boards should be established and adopted so as to ensure the safety of workers and other persons who are likely to be affected by the work. The system of work should include, but not limit to, the following:

- Risk assessment should be conducted to identify the risks associated with the lifting operation.
- Lifting operation should be well planned beforehand, with particular attention to the characteristics of the load, and the method and the moving path of the lifting operation.
- A person should be appointed to co-ordinate and supervise the overall lifting operation. The appointed person should have adequate training and experience to carry out the duties.
- Rigging operation should be undertaken by competent slinger who should, among other things, be trained in the principles of rigging, be capable of selecting tackle and lifting gear suitable for the load to be lifted and be capable of directing the movement of the crane and the load.
- Suitable arrangement should be made to prevent the load being lifted from passing over persons.
- Safe work procedures for the lifting operation should be established and adequate steps should be taken to ensure the compliance by workers.
- Suitable information, instruction and training on the lifting operation should be provided to the workers.

An operator of a forklift truck hit by a detachable counterweight of the truck

Scenario

The deceased person (D/P) was a forklift truck operator employed by a cargo handling company to work at a railway freight terminal.

On the day of the accident, the D/P was responsible for operating a 5-tonne forklift truck to relocate some metal sheet rolls.

When the D/P was driving the forklift truck to relocate a metal sheet roll, the tail part of the forklift truck tipped up off the ground and dropped back in a second. At that moment, a metal counterweight at the rear part of the forklift truck dislodged and hit the driver's seat. The D/P got injured in the incident and was sent to hospital. He passed away in the hospital.

Case Analysis

The place of the accident was an open ground, paved with concrete, at the terminal. A railway track ran along the ground leading to a slightly undulated surface. The forklift truck had to pass across the track during the work.

The D/P held a valid operator's certificate for operating forklift truck.

The forklift truck involved was a diesel-fuelled one fitted with two forks on its lifting bracket. The dimensions of each fork were 40 mm in thickness x 150 mm in width x 1800 mm in length.

The forklift truck had 4 front wheels and 2 rear wheels. The threads of the front wheels had worn out. Only the front wheels were linked to the braking system while the rear wheels were for steering purpose only. In case of an emergency braking during travelling with excessive load at high speed, the chance of tipping up would increase.

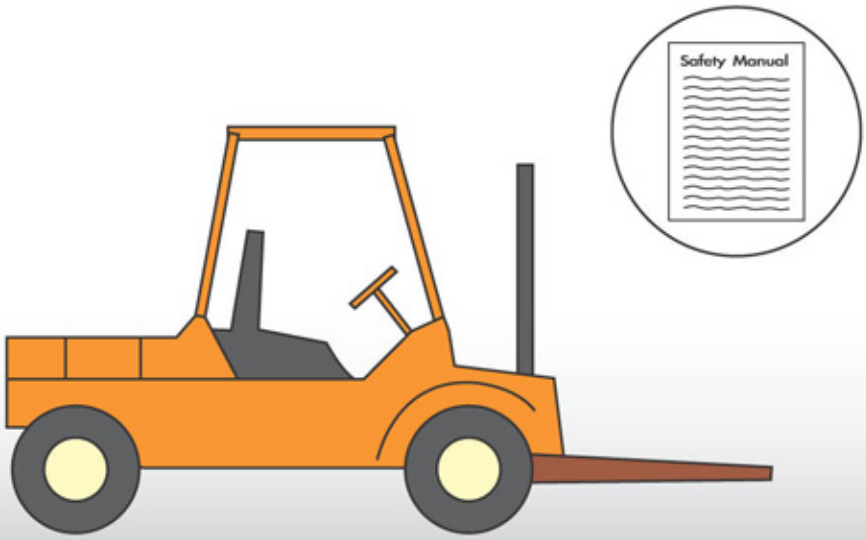
Six months before the accident, a Registered Professional Engineer had conducted test and examination to the forklift truck. It was found to be in a safe working order and the safe working load was 5 tonnes.

CASE 7

The metal sheet roll being transported was cylindrical shape with hollow centre. Its weight was 5.46 tonnes, which was beyond the safe working load of the forklift truck. The forks of the truck were inserted into the hollow centre of the metal sheet roll for transportation.

A homemade metal counterweight of semi-circular shape (110 mm diameter, 140 mm thick and 760kg in weight) was affixed to another counterweight at the tail part of the truck so as to increase the lifting capacity. It had two projecting rods (30mm in diameter and 180 mm in length) on its underside for inserting into the holes of the counterweight of the truck.

It was possible that the D/P, while operating the forklift truck at quite a speed and coming close to the railway track, might have applied brake upon entering the undulated surface there. The metal sheet roll shifted forward, and so did its centre of gravity. That caused the forklift truck to tilt forward. Since the extra counterweight had not been secured in position, it dislodged and hit the D/P from the back.



Lessons to learn

(a) No forklift truck shoud be allowed to lift a load that exceeds the safe working load of the truck.

(b) Use of forklift truck with additional counterweight should be prohibited unless it has got approval from the manufacturer.

(c) A safe system of work should be provided and maintained for operating forklift trucks. The system should include:

- Risk assessment and proper planning for the work;
- Provision and use of suitable forklift truck;
- Provision of safe work procedure, instruction and supervision; and
- Specification of safe driving speed within the workplace.

A worker was crushed to death by collapsed structures during concreting work

Scenario

On a construction site, a 2-storey building was being constructed through assembling pre-cast concrete columns and beams. In the method, pre-cast beams were supported at their ends by falsework that consisted of tubular towers. Concrete panels would be placed on the beams to hold the reinforcement bars of a floor slab, and concreting of the floor slab and upper part of beams would then be carried out to form a permanent structure.

On the day of the accident, concreting was in progress at the roof level of the building by eight concreting workers of the subcontractor. A site foreman of the principal contractor was supervising the work. Pre-mixed concrete was pumped to the concreting position by a pump truck.

At the time of the accident, while concrete was being laid near the junction of a beam and a column, a supporting falsework suddenly failed and collapsed. The end of the beam formerly supported by the falsework, together with concrete panels placed on it, fell down onto the floor below. At the same moment, the eight workers and the site foreman also fell down and got injured. A worker engaged in clearing cement/sand slurry on the floor below was fatally crushed by the collapsed structures.

Case Analysis

Investigation of the accident revealed the following:

(a) Missing members of the collapsed tubular tower

No diagonal braces were fitted to the two vertical faces of the tower, thereby greatly reducing its lateral resistance. Moreover, there were no lateral braces for tying the tower to any existing structures to secure its lateral stability. As the concrete was being laid at the time of the accident, the tower failed under the increasing superimposed load.

(b) Procedure for approval of the design incomplete and absence of method statement and clear drawings

The design of the supporting tubular towers had not gone through the internal procedure of approval, nor the external checking and certification by an independent checking engineer. The method statement for the relevant falsework erection had not yet been completed up to the day of the accident.

In the absence of side view drawings, the configuration of the supporting tubular towers were not clear enough to enable the workers concerned to erect the falsework in accordance with the design.

Furthermore, the drawings were not provided to the relevant falsework subcontractor, workers, and even the site foreman of the principal contractor who was assigned to check the falsework. Coupling with the fact that the site foreman had not been trained in falsework inspection, he could not discharge his duty.

(c) Insufficient safety information, instruction, training and supervision

No safe work procedure was formulated for governing the falsework erection. The workers concerned were only given with simple instruction that they should remember the configuration of the dismantled towers and that they should follow the same configuration during re-erection of towers.

No safety training on the erection of the falsework was provided to the workers concerned. They only received general safety information and instruction when they were first employed on the site.

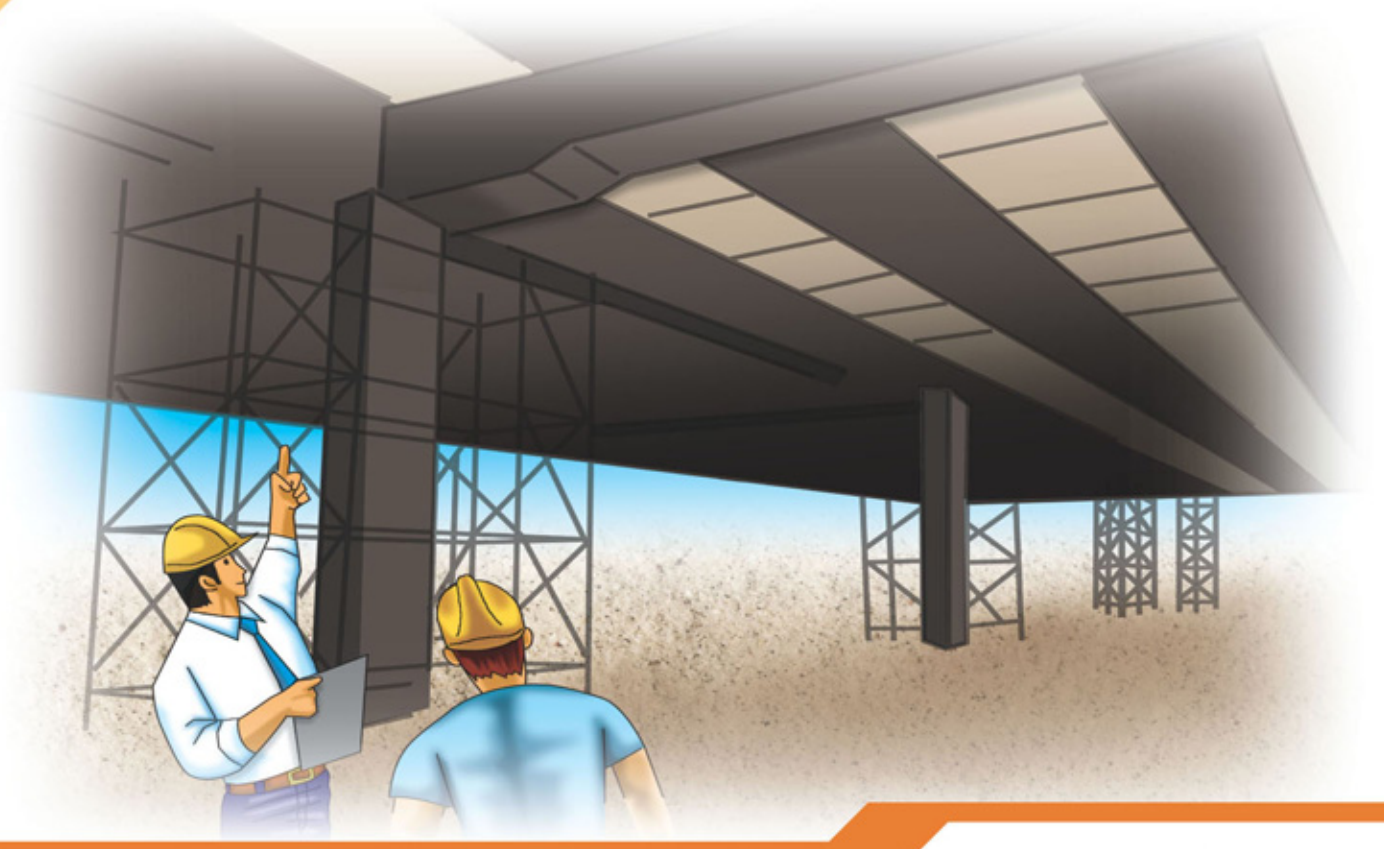
No stringent supervision was exercised on the erection of the supporting tubular towers, nor was any instruction given to the workers concerned that they should report the completion of the erection so that an inspection could be effected.

(d) No checking of the falsework

The supporting tubular towers had not been checked for structural integrity prior to the concreting work.

(e) Vibration due to the concreting

Although the concreting workers did not notice any abnormal vibration from the concrete delivering pipe and the concrete vibrator during the concreting, it was probable that these operations and related work activities emanated considerable disturbance causing the supporting tubular towers below to sway.



Lessons to learn

A safe system of work should be developed and adopted for the work. The system should include, but not limit to, the following:

(a) The falsework should be designed by a competent engineer and the design should be cross-checked by an independent checking engineer.

(b) Clear, concise and complete drawings of the falsework should be provided to the site operatives concerned.

(c) Safe working procedures regarding falsework erection and inspection should be formulated and implemented. All relevant supervisors and workers should be adequately trained in the procedures.

(d) The falsework should be checked for structural integrity by a competent person and a formal record should be kept.

(e) A qualified falsework co-ordinator should be appointed to ensure that all relevant procedures have been followed, all inspections and maintenance works have been carried out and that all modifications and changes to the falsework have been approved.

A wheel loader knocked down a site foreman inside a tunnel under construction

Scenario

A construction site was undergoing tunnel construction work. The deceased person (D/P) was a site foreman employed by a subcontractor.

On the day of the accident, the D/P was leading a group of workers for work inside a tunnel. At about 9:00 am, they found that a spanner required for the work was left in the changing room adjacent to the entrance of the tunnel. The D/P went to fetch the spanner. At the same time, a worker was driving a wheel loader inside the tunnel to collect materials for road surface levelling work.

When the D/P reached a position where a vehicle was parked by the right side of the tunnel, he was knocked down by the wheel loader from behind. He sustained fatal injury as a result.

Case Analysis

The original width of the tunnel was 7.2 m. There were 3 vehicles parked at right side of the tunnel. As a result, the width of the passageway was reduced to 4.7m.

Inside the tunnel, no separate pedestrian footway was demarcated. Traffic and pedestrian flow were mixed together. Furthermore, no traffic management scheme, nor warning sign was provided to ensure traffic safety.

The road surface of the tunnel was wet, muddy and uneven. The illumination inside the tunnel was insufficient. Fluorescent lighting was installed at every 3.5 m interval on the right side along the tunnel wall whilst on the left side of the tunnel, only a spotlight was mounted at height near the entrance. The glare of the spotlight affect the eyesight of the wheel loader driver. The D/P was wearing dark green trousers with naked upper body. It would not be easy for the wheel loader driver to spot him against the concrete surface of the tunnel.

Lessons to learn

(a) Pedestrian footway should be demarcated inside the tunnel to separate pedestrians from traffic.

(b) Adequate lighting, free from glare, should be provided inside the tunnel.

(c) The road surface of the tunnel should be rendered even and non-slippery.

(d) Parking of vehicles inside the tunnel should be avoided, especially when it affects traffic safety.

(e) Worker should wear reflective clothing while working inside the tunnel.

Enquiry

If you wish to know more about occupational safety and health information, you may contact Occupational Safety and Health Branch of the Labour Department through -

Hotline : 2559 2297

E-mail: enquiry@labour.gov.hk

Information on the services offered by the Occupational Safety and Health Council can be obtained through hotline **2739 9000**.

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