



Factsheet

20 Nov 2009

RECENT ACCIDENTS INVOLVING USE OF GONDOLAS

Background

The Ministry of Manpower (MOM) is concerned over the recent accidents (including a fatal accident) involving the use of gondolas.¹ There are currently about 4,000 active gondolas that are registered with the Ministry. Our statistics revealed that there were three workers killed in the past 3 years while working on gondolas. Details of the cases are in the Annex A.

2. Gondolas such as the one shown in Annex B are commonly used to facilitate cleaning or painting of buildings. The gondolas moved vertically via winches attached to wire-ropes that are in turned secured to the rooftop of the building using a anchorage system. As the gondolas are only designed to move vertically, in order to cover the façade of the building, this means that the anchorage point at the rooftop would have to be relocated. Hence it is critical that the integrity of the gondolas and its anchorage is maintained in order to prevent the occurrence of accidents.

Key Learning Points

3. MOM will like to highlight to the industry three key learning points on the safe use of gondolas.

(i) Proper design, installation and testing of gondolas

4. All gondolas and its anchorage system must be designed by a Professional Engineer. The design should be in accordance with established codes of practice and standards. In particular, the design of the gondolas especially its anchorage system need to focus on the following areas:

¹ There were two separate accidents involving the use of gondolas in recent weeks. In the first accident on 7 Nov 2009, a worker escaped unharmed when the gondola he was working in tilted. A worker was killed in the separate accident on 12 Nov 2009 when he was hit by a piece of falling plaster that probably chipped off during the installation of the gondola.

- a. Where wall clamps are used as part of the anchorage system (refer to Annex C), they must be installed on a structure which is capable of withstanding the stresses imposed on it. Where there is contact between the clamps (metal) and the wall (plaster) adequate packing must be used. It is also recommended that sufficient clearance be maintained between the wall clamps and other parts of the supporting structure (other than the designated padded areas)
 - b. The wire ropes of the gondolas must remain vertical at all times and must not come into contact with any part of the building such as a roof canopy.
 - c. Proper entry / exit point into the gondola must be catered for. Workers must be able to climb in and out of the gondola from a secured and safe landing.
5. The above measures are necessary to prevent accidental dislodging of wall materials resulting in falling objects, damage to the wire ropes which can potentially destabilise the gondola or even worker falling from height. A pre-installation site inspection in order to establish the actual condition on site is hence critical in order to identify potential problems that may hinder the safe operation of the gondolas.
6. After the design, the gondola can only be erected by an Approved Scaffold Contractor (ASC) who is responsible to ensure that the installation adhere strictly to the design. In addition, the ASC is required to ensure that the gondola is installed by competent riggers under the supervision of a qualified supervisor². As part of the installation, the safe working load and number of workers allowed within the gondola must be clearly specified in order to prevent overloading.
7. After the gondola has been first installed on site, it must be tested by an Authorised Examiner³ before it is used. The test would include loading the gondola with weights to ensure that the gondola can take the load it was designed for. This test is to be repeated at least once every 6 months thereafter.

(ii) Regular inspection and maintenance of gondolas

8. Given the mobility of the gondolas, it is paramount that they are subjected to regular inspection and maintenance in accordance to the manufacturer's recommendation. Measures include the following:

² The qualified supervisor is known as a *suspended scaffold supervisor* as gondolas belong to a class of work platform known as suspended scaffolds.

³ The Authorised Examiner is a Professional Engineer who is specially approved by the Ministry to conduct inspections on lifting machines such as gondolas or cranes.

- a. The gondola must be re-inspected by the qualified supervisor once every seven days or when the gondola is relocated or if environmental factors (such as heavy storm) may have affected the stability or strength of the gondola.
- b. The winches must be inspected to ensure that the gondola remains horizontal during its ascent or descent. The winches should be opened up for a thorough inspection by a competent person at least once every 12 months.
- c. The wire ropes must be inspected to ensure that it is not frayed or damaged.

(iii) Adequate fall protection measures when using gondolas

9. Workers working in the gondolas are constantly exposed to the risks of falling from height. Notwithstanding the above measures, adequate fall protection measures must be implemented. The primary control measure is to provide every worker with a safety harness (coupled to a shock absorber) which must in turn be secured to an independent lifeline.

10. In addition, the Ministry would also like to remind all contractors and gondola workers of the following prohibitions:

- a. Not to overload the gondola with equipment or materials;
- b. Not to over-stretch by standing on the guardrail of the gondola;
- c. Not to climb out of the gondola unless it is at the designated landing point / level.

Reminder to Industry

11. Mr Silas Sng, Director, Occupational Safety and Health Inspectorate said, "Work involving gondolas present a high level of risk. MOM would like to urge the industry to pay attention to ensuring its safe installation and use. Practical guidance can be found in the Approved Code of Practice CP20:1999 – Code of Practice for Suspended Scaffolds and the relevant legislation on suspended scaffolds. MOM will be conducting checks on gondolas around the island in the coming weeks. MOM will also be working with the Workplace Safety and Health Council to alert all Approved Scaffold Contractors on the learning points from the recent accidents."

Annex A

Case 1 – 8 Nov 2006

The Deceased and a co-worker were re-positioning a gondola which was resting on an external cantilevered platform on the ninth storey of a building under construction. The Deceased was inside the gondola tensioning the cables when it tilted outwards. The Deceased fell out off the gondola and struck the ground 39m below, he died on the spot.

The Occupier of the worksite, China Construction (South Pacific) Development Pte Ltd was fined \$130,000 under the Workplace Safety and Health Act for failing to take reasonably practicable measures to ensure a safe workplace.

Case 2 – 3 Apr 2007

A worker was painting the exterior of a HDB block from a gondola. He climbed off the gondola onto the inclined concrete canopy located on the 10th floor of the HDB block, where he fell and landed on the ground. The worker was immediately conveyed to the hospital, where succumbed to his injuries.

The Employer of the Deceased, Giftbuild Pte Ltd, was prosecuted and fined \$70,000 for failing to take reasonably practicable measures to ensure the safety of its workers. The Giftbuild Director, Goh Eng Ban, was fined \$20,000 for failing to discharge his responsibilities under the Workplace Safety and Health Act. The Occupier of the worksite, Jotun (Singapore) Pte Ltd, was fined a total of \$18,000 for various violations under the Workplace Safety and Health Act and the Factories (Scaffolds) Regulations.

Case 3 – 12 Nov 2009

A worker was killed when he was hit by a piece of falling plaster. The gondola was resting on the ground floor and he was most probably tensioning the cables in the gondola. Another set of workers were on the roof top installing the gondola and the plaster was probably chipped off during the installation process.

Investigation is on-going.

Annex B



Photo showing a typical gondola used in painting of a building



Photo showing the winches used for the climbing of the gondolas

Annex C

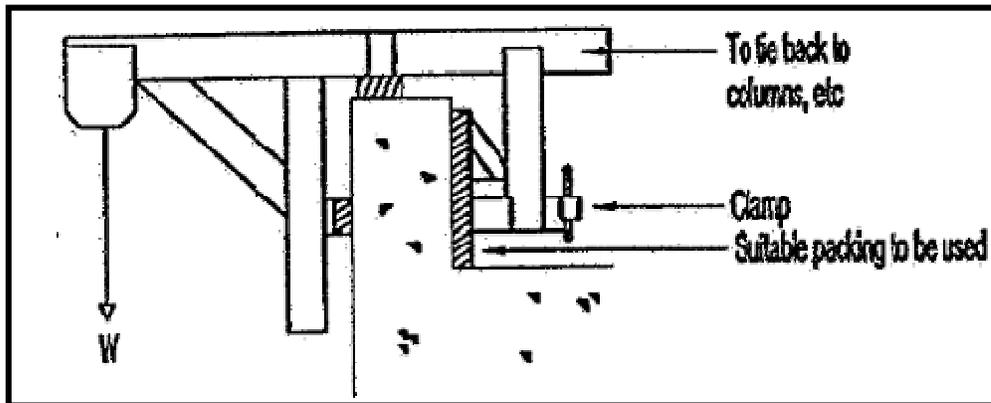


Diagram of a typical wall clamp

Source from CP20: Code of Practice for Suspended Scaffolds

- Point of anchorage should withstand stress; and
- Secure and adequate packing provided to prevent contact with non-structural elements