



有利建築有限公司

鐵模板安裝及工地吊運實務措施





## 內容簡介

- 鐵模板及掛籠安裝
- 非指定吊運區吊運



# 鐵模板及掛籠安裝



# 鐵模板安裝問題及改善措施





## 鐵模板安裝問題及改善措施





## 外牆掛籠安裝問題

- 外牆掛籠的部份螺絲沒有收緊；
- 掛籠運身橋的部份螺絲沒有收緊、沒有裝上壓槽或螺絲沒有裝上介子等問題。

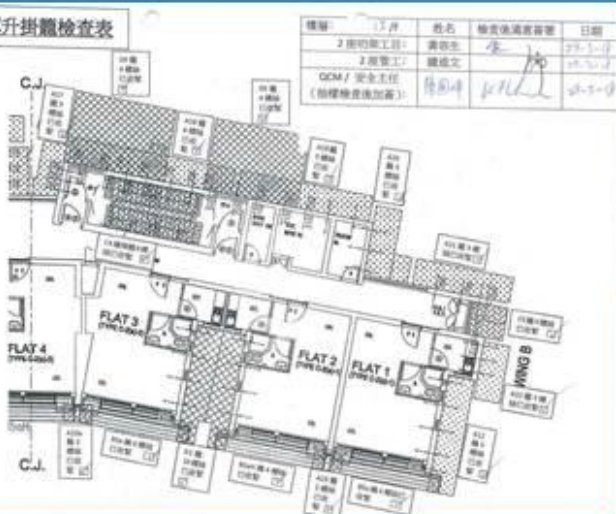




## 外牆掛籠安裝實務措施

- 即時由地盤最高管理層與叻架工人進行會議以了解問題所在，並說明按設計安裝螺絲的重要及指示要嚴格跟從；
- 設計一款新的掛籠檢查表格，圖文並茂地指示出每個掛籠螺絲位置及數量，由叻架監工及座管工共同檢查並由 QCM或安全主任抽樣檢查。

2座B翼掛籠檢查表



QCM





## 利用升秤時段安排叻架工 進行吊運檢討

- 升秤時 QCM / 安全主任與樓面叻架工進行吊運及安裝鐵模板和預製件檢討;
- 溫故知新提醒他們吊運及安裝鐵模板和預製件的安全程序。







## 設置防止物料下墮設施

- 升掛籠及吊運鐵模板時難保會有碎石下墮的危險；
- 設置掛籠式斜擋；
- 扎鐵場設置可伸縮的天羅地網。





## 設置噴霧風炮為樓面工作降溫

- 於烈日下樓面裝拆鐵模板十分炎熱；
- 噴霧風炮降低樓面工作溫度（-約 $2^{\circ}\text{C}$ ）及工地除塵。



持續使用風炮降溫除塵



# 非指定吊運區吊運



## 提供臨時圍封設施及電子哨 與街外吊雞車借用

- 街外吊雞車由總管安排臨時吊運及物料存放位置；
- 在車間設置臨時圍封設施與街外吊雞車借用；
- 埋碼 / 訊號員使用電子哨以警惕接近吊運區的人士；
- 響亮警號聲，比普通哨子更衛生及可節省吹哨子的氣力。





## 執行 3、3、3 吊運守則

- 吊運工序按照 3、3、3 的吊運守則進行；
- 所有人要離開吊運物料 3 m；
- 物料吊起 30 cm 後；
- 等待 3 秒檢查是否穩固及沒有勾到其他物件，才可以繼續吊運工序。





## 圖像化吊運守則

- 於吊運區張貼圖像化吊運守則使工人更清晰容易跟從。





## 地盤管理層不時巡視吊運工序

- 工程經理/QCM 不時巡視 / 檢查吊運工序;
- 如吊運預製件方法、外牆掛籠安裝方法等;
- 獎勵表現好的員工，有問題的員工會即時進行教育。





## 安排所有管工、總管及安全主任上吊運銀卡課程

- 包班上吊運銀卡課程 (A12)，以確保各前線人員都有足夠知識去監督吊運安全。

**CIC吊運銀卡實習場**



**CIC吊運銀卡理論堂**





簡報完畢！

**Q & A 時間**



Here is the footage of  
Site Safety Forum 2018 for Works Contracts and Property Services  
Contracts

which was held on 3 July 2018

The speaker comes from  
Yau Lee Construction Company Limited

Mr. Chan Kwok-fung

His topic is

Metal Formwork Installation and Lifting Operation on Site

\*\*\*\*\*

(00:25)

Dear guests, fellow practitioners, good afternoon

I am Chan Kwok-fung from Yau Lee

I am Chan Kwok-fung from Yau Lee

It is Yau Lee's pleasure to be invited by Housing Department  
to share on high risk activities

My topic today is "Metal Formwork Installation  
and Lifting Operation on Site"

There are two themes. The first one is about the  
installation of metal formwork and hanging working platform

The second is lifting at non-designated lifting zone

These two processes are very common on site  
and often encounter many problems

Owing to the limitation of time, I cannot share in detail

I will highlight the key points

Let's share our experience

Installation of metal formwork and hanging working platform

Metal formworks used nowadays  
are different from the previous ones

Most formworks are lifted to the ground for temporary storage

In the past, the metal formwork could be reused  
on the other side of the same floor

e.g. after being dismantled from Wing A

it can be reused at Wing B

If the material storage on the hanging working platform or metal formwork was not in order say the accessories or screws were not placed properly the lifting operation would become problematic because of increasing risk of falling objects Usually, this problem occurred when the metal formwork was installed

In these photos, there were many accessories and screws inserted on the metal formwork

If it was not the designated location it would be dangerous when lifting

There would be an opportunity of falling down

In the design, we prepared some areas for the storage of materials, accessories and screws on the metal formwork, metal boxes, etc. for workers to use

But in the actual situation

Workers might find the location not convenient the box might not be big enough or for the sake of convenience

they would put the materials improperly

It would be very dangerous during the lifting

These problems usually occurred

when the installation of metal formwork commenced

Whenever we note these problems

we would immediately discuss with the workers on site

The site manager and engineer would

cooperate with the workers of metal formwork on site

what problem had happened

We added chain locks, hoops

or boxes at appropriate place

Allow appropriate and sufficient storage space for workers

At the same time, not affecting the safety  
of lifting or installing metal formworks

In addition, we designed a lot of small trays  
on the metal formworks and hanging working platform  
If the trays were not big enough  
or the quantity was insufficient  
workers would continue to put their accessories randomly  
and endanger the lifting of the metal formwork  
There might be collision during  
the lifting of the metal formworks  
The screws would fall when it collided  
In this case, we must immediately  
communicate with the workers on site  
to find out better locations to install the trays  
or increase the size of trays  
We would communicate with other colleagues  
at the same time  
to understand whether the bar benders  
would hinder their job  
Add trays at right places for workers

The third is about the installation of  
the hanging working platform on external wall  
Metal formwork workers are usually very experienced  
They know how to install even with their eyes closed  
During the 6-day working cycle, the programme is tight  
They might neglect the importance  
of installing screws on hanging working platform  
In this photo of hanging working platform  
some screws were not fastened  
The screws of the hanging working platform  
were not tightened  
The U-channel had not been installed  
Some had been fitted with U-channels

but the washers had not yet been installed  
These were very serious problems  
It could affect the stability of the hanging working platform  
So once we found these serious problems  
Our top management  
such as the director and project manager  
would immediately meet all the related subcontractors  
and arrange meetings for the workers of metal formworks  
The first question would be about the cause of the problem  
Whether it was due to the worker's behaviour  
or any other causes  
that lead to improper installation of screws  
Through the communication  
sometimes it is workers' behavioural problem  
such as laziness, for the sake of convenience  
or rushing to adhere to the programme  
Through the communication  
we might note that it was not necessarily related to people  
It might be due to the quality of the screws  
We did experience the mismatching problem  
of bolts and nuts  
Mismatch would be problematic as you know  
they couldn't be fastened  
However the workers didn't report the incident  
They continued the installation  
we dealt with it and communicated  
with the workers accordingly

What was the problem?

If it was a workers' behavioural problem  
the workers needed to be retrained

If it was a problem of the screw that  
could not be installed properly

We would contact the manufacturer immediately  
and ask them to ship a batch of

the right screws to match

Once the problem was identified, communicate swiftly  
find out the reason and solve it right away

If the screws did not match

then it was not installed securely

Risk would arise

We deliberately design a new checklist  
for hanging working platform

It showed the position and number of all the screws  
of hanging working platform by clear graphical illustration

Let the subcontractors, the metal formwork workers

the metal formwork supervisor

and the block foreman to check

After checking, our quality control manager

and safety officer would also conduct random inspection

We would use the telecopying time of tower crane  
to arrange review meetings with riggers

The metal formwork workers could be very busy  
after entering the 6-day working cycle

It's hard to spare time for training

During the climbing of the crane

some other workers would be

employed as temporary workers to perform simple tasks

such as repairing the metal formwork, etc.

So, we could arrange training and review meeting for riggers

to refresh the good practice and learn new technique

In addition, we also had

some measures to prevent falling objects

We would arrange cleansing

of the metal formwork after work

Nevertheless, it was inevitable that

some concrete debris would remain after cleaning

So we would install a catch fan

under the hanging working platform  
to prevent the concrete debris from falling  
At the same time, we would install  
extendable nets over the steel bending yard  
The nets could prevent falling objects  
during the climbing of hanging working platform  
or lifting of the metal working platform  
It could be opened when steel bars  
were delivered to the yard

We would also set up a mist gun machine  
to reduce the temperature on working floor  
Workers working on the working floor  
were often subject to the hot weather, especially during  
the installation and dismantling of metal formwork  
Owing to the reflection from the mould oil  
on the metal formwork  
the temperature may rise to 30 to 40 degrees  
it was very uncomfortable  
Therefore we deliberately provided mist guns  
It could automatically rotate 180 degrees and spray mist  
The spray range could cover the entire wing  
to achieve a cooling effect  
by reducing the temperature of one to two degrees  
Reducing one or two degrees could be significant  
and welcomed by the workers  
Workers always asked us  
to turn on mist guns for cooling down

Second, about lifting at non-designated lifting areas  
If you have worked for sites of the Housing Department  
you should know that the lifting zones also refer to  
the metal formwork yard, prefabricated concrete  
element yard and steel bending yard, etc.  
All have fencing with notices

Non-designated lifting area refers to the lifting zone used by the subcontractors or lorry mounted cranes when they enter the construction site

Fencing facilities are not sufficient

We would also set up a system

We would lend temporary fencing and electronic whistle for use by lorry-mounted cranes

First of all, the lorry mounted crane should follow the instruction of our foreman on the designated area for lifting and storage of materials

At the entrance gate, they could also borrow traffic cones, warning sticks fences and electronic whistles

They could borrow the facilities when they did the registration

The electronic whistle was welcomed by the workers which was easy to use, loud and hygienic

In addition

we would also implement the 3-3-3 lifting system

That is, the lifting personnel should stay away at 3m from the load of materials

Lift up the load by 30 cm for 3 seconds

Ensure that the surrounding is cleared before further lifting

We also provided lifting operation guide in a graphical format for many years

It clearly showed the right and wrong practice with clear instruction

Moreover, the quality of any system rely on routine checking

Therefore, our quality control manager and project manager would check regularly

For example



the method of lifting prefabricated components  
and the installation of hanging working platform  
would be checked

We appreciated the good practice and  
provide re-training for those involved  
in the sub-standard practice

In addition, all the foremen site agents and safety officers  
were required to attend silver card course

All metal formwork workers or riggers  
should have silver card qualification of A12

Do our supervisors have the qualification or knowledge?

So we let all of our frontline staff attend the course

Learning safe rigging method enabled them  
to perform their supervisory work

This is the end of my sharing

Thank you, Mr. Chan

Mr. Chan, please ask a question

As I mentioned just now

When problem occurred during the installation of  
metal formwork or hanging working platform  
what should we do?

Couldn't you understand the questions? Shall we repeat?

When a problem occurred during the installation  
of metal formwork or hanging working platform

What should we do?

Do we need to repeat for the third time?

What is the best way to deal with these problems?

Immediately report to the management level

Is the answer correct?

Almost correct

If you find a problem, of course  
you should communicate with the frontline staff  
at that moment

Identify the problem and solve it

After clarification, we consider his answer is correct

Thank you

Thank you, Mr. Chan

Thank you for watching

(10:52)