#### SITE SAFETY SEMINAR

FOR

## WORKS CONTRACTS AND PROPERTY SERVICES CONTRACTS

ON

**15 DECEMBER 2011** 

TRUSS-OUT SCAFFOLDING

## Three Components of Truss-out Scaffold

1.Steel Bracket



2. Bamboo Members



3. Anchor Bolt



(Source: Section 1.1, Figure 1.5 to 1.7, Follow-up Study on Safety and Reliability of Truss-out Metal Bracket Bamboo Scaffoldings, The Hong Kong University of Science & Technology, June 2006)



I - Bracket



**Cross Bracket** 



T - Bracket

#### Recommended Size & Grade

(Source: Part B, section 1.5; Guidelines on the Design and Construction of Bamboo Scaffolds, Buildings Department)

- 50 x 50 x 5mm Grade S275 Equal Angle (min. 3.79 kg/m) with 5mm fillet welds;
- Galvanized or painted with 2 layers of red lead primer; and
- Mounted to structure elements with high quality anchor bolts.

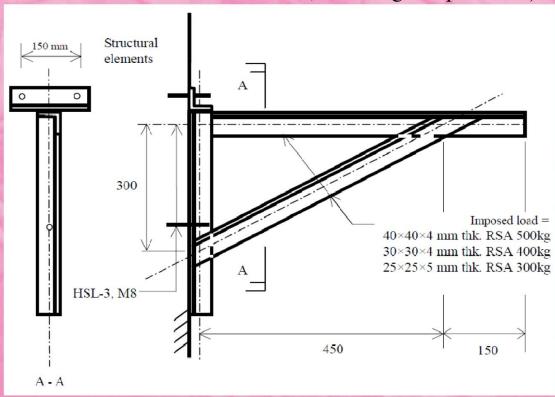
#### T – Bracket

(Source: Part B, section 3; Guidelines on the Design and Construction of Bamboo Scaffolds, Buildings Department)

	Size
1	40 x 40 x 4 mm thk.
2	30 x 30 x 4 mm thk.
3	25 x 25 x 5 mm thk.

#### T – Bracket

(Source: Part B, section 3, Diagram 8; Guidelines on the Design and Construction of Bamboo Scaffolds, Buildings Department)



#### **Steel Bracket Distance**

#### Recommended Centre-to-Centre Distance

(Source: Part B, section 3; Guidelines on the Design and Construction of Bamboo Scaffolds, Buildings Department)

The horizontal spacing between the steel brackets should not be larger than 1.3 m.

#### **Bamboo Members**



#### Mao Jue (毛竹)

The nominal external diameter along the unlapped length should not be less than 75 mm with a nominal minimum thickness of 10 mm.

#### Kao Jue (篙竹)

The nominal external diameter should not be less than 40 mm with a nominal minimum thickness of 10 mm.

(圖片來源: 3.1段,圖二,安全裝拆「吊棚」基本法,職業安全健康局)



Key factors affecting the tensile strength of anchorage system

- 1. Size of Drill Hole
- 2. Tightening of Anchor Bolt
- 3. Anchorage Depth
- 4. Position of Anchor Bolt

#### 1. Size of Drill Hole



Diagram 3: An expansion anchor bolt installed at the base material matched the drill hole.



Diagram 4: Extra space at drill hole was stuffed with nylon strip, which was no use for the anchor to hold the base material effectively.



(Source: Installation of Metal Bracket of Truss-out Scaffold by Anchor Bolts, OSHC.

#### 2. Tightening of Anchor Bolt



Diagram 6: The structure of the anchor bolt was seriously damaged (The right-hand side anchor bolt) as a result of fixing it with too large tightening torque.

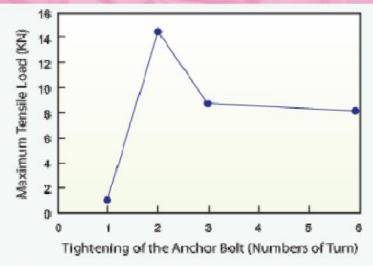
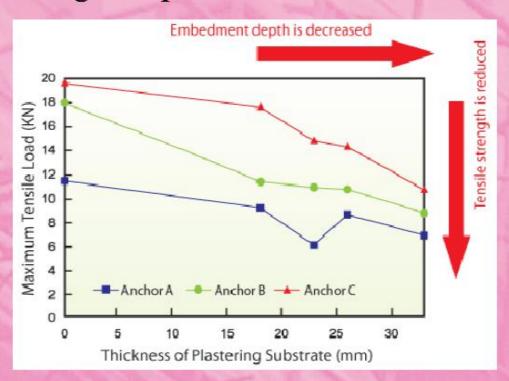


Diagram 7: Graph of maximum tensile load against tightening of the anchor bolt in terms of numbers of turn

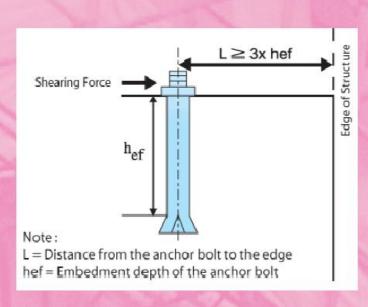
(Source: Installation of Metal Bracket of Truss-out Scaffold by Anchor Bolts, OSHC.

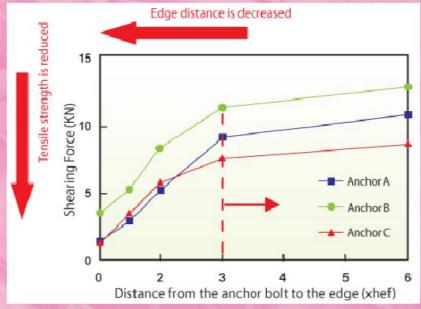
#### 3. Anchorage Depth



(Source: Installation of Metal Bracket of Truss-out Scaffold by Anchor Bolts, OSHC.

#### 4. Position of Anchor Bolt





(Source: Installation of Metal Bracket of Truss-out Scaffold by Anchor Bolts, OSHC.

### Site Photos Regarding

#### **Installation of Truss-out Scaffold**



Interlocked Steel Barriers Under The Truss-out Scaffold



Checking of Anchor Bolt Size (≥12mm ø)

#### Site Photos Regarding

#### **Installation of Truss-out Scaffold**



Three Anchor Bolt for Steel Bracket



Thickness of Planking = 25mm for Planking of 200mm wide

# Site Photos Regarding Installation of Truss-out Scaffold



Height of Toeboard (≥200mm)



Toeboard, Closed Planking & Tarpaulin Sheet Envelope of Truss-out Scaffold

#### **Fall Arresting System**

Transportable Temporary Anchor Device



(Photo Source: http://www.liftingsafety.co.uk/product/door-bar-anchor-2202.html)

#### Fall Arresting System



(Photo Source: http://www.gcs.gov.mo/showNews.php?DataUcn=46720&PageLang=C)

#### Fall Arresting System

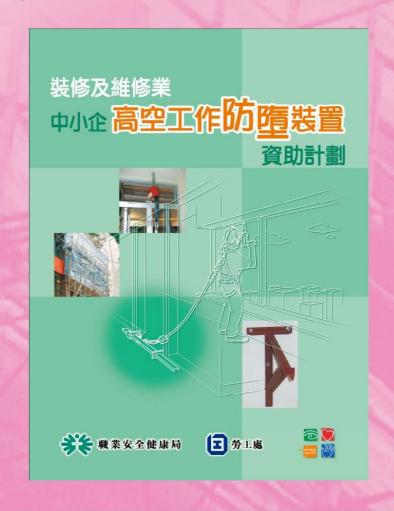
√=GOOD

	Ease of		
Туре	Install	Use	Remove
Door Bar	<b>\</b>		
Lifeline from Roof	•	<b>\</b>	•
Eye Bolt	×		x

⊙=FAIR

×=BAD

## SME Sponsorship Scheme for Fall Arresting Equipment for Renovation & Maintenance Work





電郵: oshc@oshc.org.hk

職安熱線: 2739 9000

職安資訊傳真服務: 2316 2576

網址:www.oshc.org.hk

#### 裝修及維修業中小企「高空工作防墮裝置」 資助計劃申請須知

#### 資助簡介:

每間企業只可申請一次,而資助計 劃最高資助金為港幣4,500元,包 括 -

- 購買一項「流動式臨時防墮繫穩裝置」(上限2,000元);
- · 一套全身式安全吊帶及其繫穩系統 (上限1,000元);
- 10個「T」型狗臂架(上限1,000 元);及
- 培訓津貼(上限500元)。

#### 申請資格:

- · 已根據《商業登記條例》在香港完成辦理商業登記;
- 僱用少於50人;
- · 經營活動及經營基地必須在香港境內;及
- · 僱用的人員是須要進行裝修及 維修工作。

#### 裝修及維修業中小企「高空工作防墮裝置」 資助計劃申請表

7	* 職業安全健康局	至 勞工處	(只供內部填寫) 收表日期: 
	中小型企業	「高空工作防墮裝置資	助計劃」申請表格
Ħ	部 申請企業資料		
	企業名稱 (請參閱備註一):		
		(中文)	(英文)
	企業地址:		
-	0		
. 1	電話號碼:	傳真號碼:	電郵地址:
	聯絡人姓名:	職街:	企業網址:
	企業成立日期:	在港僱用	人數(請參閱備註二):
			有效日期至:
註		现的支票收款人名稱完全相同。	·企業的受薪員工,包括在 <b>建</b> 交申請書時,由有 時期的確員。
註	三: 申請企業必須遞交有效商業	·登記證副本一份。	
Z	部訓練課程		
青心	《須填寫員工姓名及身份證號码	碼 (請參閱備莊四)	
	本人謹代表甲部列明的中請	企業委任一名員工:	(姓名)及
1	身份證號碼	接受職業安全健	康局舉辦的「流動式臨時防墜繁種裝置」
		<b>小芸術パーク目で・//)</b>	(姓名)
		正来安性—石貝工·(1) ;(2)	
	及身份證號碼	接受職業安	全健康局舉辦的「懸空式櫃架工作安全」
	及身份證號碼 半天訓練課程。	接受職業安	全健康局舉辦的「懸空式棚架工作安全」

中小型企業「高空工作防煙裝置」資助計劃

#### 丙部 流動式臨時防鹽繁穩裝置、全身式安全吊帶及其繁穩系統(精參閱備註五)

請選擇適當的一項組合・並在空格內填上「ノ」號

□組合一:獨立教生繩組合

牌子及型號	供應商名稱	費用
	南于 <b>从型</b> 型	<b>房子及型繁</b> 供题陶名欄

□ 組合二: 伸縮式防魔裝置組合

項目	牌子及型號	供應商名稱	費用	
1項流動式臨時防墜繁穩 裝置				
1套全身式安全吊帶				
兩個連接器				
1個有眼螺栓				
1個伸縮式防墜裝置				
10個 "T" 型狗臂架				
-	-			

總費用(上限4,000元):

備註五: (1) 企業須提交款設備的報價單及有關規格的簡介資料。

- (2) 所練運報價的供應商・不能與申請企業及其僱員存在任何利益或關係上的衝突(例如:僱主、董事、合夥人、股東、僱員、稅職或虧問等)。
- (3) 申請企業須使用所購買的設備來作高空工作防塵裝置用途。
- (4) 申請企業不得轉賣所購買的設備。



#### Reference

- 1. Code of Practice for Bamboo Scaffolding Safety, Labour Department HKSAR
- 2. Guidelines on the Design and Construction of Bamboo Scaffolds, Buildings Department HKSAR
- 3. 安全裝拆「吊棚」基本法,職業安全健康局
- 4. 「狗臂架」式棚架安全須知,勞工處
- 5. Follow-up Study on Safety and Reliability of Truss-out Metal Bracket Bamboo Scaffoldings, The Hong Kong University of Science & Technology, June 2006 (http://www.safetydirectory.hk/info\_list015\_e.htm)
- 6. http://www.liftingsafety.co.uk/product/door-bar-anchor-2202.html
- 7. http://www.gcs.gov.mo/showNews.php?DataUcn=46720&PageLang=C