



Safety in Rebar Lifting

by Structural Engineer Viewpoint

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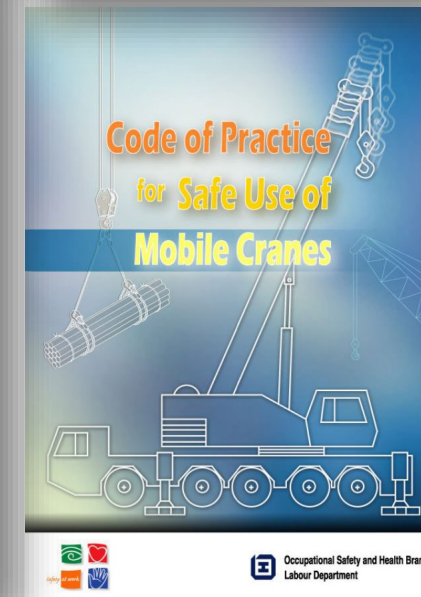
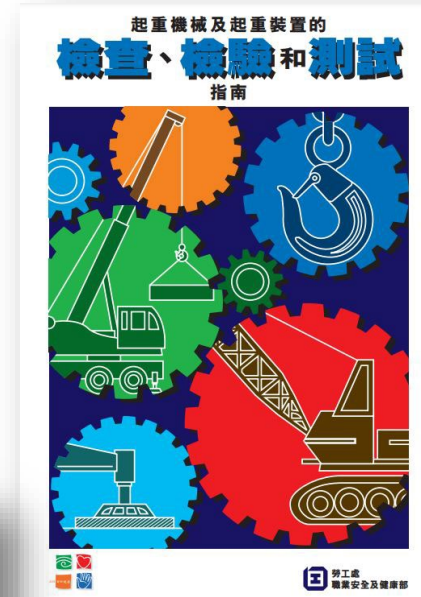
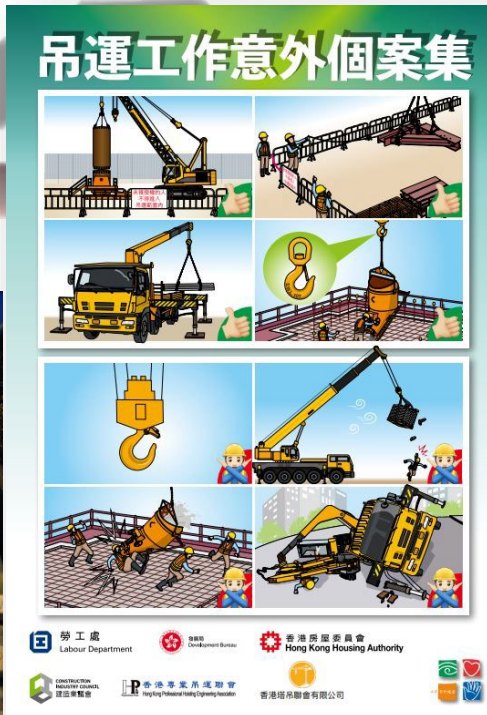
Introduction & Review



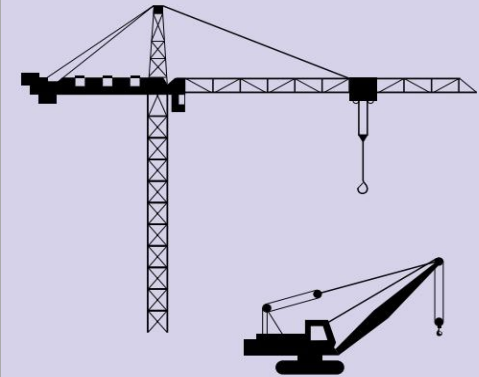
Introduction & Review

Codes of Practice and Guidance Notes ...

Still Room for
Improvement...



工廠及工業經營
(起重機械及起重裝置) 規例
簡介



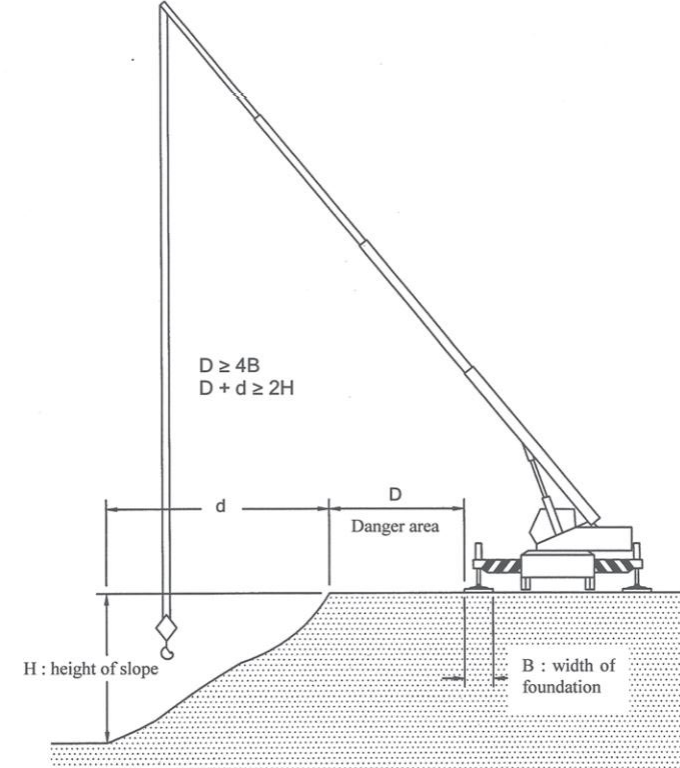
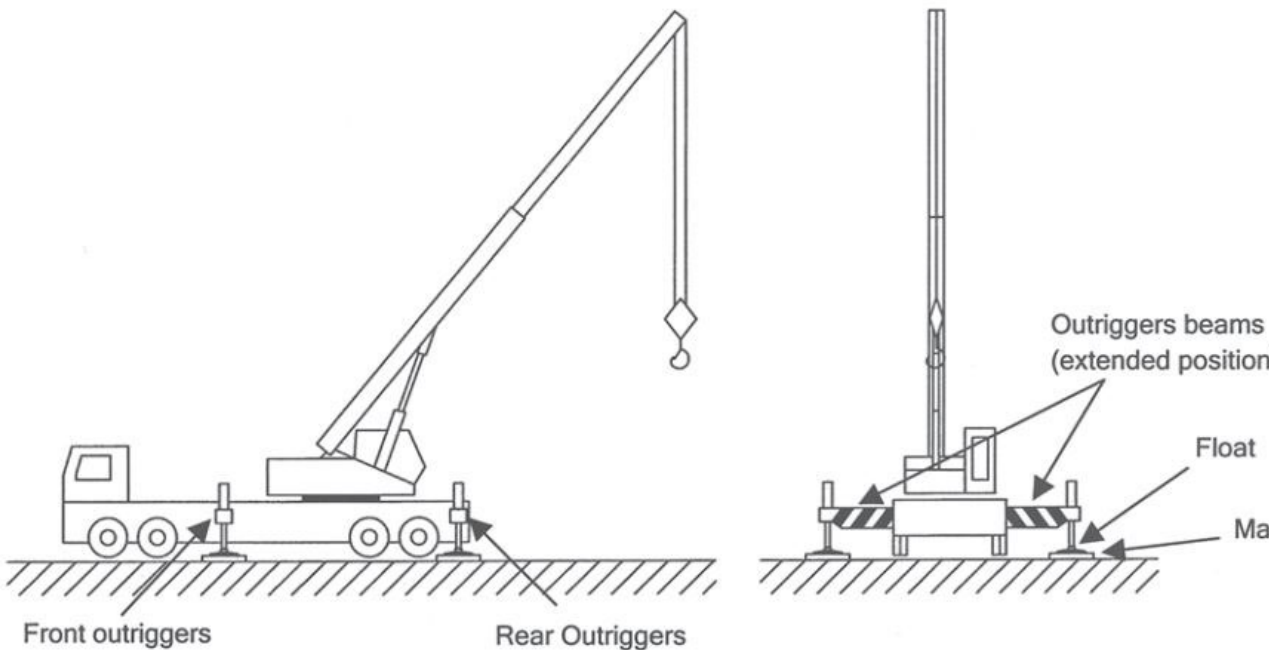


Fig. 4 Position of mobile crane

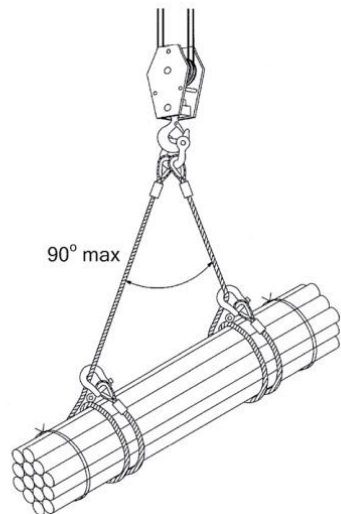


Fig. 16 Two single-leg slings in double wrap choker hitch

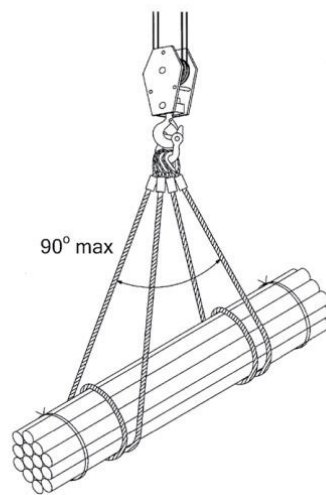


Fig. 17 Two single-leg slings in double wrap basket hitch

Fig.12 Choker hitch double wrapped



Good Practice

already Sharing
from Code of
Practice, Guidance
Notes, Guidebooks
and etc. issued by
Labour
Department and
Occupational
Safety & Health
Council

Introduction & Review

Legal Requirements ...

| Types of appliance | Inspection | Thorough examination | Test and thorough examination |
|--|---|---|---|
| Lifting appliance except crane, winch, crab. | within the preceding 7 days (Reg.7A of LALGR) | at least once in the preceding 12 months (Reg.5(1) of LALGR) | before use for the first time or after substantial repair, re-erection, failure, overturning or collapse (Reg.5(2) & 5(4) of LALGR) |
| Crane | within the preceding 7 days (including the automatic safe load indicator) (Reg.7A & 7B(1)(c) of LALGR) | at least once in the preceding 12 months or before erection (all of the devices used for the anchoring and ballasting of the crane) (Reg. 5(1) & 7E(1) of LALGR) | within the preceding 4 years or after substantial repair, re-erection, failure, overturning or collapse or after each erection and removal to a new location, any arrangement which involves changes to the anchoring or ballasting of the crane or after exposure to weather likely to have affected the stability of the crane (Reg.5(3), 5(5), 7B(1)(b), 7E(2) & 7G(2)(a) of LALGR) |
| Winch and crab | within the preceding 7 days (Reg.7A of LALGR) | at least once in the preceding 12 months (Reg.5(1) of LALGR) | within the preceding 4 years or after substantial repair, re-erection, failure, overturning or collapse (Reg.5(3) & 5(5) of LALGR) |

Table 1 - Legal requirements for 'inspection', 'thorough examination' and 'test and thorough examination' of lifting appliances

| Types of gear | Inspection | Thorough examination | Test and thorough examination |
|---------------|---|--|--|
| Lifting gear | before use on each occasion (Reg.18(1)(ea) of LALGR) | in the preceding 6 months before it is used (Reg.18(1)(e) of LALGR) | before use for the first time (except for a fibre rope or fibre-rope sling) (Reg.18(1)(d) of LALGR) |

Table 2 - Legal requirements for 'inspection', 'thorough examination', 'test and thorough examination' of lifting gear

| ITEM | Form No. (LALGR) | | | | | | |
|---|------------------|----------------|--|---|-----------|---------------------|----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Crane | * | | * | | * | | |
| Crane with anchoring or ballasting devices | * | * | * | | * | | |
| Winch, Crab | * | | * | | * | | |
| Pulley Block, Ginwheel, Sheerlegs, Pile Driver, Pile Extractor, Excavator, Overhead Runway, Dragline, etc | * | | | * | * | | |
| Lifting Gear | | | | | | * | * |
| Fibre Rope | | | | | | | * |
| Period | 7 days | after erection | 4 years before use or after substantial repair, re-erection, failure, overturning or collapse | | 12 months | before put into use | 6 months |

Note: * stands for applicable

Table 3 - Forms for Inspections, Examinations and Tests

Operator / Mechanic

RPE (Mechanical)

Introduction & Review

Legal Requirements ...

Exception the regular inspection, examination and testing of the tower cranes by **RPE (Mechanical)** and issued a **Form 2**, **Form 3** and **Form 5**, an addition further checking to the footing of tower crane by **RPE (Structural)** joint with our Plant Section



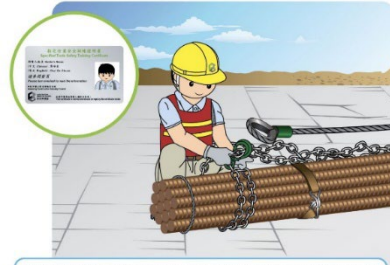
Introduction & Review

Good Practice ...

安全吊運 3、3、3 SAFE LIFTING 3,3,3



吊索工的角色與責任 RIGGER'S ROLES AND RESPONSIBILITIES



吊索工應負責將負荷物裝上起重機及將負荷物從起重機卸下，並應根據工作計劃使用正確的起重裝置及堆碼方法。吊索工應符合下列要求：

- 年齡已滿18歲，並曾受有關一般索具使用原理的訓練（例如：【銀卡課程A12 工地建築材料工】）；
- 完全明白吊運圖則之間所示的手號及無線電通訊的訊號；及
- 留意吊運範圍，如發現非相關工作人員進入，需立即通知起重機操作員並顯示該名人士離開。

The rigger should be responsible for loading and unloading the load from the crane, and should use the correct lifting gear and rigging method according to the lifting plan. The rigger should fulfill the following requirements:

- Aged 18 years old or above with Training on the principles of using general rigging (for example, "Silver Card Course A12 Construction Materials Rigger").
- Fully understand the hand signals and radio communication signals used by the lifting team, and
- Pay attention to the lifting zone. If any unauthorised entry is observed, the crane operator must be notified immediately and the person shall be warned to leave.

理碼方法 RIGGING METHOD



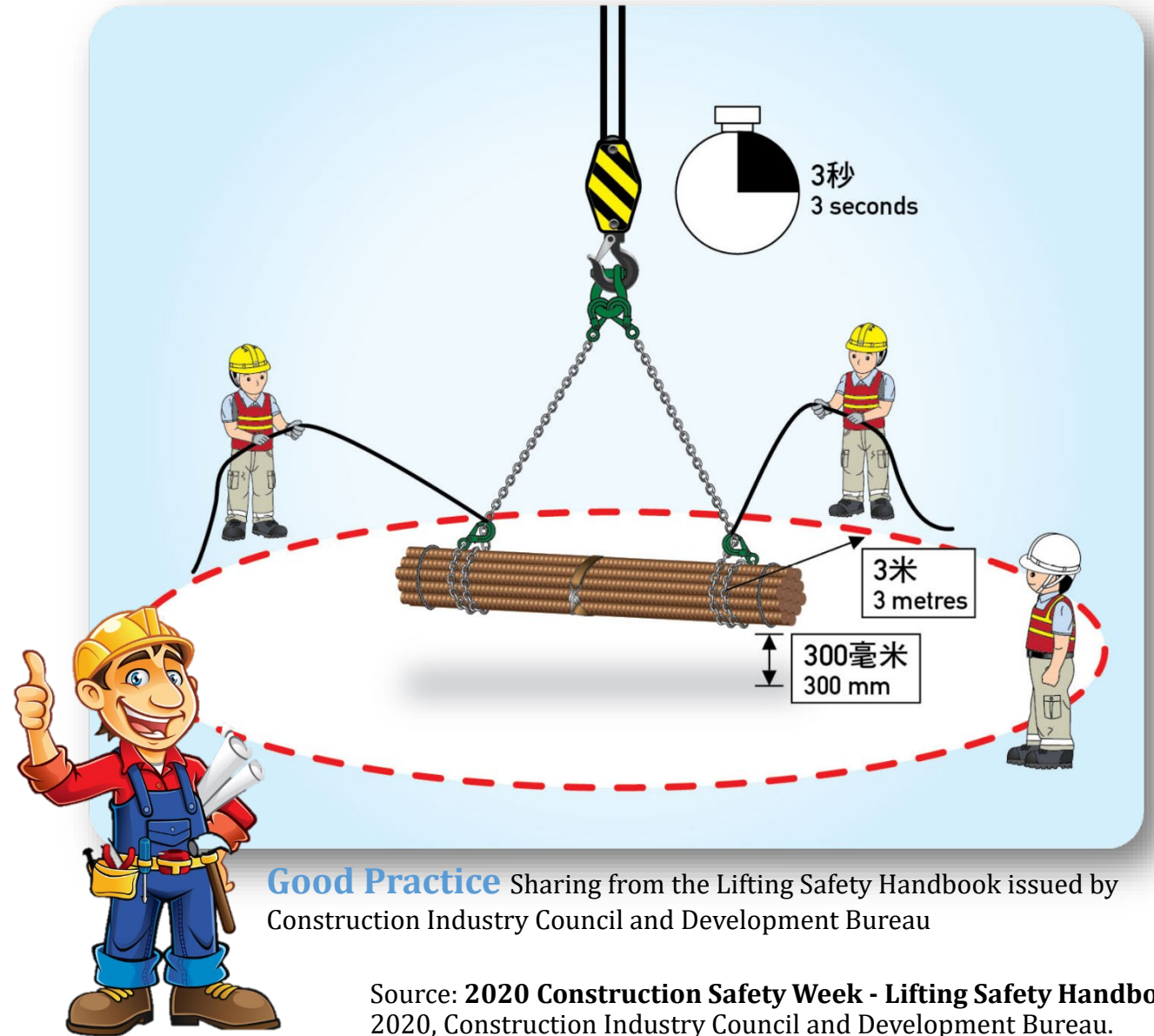
如需要在吊鉤下使用兩條或以上的吊索，必須使用足夠強度的鉤環，環圈或鏈環連接吊具支撐的上端。

If two or more slings under the lifting hook, their upper ends should be connected by a shackle, ring or link of adequate strength.



確保負荷物每一部份都平穩牢固地繫著，以免有鬆動物料或負荷物於吊運過程中滑落或移位。例如，吊運物料如鋼筋、木枋等，應使用雙網索結法、飛機帶及尾繩作固定。

Every part of the loads should be balanced and securely fastened to prevent slipping or displacement of any loose objects or loads during lifting. For example, double wrap choker hitch method, straps and taglines should be used for lifting materials such as steel bars, wooden blocks, etc. for rigging stabilization.



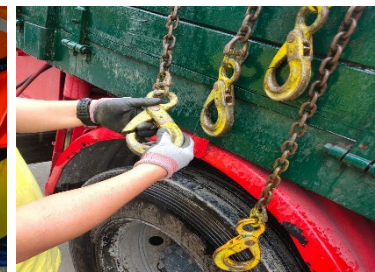
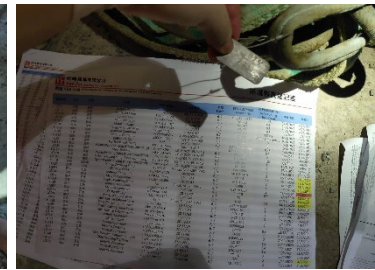
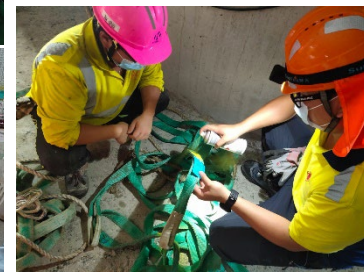
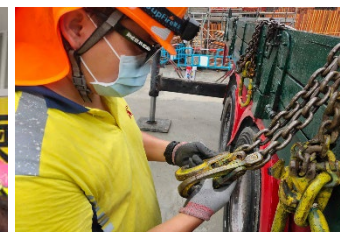
Good Practice Sharing from the Lifting Safety Handbook issued by Construction Industry Council and Development Bureau

Source: 2020 Construction Safety Week - Lifting Safety Handbook, 2020, Construction Industry Council and Development Bureau.

Implementation

Implementation

Start from Specific Safety Training



Implementation

Start from Safety Training



每週向日薪員工，分享安全注意事項



Implementation

Start from Safety Training



每週向月薪員工，分享安全注意事項



Implementation

Employment of Independent Safety Consultant to Provide Advice and Training



Implementation

Daily Morning Pre-work Briefing to Workers



高危作業
每日施工前早會



高危作業每天工前早會
分享每日發現隱患之處
加強教育鞏固安全意識

Implementation

Use of Communication Technology



Form 1: Yee Fai Construction Company Ltd. 汽車式起重機械(吊籠車)檢查表

Form 3: Construction Industry Safety Training Certificate (Construction Workers Registration Card)

Form 5: Certificate of Results of Thorough Examinations in the Preceding Twelve Months

Form 7: Certificate of Results of Thorough Examination in the Preceding Six Months

WhatsApp

An Example of Checking Hydraulic Truck Crane (i.e. Operator Certificate, Form 1, Form 3, Form 5 and In-house Permit-to-Work) by Subcontractor and report via WhatsApp group

Implementation

Good Housekeeping can Improve the Lifting Safety



Implementation

Check Point Prior to Carry out Loading and Unloading

分區分工管理



吊運前檢查點



上落梯具借用



吊運資訊板



現場檢查



Implementation

Area Management with Clear Responsibility

分區分工管理



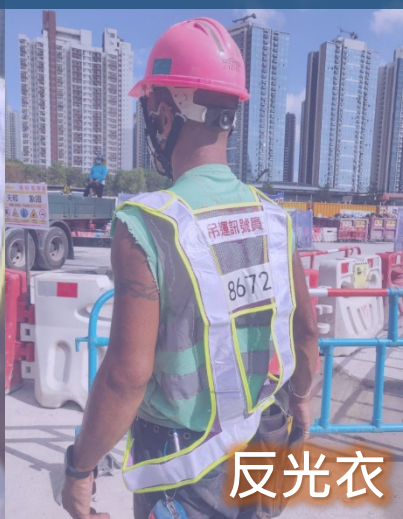
Implementation

Designated Lifting Supervisor with Safety Provisions

分區分工管理



對講機



反光衣



電子哨子或哨子



吊運安全資訊



訊號員訓練



吊運實習測



定期抽查

Implementation

Joint Site Safety Inspection, Surprise Check and Safety Meeting

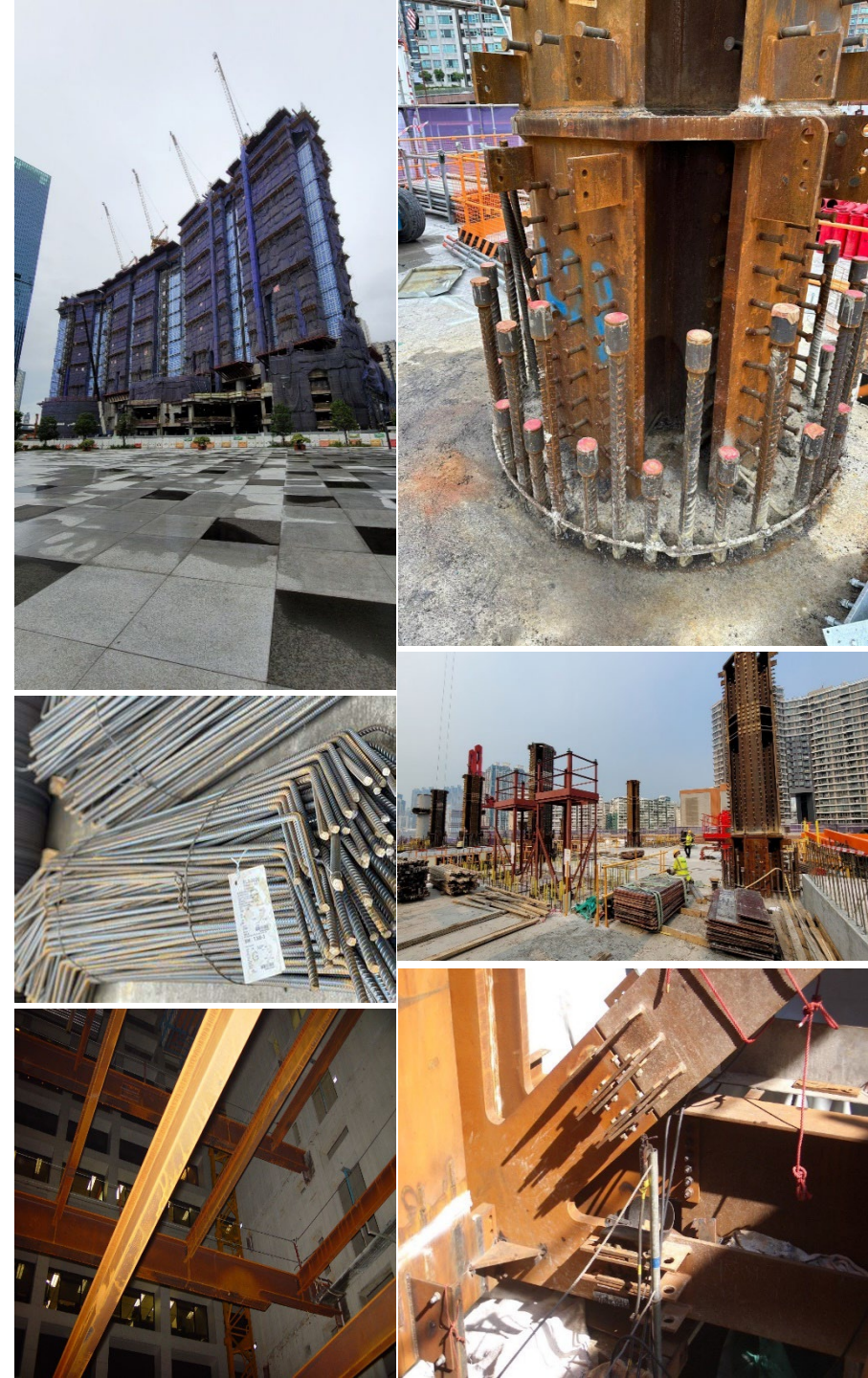


Planning, Design & Management



Planning, Design & Management

- Factors to affect the size and the number of rebars to be used.
 - Coupler
 - Cut & Bend
 - Composite Column
 - Steel Structure
 - RC Structure
 - Pre-stress or Post-tensioning



Cut & Bend Advantage

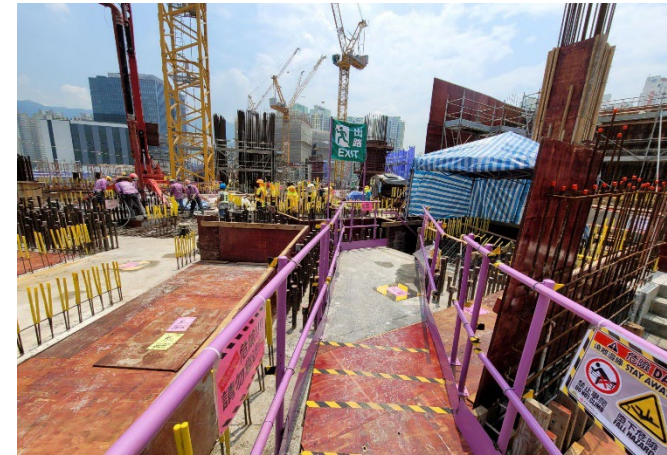


Automation System
Rebar Bending & Cutting



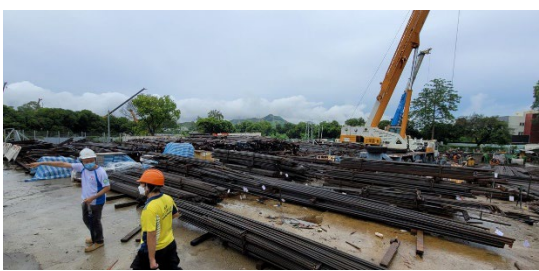
Planning, Design & Management

- Other factors to affect the size and the number of rebars to be used.
 - Site Constraint
 - Storage Area
 - Work at Height
 - Manpower Effectiveness (Shortage & Skill Mismatch)
 - Aging Factor

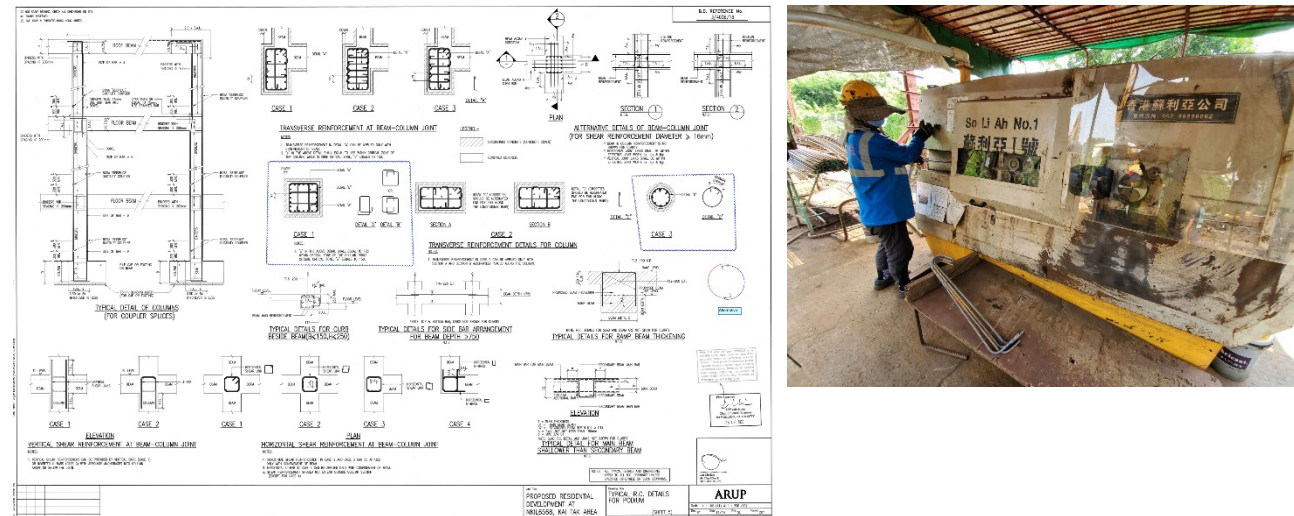
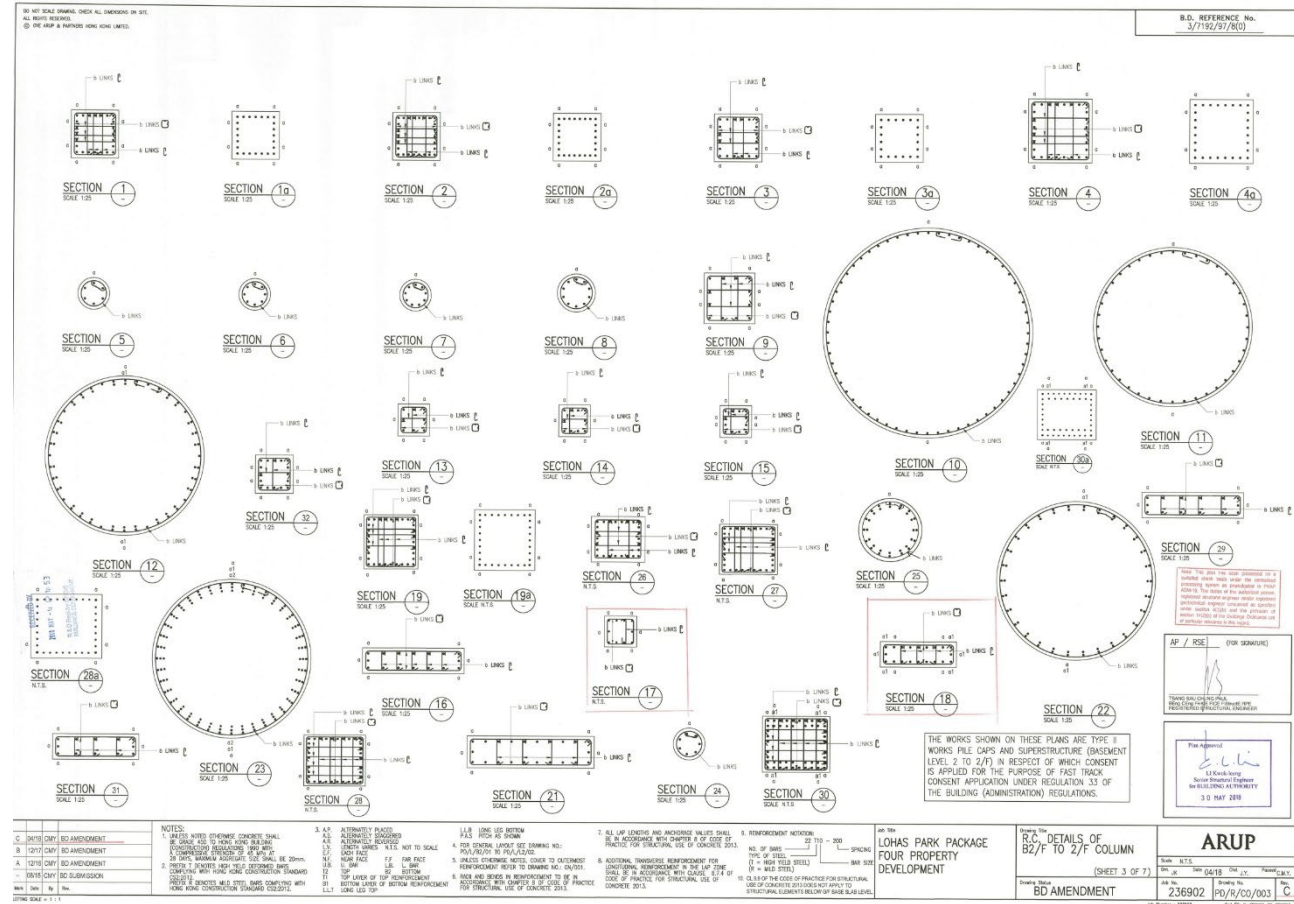


Safety in Rebar Lifting Depends...

| Rebar | Safety Consideration |
|-----------------|--|
| Size (Diameter) | Weight Rigging Method Bucket |
| Length | |
| Number | |
| Shape | Rigging |



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Closing Remark

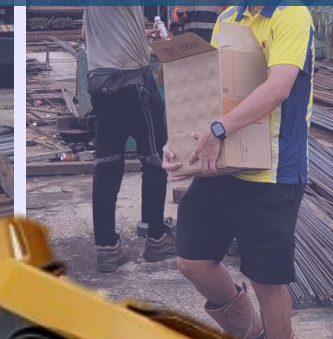
Regular Safety Promotion and Positive Reminder to Achieve Better Result



盡力保障員工健康及每天平安收工回家

Closing Remark

Regular Safety Promotion and Positive Reminder to Achieve Better Result



定期...為工友打打氣

