

The 1st Hong Kong Construction Skills Competition

Competition Handbook (Version 4)

Bar Bending and Fixing (Open Group)

〈 The document only serves as a reference for pre-competition preparation and
is updated from time to time without prior notification. 〉

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Competition Handbook

Table of Contents

1. Test Project.....	3
2. Notes to Competitors	4
3. Reference List of Tools.....	10
4. Reference List of Materials.....	11
5. Reference List of Safety Equipment.....	12
6. Reference Test Project Drawings.....	13
7. Contact Information.....	17

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1. Test Project

Content	Score
Complete the following items according to the drawings at the designated location:	
a. Cutting and bending of reinforcement	(20 marks)
i) Cut and bend reinforcement bars with Ø 16mm or above with the cutting and bending machine.	
ii) Cut reinforcement bars with Ø 12mm or below with the cutting and bending machine and bend to shape with the stirrup bending machine.	
b. Fixing of reinforcement structure according to drawings provided	(80 marks)
i) Pentagonal column	
ii) Sphere	
iii) Octagonal door frame and fan-shaped window frame	
iv) Wall with eaves;	
v) Fake mountain beam.	

Time Allowed: 6 hours (lunch time excluded)

2. Notes to Competitors

2.1 General Instructions

- 2.1.1 Read the test project, specifications and regulations listed in the Handbook carefully and ask the adjudicators for any queries.
- 2.1.2 Carry out the test project according to working drawings and specifications provided.
- 2.1.3 Check and collect the tools and materials required before the competition starts. Obtain additional items as soon as possible in case of shortage.
- 2.1.4 Competitors are required to handle tools and materials and carry out associated works on their own. All tools must be returned after the competition. Please ask the adjudicators for any queries.
- 2.1.5 Stop all works when time is up.
- 2.1.6 Do not talk loudly, cause nuisance or affect other Competitors during the competition.
- 2.1.7 No photos or videos are allowed, including those taken with cameras and mobile phones.
- 2.1.8 The use of mobile phones is not allowed during the competition except for emergency situations.
- 2.1.9 The display of behaviours and objects with religious, political, sexual and violent implications or causing discomfort and controversies are not allowed during the competition. The Construction Industry

Council (CIC) reserves the right to discretion on the above behaviour without the need to provide any explanations.

2.1.10 In case of substantiated violations of item 2.1.9, Competitors will be disqualified from the competition.

2.1.11 The judging criteria are briefly listed as follows:

- a. Understanding of drawings and specifications
- b. Preparation before work
- c. Work procedures
- d. Accuracy and quality of work
- e. Work progress
- f. Appropriate use of handling of materials
- g. Proper use of tools and equipment
- h. Housing-keeping after work completion
- i. Safety precautions

Note: Detailed judging criteria will be announced later.

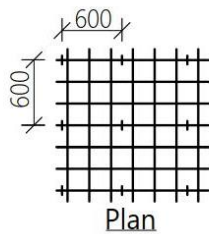
2.2 Technical Guidelines

Construction Summary

Spacer

Slab & Staircase : -

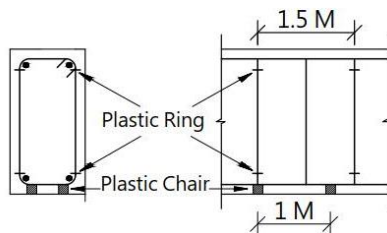
Bottom Steel-Use plastic spacer, at max. allowable 600 mm in both directions.
Top Steel- Use steel chairs, at intersection & max. allowable 600mm spacing in both directions.



Beams :-

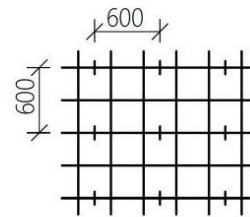
Bottom & Side spacer- main bar $D \leq 25$: -

Bottom spacer- Use plastic chair type spacer, 2 Nos. per set, 1 set per 1M run of beam.
Side spacer-Use plastic ring type spacer, clipped on stirrups, 4 Nos. per set per 1.5M run of beam.



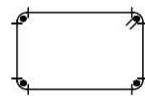
Wall : -

Use ring type plastic spacers, clipped on horizontal bars. Spacing 600, horizontally and vertically, for each wall face.



Column : -

Use plastic ring type spacer, clipped on binder.



8Nos. per set



6Nos. per set

For longitudinal bars
 $D \leq 20$, one set at 1 M max. spacing
 $D > 20$, one set at 1.25M max. spacing

Securing of Reinforcement (The wire ends encroaching into cover not more than 5mm)

Slab & Staircase : -

- # Secure all edge intersections of panels
- # Secure every alternate intersections inside the panels, or closer.

Beam stirrups & Column binders : -

- # Secure longitudinal bars at corners, hooks & bends of stirrups & binders at all intersections.
- # Secure longitudinal bars other than above at alternate intersection with stirrups & binders,

Wall reinforcement : -

- # Secure the top horizontal bar below floor level of each lift at all intersection with vertical bars.
- # Secure other bars at alternate intersections, or closer.

Cantilever slab & Canopy reinforcement:-

- # Secure all intersections.

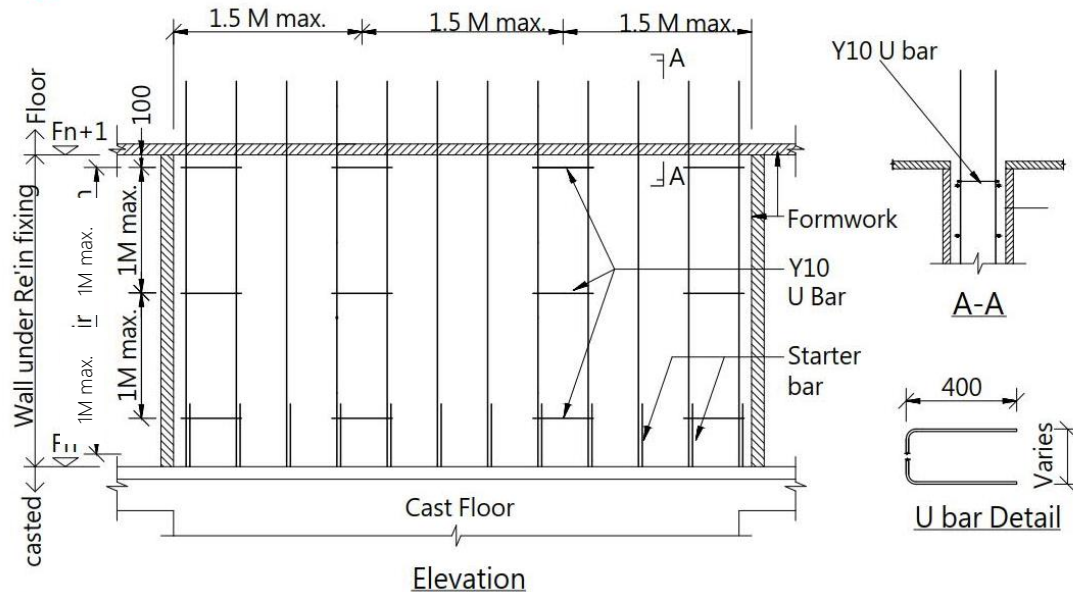
Steel bar lapping : -

- # At least two secure points.

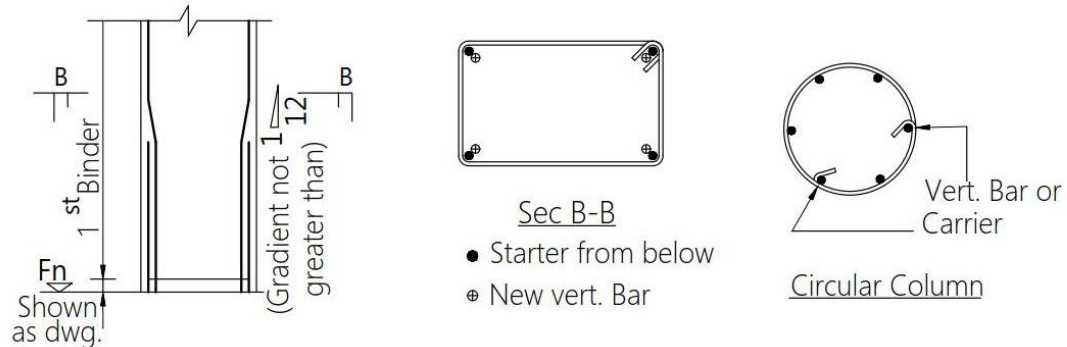
Not to Scale
All Dimensions are in mm

Construction Summary

Fixing of wall reinforcement : -



Column Fixing



Mechanical operation : -

- # Handling of bar machine should comply with the operation manual.
- # Before operation, candidates must test all the buttons, brakes, and the maximum and minimum angles of the obtuse and hook of the stirrup bending machine.
In order to ensure that some of the parts are operating normally; during the candidates' test machine, marking notes, and operating the bar cutting machine or stirrup bending machine, Hands cannot enter or stay in the danger zone.

Working off the ground : -

- # Candidates must use and transport the ladder provided by the workshop correctly.

Not to Scale
All Dimensions are in mm

2.3 Safety and Environmental Guidelines

- 2.3.1 Competitors should wear the safety helmet with chinstrap provided by the organizer during the competition.
- 2.3.2 Bring and wear proper clothing and safety shoes. Other safety equipment will be provided at the venue.
- 2.3.3 Wear the personal protective equipment provided by the organizer. Do not wear cotton gloves when operating motor tools and machinery with spinning components.
- 2.3.4 Certain works involve work above ground. Competitors can use related safety equipment provided by the organizer if necessary.
- 2.3.5 Check the tools and materials distributed by the organizer before the competition starts. For any irregularities, inform staff members on the site for follow-up.
- 2.3.6 No eating and drinking at the workstation area.
- 2.3.7 Safety constitutes one of the judging criteria. Competitors should take all safety precautions to ensure safety. Those displaying unsafe behaviour or affecting other Competitors would receive mark penalty or face disqualification from the competition.
- 2.3.8 In case of emergency (e.g. fire), the competition will be halted. Competitors should evacuate according to the instructions of fire wardens (personnel wearing red safety helmets) at the venue.
- 2.3.9 In case of physical discomfort or injury, inform staff members immediately for arranging first-aid assistance.

2.3.10 The organizer has prepared a sufficient supply of materials for all Competitors. Competitors should make good use of all materials to avoid wastage.

2.3.11 All tools and materials used in the competition will be recycled for other uses after the competition.

3. Reference List of Tools

3.1 Tools provided by the organizer

Item no.	Item	Quantity
1	HS40 Cutting and bending machine	1
2	HSR25 Stirrup bending machine	1
3	Fixing hook	1

3.2 Self-prepared tools allowed

Item no.	Item	Quantity
1	Measuring Tape	1
2	Gloves	1
3	Fixing hook	1

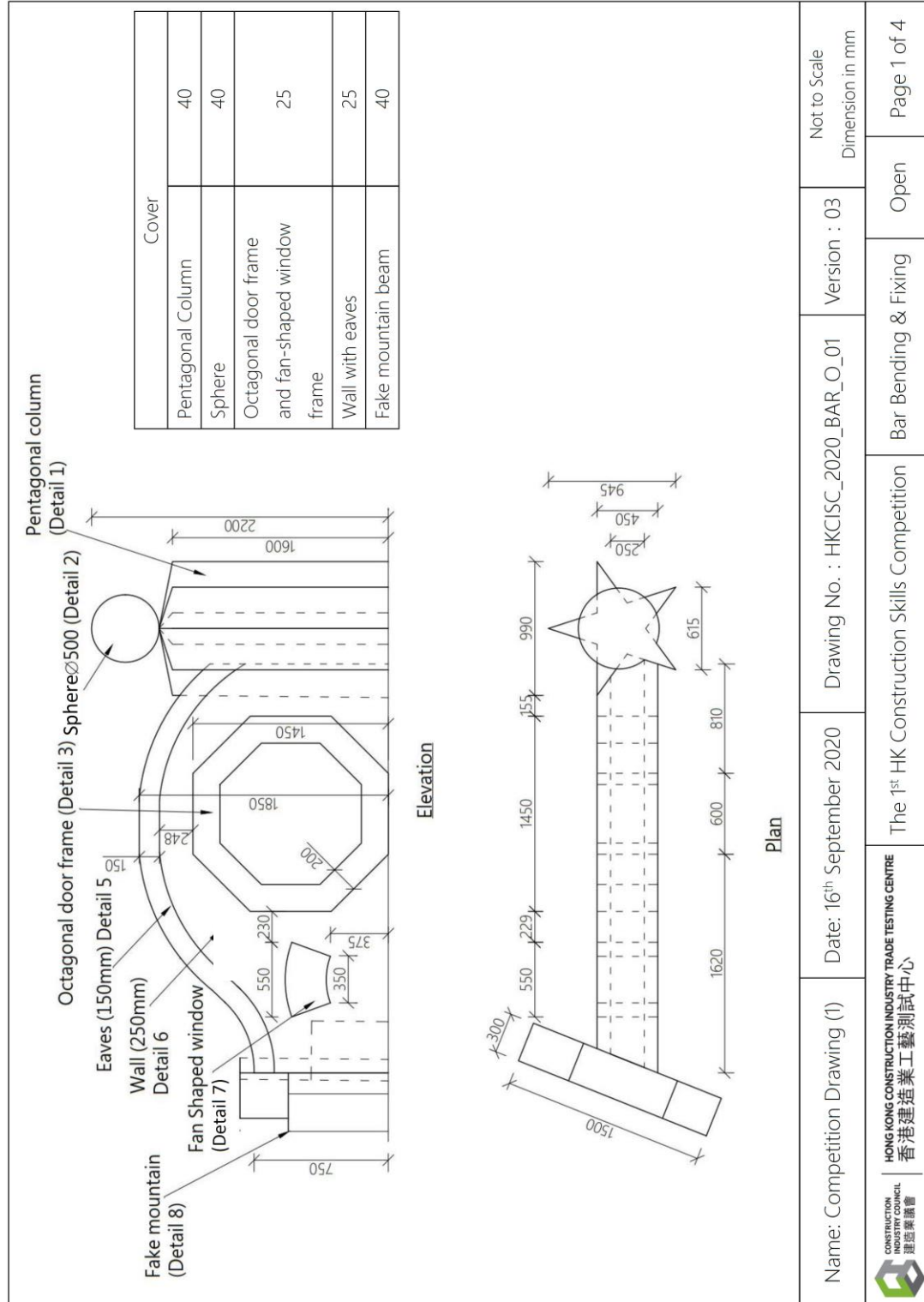
4. Reference List of Materials

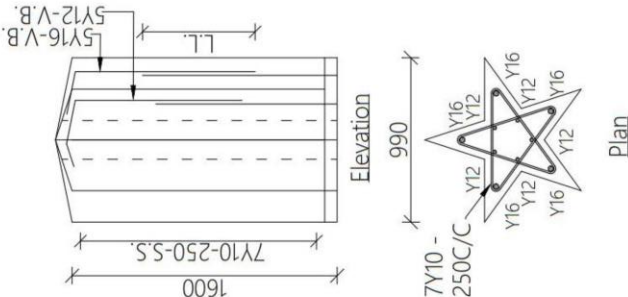
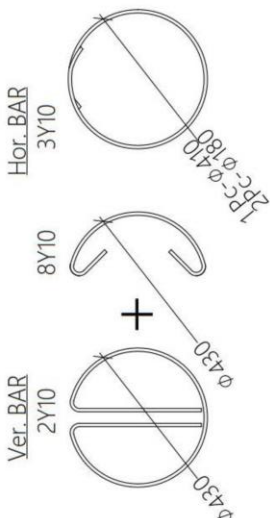
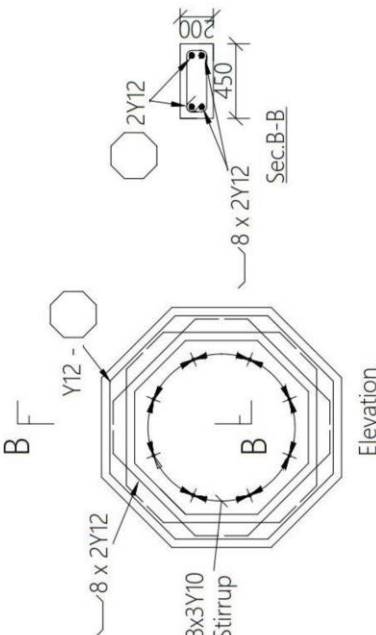
Item no.	Item	Quantity
1	Y10 re-bar	Sufficient supply
2	Y12 re-bar	Sufficient supply
3	Y16 re-bar	Sufficient supply
4	Y20 re-bar	Sufficient supply
5	10" securing wire	Sufficient supply
6	12" securing wire	Sufficient supply
7	14" securing wire	Sufficient supply
8	40mm beam spacer	Sufficient supply
9	25mm slab spacer	Sufficient supply

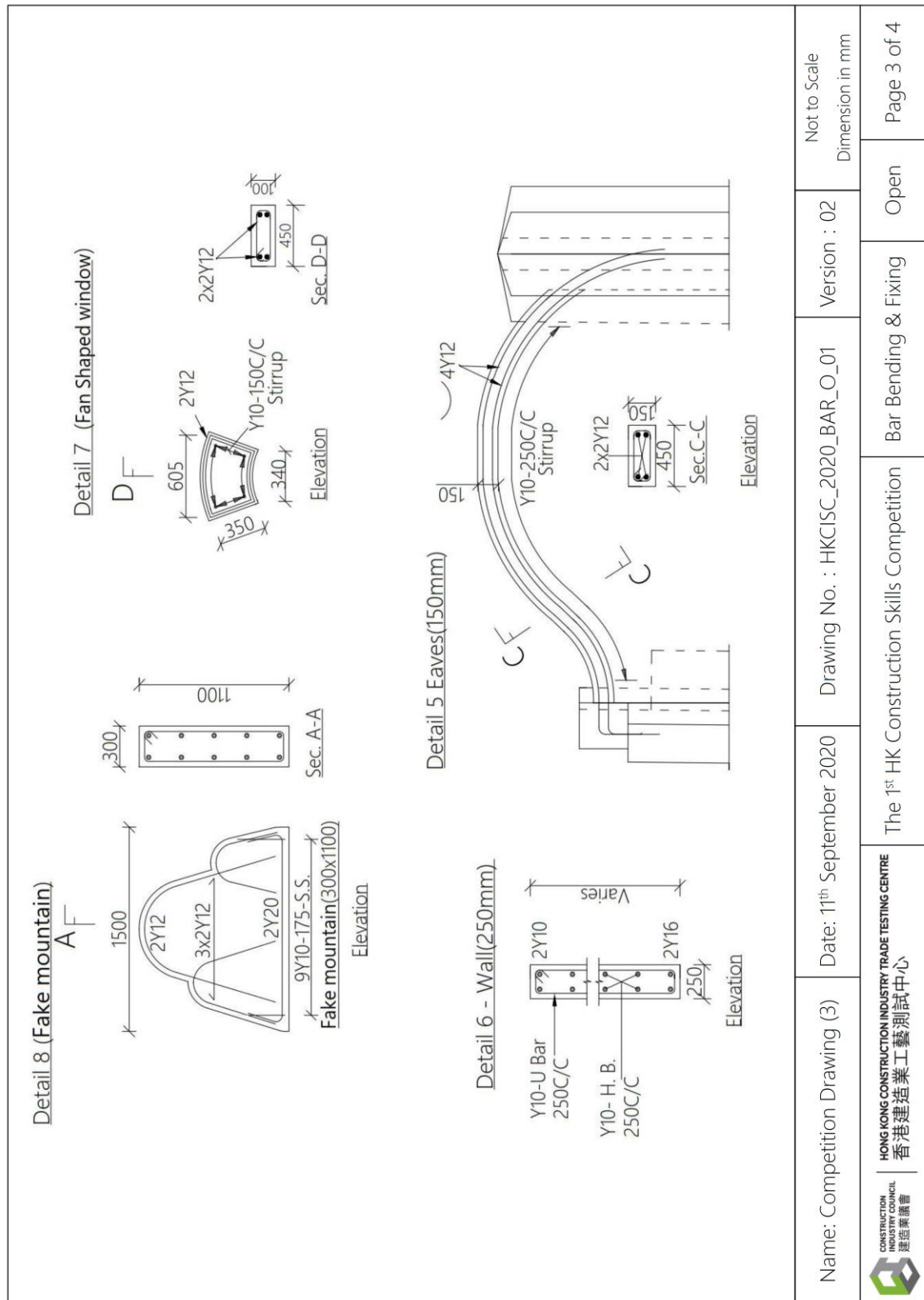
5. Reference List of Safety Equipment

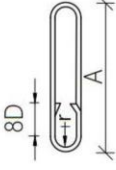

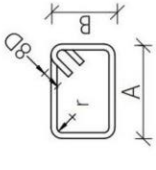
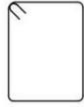
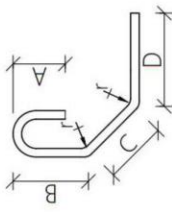
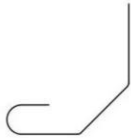
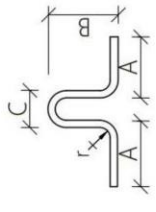

Item no.	Item	Quantity
1	Safety helmet with chinstrap	1
2	Transparent safety goggles	1
3	Corded ear plugs	1
4	Dust mask	1
5	Leather gloves	1
6	Safety step stool	1
7	Light duty working platform (for work above ground)	1

6. Reference Test Project Drawings




Name: Competition Drawing (2)			Date: 11 th September 2020		Drawing No. : HKCISC_2020_BAR_O_01		Version : 02		Not to Scale Dimension in mm			
Detail 1 (Pentagonal column)					Detail 2 (SphereØ500)				Detail 3 (Octagonal door frame)			
Name: Competition Drawing (2)			Date: 11 th September 2020		Drawing No. : HKCISC_2020_BAR_O_01		Version : 02		Not to Scale Dimension in mm			
The 1 st HK Construction Skills Competition			Bar Bending & Fixing		Open		Page 2 of 4					



Item	Type	Specification	Length	Style
01	3Y10	 Mono Link	A = 500	
02	3Y12	 135° Binder	A=420 B=480	
03	1Y20	 45° Oblique	A=350 B=380 C=380 D=580	
04	1Y20	 Lifting hook	A=600 B=300 C=160	

r = Bending Radius Y20 or Below r = 3D

Name: Competition Drawing (4)	Date: 11th September 2020	Drawing No. : HKCISC_2020_BAR_O_01	Version : 02	Not to Scale Dimension in mm
 HONG KONG CONSTRUCTION INDUSTRY TRADE TESTING CENTRE 香港建造業工藝測試中心		Bar Bending & Fixing		Page 4 of 4

7. Contact Information

For an enquiries related to the Competition Handbook, please refer to the official website

http://www.cic.hk/chi/main/aboutcic/news_and_updates/events_calendar/event-370.html

or contact the Hong Kong Construction Industry Trade Testing Centre via:

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