



**TAIPEI 2024**

Capital Cup WorldSkills Competition



**2024 Taipei Capital Cup WorldSkills Competition  
Test Project(試題)**

**Construction Metal Works**(金屬結構製作)  
**Specifications drawings and information**(圖紙規格和訊息)

Submitted by:  
\_\_\_\_\_, Chief Expert

**TAIPEI  
2024**

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## 1. Introduction to Test Project 簡介

- 1.1 This document is intended as a guideline and rulebook so that Competitors can complete the Test Project in an efficient manner. It does not cover every conceivable scenario that may occur during the competition; however, Competitors should not assume that they are free to complete an action or actions that are not stated in this document. Issues may arise that are not stated within this document. If a Competitor / Expert has any doubt about any issue stated/not stated within this document, they should consult the CE / E to clarify any / all relevant issues.

本文件為指導手則，旨在讓選手以效率的方式完成試題內容。儘管本文件未涵蓋競賽期間可能出現的所有情況，但選手不應認為可自由完成本文中未說明的操作或動作。本文中未善盡說明之處，可能出現問題。若選手/裁判長對本文中陳述/未說明的任何問題有疑惑，應諮詢總裁判長/裁判，以澄清任何/所有相關問題。

## 2. General Instructions 一般說明

- 2.1 All Competitors must have relevant knowledge of the contents of the Technical Description. 了解技術說明書
- 2.2 Competition work time is 16 Hrs 工作時間16小時
- 2.3 At the beginning of the competition, C1, 1 hours will be devoted to work planning, This time is included in the total competition time. NO MARKING-OUT OF MATERIAL IS ALLOWED. Refer to section 15  
競賽第一天開始時，會有1小時工作規畫時間，包含在整個競賽時間內。不得開始精準落樣。請參照第15章
- 2.4 If workshop machines are unavailable, Competitors are free to construct any other module. Competitors are also free to construct any other module/parts during competition time. 工廠機器有人在使用時，選手可自行決定先做其他模組。競賽期間，也可隨時做其他模組。
- 2.5 After a module has been submitted the Competitor is not allowed to change the orientation or location of parts, by filing, grinding or cutting. The Competitor **can** complete welding, deburr holes and remove sharp edges on the module on the following day and the Competitor may also clean (wire brush) completed modules again at the end of competition each day.  
繳交模組後，不得再動工件位置，不能磨、銼、切。後續幾天，選手可完成銲接、孔倒角、去除銳利邊。每天結束時，選手也可再次清潔（鋼絲刷）完成的模組。
- 2.6 The time stated on the competition schedule is NOT to be assumed as the time it takes to mark- out, cut, assemble and weld a module.

競賽日程的表定時間不應視為落樣、切割、組合與焊接模組所需之時間

- 2.7 Regarding the 'Material List' accuracy is determined by the Competitor.  
材料清單的精確程度由選手自己決定
- 2.8 All material supplied to complete the Test Project must be precisely controlled by the Competitor.  
所有提供給選手完成試題內容的材料，必須由選手準確掌控
- 2.9 All material must be marked in the most economical way, if not it will appear that the material was not adequately supplied. 所有材料必須以最經濟節約的方式標記，否則看起來材料沒有充分供應
- 2.10 The Competitor is not allowed to grind, hammer or weld onto the surface of the marking tables. The table is not to be considered as a 'blacksmiths anvil'. 組合平台表面不能磨、槌擊、銲。這張桌子不應被當作鐵匠砧(鋼砧)
- 2.11 The cleaning agents supplied with the marking tables are for the purpose of cleaning the surface of the table only. These cleaning agents are not to be used on any part of the Test Project. If any cleaning agent is used on the part / module, no assessment either judgment or measurement will take place. If there is an accidental spillage on the any part of the Test Project, then the Competitor must inform the CE / E immediately, before clean-up so that the issue can be resolved.  
It is accepted that cutting lubricant may be used for the drilling of holes, but this lubricant is not to be used as a cleaning agent. 組合平台桌面清潔劑，不可用於試題。若用於試題上，測量測與判斷評分皆不評。如果意外打翻在試題上，選手必須在清理前，通知裁判長或裁判，才能解決爭議。鑽孔可用切削液，但切削液不得用做清潔劑。
- 2.12 The Test Project must be completed as per Fabrication Instructions, **refer to section 3, 'Fabrication Instructions'**. No assessment either judgment or measurement will take place on elements of the Test Project where fabrication instructions have been disobeyed.  
試題內容必須按照製造說明完成，請參照第三章：「製造說明」。若未依照製造說明完成之試題內容部件，則不會對測試項目部份進行量測與判斷評分
- 2.13 A cut face / edge must be cut as per fabrication instructions. Cut faces that cannot be seen may be cut using any other process i.e. thermal or mechanical cut. 切割面 / 邊必須依製造說明切割。看不到的切割面，可用任何其他方法，例如熱切或機切。
- 2.14 During the competition, vernier calipers and height gauges are not allowed to be used at all stages of the module production process, otherwise the

module will not be evaluated, and the relevant parts of the module will not be scored. 在競賽過程中，在各階段模組製作過程中，全程不可使用游標卡尺及高度規，否則該模組不予評測，與該模組有相關部份將不被評分。

2.15 To evaluate the final product, experts will use vernier calipers and height gauges. 最終成品評量，專家將使用游標卡尺及高度計量測。

2.16 The procedures for the Test Project will be stated below:

試題內容製作程序如下

(This information will be provided before competition for translation)

下面資訊將在比賽之前提供給予翻譯

i Day One, competitors must complete Module one and present it for marking as specified by drawing sheet 2 of 8. Once completed Module One the competitor can start on module two.

Competitors must complete the AutoCAD dwg format files of the parts shown in drawing sheets 5 of 8, and 6 of 8, with the file name being the job number, and submit it before the end of the first day.

比賽第一日，如8張圖紙中的第二張所示，選手必須完成並呈現模組並繳件評分。模組一完成後，選手便可著手製作模組二。

參賽者必須完成圖面第 5 張（共 8 張）和第 6 張（共 8 張）所示零件的 AutoCAD dwg 格式文件，文件名為作業編號，並在第一天結束前提交。

ii. Day Two, before 12 noon competitors must complete Module two and it must be presented for marking assemble to Module two as specified by drawing sheets 3 of 8, 4 of 9. The competitor can start on Module Three.

比賽第二日，中午12點前，選手必須完成模組二，且必須按照八張圖紙中第3、4張所示，完成模組二繳交後，將可以開始製作模組三部份

Day Two, Before 16:00, competitors must complete Module 3 and must follow the regulations of by drawing sheets 5 of 8. After completing the submission of Module Three, The competitor can start on Module Four.

16:00 之前，參賽者必須完成模組 3，並且必須遵守圖面第 5 張（共 8 張）的規定。完成模組三繳交後，選手可以開始製作模組四部份

Before the end of the second day (18:00) competitors must complete the test project with Modules One, Two, Three and Four and final assembly as specified by drawing sheets 1 of 8.

在第二天（18:00）結束之前，參賽者必須完成第 1、2、3 和 4 模組的測試項目以及第 1 張圖紙（共 8 張）中指定的最終組裝。

### 3. Fabrication Instructions 製造說明

The following table details the instruction by which the test project is to be completed. 下表為完成試題所需的詳細說明

(This information will be provided before competition for translation)

這部分資訊會於競賽前提供，以利翻譯進行

#### Module one 模組一

PART NO 部位 編號	MATERIAL SIZE 材料規格	MAT'L TYPE 材料 種類	No REQ'D 所需 數量	CUTTING & FORMING INSTRUCTION 切割與成形說明
1.1	Flat Steel, 2t×20mm×30mm	M/S 黑鐵	2	<ul style="list-style-type: none"> <li>● For the cutting part, you can use a circular saw or cutting wheel.</li> <li>● Parts 1.1~1.5 are all cut using the same Flat Steel.</li> <li>● Part 1.1, processing of the curved part, manual cold bending or hot bending processing.</li> <li>● For the explanation part of welding symbol 135, a semi-automatic co2 welding machine will be used for welding.</li> <li>○ 切割部分可以使用圓鋸機或切割砂輪。</li> <li>○ 件號1.1~1.5部分均採用同一扁鋼切割而成。</li> <li>○ 件號1.1部分，彎曲部分的加工，可使用手工冷彎或熱彎加工。</li> <li>○ 焊接符號135的說明部分，採用半自動二氧化碳焊接機進行焊接。</li> </ul>
1.2		M/S 黑鐵	1	
1.3		M/S 黑鐵	1	
1.4		M/S 黑鐵	1	
1.5		M/S 黑鐵	2	

#### Module two 模組二

PART NO 部位 編號	MATERIAL SIZE 材料規格	MAT'L TYPE 材料 種類	No REQ'D 所需 數量	CUTTING & FORMING INSTRUCTION 切割與成形說明
2.1	600×600×5mm Plate 鐵板	M/S 黑鐵	1	<ul style="list-style-type: none"> <li>● This part is marked out and cut from this material.</li> <li>● All exposed edges are guillotine cut.</li> <li>● All internal slots are flame cut; competitor can drill a hole to help start the cutting process for each slot</li> <li>● Use the press break to form the angles</li> <li>○ 2.1件使用這項材料進行落樣與切割</li> <li>○ 所有外露邊：剪床切割</li> <li>○ 所有內孔皆為火切；選手可鑽一個孔，以利後續各孔的切割流程</li> <li>○ 用折床成形角度</li> </ul>

2.2	600×600×6mm Plate 鐵板	M/S 黑鐵	2	<ul style="list-style-type: none"> <li>● This part is marked out and cut from this material.</li> <li>● All exposed edges are guillotine cut.</li> <li>● All internal slots are flame cut</li> <li>● Markout and Drill Ø12 hole.</li> <li>● There are two rounded corners on the top of part 2.2, which can be ground with a grinder.</li> </ul> <p>○ 2.2件使用這項材料進行落樣與切割</p> <p>○ 所有外露邊：剪床切割</p> <p>○ 所有內孔皆為火切；</p> <p>○ 落樣並鑽 Ø12 孔 (配合2.4)</p> <p>○ 零件2.2上方有兩處圓角，可使用砂輪機研磨</p>
2.3	600×600×5mm Plate 鐵板	M/S 黑鐵	2	<ul style="list-style-type: none"> <li>● This part is marked out and cut from this material.</li> <li>● All exposed edges are guillotine cut.</li> <li>● For the arc bending part : there are no restrictions on rounding machines, manual processing bending, and folding machine bending.</li> </ul> <p>○ 2.3件使用這項材料進行落樣與切割</p> <p>○ 所有外露邊：剪床切割</p> <p>○ 彎弧部份：未限制滾圓機、手動加工彎曲、折床彎曲。</p>
2.4	Ø12×1500mm Bright Round Bar Ø 12mm光滑圓棒	M/S 黑鐵	2	<ul style="list-style-type: none"> <li>● This part is marked out and cut from this material.</li> <li>● The part is cut to length using a mechanical grinder or hack saw.</li> </ul> <p>○ 2.4件使用這項材料進行落樣與切割</p> <p>○ 使用機械磨床或手弓鋸，將2.4 部件切割到正確長度</p>
2.5	Ø139.8 mm Carbon Steel Pipe Ø 139.8mm碳鋼管	M/S 黑鐵	4	<ul style="list-style-type: none"> <li>● This part is supplied cut to length (40mm)</li> </ul> <p>○ 此零件為提供件，長度40mm。</p>
2.6	Ø60.3×300mm Carbon Steel Pipe Ø 60.3mm碳鋼管	M/S 黑鐵	4	<ul style="list-style-type: none"> <li>● This part is supplied cut to length (30mm)</li> </ul> <p>○ 此零件為提供件，長度30mm。</p>
2.7	600×600×6mm Plate 鐵板	M/S 黑鐵	4	<ul style="list-style-type: none"> <li>● This part is marked out and cut from this material.</li> <li>● All edges are flame cut</li> </ul> <p>○ 2.4 件使用這項材料進行落樣與切割</p> <p>○ 所有切割邊：火切</p>
2.8	300×600× 9 mm Plate 鐵板	M/S 黑鐵	4	<ul style="list-style-type: none"> <li>● This part is marked out and cut from this material.</li> <li>● All edges are flame cut using a manual operated circle cutting attachment.</li> <li>● Markout and drill Ø12 hole for the Worldskills sign.</li> </ul> <p>○ 2.4 件使用這項材料進行落樣與切割</p> <p>○ 所有切割邊：火切，可用一個手動圓形切割做輔助</p> <p>○ 落樣並鑽 Ø12 孔 (配合2.4)</p>

2.9	D20×d12.1×300mm Pipe 直徑17.2mm 碳鋼管	M/S 黑鐵	4	<ul style="list-style-type: none"> <li>● This part is marked out and cut from this material.</li> <li>● The part is cut to length using a mechanical grinder or hack saw.</li> </ul> <ul style="list-style-type: none"> <li>○ 2.9 件使用這項材料進行落樣與切割</li> <li>○ 使用機械磨床或手弓鋸，將2.4 部件切割到正確長度</li> </ul>
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**Module Three 模組三**

PART NO 部位 編號	MATERIAL SIZE 材料規格	MAT'L TYPE 材料 種類	No REQ'D 所需 數量	CUTTING & FORMING INSTRUCTION 切割與成形說明
3.1	304 2B, 300×600×3mm 不銹鋼板	S/S 不銹鋼	1	<ul style="list-style-type: none"> <li>● These part 3.1 &amp; 3.2 are marked out and cut from this material.</li> <li>● All exposed edges are guillotine cut.</li> </ul>
3.2	304 2B, 300×600×3mm 不銹鋼板	S/S 不銹鋼	2	<ul style="list-style-type: none"> <li>● Use the press break to form the angle on part 3.1</li> </ul> <ul style="list-style-type: none"> <li>○ 3.1及3.2件皆使用這項材料進行落樣與切割</li> <li>○ 所有外露邊：剪床切割</li> <li>○ 用折床成形3.1 件角度</li> </ul>
3.3	5mm Plate 鐵板	M/S 黑鐵	2	<ul style="list-style-type: none"> <li>● The Competitors use AutoCAD drawing to develop, and the material is 5mm Carbon Steel plate, which is cut by laser.</li> </ul> <ul style="list-style-type: none"> <li>○ 參賽者採用AutoCAD繪圖進行開發，材料為5mm鐵板，採用雷射切割而成。</li> </ul>

**Module Four 模組四**

PART NO 部位 編號	MATERIAL SIZE 材料規格	MAT'L TYPE 材料 種類	No REQ'D 所需 數量	CUTTING & FORMING INSTRUCTION 的切割與成形說明
4.1	300×600× 9 mm Plate 鐵板	M/S 黑鐵	2	<ul style="list-style-type: none"> <li>● This part is marked out and cut from this material.</li> <li>● All edges are flame cut using a manual operated circle cutting attachment.</li> <li>● Select drill size to correctly tap a thread for a M10 bolt with a thread pitch 1.5.(配合4.7)</li> <li>● Markout and Drill Ø10 hole.</li> </ul> <ul style="list-style-type: none"> <li>○ 4.1 件使用這項材料進行落樣與切割</li> <li>○ 所有切割邊：火切，可用一個手動圓形切割做輔助</li> <li>○ 落樣並鑽 Ø10 孔 (配合2.4)</li> </ul>
4.2	600×600×5mm Plate 鐵板	M/S 黑鐵	2	<ul style="list-style-type: none"> <li>● This part is marked out and cut from this material.</li> <li>● All edges are flame cut using a manual operated circle cutting attachment.</li> </ul>



				<ul style="list-style-type: none"> <li>● All exposed edges are guillotine cut. Other edges are flame cut using a manual operated circle cutting attachment.</li> <li>● Markout and Drill Ø10 hole.</li> <li>○ 4.1 件使用這項材料進行落樣與切割</li> <li>○ 所有外露邊：剪床切割，其它切割邊：火切，可用一個手動圓形切割做輔助</li> <li>○ 落樣並鑽 Ø10 孔 (配合2.4)</li> </ul>
4.3	600×600×5mm Plate <u>鐵板</u>	M/S <u>黑鐵</u>	4	<ul style="list-style-type: none"> <li>● The Competitors use AutoCAD drawing to develop, and the material is 5mm Carbon Steel plate, which is cut by laser.</li> <li>○ 參賽者採用AutoCAD繪圖進行開發，材料為5mm鐵板，採用雷射切割而成。</li> </ul>
4.4	600×600×5mm Plate <u>鐵板</u>	M/S <u>黑鐵</u>	2	<ul style="list-style-type: none"> <li>● This part is marked out and cut from this material.</li> <li>● Curved part: Competitors can choose to use a rounding machine, manual bending, or folding machine bending.</li> <li>● All exposed edges are guillotine cut</li> <li>○ 4.5件使用這項材料進行落樣與切割</li> <li>○ 彎弧部份：選手可選擇使用滾圓機、手動加工彎曲、折床彎曲成型。</li> <li>○ 所有外露邊：剪床切割</li> </ul>
4.5	600×600×5mm Plate <u>鐵板</u>	M/S <u>黑鐵</u>	2	<ul style="list-style-type: none"> <li>● This part is marked out and cut from this material.</li> <li>● All exposed edges are guillotine cut</li> <li>● Use the press break to form the angle on part 4.5</li> <li>○ 4.5件使用這項材料進行落樣與切割</li> <li>○ 所有外露邊：剪床切割</li> <li>○ 使用折床成形4.5 件角度</li> </ul>
4.6	25×25×500mm Square Pipe <u>方型管</u>	M/S <u>黑鐵</u>	2	<ul style="list-style-type: none"> <li>● This part is marked out and cut from this material.</li> <li>● The part is cut to length using a mechanical grinder or hack saw.</li> <li>● For the inwardly concave arc part, mechanical grinding can be used, or flame cut using a manually operated circle cutting attachment.</li> <li>○ 4.6部件使用這項材料進行落樣與切割</li> <li>○ 使用機械磨床或手弓鋸，將4.6部件切割到正確長度</li> <li>○ 對於內凹的圓弧部分，可以採用機械磨削，也可以採用手動操作的圓切割附件進行火焰切割。</li> </ul>
4.7	Bolt M10×1.5× 50	B/B <u>黑鐵</u>	2	<ul style="list-style-type: none"> <li>● 1 bolt supplied at approx 50mm long</li> <li>○ 一個螺栓提供件，約50mm長</li> </ul>
4.8	D30×d10×25mm	M/S <u>黑鐵</u>	2	<ul style="list-style-type: none"> <li>● This part is supplied cut to length (25mm)</li> <li>○ 提供件</li> </ul>

4.9	Ø10.5mm, 2.5mm Thick washers	M/S <u>黑鐵</u>	4	<ul style="list-style-type: none"> <li>● Washers supplied to suit M10 bolt</li> <li>○ 華司/墊片提供件 可套用M10Ø螺栓</li> </ul>
4.10	D20×d10×25mm	M/S <u>黑鐵</u>	2	<ul style="list-style-type: none"> <li>● This part is supplied cut to length (25mm)</li> <li>○ <u>提供件</u></li> </ul>
4.11	D20×d12.1×300mm Pipe <u>黑鐵管</u>	M/S <u>黑鐵</u>	2	<ul style="list-style-type: none"> <li>● This part is marked out and cut from this material.</li> <li>● The part is cut to length using a mechanical grinder or hack saw.</li> <li>○ 4.11件使用這項材料進行落樣與切割</li> <li>○ 使用機械磨床或手弓鋸，將4.6部件切割到正確長度</li> </ul>
4.12	Ø12×1500mm Bright Round Bar Ø 12mm光滑圓棒	M/S <u>黑鐵</u>	1	<ul style="list-style-type: none"> <li>● This part is marked out and cut from this material.</li> <li>● The part is cut to length using a mechanical grinder or hack saw.</li> <li>○ 4.12 件使用這項材料進行落樣與切割</li> <li>○ 使用機械磨床或手弓鋸，將4.12部件切割到正確長度</li> </ul>
4.13	D20×d10×30mm	M/S <u>黑鐵</u>	2	<ul style="list-style-type: none"> <li>● This part is supplied cut to length (25mm)</li> <li>○ <u>提供件</u></li> </ul>
4.14	Split Cotter Pin 3×40mm	M/S <u>黑鐵</u>	2	<ul style="list-style-type: none"> <li>● This part is supplied</li> <li>○ <u>提供件</u></li> </ul>
4.15	Ø10×500mm Bright Round Bar Ø 10mm光滑圓棒	M/S <u>黑鐵</u>	2	<ul style="list-style-type: none"> <li>● This part is marked out and cut from this material.</li> <li>● The part is cut to length using a mechanical grinder or hack saw.</li> <li>○ 4.15 件使用這項材料進行落樣與切割</li> <li>○ 使用機械磨床或手弓鋸，將4.15部件切割到正確長度。</li> </ul>
4.16	Ø10×500mm Bright Round Bar Ø 10mm光滑圓棒	M/S <u>黑鐵</u>	2	<ul style="list-style-type: none"> <li>● This part is marked out and cut from this material.</li> <li>● The part is cut to length using a mechanical grinder or hack saw.</li> <li>○ 4.15 件使用這項材料進行落樣與切割</li> <li>○ 使用機械磨床或手弓鋸，將4.15部件切割到正確長度</li> </ul>
4.17	600×600×5mm Plate <u>鐵板</u>	M/S <u>黑鐵</u>	2	<ul style="list-style-type: none"> <li>● This part is marked out and cut from this material.</li> <li>● All exposed edges are guillotine cut</li> <li>● Use the press break to form the angle on part 4.5</li> <li>○ 4.17件使用這項材料進行落樣與切割</li> <li>○ 所有外露邊：剪床切割</li> <li>○ 使用折床成形4.17 件角度</li> </ul>

**Note: B/B MEANS BLACK BOLT**

**注意: B/B指的是黑螺栓**

**Skid Steer Loader Internal Structure Parts:**

PART NO 部位編號	MATERIAL SIZE 材料規格	MAT'L TYPE 材料種類	No REQ'D 所需數量	CUTTING & FORMING INSTRUCTION 模組一的切割與成形說明
5.1	600×600×5mm Plate 鐵板	M/S 黑鐵	1	<ul style="list-style-type: none"> <li>● This part is marked out and cut from this material.</li> <li>● All exposed edges are guillotine cut</li> <li>○ 5.1件使用這項材料進行落樣與切割</li> <li>○ 所有外露邊：剪床切割</li> </ul>
5.2	600×600×5mm Plate 鐵板	M/S 黑鐵	1	<ul style="list-style-type: none"> <li>● This part is marked out and cut from this material.</li> <li>● All exposed edges are guillotine cut</li> <li>● Use the press break to form the angle on part 4.5</li> <li>○ 5.2件使用這項材料進行落樣與切割</li> <li>○ 所有外露邊：剪床切割</li> <li>○ 使用折床成形5.2件角度</li> </ul>
5.3	Ø10×500mm Bright Round Bar Ø10mm光滑圓棒	M/S 黑鐵	2	<ul style="list-style-type: none"> <li>● This part is marked out and cut from this material.</li> <li>● The part is cut to length using a mechanical grinder or hack saw.</li> <li>○ 5.3 件使用這項材料進行落樣與切割</li> <li>○ 使用機械磨床或手弓鋸，將5.3部件切割到正確長度</li> </ul>
5.4	Ø10×500mm Bright Round Bar Ø10mm光滑圓棒	M/S 黑鐵	1	<ul style="list-style-type: none"> <li>● This part is marked out and cut from this material.</li> <li>● The part is cut to length using a mechanical grinder or hack saw.</li> <li>○ 5.4 件使用這項材料進行落樣與切割</li> <li>○ 使用機械磨床或手弓鋸，將5.4部件切割到正確長度</li> </ul>

## 4. Measurement of the Test Project 試題量測

- 4.1 The Test Project (modules) will be measured for evaluation using the official measuring tools or the competitor measuring tools. This shall consist of engineer's square, vernier callipers, heightgauges and feeler gauge. 用官方量具量測。
- 4.2 A dimension can only be measured for a part no. / module when the Test Project (module) is completed (including orientation) as per the drawing, the Fabrication Instructions and Welding Instructions – Refer to section 3 and section 5. 只有依照圖紙、製造說明與焊接說明，完成（包含定位）試題（模組）時，才能測量尺寸。請參閱第3章及第五章
- 4.3 Competitors are to submit parts of completed module(s) before their allocated time for assessment. The module submission deadline is due. If the module is not submitted, the module will not be evaluated.  
參賽者應在繳件的評分時間之前提交已完成模組的部分內容。模組提交截止日期已到。如果未提交模組，則不會評估該模組。

### Example of instruction(s) 說明範例

- 4.3.1 All Competitors are to submit Module 1 as required by the drawing at 5:00 pm. Module 1 will consist of items assembled and welded as per the drawing.  
Items must be submitted for assessment before assembly for dimensional accuracy only. The parts must be submitted with all sharp edges removed and the parts fully cooled – no water residue allowed on the parts.  
**No judgement marking will occur during this assessment.**  
Once a part has been measured, the competitor cannot request extra material and get the part remeasured.  
模組一按照圖紙要求的繳交時間：17:00。模組一是按照圖紙進行組合及焊接後的工件。必須繳交以供評分，且僅評分尺寸精確度。必須去除工件銳利邊、待完全冷卻後才能繳交，工件上不得出現殘留水漬/液體。此階段不會出現判斷評分。一旦工件經過量測，選手不得要求額外材料或是讓工件重測
- 4.4 At the end of the C3 competition time, contestants should immediately stop working and follow the instructions of the chief referee to complete the submission of works.  
C3比賽時間結束，選手應立即停止工作，並依照裁判長的指示完成作品提交。
- 4.4 Marks will be deducted for all / either Measurement **or** Judgement marking elements of the marking scheme if the following occurs: 若發生下列情形，量測與判斷分數兩者/其中之一會扣分：

- 4.4.1 The Fabrication Instructions were disobeyed. 違反製造說明
- 4.4.2 Minimum marks will be awarded for any part/pieces that have been cut/formed incorrectly and which then have been re-cut and re-welded and which have been fabricated back onto the Test Project. A Competitor must request extra material if this scenario occurs.  
切割/成形錯誤，重剪並重新焊接，放到試題上，該部件為最低分。這種情形發生時，選手必須請求額外材料。
- 4.4.3 A part which has been formed in the hydraulic press/digi bender and folded in the wrong direction and then re-folded is allowed. The Competitor can expect to lose substantial Judgement marks through this action. If, however the material cracks during this operation, the Competitor is not allowed to re-weld the cracked part. The Competitor must request extra material. See also section 11.2.  
用折床成形彎錯方向，可以再重新折。選手可預期失去一定判斷評分分數。但如果材料裂開，選手不得重新銲接裂開部件。選手必須請求額外材料。
- 4.5 The material provided was distorted (changing the shape of the surface) by 材料變形(改表面表形狀)，因為
- 4.5.1 Hammering at the location of the assessment point(s) 槌擊測量點
- 4.5.2 Excessive heating causing obvious distortion at the location of the assessment point(s) 在測量點過度加熱導致明顯變形
- 4.5.3 Damaging/grinding the flame /guillotine cut surface at the location of the assessment point(s) 在測量點損壞/研磨火切/機切表面
- 4.5.4 Grinding and welding on the measurement point(s) 在測量點研磨與銲接

*Note: Use of skilled heating, cooling and use of a hammer is permitted on the work piece to control distortion.*

注意：工件上允許使用加熱、冷卻與槌擊技巧，以控制變形。

## 5. Welding Instructions 焊接說明

- 5.1 Unless otherwise indicated all welds are symmetrical. If in doubt, ask.  
除非有特別說明，不然銲道皆對稱。如有疑問，請發問。
- 5.2 Welding be assessed by visual inspection Refer to section 13.4.  
焊接以肉眼判定評分
- 5.3 Welding symbols are according to ISO-Standard 2553 - System A.  
銲接符號皆符合ISO 2553系統A標準
- 5.4 Size of welds is for 111 = z4 to z5, 135 =z4 to z6 and for 141=z2 to z4 - the weld size will be indicated on the welding symbol on the drawing.  
111銲道尺寸為z4到z5，而141銲道尺寸為 z2到z4。銲道尺寸會在圖紙上以銲接符號說明。
- 5.5 Failure to complete less than 75% of the welding, indicated by the welding symbol, on each module from the drawing will result in the Competitor been awarded minimum marks for all Judgement and Measurement marks associated to the part(s).  
若未依銲接符號在每個模組 上完成75%以上銲接，量測與判斷成績皆為最低分
- 5.5.1 If there are 6 or less welds on a module then 90% of the welding will need to be completed.  
若單一模組銲道數量等於或小於6道，則銲接的90%部分皆需完成
- Note: The value of 75% & 90% will be calculated through counting the number of welds that are required for the associated part(s) and getting 75% of this value. This value does not include tack welding, refer to section 6.2.  
注意：75%及90%數值，會計算部件所需銲道數量，取75%，不包含點焊。
- 5.6 If a Competitor uses the incorrect welding process or misinterprets the welding symbol(s), but completes the number of welds and spacing as indicated by the weld symbol(s) on the part, then 0 (zero) marks will be awarded for weld quality and weld symbol interpretation for this part. This only applies to mistakes made between SAEE/MMAW (111) and MAGS/GMAW (135). However, the module / Test Project will still be assessed as per the measurement assessment points indicated on the drawing as the part will be considered welded.  
若選手使用錯誤銲接法或錯誤解讀銲接符號，但依部件銲接符號完成銲道數量與間距，則此部分銲接品質與銲接符號為零分。這只適用於 111和135之間的錯誤。

- 5.7 The Competitor may use either MAGS/GMAW (135), TAG/GTAW (141) or SAEE/MMAW (111) during the assembly process. 組合時可任選135、141或111
- 5.8 No anti-spatter, or any other substance which will enhance the appearance of the completed test pieces is allowed. Refer to section 2.11.  
抗渣劑或其他增進外觀的物質不可使用。
- 5.9 Marks will be deducted if exposed welds are tampered with by grinding, filing or hammering. Cleaning, light mechanical wire brushing and light polishing of welds is permitted, once the profile of the weld has not been tampered with and is clearly visible.  
露焊道若因研磨、銼或 槌擊而損壞，扣分。可以清潔、輕輕地用機械鋼絲刷、輕拋焊道，只要焊道紋路未毀損，且清晰可見。
- 5.10 For the welding of stainless steel, the weld may be brushed/polished (mechanical or hand brushing), however the weld bead/profile must be still be visible.  
不鏽鋼焊接，焊道可刷／拋光（機械或手刷），但焊道紋路需可見。
- 5.11 Mill scale and residue on the steel plate may be removed before welding. However, excessive grinding / scratch marks must not be visible on the welded part. Marks will be deducted for general appearance if excessive grinding marks are visible.  
焊接之前，可以去除鐵板上的鏽皮和殘留物。但不可在焊接部分看到多餘的磨／刮痕跡。如果看見多餘研磨痕跡，扣一般外觀分數。

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## 6. Welding Symbols 焊接符號

6.1 For each completed module the number of welds as indicated on the drawing by the welding symbol will be counted. If a competitor achieves all welds as indicated, then full marks are awarded. If the competitor does not complete all welds as indicated, then zero marks are awarded. Refer to section 5.5.

如果選手所有焊接正確，得滿分。如果未依圖完成所有焊接，零分。請參考第五章 5.5

6.2 A tack weld will be considered as a weld, this will be considered extra welding when assessing weld symbols, which is not permitted. Please refer to images below assuming the weld symbol stated the following;

點焊將視為焊道，評分焊接符號時，這將視為額外焊接，不允許。假設焊接符號如下，請參照下圖





## 7. Thermal Cutting Instructions 熱切說明

- 7.1 All exposed edges/face must be left in the flame cut condition and must not be ground by a mechanical grinding device, hammered or filed. The flame cut face may be lightly brushed with a mechanical grinder, but not to the extent that it effects the profile or shape of the cut face.  
外露邊/面保留火切狀態，不得機械研磨、敲或銼。火切表面可用磨床輕微刷洗，但不會達到影響切割面輪廓或形狀的程度。
- 7.2 The face & edge at the start of the cut (first 5mm) may be de-burred by a hand file to remove any sharp edges.  
表面及切割邊的起始處，可用手銼前5mm倒角除毛邊，以去除尖銳邊
- 7.3 The maximum tolerance for de-burring the edge is 0.5mm. Zero marks (measurement and judgment) will be awarded if cut faces are tampered with at the location of the assessment point.  
除毛邊的最大公差為0.5mm。若切割表面上測量點出現毀損，則量測與判定分數皆為零分
- 7.4 Cutting attachments or guides may be fitted to the hand torches for both straight and circular cutting, however power operated attachments must not be used on hand cutting torches.  
焰炬可配合導軌，直線與圓切割皆可

## 8. Mechanical & Guillotine Cutting 機器和閘刀切割

- 8.1 A mechanical cut is a part which may be cut using a power tool, e.g. mechanical grinder, band /chop saw etc. The following on the fabrication instructions refer to: 機械切割指使用有利的工具切割工件，例如：機械磨床、帶鉅切割機/切割機...等等。下述關於製造說明請參考：
- 8.1.1 Mechanical cutting - angle grinder or straight grinder (large or small), bandsaw / chop saw.  
機械切割 - 角磨機或直磨機（大或小）、帶鉅切割機/切割機
- 8.1.2 Guillotine cut, without the use of the back gauge.  
剪床切割，不得使用背規。

Note: The guillotine cut face may be very lightly brushed with a mechanical grinder, but not to the extent that it effects the profile or shape of the cut face. The cut face must show the distinctive mark of a guillotine cut. Edges may be de-burred to a maximum tolerance of 0.5mm. Edges and the start of the cut (first 5mm) may be de-burred by a hand file to remove any sharp edges. Zero marks

(measurement and judgment) will be awarded if cut faces are tampered with at the point of assessment.

注意：剪床切割表面可用機械研磨機輕刷，但不得影響剪床切割表面紋路。可除毛邊的最多為0.5mm。起始處可以用手銼前5mm倒角，移除尖銳邊。如果切割表面損毀，量測與判讀評分皆零分

*Note: The Competitor must ensure that blade clearance and rake angle of the guillotine are set correctly before cutting. If the machine is set-up correctly but the blade is defective the Competitor must notify the CE / DCE / WSM immediately. The Competitor can get assistance from the WSM / guillotine technician to set-up the guillotine if he so wishes.*

注意：如果剪床有問題、刀片故障等等，選手必須立刻通知裁判長或副裁判長。若有設定問題，選手可得到工廠管理員或剪床技術員的幫忙。

8.18 Tubes, round bar, T-section, box section etc. must be hand sawn or mechanical cut.

管、圓棒、T型材、方形材等等必須鉅或機切

Note: A supplied thermal cut edge may not be used as an exposed face / edge for the assembly of the Test Project.

注意：提供的熱切邊，在試題組裝上，不可用做外露面/ 邊


  
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## 9. Drilling Instructions 鑽孔說明

9.1 All drilled holes must be deburred on both sides at a depth of 0.25 mm +/- 0.1, refer to the sample plate.

所有鑽孔必須兩邊倒角0.25mm +/- 0.1，請參考樣板

9.2 The sample plate provided, indicating tolerance for drilling and countersinking cannot be removed from the drilling area, and it should not be altered with or obstructed.

鑽孔樣本用來展示鑽孔公差，不可移開鑽孔區，亦不得改造或堵住

9.3 As a measurement cannot be taken from the centre of a hole, the measurement will be that of the drilled hole centre plus half the diameter of the round bar which is passing through the hole.

由於無法從鑽孔中心測量，測量數據會是鑽孔中心 + 可穿過孔的圓棒半徑

9.4 Zero marks will be awarded to all parts attached to a drilled hole which has been drilled greater / smaller than that specified on the drawing or which has been deformed to an irregular shape by filing and grinding. Refer to Marking Criteria, drilling.

鑽孔大於/小於圖上尺寸，或是因為銼或磨而變形，零分。請參照評分標準：鑽孔

9.5 A Competitor is free to re-drill holes which may have been inaccurately drilled. Inaccurately drilled holes may be filled-in using any welding process, with the resultant weld ground flush with the plate. Marks be lost for general appearance due to this action, but it does not constitute deforming of the material. Refer to section 2.12 & section 13.3.

鑽錯可用任何焊接法填銲後再鑽，會扣一般外觀分數，但不構成材料變形的扣分

9.6 Deliberately placed small tack(s) or spot welds are not permitted inside a drilled hole to achieve a dimension. The penalty for this will be that as stated in point 8.4.

不可內孔點銲，不然零分。犯規之處罰措施請參照8.4點

## 10. Bending & Forming 彎曲與成形

### 10.1 Break Press and Digi Bender 油壓折床及臥式折床

Flat plate that requires bending will be completed using the hydraulic break press and digi benders as stated on the fabrication instructions. The Competitor must ensure that the correct veeblock for the material being formed is used. The Workshop Manager is responsible for setting-up the vee block. Generally, the ratio will be 1:6 for thickness of material to the width of the Vee for carbon steel and stainless steel which is been formed to 90°.

需要彎曲的平板將使用液壓折彎機和數位彎曲機完成，如製造說明所述。參賽者必須確保使用適合所形成材料的正確 V 形塊。車間經理負責安裝 V 形塊。一般情況下，成型為90°的碳鋼與不銹鋼材料厚度與V形寬度之比為1:8。

### 10.2 Depending on the quality of the material. The first 5mm of the bend will be ignored if cracks appear on the plate surface.

根據材料品質，彎曲表面的前5mm如有裂紋，可忽略。

### 10.3 The competitor is allowed to nick / notch the start of any bends

選手可以在彎曲表面的開端上刻痕/V型切口

### 10.4 Heat bending 熱彎

This will be completed using heat bending using the oxy-acetylene torch. No Competitor can use jigs (a piece of material with a fixed internal dimension) or special clamps to complete this type of bending. If the Competitor is using the table vice for this operation, angle bar with rounded/square edges or flat bar can be used for heat bending, to protect the vice jaws – refer to image.

不可用內形板或特殊治具。

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## 11. Extra Material 額外材料

### 11.1 Competitors will be deducted a mark(s) (to a maximum of 4 marks) for any extra individual Part No. (That which is stated on the Material List) which they require to complete the Test Project due to the part been lost, damaged or inaccurately cut/formed by the Competitor. Refer to section 2 and section 4.

因為選手遺失部件、損壞部件或切割/成形不準確，選手為完成試題，索取任何（材料表上）額外的獨立部件，將被扣分（最多4分）請參照第2及第4章。

- 11.2 A spoiled part is also any material that was deemed to be cut incorrectly and then re-welded, refer to section 4. Additional material will be granted when the Competitor requests (with the knowledge of their compatriot Expert) the extra part no. to be re-supplied and when the spoiled piece(s) are stamped with the name of the candidate and given to the Chief Expert  
損壞的部件也包括不正確切割，並重新銲接的任何材料，請參考第11.2.2點。當選手（經其同國裁判了解後）請求再提供額外部件，且當損壞的部件印上選手姓名，並交給裁判長後，才會給予選手額外材料。
- 11.3 A mark will be deducted for each additional piece of material received from the Material List to a maximum of 4 points.  
獲得每件材料表上的額外材料，將扣1分，最多4分。
- 11.4 The size of the additional material supplied will be approximately 30mm greater all-round than the individual spoiled part. This does not include any supplied parts, as supplied parts and will be resupplied to the sizes specified from the material list.  
提供的額外材料尺寸，每邊都將超出獨立的損壞部件30mm。這不包含任何提供件，因為將再提供材料表上提供件的指定尺寸。
- 11.5 The M10 bolts, nuts & washers will not be considered as extra material.  
失/錯置螺栓，視為需要額外材料。
- 11.6 Competitors is not permitted to request extra material from the WSM.  
選手不得要求工廠管理員提供額外材料

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## 12. Function Definition 功能定義

12.1 The function is defined as follows: 功能定義如下述

12.2 The completed module(s) and final presentation of the Test Project must be presented as indicated by the drawing sheet 1 of 8. No assessment will occur on the part(s) that are presented incorrectly.

完成之模組及試題內容最後呈現，必須依照八張圖紙的第1張所示。若呈現方式錯誤，則這些工件不會評分。

Note: All bolts must be fully tightened into a closed position. The bolts must be lightly tightened with a spanner. To complete the function all bolts must be removed with minimum force.

注意：所有螺栓皆須鎖緊到閉合位置。螺栓必須用扳手輕輕鎖緊。為達到其功能，必須用最小力氣拔開所有螺栓。

If at any position the bolts do not line up with the tapped hole, no marks will be awarded for this specific position. 如果在任何位置上，螺栓與攻牙孔不在同一直線上，該特定位置為零分

If the function cannot be completed for its given position, then no marks (measurement & judgement) can be assessed. Example; if the part cannot be rotated / moved and fixed in its position as per the drawing, then no assessment of these parts will occur.

如果在任何指定位置上，無法完成其功能，則量測與判斷皆不評分。

例如：如果工件如圖示，無法轉/移動且固定在位置上不動，則這些工件不會評分

(This information will be provided before competition for translation)

(此資訊將在翻譯比賽之前提供)

12.3 The function is defined as follows: 功能的定義如下：

(The front bucket is raised to a horizontal position, raised to a rearward tilt position of 27°, and raised to a rearward tilt position of 54°.) 旋轉部分為：前斗抬高後水平位置、抬高後向後傾27°位置、抬高後向後傾54°位置。

i. 0° position horizontal of part 3.1, part 3.3, part 4.12, part 4.14, part 5.3 and parts 5.4 must be in the correct position, all Measurements must be taken at the assessment points shown, refer to sheet named

function of completed project. 工件3.1、3.3、4.12、4.14、5.3及5.4的0°水平位置必須在正確位置。所有量測必須依照測量點進行，請參照完整試題的「功能」部分

- ii. 27 ° Rearward tilt position of part 4.14, and parts 5.4 must be removed with ease (slight hammer blows can be used if required) now move the module 3 is put on the function two position. The part 4.14 to 27° position and place part 5.3 into the 27° locating holes (slight hammer blows can be used if required) the measurement must be taken at the assessment points shown, refer to the sheet named function of completed project.  
27° 向後傾斜位置的零件 4.14 和零件 5.4 必須輕鬆拆卸（如果需要，可以使用鐵鎚輕輕敲擊）現在將模組 3 移到功能二位置。將第4.14 部分調整到27° 位置，並將第5.3 部分放入27° 定位孔中（如果需要，可以使用鐵鎚輕輕敲擊）。所有量測必須依照測量點進行，請參照完整試題的「功能」部分
- iii. 54 ° Rearward tilt position of part 4.14, and parts 5.4 must be removed with ease (slight hammer blows can be used if required) now move the module 3 is put on the function two position. The part 4.14 to 54° position and place part 5.3 into the 54° locating holes (slight hammer blows can be used if required) the measurement must be taken at the assessment points shown, refer to the sheet named function of completed project.  
54° 向後傾斜位置的零件 4.14 和零件 5.4 必須輕鬆拆卸（如果需要，可以使用鐵鎚輕輕敲擊）現在將模組 3 移到功能二位置。將第4.14 部分調整到27° 位置，並將第5.3 部分放入54° 定位孔中（如果需要，可以使用鐵鎚輕輕敲擊）。所有量測必須依照測量點進行，請參照完整試題的「功能」部分
- iv. After completing the assessment of the raised positions, module 3 must be lowered back to the lowest horizontal position with part 4.14, and parts 5.4 located in the correct hole position.  
在完成抬高位置的測量後，必須將工件3.12降低至水平位置或0°，且工件3.15 需位於正確孔位。

#### Note: Capital Cup WorldSkills Competition

It is not permitted to bend or distort part 4.14, and parts 5.4 to achieve fit-up to complete the function movement from 0°, 27° and 54° When completing the function, it is acceptable that part 4.14, and parts 5.4 could be a slightly tight fit so a gentle use of a hammer is permitted to remove part 4.14, and parts 5.4 however excessive force cannot be used to fit by manipulation of other parts. Full marks will be award for each separate function from 0°, 27° and 54° if it is completed as stated.

注意：4.14及 5.4工件不得折彎或變形以達到0°、27° 及 54°功能之動作，完成功能時，允許4.14及5.4工件稍緊，因此可輕輕搥擊並移除4.14及 5.4工件，但是不得為了配合其他工件而過度使力。

若每項功能依照指示各自達到0°、27° 及 54°，得滿分

## 13. Marking Criteria 評分標準

### 13.1 Dimensional Accuracy: 尺寸精度：

13.1.1 Checked as per number and locations indicated on the drawing for assessment, to specified tolerance for example;  $\pm 0.59\text{mm}$  to  $\pm 1.09\text{mm}$ . Where dimensional accuracy has been achieved by disobeying fabrication instructions, minimum marks will be awarded. Refer to section 4.

根據圖紙上數字和位置進行檢查，應在指定公差內，例如： $\pm 0.59\text{mm}$  到  $\pm 1.09\text{mm}$ 。在不遵守製造說明的情況下達到尺寸精度，將給予最低分。請參照第四章

### 13.2 Technical Perfection: 技術完善度

13.2.1 Flatness, squareness and parallelism to specified tolerances. These elements are assessed using measurement or Competitor feeler gauges or official gauges (equipment) supplied by 2024 Taipei Capital Cup WorldSkills.

平坦度、垂直度與平行度，應在指定公差內。這些項目會使用2024 臺北首都盃國際技能競賽提供的量具、選手厚薄規或官方的量具（設備）進行測量。

For the assessment of flatness, the 0.6mm feeler gauge blade must not fit in under or between the part being access by more than 10mm, for the part to be deemed inside the required tolerance.

若評估平坦度，0.6mm的厚薄規片不得插入待評分之工件下或插入工件中超過10mm，該部件才會視為在所求公差範圍內。

The following points refer to Judgement marking. Experts are expected to mark to best industry standard and as per grading rubrics, not to the standard produced by the Competitors.

以下幾點是指判斷評分。預期裁判依評分規則，評出最佳職業標準，而不是選手製定的標準。

### 13.3 Drilling: 鑽孔：

Ø3.0mm hole size checked with Ø3.2 mm shanks.

Ø10.0mm hole size checked with Ø10.2mm shanks.

Ø3mm孔徑須用Ø3.2 mm鑽柄檢查

Ø10.0mm孔徑須用Ø10.2 mm鑽柄檢查

13.3.1 No filing, grinding or deforming of holes is permitted. Deburring of all holes and countersinking, as per sample piece. Orientation



of holes, P.C.D, and hole pitch to specified tolerance as indicated on the drawing. Refer to section 8.

禁止銹孔、磨孔或使孔變形。依據每件樣品，除去所有孔的毛刺，並鑽孔裝埋。孔的定位、節圓直徑與孔間隙應依圖紙，在指定公差內。請參考第八章

#### 13.4 Welding quality: 焊接品質：

13.4.1 Welds are assessed to industry standards by visual inspection and as per grading rubrics/sample plates. Generally, welds should be of uniform profile, regular bead size, smooth toe blend and specified size - no welds are measured for length or leg length. Welds should be free of defects such as slag inclusions, porosity, lack of fusion, stop/start defects, undercut (to a depth of 0.5mm) and cracks with all tool' s marks, slag and spatter removed. Refer to section 5.

銲接依照業界標準，以肉眼判定與評分規則來評分。一般而言，焊道應具有均勻輪廓、規則銲珠尺寸、平滑銲趾融合和指定尺寸。焊道不會以長度或焊腳長度進行量測。焊道應無缺陷，如銲渣夾雜物、氣孔、缺乏融合、停止/起始缺陷、過熔（深度為0.5mm）、所有工具痕跡和移出銲渣和銲濺物造成的裂紋。

#### 13.5 Weld symbols: 焊接符號：

13.5.1 All welding to be completed as per the weld symbol. Unless stated all weld symbols are symmetrical and to ISO-Standard 2553 - System A. Full marks will be awarded for obeying the weld symbol and applying the number of welds stated. Zero marks will be awarded for disobeying the weld symbol. Refer to echnical Description and to section 4.

依每個銲接符號，完成所有銲接。除非另有說明，所有銲接符號皆對稱並符合ISO 2533 - 系統A的標準。若依照銲接符號，並銲出指定銲接數量，將給予滿分。若未依照銲接符號，將給予零分。

#### 13.6 Fit-up: 組合：

13.6.1 Location, alignment and fit up of parts to specified tolerances and as indicated on the drawing sheets.

零件的位置、對齊與部件裝裝應在指定公差內，並依據圖紙指示

#### 13.7 General Appearance 一般外觀

13.7.1 Overall appearance and finish of parts to complete each Module. Fabrication symmetry (position and orientation of parts) and joint alignment (visual consideration not included in any other previous

criteria). Finished module is free from burrs, sharp edges and work marks.

完成每個模組的零件的整體外觀和光潔度。製造對稱性（零件的位置和方向）和接頭對齊（任何其他先前標準中未包含的視覺考慮）。成品模組沒有毛邊、銳邊和加工痕跡。

13.8 Presentation of completed Test Project: 呈現完成後的試題內容：

13.8.1 At the end of competition of day Four (C3), competitors are required to position their Test Project on their worktables. The Test Project must be assemble as shown in sheet 1 of 8 drawing sheet.

第三天（C3）結束→選手必須在工作桌上放置試題內容，且試題內容必須以八張圖紙中的第1頁圖示組合

## 14. Test Project Marking 試題評分

Refer to Technical Description. 請參照技術說明書



TAIPEI 2024  
Capital Cup WorldSkills Competition

## 15. First Competition Day C1 競賽第一天

- 15.1 Read the drawings and work plan for 1 hour. You can make notes, do calculations and make chalk/ink marks on the material but DO NOT start precise marking out or working e.g. dot punching, scribing lines, cutting & forming.  
讀圖與工作規劃1小時。可做筆記、計算和用粉筆/墨水在材料上做記號，但不得開始精準落樣或工作，例如：衝孔、劃線、切割和成形
- 15.2 At the end of work planning time will be allocated for question time.  
工作規劃結束後，會開放提問時間
- 15.3 The Chief Expert will answer any general questions.  
裁判長將回答任何一般問題
- 15.4 The Test Project Designer will answer any questions about the drawing. 出命題者將回答任何與圖紙相關問題
- 15.5 The Competitor may ask any ambiguous questions not clear about the task.  
選手可問任何對於工作不清楚的問題
- 15.6 If your question is related to the task, and within the task, you will be told so.  
如果問的問題是關於工作，且在工作範圍內，就會得到答案
- 15.7 The Chief Expert will seek acknowledgement from all Competitors and Experts that they are ready, (understand the rules, understand the task, and have had questions clarified, understand their health and safety obligations).  
裁判長將向所有選手與裁判確認他們已準備好（了解規則、了解工作、已釐清問題，以及了解他們的健康與安全責任）
- 15.8 IF IN DOUBT ASK! 如果有疑問，請提問！

## 16. Instructions for Health and Safety 健康安全說明

- 16.1 All regulations of health and safety, including standards of protection specified by 2024 Taipei Capital Cup WorldSkills or Workshop Manager/Experts, must be followed exactly.  
必須嚴格遵守所有健康和 safety 規定，包括 2024 年台北首都盃世界技能大賽或車間經理/專家指定的防護標準。
- 16.2 Any abnormality in the machinery or equipment must be immediately reported to the Chief Expert and WSM immediately.

機器不正常運作或任何設備故障，必須立刻回報總裁判長及工廠管理員

16.3 16.3 Refer to the document titled HEALTH, SAFETY, AND ENVIRONMENT POLICIES AND REGULATIONS for Construction Metal Work at 2024 Taipei Capital Cup WorldSkills

請參照第2024首都盃國際技能競賽冷作職類之健康安全說明文件

16.4 Safety glasses must be used in all material removal operations.

進行任何削除工作時，皆須戴護目鏡

16.5 Clothing and shoes must comply with regulations of host country health and safety.

穿著必需符合比賽主辦國的健康安全規則

Note:

If any competitor is seen by an Expert performing an unsafe or dangerous work practice during the competition they must be stop at once. The competitor must be reported to the CE /E, ESR for Safety and their respective Expert. The CE/ E and ESR for Safety must ask the competitor to stop work on their Test Project and issue a verbal warning / instruction with regard to safety.

The competitor can have up to three (3) warnings for unsafe work practices during the competition and any time lost by the competitor for any unsafe work practice will not made up by the competitor.

競賽期間，若選手被裁判長發現在不安全或危險的情況下工作，必須立即停止手邊工作。選手必須被回報給總裁判長 / 裁判及ESR (特別任務裁判)。總裁判長 / 判長及ESR (特別任務裁判)必須請選手停止試題內容的工作，酌予口頭警告 / 安全相關說明。選手因競賽間不安全或危險的工作情形最多被警告三次，且選手若因上述原因隨時失去比賽資格，便不得進行補救。

## 17. General Issues 一般問題

17.1 No materials (steel) or WSC drawings may leave the workshop area during the Competition.

競賽期間，不得將材料或圖紙帶離工廠

17.2 No outside Instructor / trainer / teacher / spectators cannot converse with Competitors other than their respective interpreter during the working time.

競賽期間，除了同國口譯外，場外指導老師不得與選手溝通

17.3 If a Competitor gets sick, the CE / Expert must be immediately. Time

allowances will be given to these requests. 若選手生病或發生意外，必須立刻告知總裁判長/裁判。可通融給予更多時間

- 17.4 Any time allowances given for sickness made must be communicated to all other Experts.  
若因生病/發生意外要通融給予更多時間，必須與所有其他裁判長溝通
- 17.5 No time allowance will be given for a toilet break.  
上廁所，不補貼時間
- 17.6 If a machine breaks, or if a Competitor is delayed for any reason, the Competitor must inform the CE or Expert immediately. If in the view of the Chief Expert, you have lost time, an allocation will be made.  
若機器故障，或選手因任何原因而被耽誤到，選手必須立刻通知總裁判長或裁判。如果總裁判長判定你流失時間，會再補給你。
- 17.7 No Expert can: 裁判不得：
- 17.7.1 Come within 2m of a Competitor while he is outside his working area.  
與選手的距離小於2公尺當選手在其崗位外時
- 17.7.2 Make gestures / facial expressions or take notes while in front view of a competitor within the working area.  
在工作區內選手前方，比手勢 / 臉部表情或寫筆記
- 17.7.3 Go into a Competitor' s area, without the attendance of the Competitor' s Expert or spend a time period outside a competitor' s work area watching the competitor. This can only occur if an Expert observes a Competitor working in an extremely dangerous manner where the Competitor is about to cause serious harm to his person.  
趁選手同國裁判長不在時走進選手區，或在選手工作區外待一段時間觀看選手。只有當裁判觀察到選手以極其危險的方式工作，將很有可能對自身造成嚴重傷害時，才能允許走進
- 17.8 No media team can enter a Competitor' s area with the attendance of the CE  
無裁判長在場時，媒體小組不得進入選手區
- 17.8.1 No flash photography is allowed 攝影禁止使用閃光燈
- 17.9 REFER TO SKILL-SPECIFIC RULES 請參考技能特定規則