

# **Modified Enlarged 36pt**

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS**

**Friday 12 June 2020 – Morning**

**A Level in Design and Technology:  
Product Design**

**H406/02 Problem Solving in Product Design**

**Resource Booklet**

**Time allowed: 1 hour 45 minutes  
plus your additional time allowance**

**READ INSTRUCTIONS OVERLEAF**



# **INSTRUCTIONS**

**Use the Resource Booklet to answer all the questions.**

**You should spend 35 MINUTES plus your additional time allowance reading this Resource Booklet.**

**Do NOT send this Resource Booklet for marking. Keep it in the centre or recycle it.**

# **ADVICE**

**Read this Resource Booklet carefully before you start your answers.**

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**The stimulus in this booklet relates to issues and opportunities encountered when setting up street food markets.**

## **Street Food Markets**

**Street food markets are a popular attraction in many towns and city centres.**

**The Council of a rural Cumbrian town intends to host a street food market during the Summer months in order to attract the wider community/visitors and promote economic growth.**

**The Council has identified that the best location is the town square shown from different views in FIG. 1 opposite. At the centre of the square is a war memorial, some picnic tables and trees. Car parking surrounds this area on four sides, providing adequate space for around twenty street food sellers. Thirty six car parking spaces would be used for the market stalls.**



**FIG. 1**



**war  
memorial**

**café**

**public toilets**



**book  
shop**

**fuel  
station**

**public house**

**inn**

**restaurant**

# **Initial Investigations**

**The Council has undertaken some research and visited a street food market called the ‘Food Fayre’ in a nearby village. As shown in FIG. 2 opposite, street food sellers traded from pop-up market stalls placed in existing car parking spaces using trestle tables.**



FIG. 2



pop-up market stall

trestle table



# **Pop-up Market Stalls**

**The Council decided to invest in pop-up market stalls. By making this investment the Council intends to give opportunities to new business start-ups by keeping the initial costs down.**

**The Council has a set of requirements when it comes to purchasing pop-up market stalls. These are summarised in FIG. 3 below.**

## **FIG. 3**

**Easy to carry from storage and set-up by 1 or 2 people.**

**Easy to clean and be resistant to food stains.**

**High resistance to wear, abrasion and impacts in normal use.**

**Easy to repair and replace broken or damaged parts.**

**Offer good value for money.**

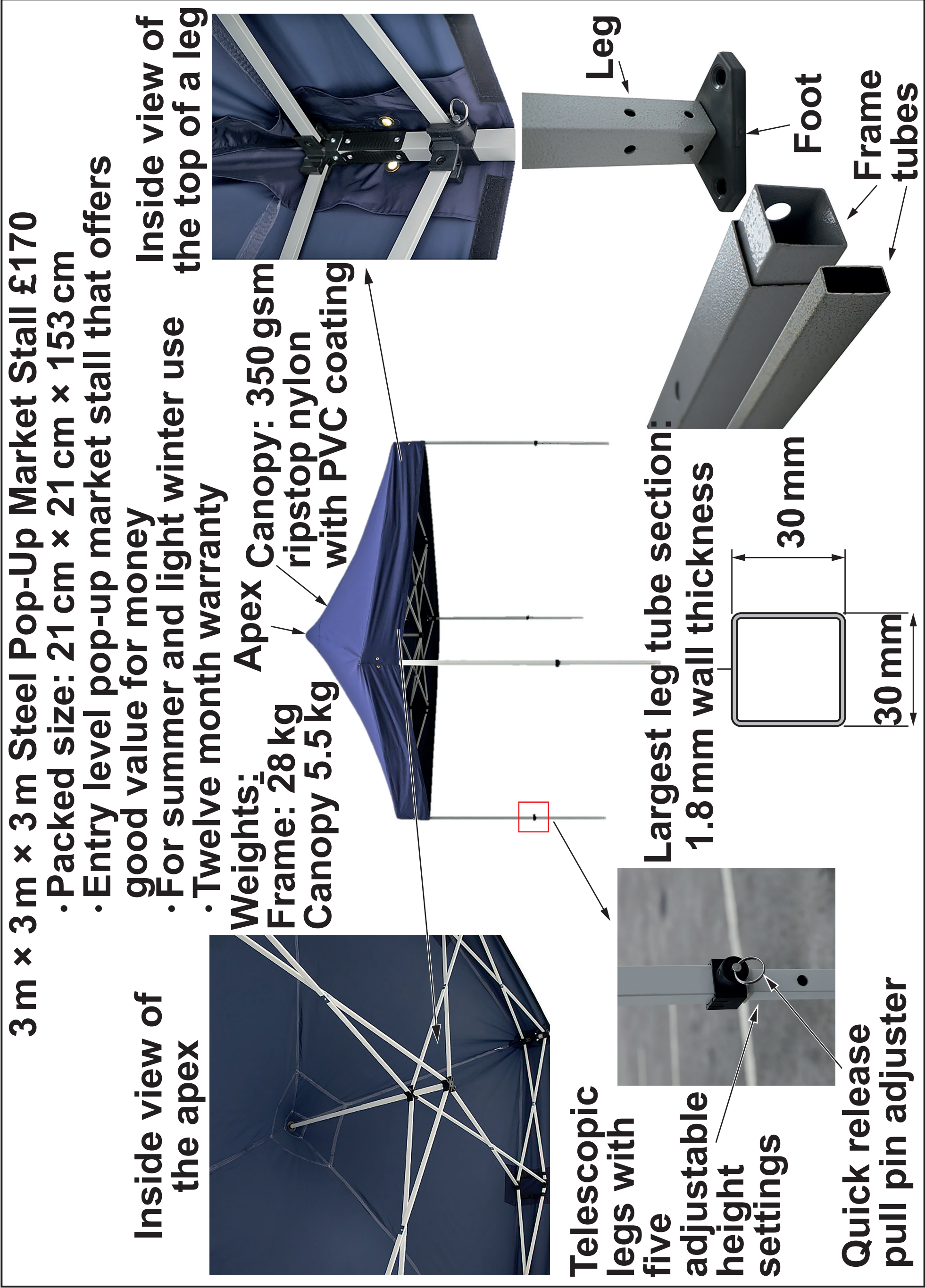


# **Product Choice**

**A supplier has recommended two products to the Council in the form of a steel pop-up market stall and aluminium pop-up stall that have been popular purchases with other councils and market traders.**

**The Council spends time researching the properties of both products before deciding which product to invest in. Look at the diagrams on the next pages.**

FIG. 4 (not to scale)





## 3 m x 3 m x 3 m Aluminium Pop-Up Market Stall £270

Inside view of the apex

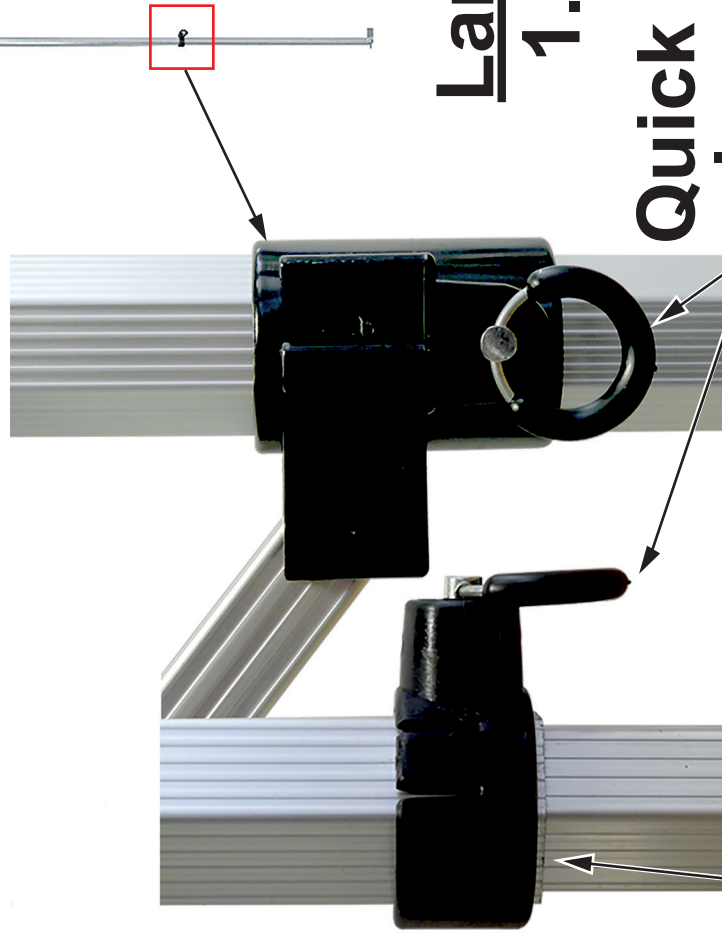
- Packed size: 24 cm x 24 cm x 155 cm
- For leisure and light commercial use
- Twelve month warranty



Weights:  
Frame: 20 kg  
Canopy 6.5 kg

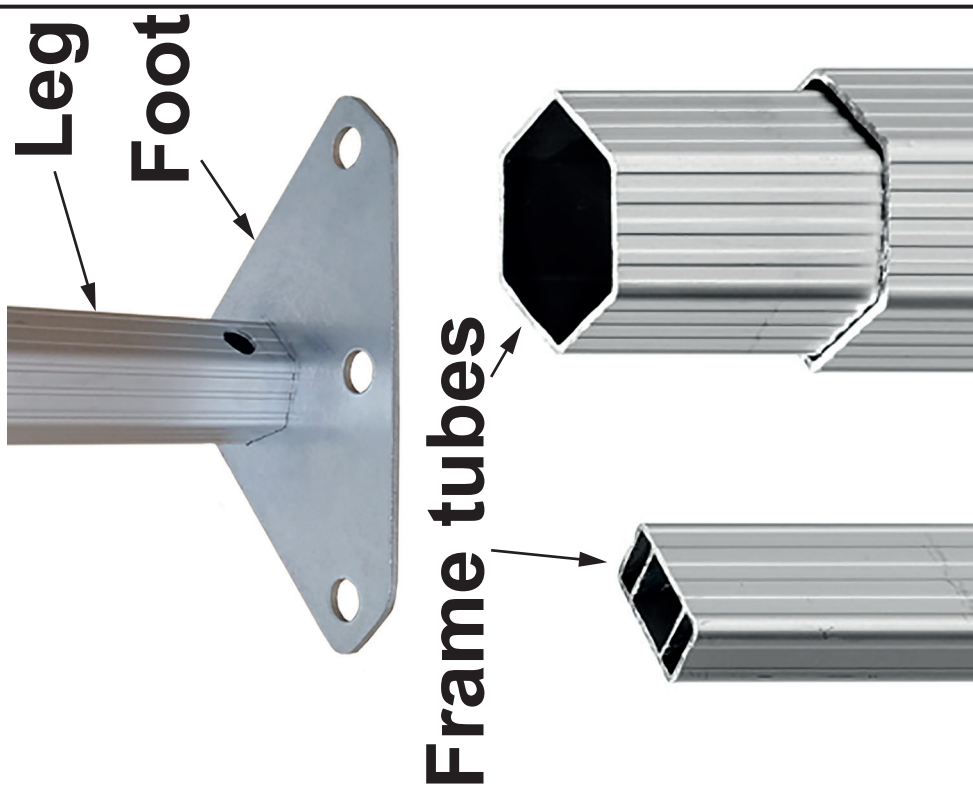
Apex

Canopy: 450  
gsm ripstop  
nylon with PVC  
coating



Telescopic legs  
with five  
adjustable  
height settings

Largest leg tube section:  
1.8 mm wall thickness



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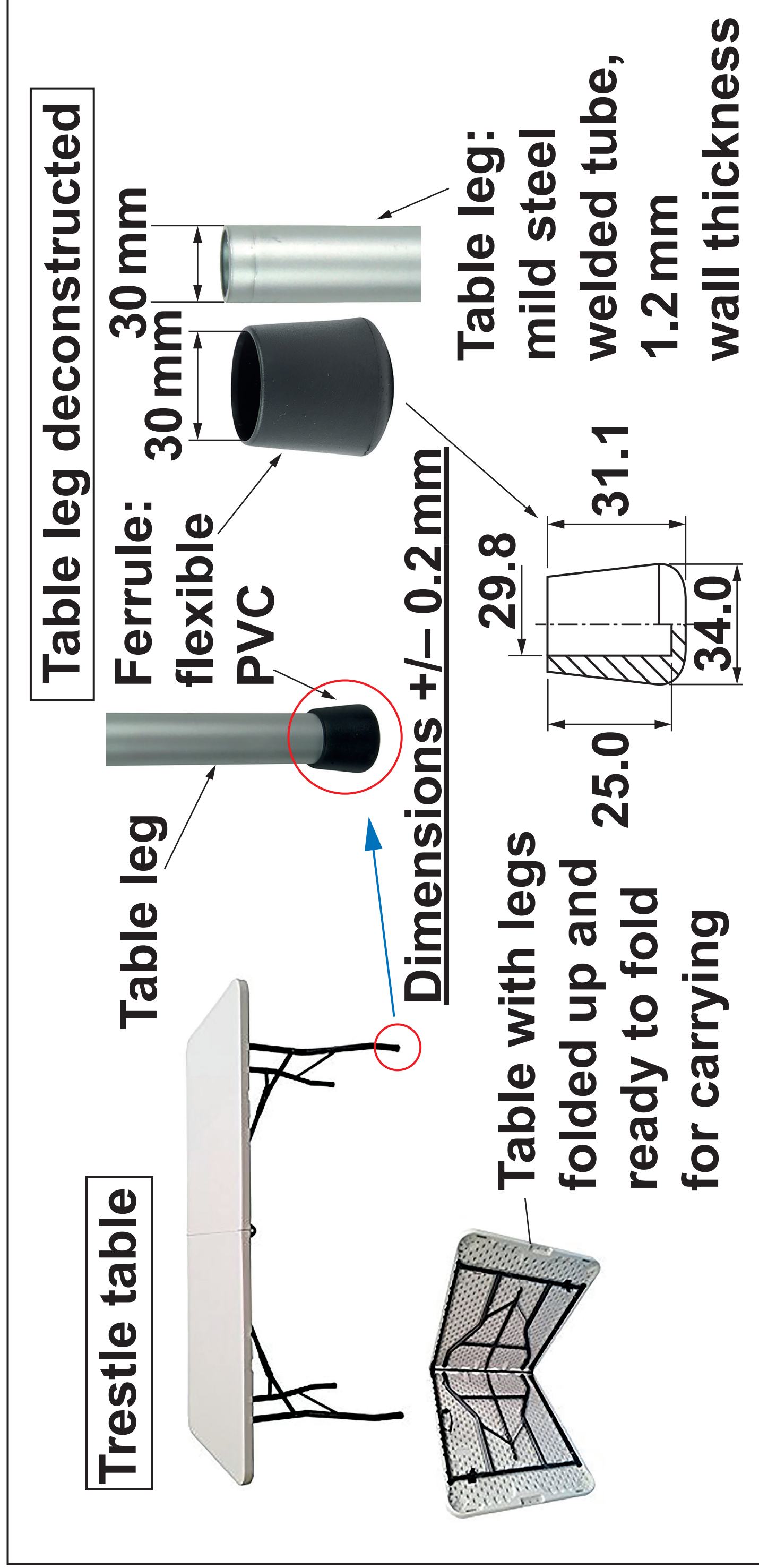
# **Sourcing Trestle Tables**

**The Council owns a large number of trestle tables which will be made available for the street food market.**

**When testing the suitability of the trestle tables with a prospective street food seller, the Council discovered that as the parking spaces around the town square are on inclined and uneven surfaces the table tops were not level. This made them unsuitable for a range of street food sellers, for example those selling curries and soups.**

**A manufacturer has advised the Council that the standard components identified in FIG. 5 on the next pages can be used to upgrade the trestle tables to make them level.**

**FIG. 5 (not to scale)**



Height adjustable  
self-levelling foot

Zinc plated steel



M10 Stem

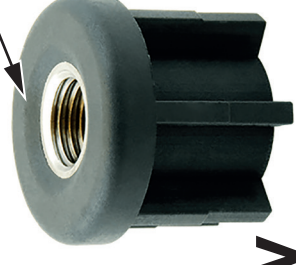
500 kg Static load capacity

Nylon foot

Standard components  
to be used for the  
upgrade

Threaded tube insert

Insert: brass with  
nickel plating

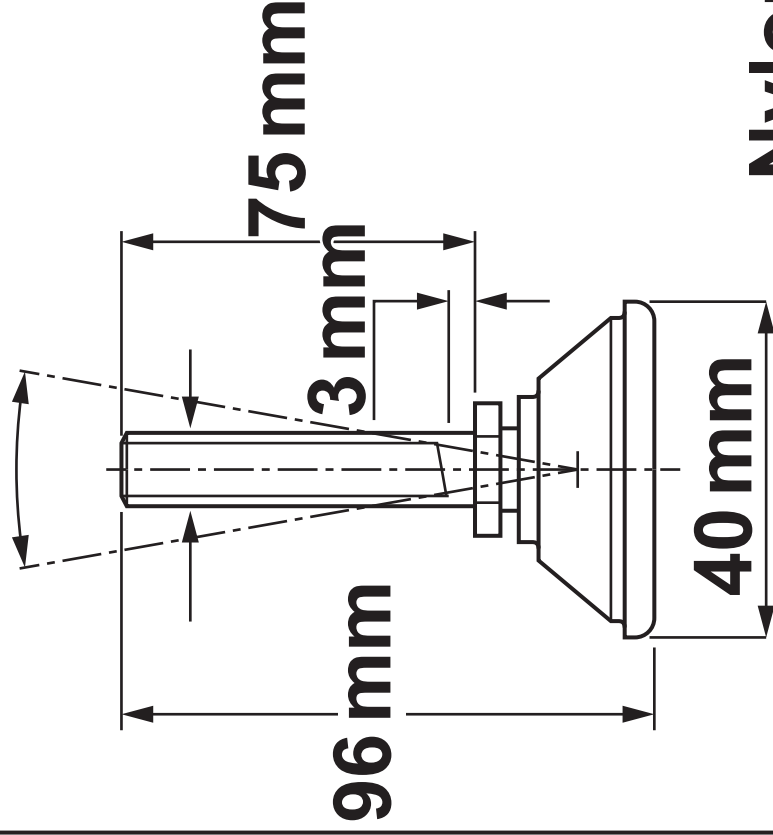


Body: glass  
reinforced  
plastic

240 kg Static  
load capacity

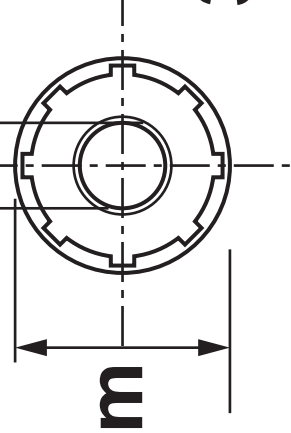
Upgraded table leg

20° ARTICULATION



M10

30 mm



30 mm

24 mm

28 mm

Table leg:  
mild steel  
tube

M10 Stem

Threaded  
tube  
insert

Spanner  
fitting

Ball joint enables  
foot to swivel

Nylon self-levelling foot

# **A Sustainable Approach**

**With decisions made on the choice of pop-up market stalls and the upgrade of the trestle tables, the Council turns its attention to the customers who will be attending the street food market during the Summer. The Council is drawn to a series of newspaper articles that have featured in the national press. FIG. 6 shows some extracts from these newspaper articles:**

**FIG. 6**

**‘THE VERY NATURE OF STREET FOOD MEANS SINGLE-USE PLATES, CUPS AND CUTLERY GO STRAIGHT IN THE BIN AFTER USE’ ‘MARKETS SAY THEY ARE LOOKING INTO SUSTAINABLE ALTERNATIVES’**

**The Council reflects on customer behaviour, specifically how some of the single-use waste can be minimised by the street food sellers. A recommendation is put to the Council to talk to a local manufacturing company who has developed a range of crockery and cutlery called ‘BambEat’ shown in FIG. 7 opposite.**



FIG. 7 (not to scale)

**‘BambEat’ features:**

- Aesthetically pleasing
- Durable
- Reusable
- Lightweight
- Resistant to impact
- BPA free
- Dishwasher safe up to 70 °C
- Microwave safe up to 100 °C

© Zuperzozial.  
‘Take-3 Cutlery set’.  
www.zuperzozial.com. Item removed due to third party copyright restrictions.

**Karabiner for clipping unused cutlery to bag**

**CUTLERY:**  
compression formed, composite bamboo and corn fibres reinforced with melamine resin

© Zuperzozial, ‘Bamboo Zip Cup’.  
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**CUP: 300 ml capacity**  
**Height**  
**132 mm**

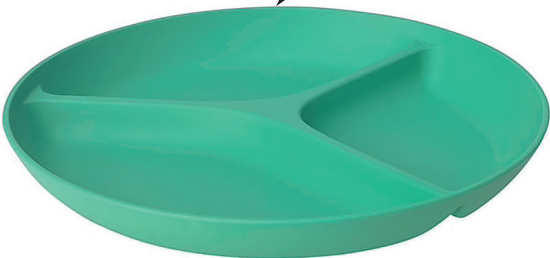


**Stacked height**  
**142 mm**

**CUPS AND PLATES:**  
compression formed, composite bamboo and corn fibres reinforced with melamine resin

**PLATE: diameter 275 mm**

**Height**  
**25 mm**



**Stacked height**  
**30 mm**

**The Council agrees to implement a scheme in its street food market during the Summer months whereby each customer will receive a 'BambEat' set on entry for a £5 deposit. Each 'BambEat' set will comprise a plate, cup, knife, fork and spoon. The deposit will be returned to the customer if the 'BambEat' set is returned undamaged.**

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## **‘BambEat’ Trolley Concept**

**Alongside the product range, the local manufacturer suggested a range of trolleys that could be used to:**

**efficiently store dirty crockery, cutlery and food waste after use**

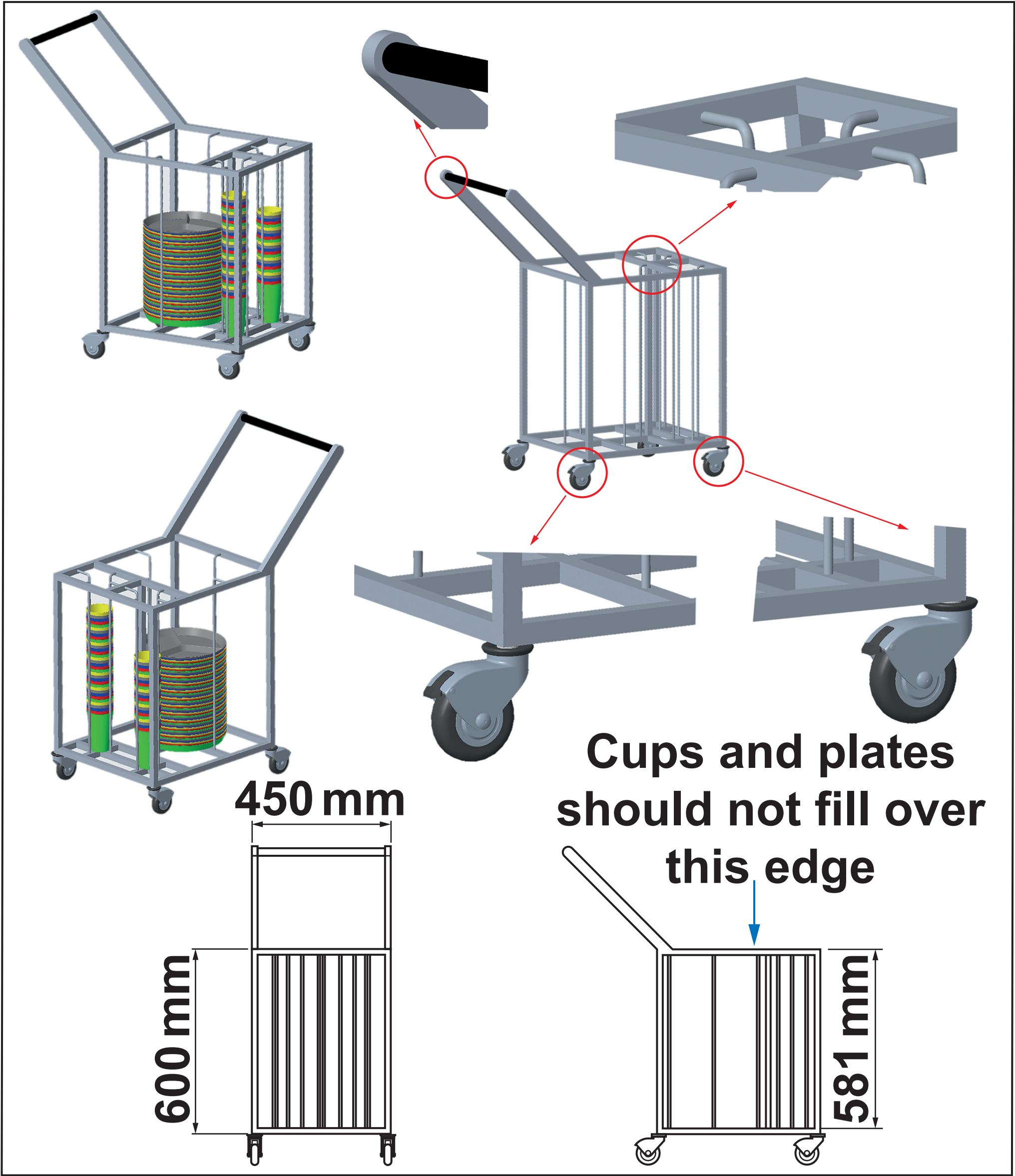
**provide storage for crockery and cutlery for cleaning**

**provide customers with a place to return used crockery and cutlery.**

**A concept model of a trolley for the storage of ‘BambEat’ plates and cups as detailed in FIG. 8 opposite has been shared with the Council for further consideration...**



**FIG. 8 (not to scale)**



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