

Installation of Outriggers for Temporary Suspended Working Platforms

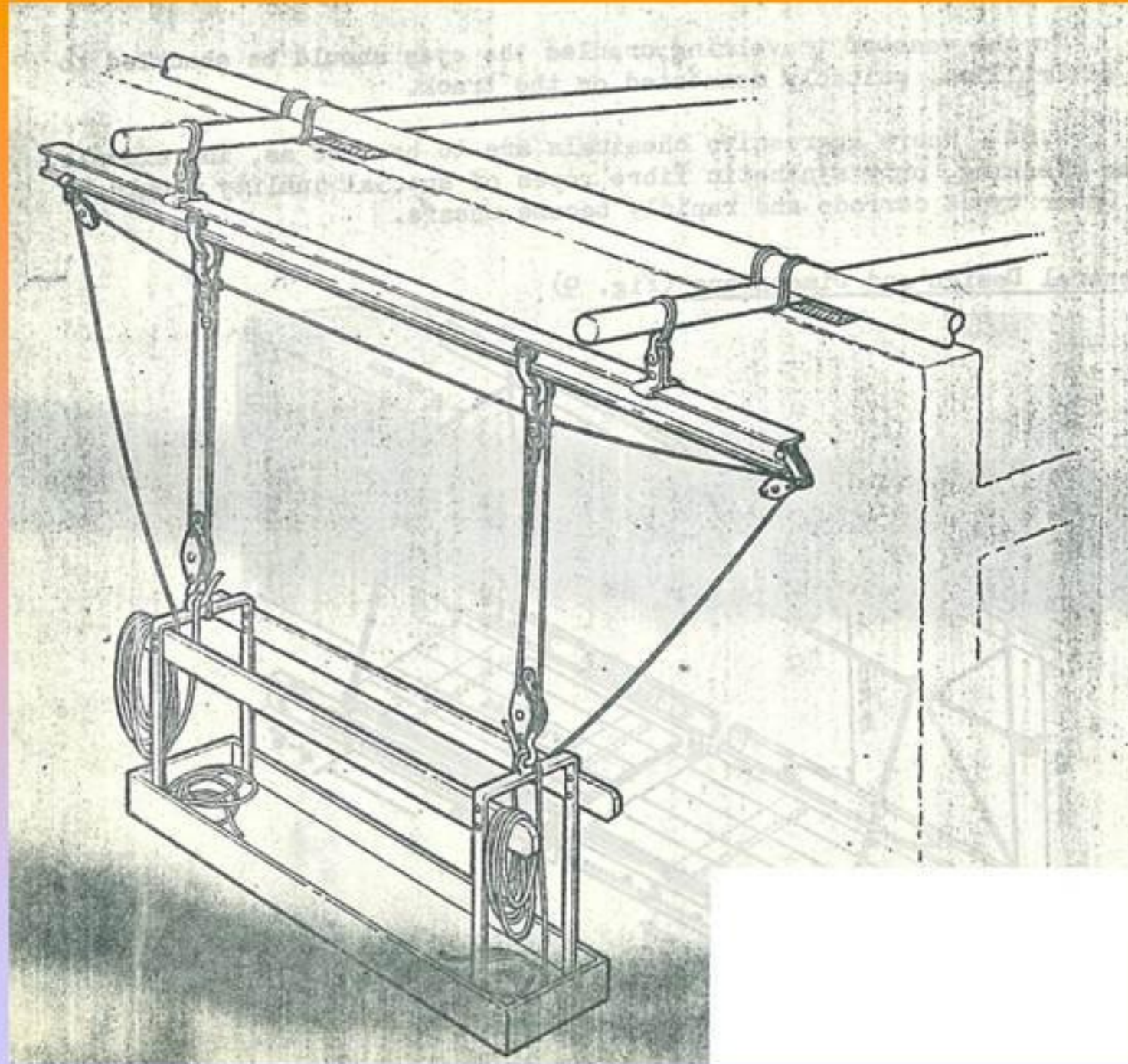
KO Pui-yung

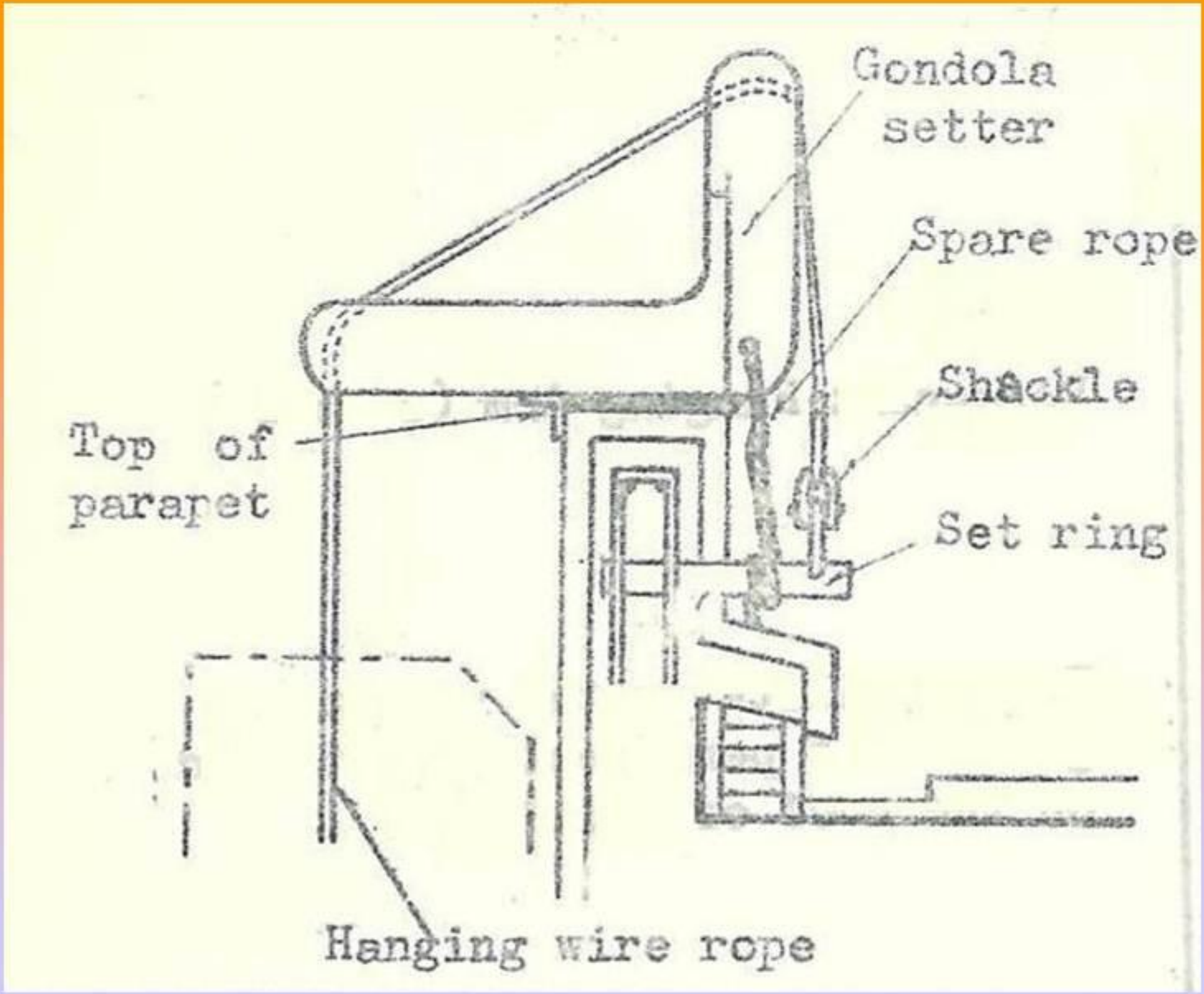
Divisional Occupational safety Officer

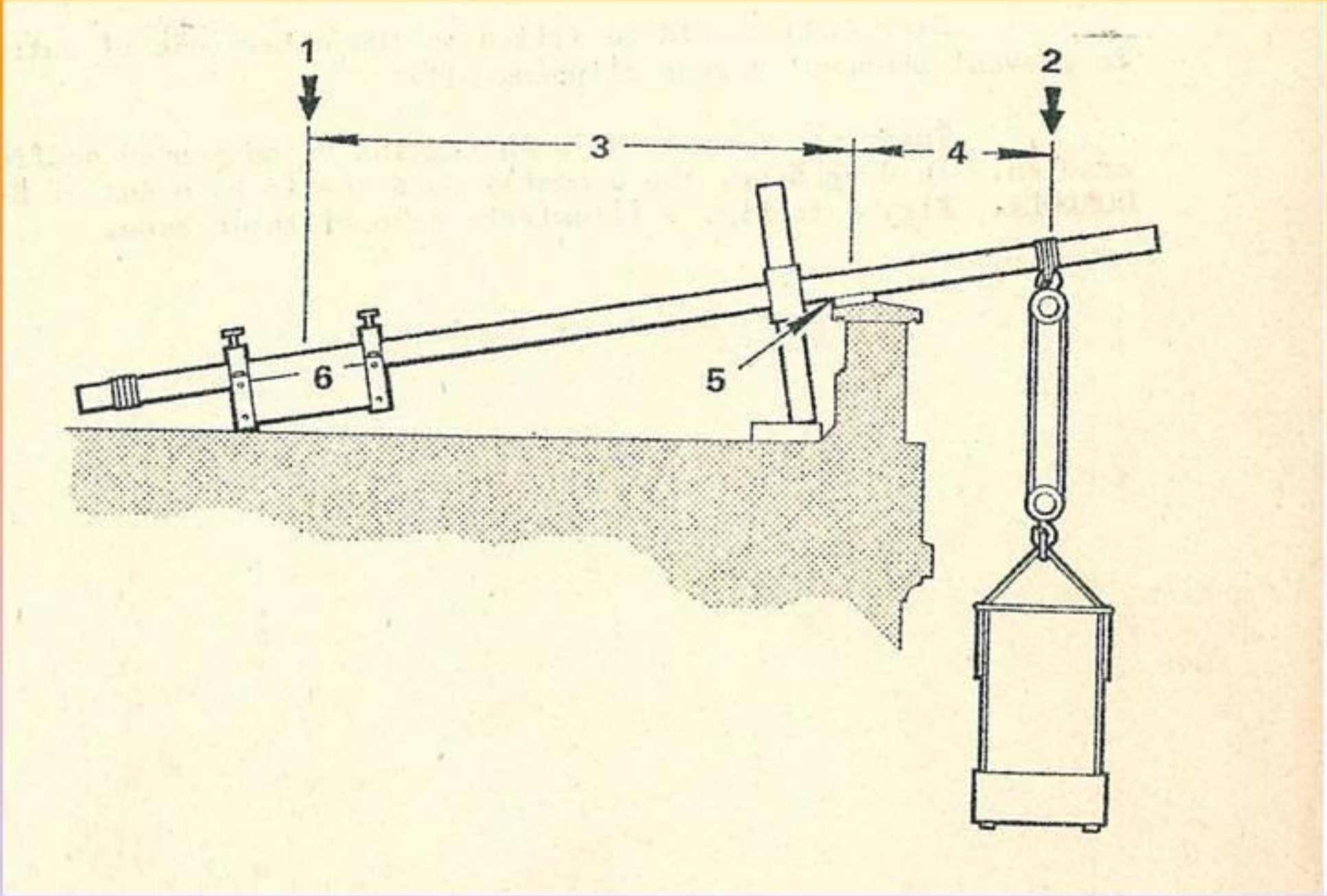
Chartered Mechanical Engineer

Member of IMECHE

Outriggers in olden days










Definition of “Outrigger”

“The cantilever portion of the roof rig or similar support or arrangement for suspending the working platform, including any assembly of beams, joists, tubular scaffold framework or proprietary brackets to which the upper ends of the suspension members are secured”



from “Code of Practice for Safe Use and Operation of Suspended Working Platforms”





Best Practice laid down

◆ **BS EN 1808:1999**

– Safety Requirements on suspended access equipment

- Design calculations, stability criteria, construction
- Tests

◆ **Code of Practice for Safe Use and Operation of Suspended Working Platforms**

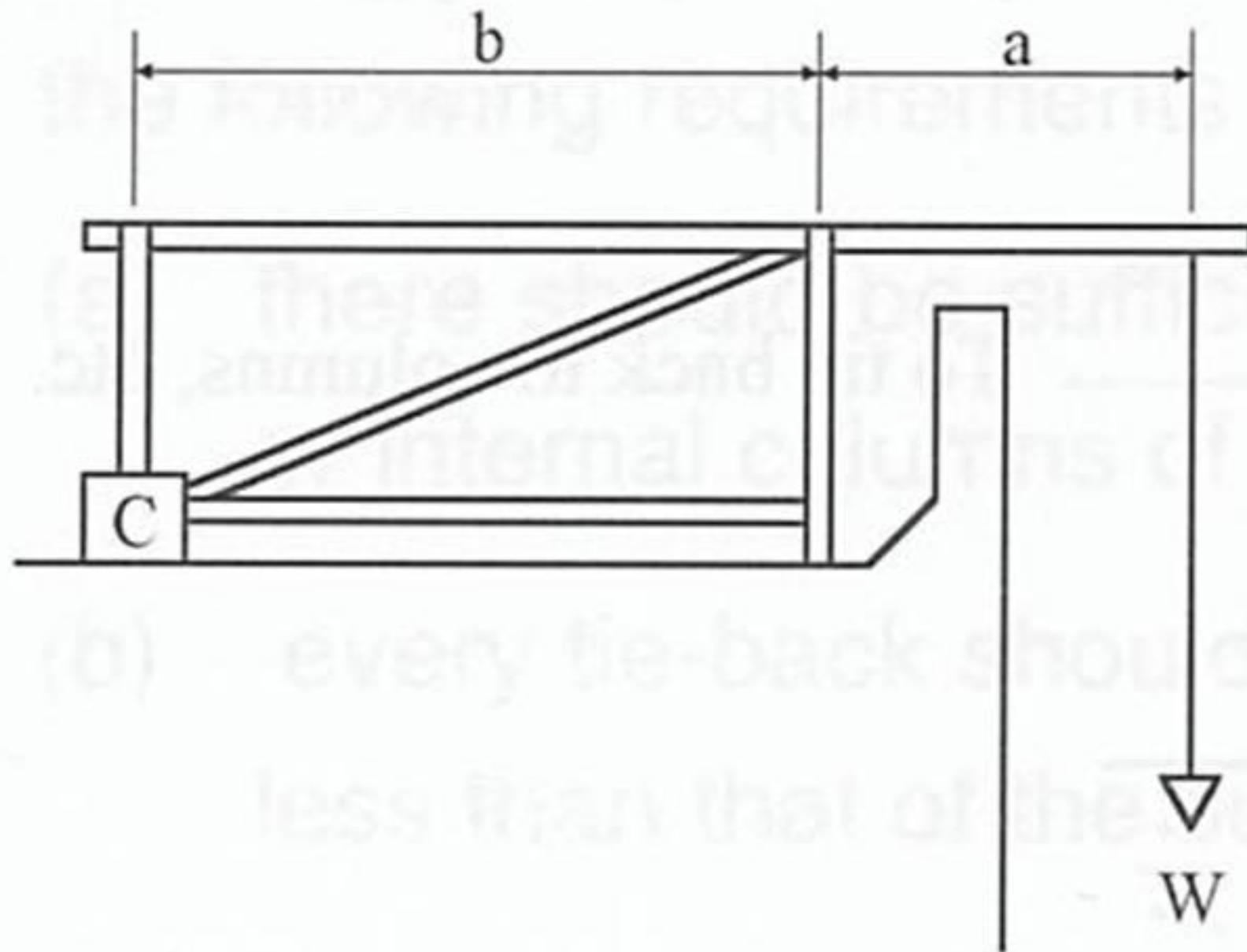




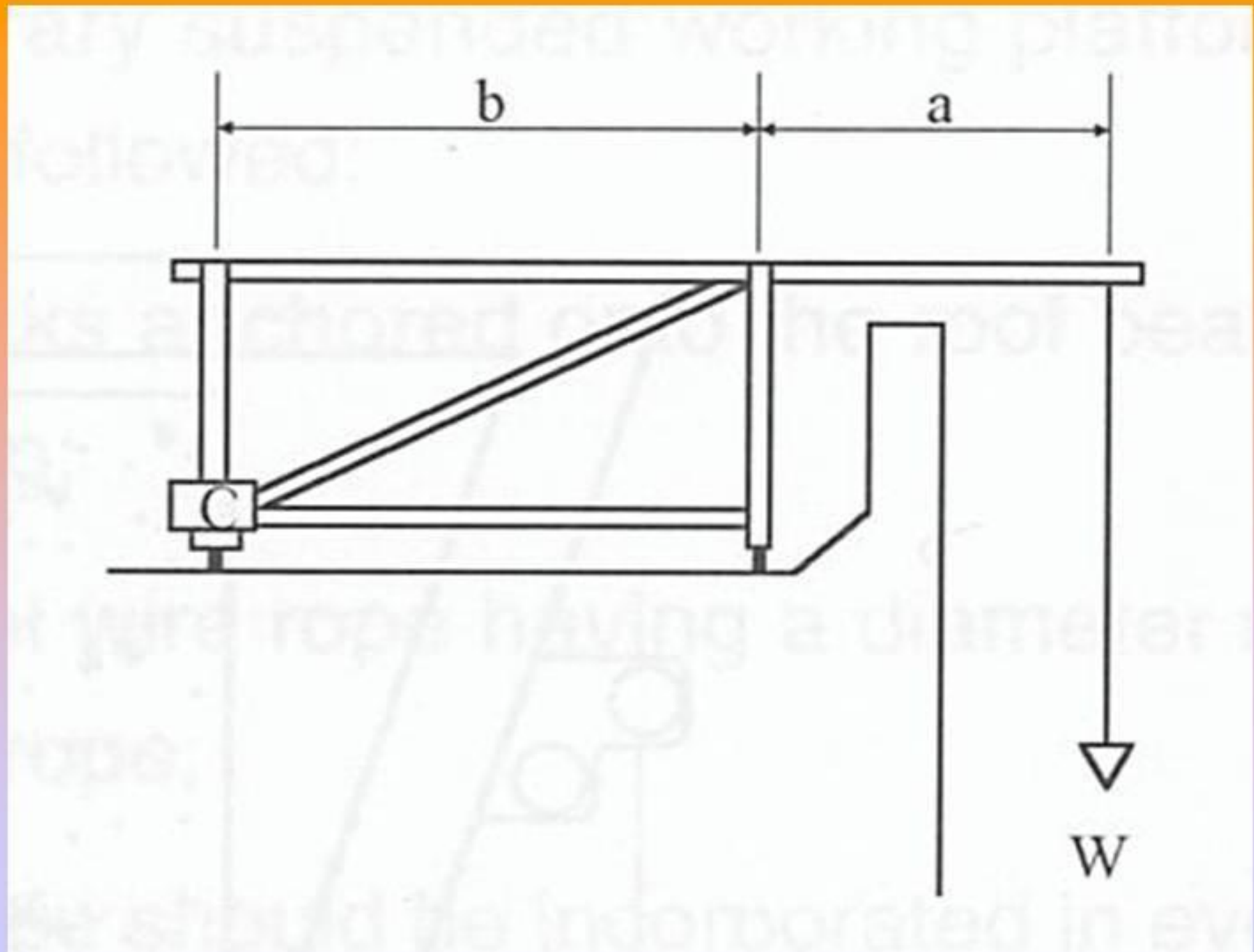
Common types of reliable outriggers

- ◆ Counter-weighted outriggers
- ◆ Parapet clamps

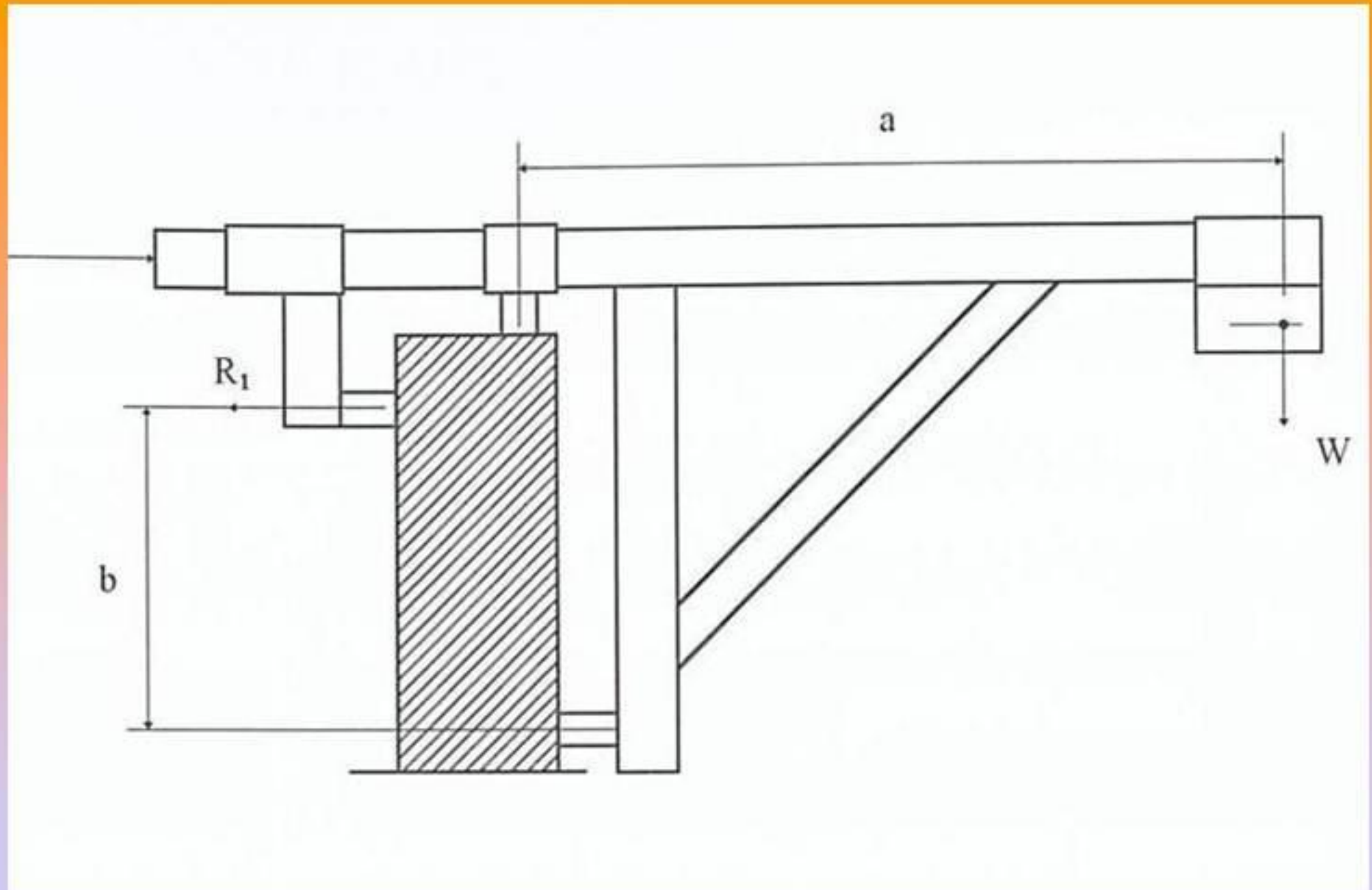
Counter-weighted outriggers



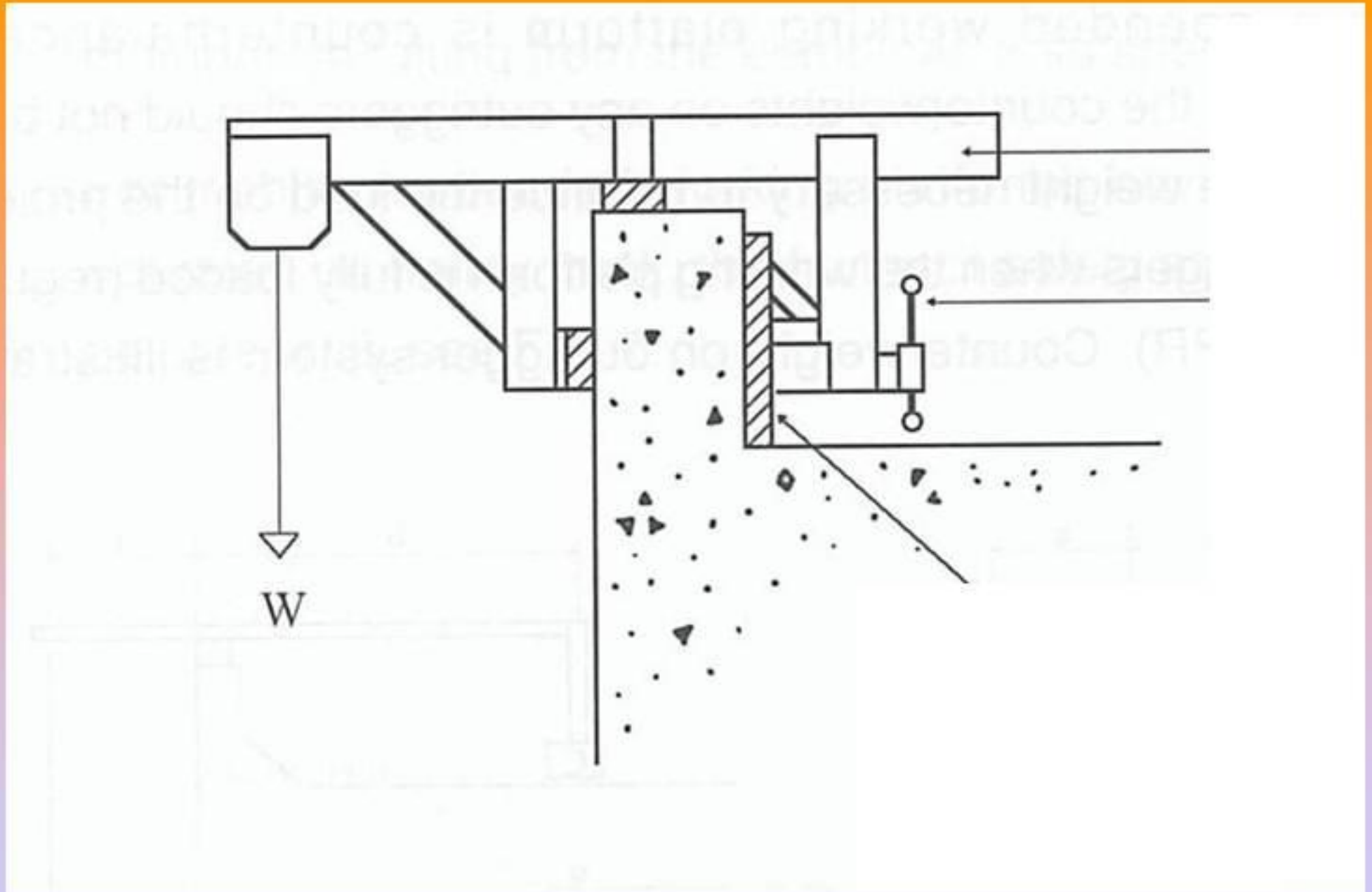
Counter-weighted outriggers



Parapet clamps



Parapet clamps

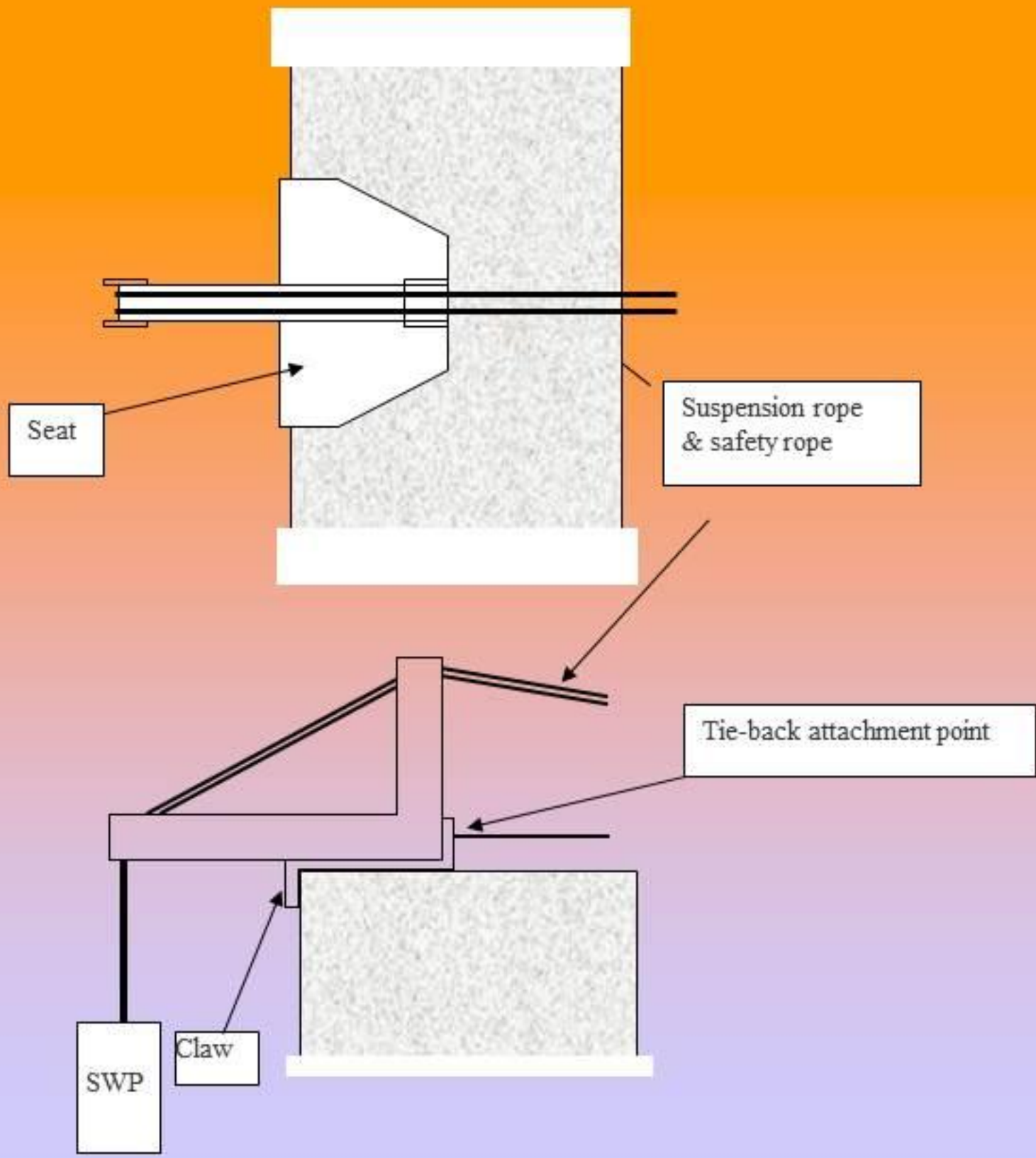


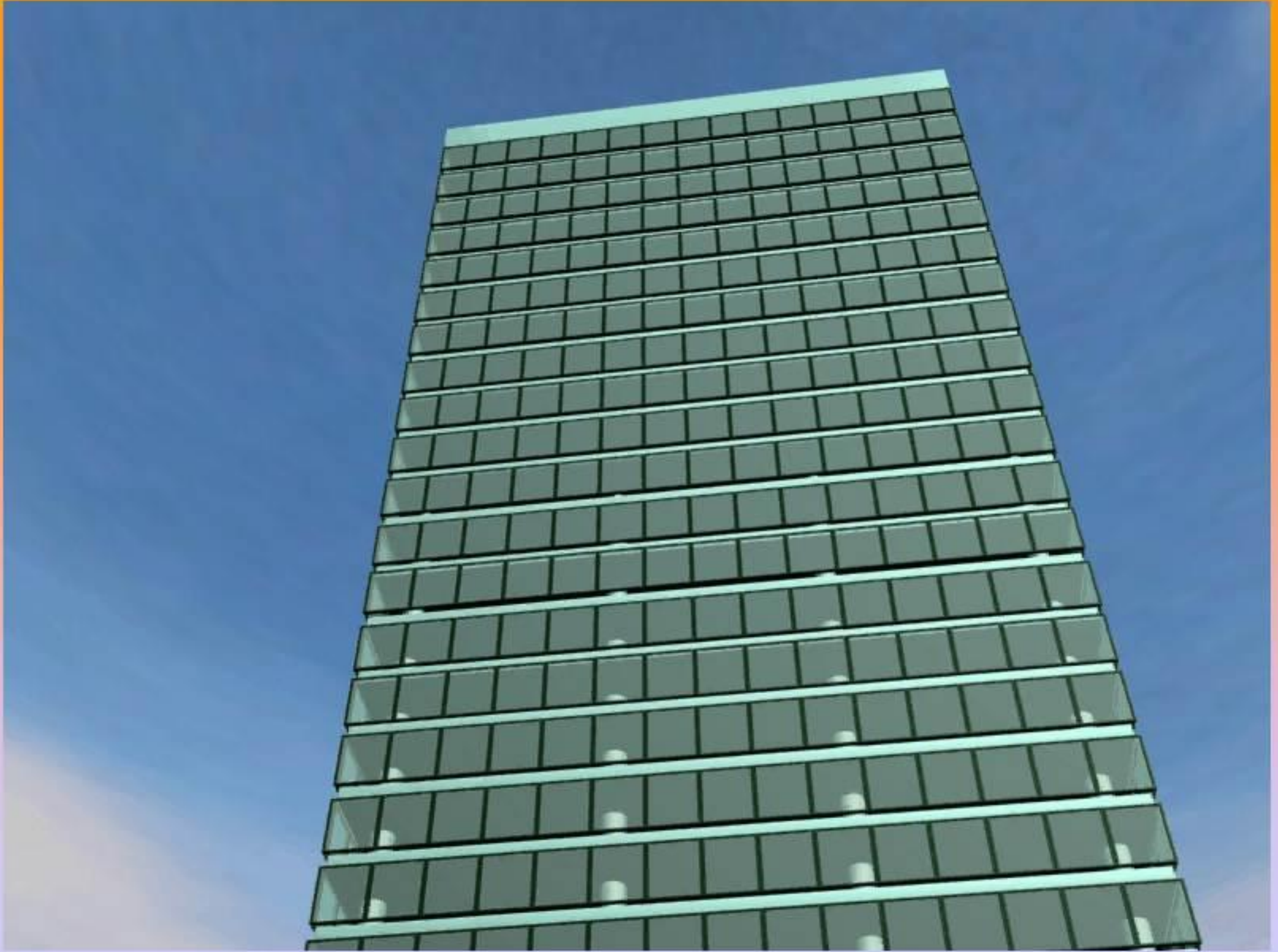


Use of Saddle Brackets (飛機架) in Hong Kong

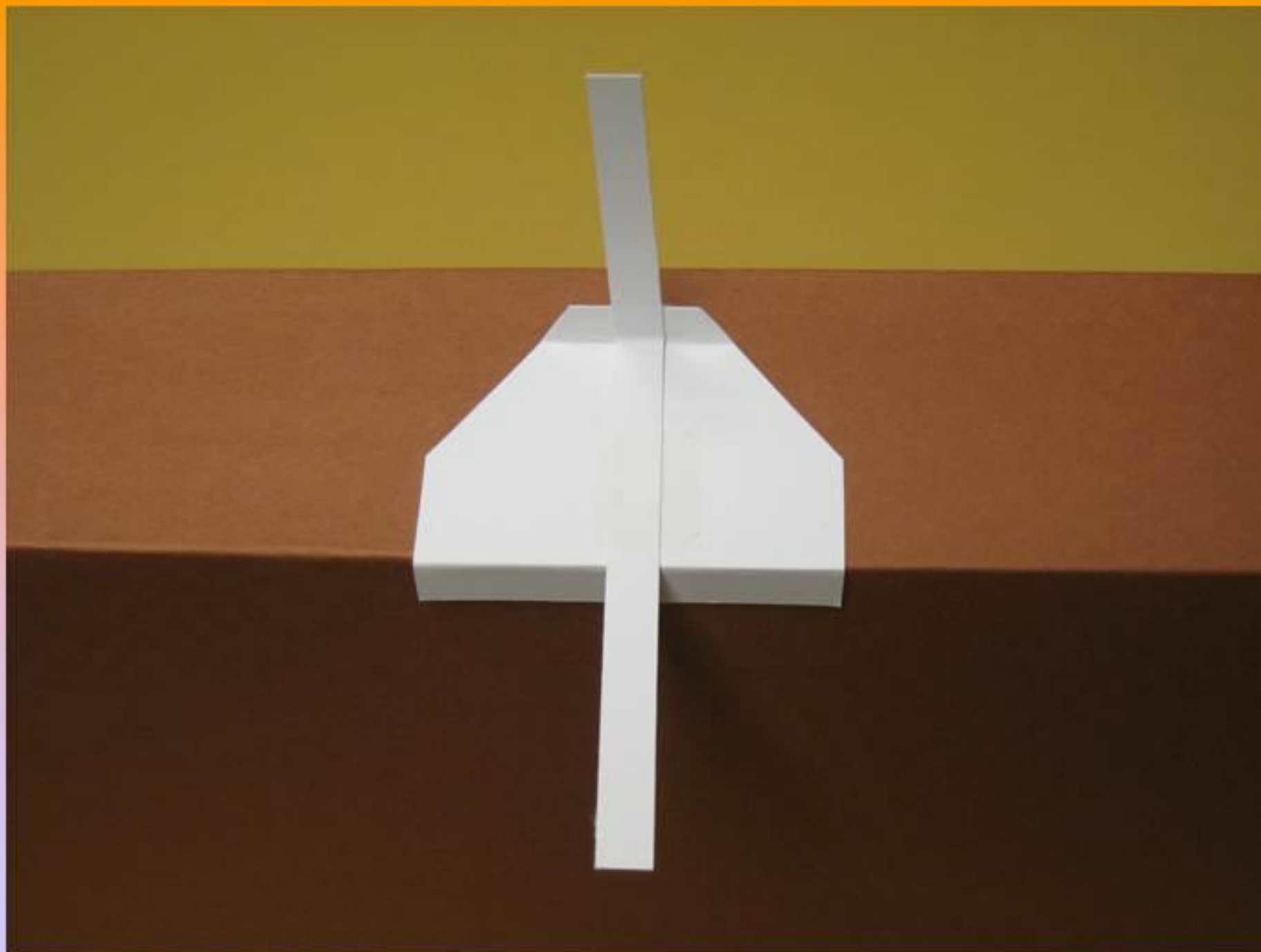
- ◆ Original design from Japan
- ◆ Seldom used in the past few years
Reason : not a reliable one



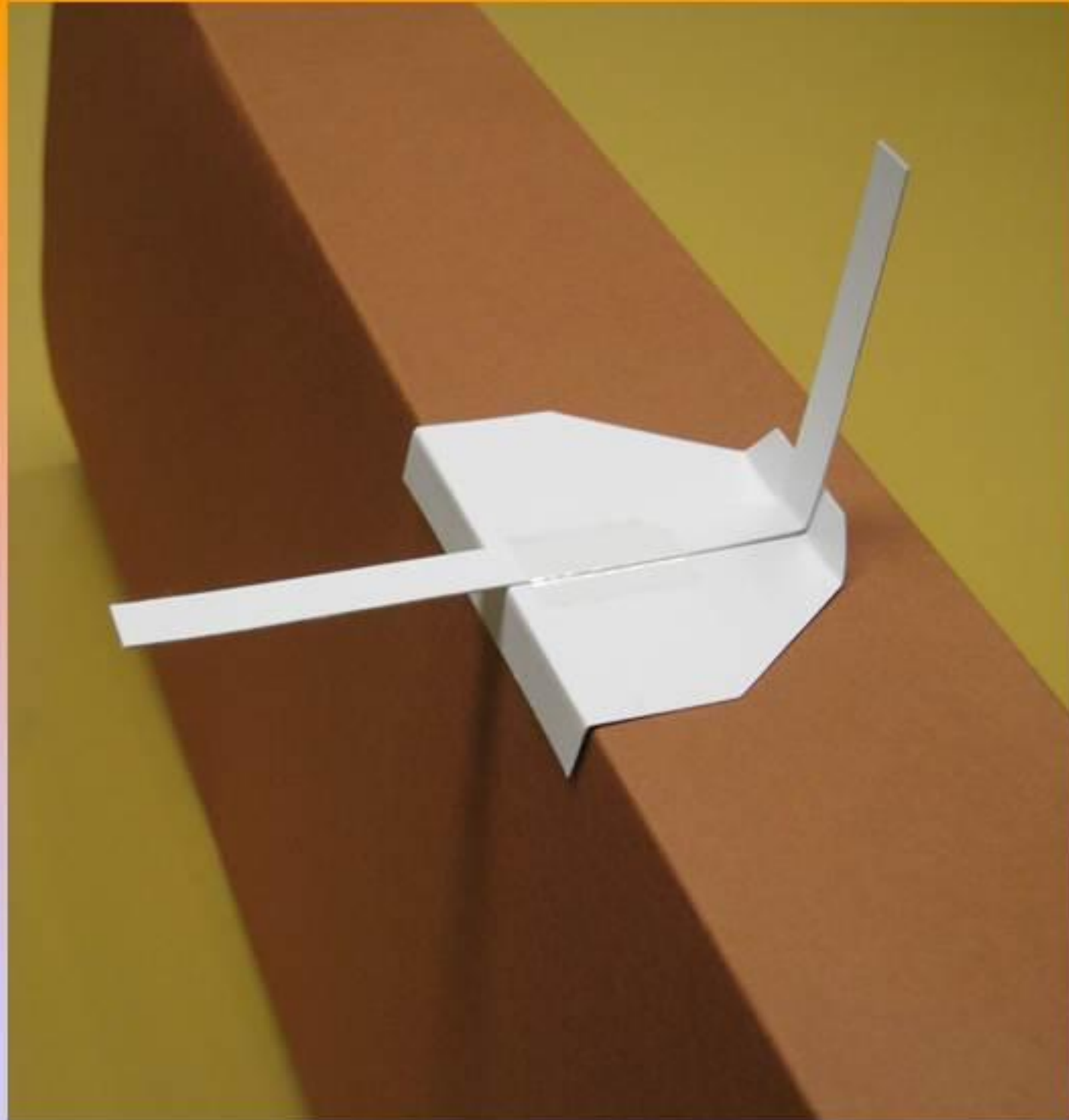




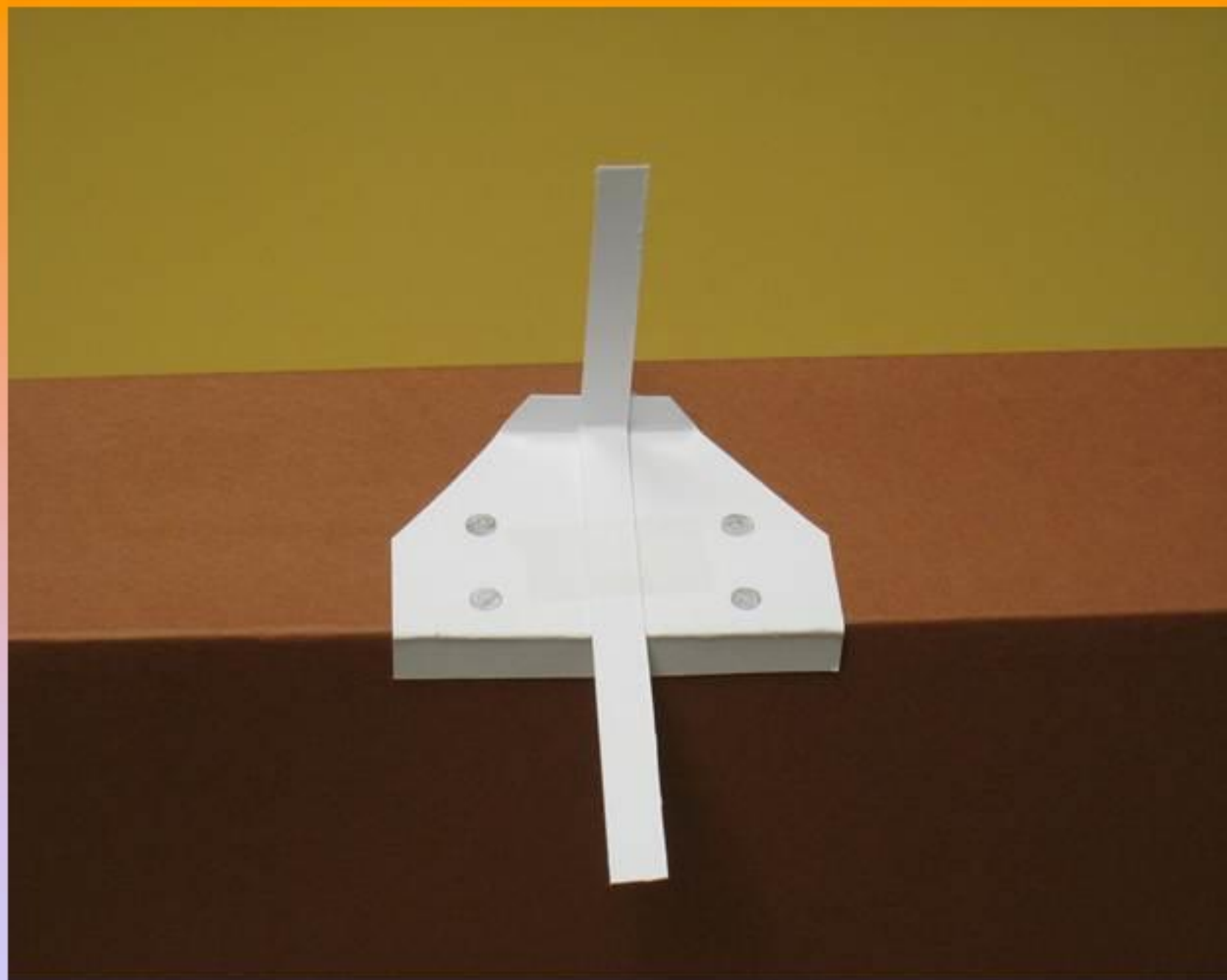
Saddle Brackets Provided



Saddle Brackets Provided



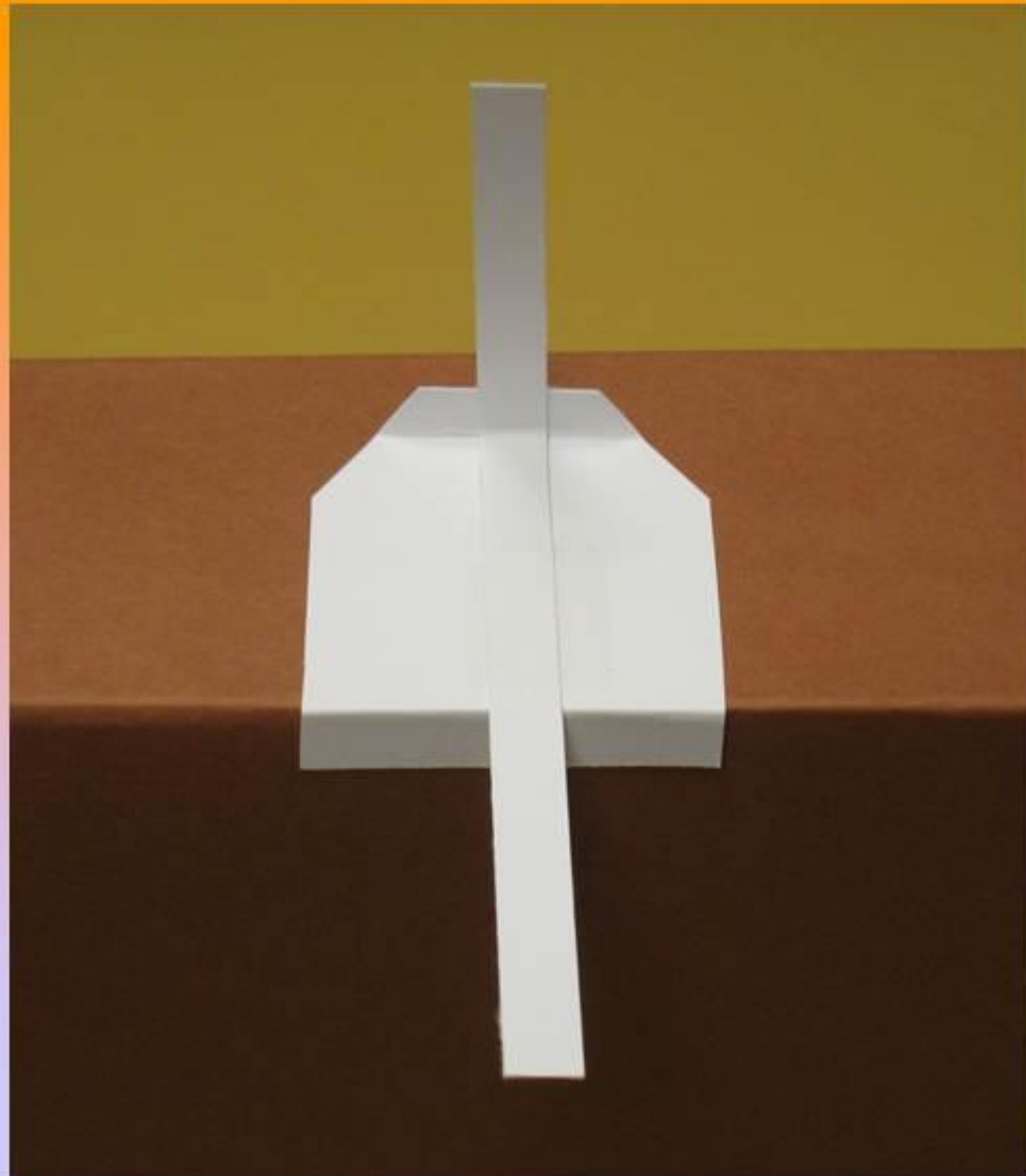
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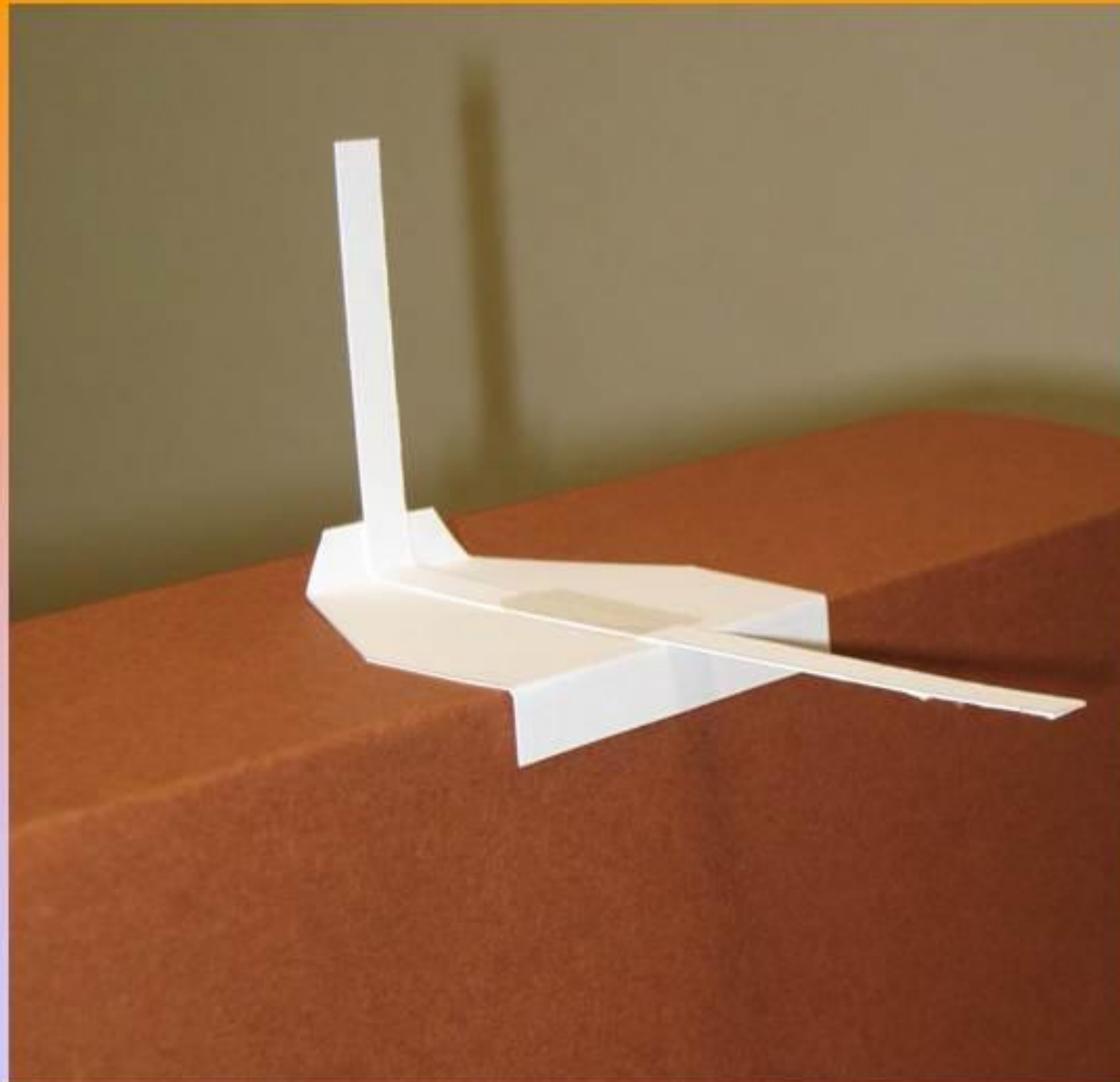
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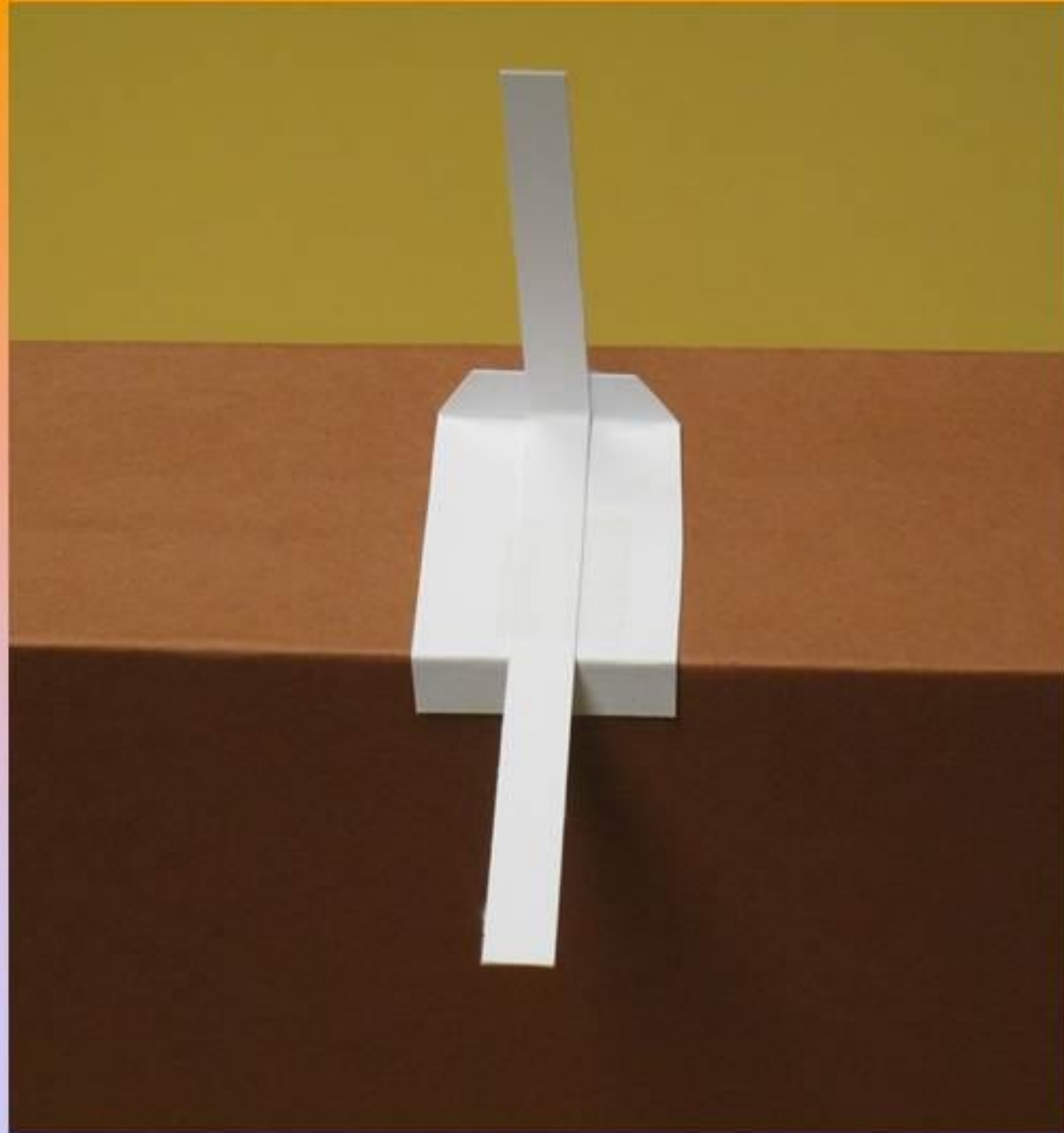
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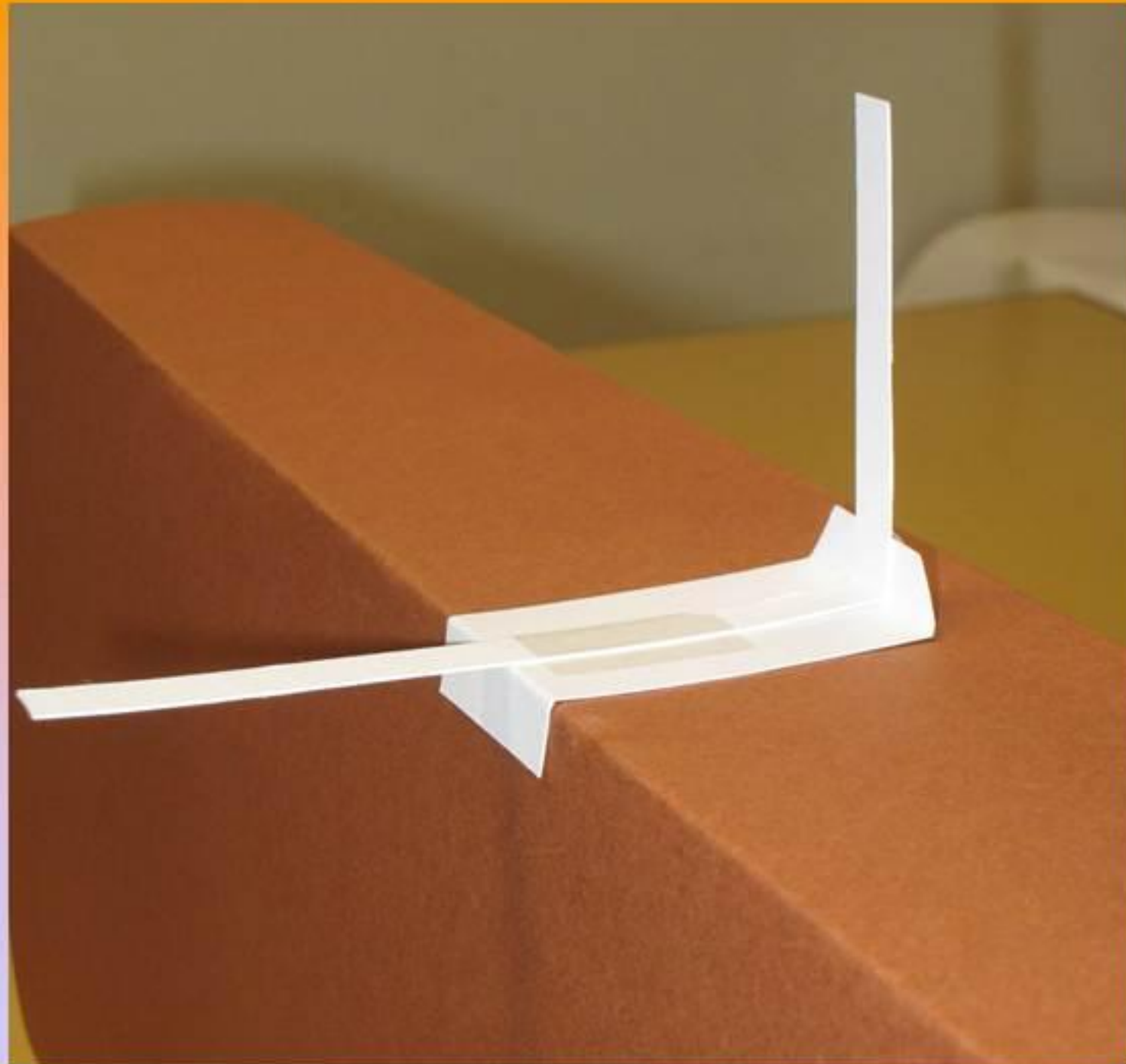
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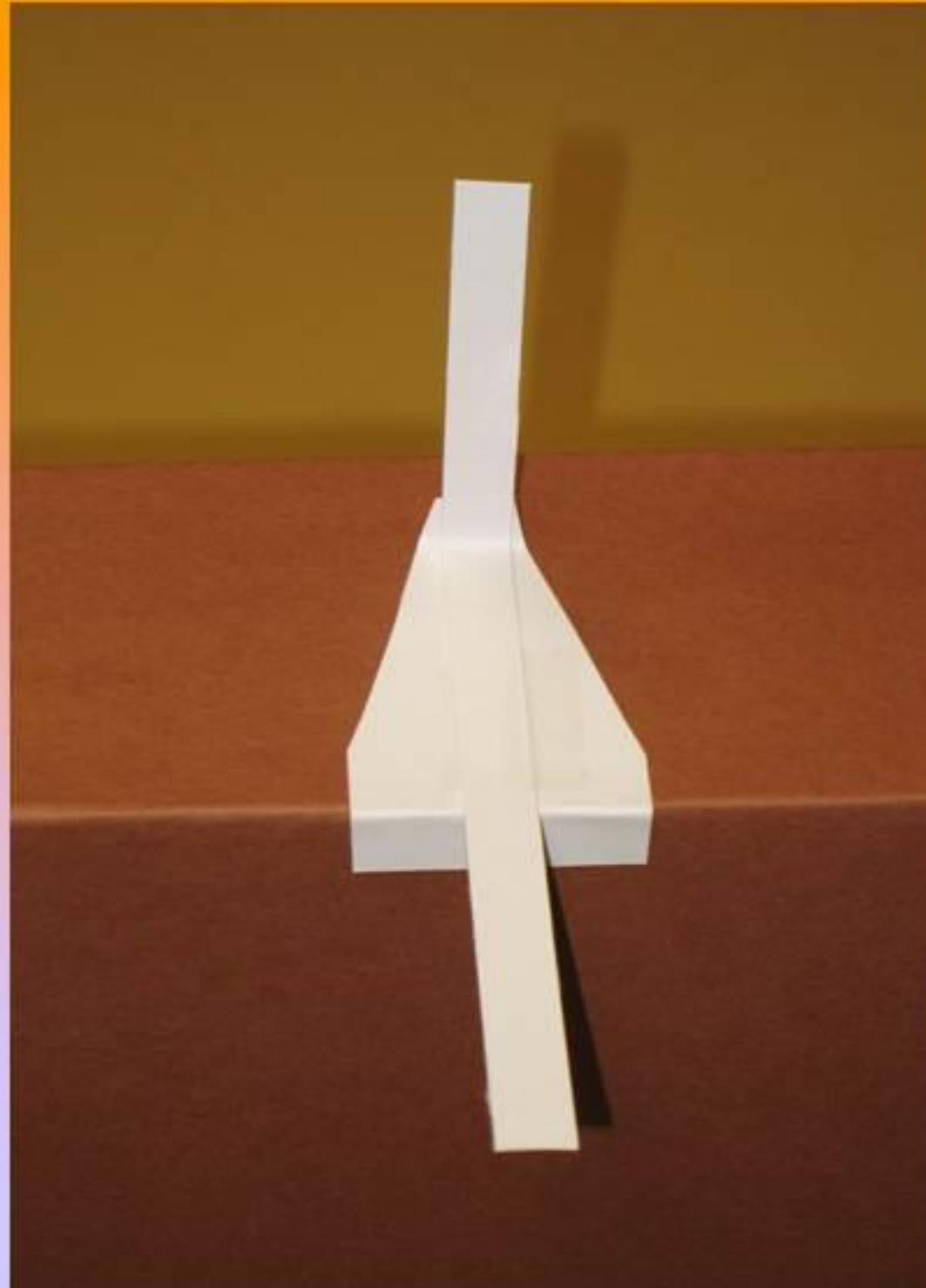
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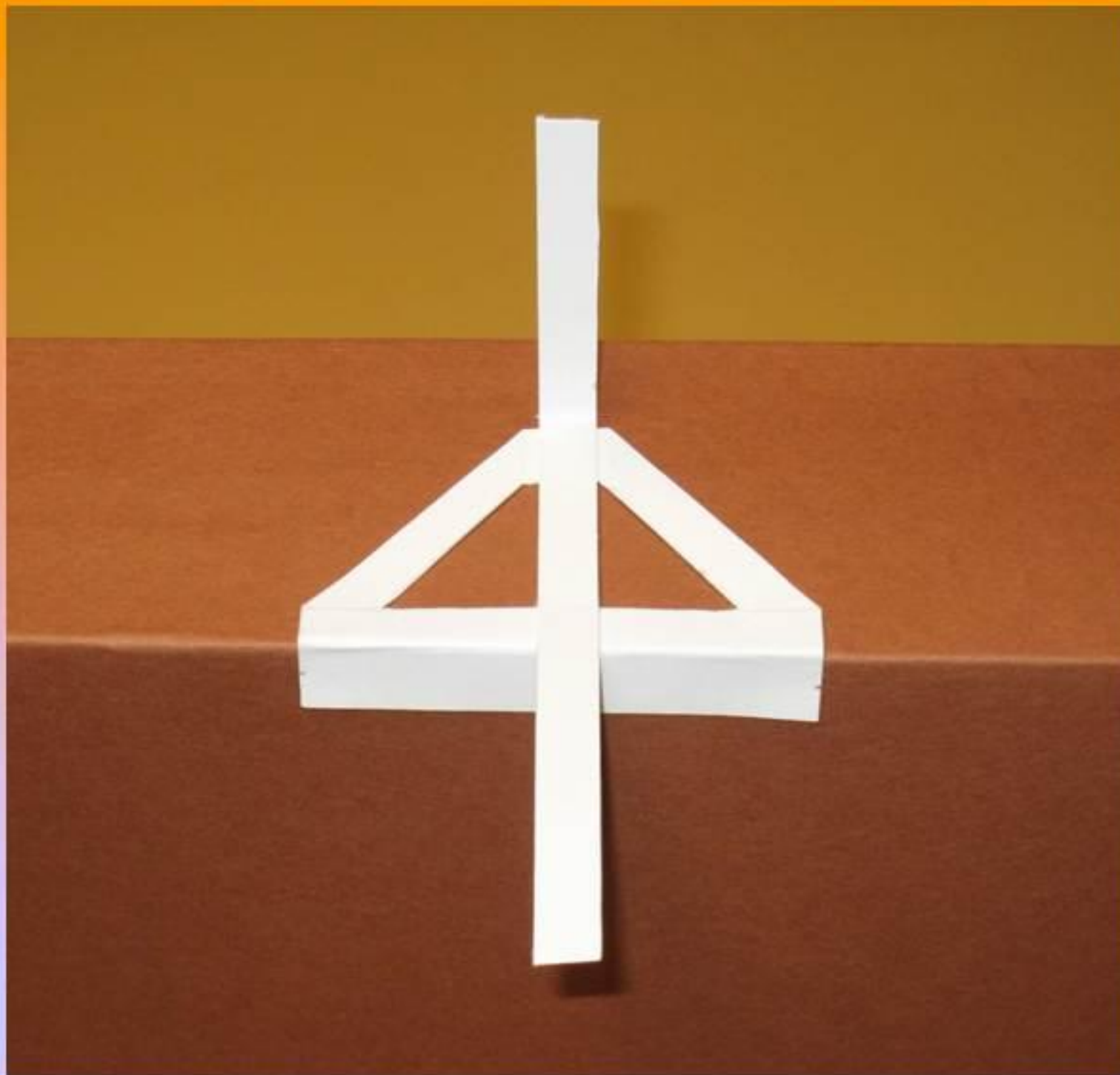
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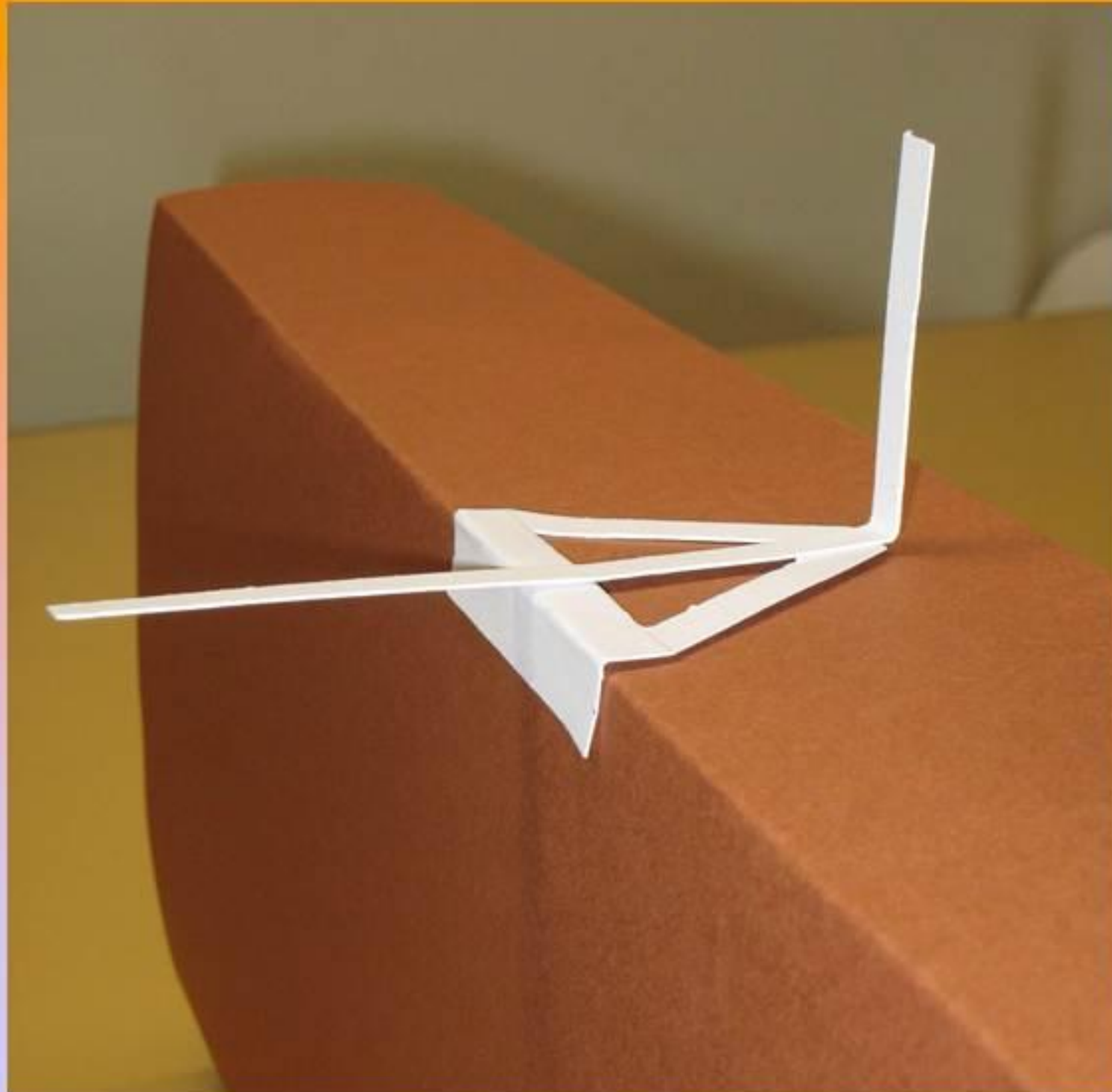
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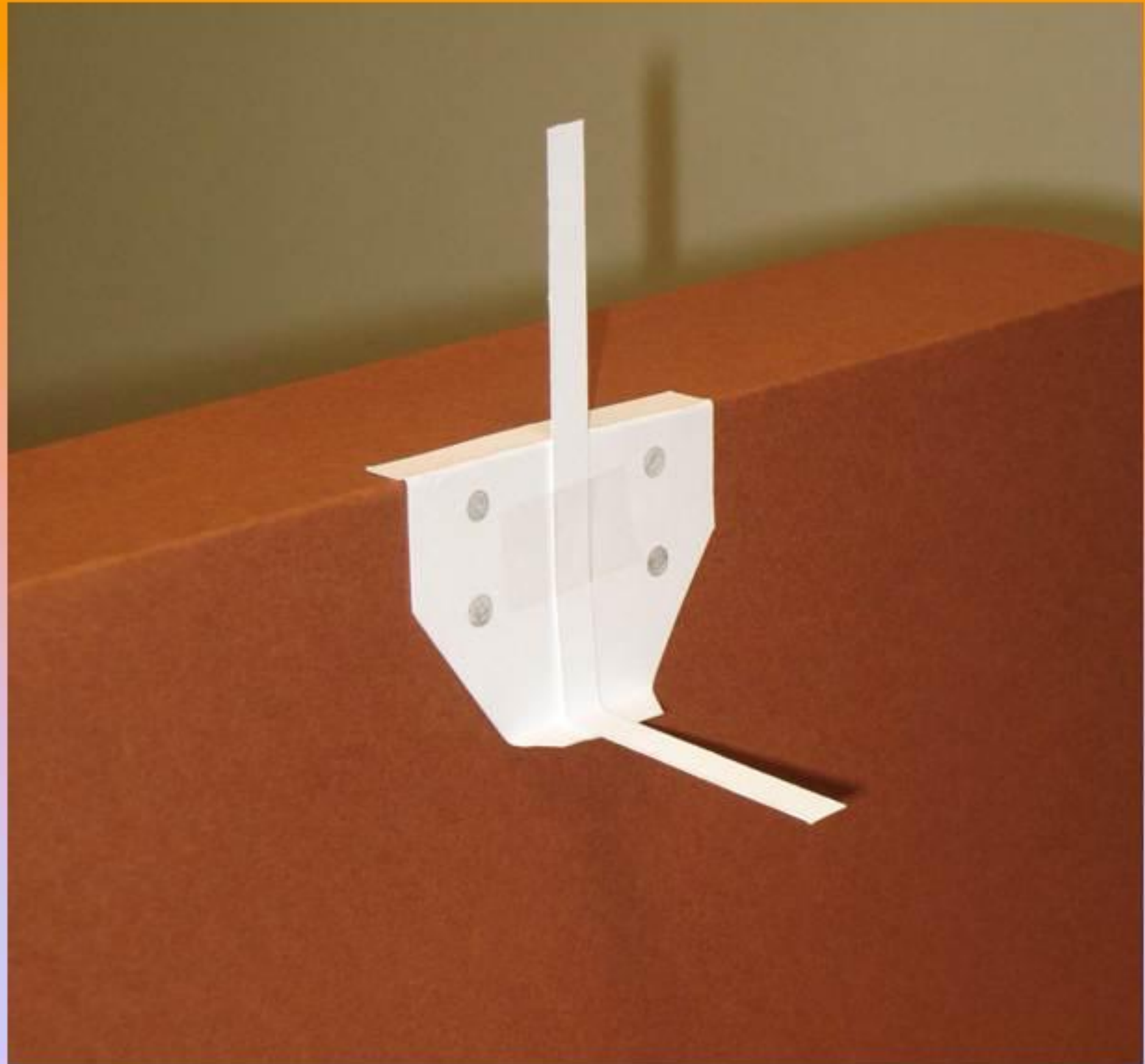
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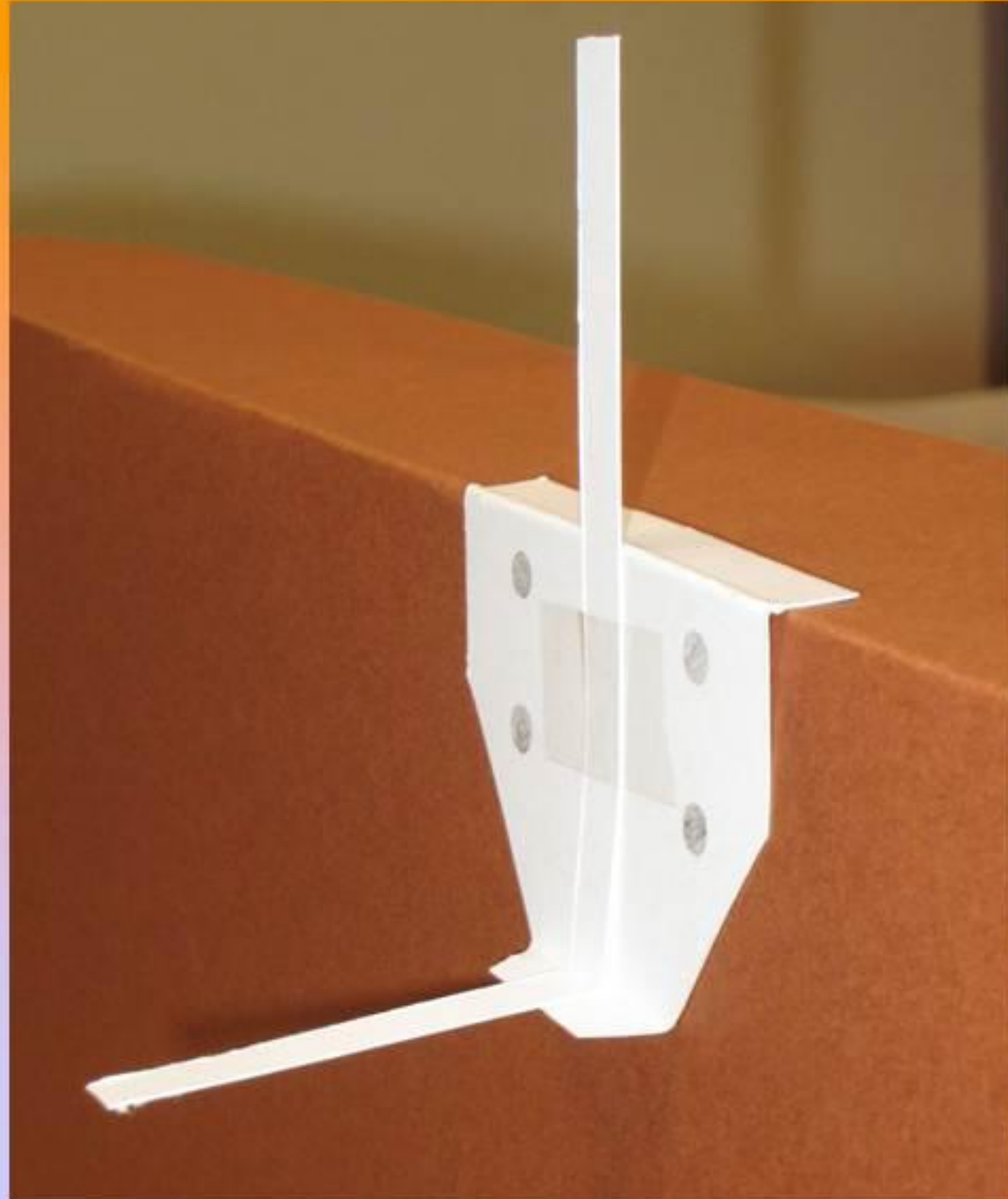
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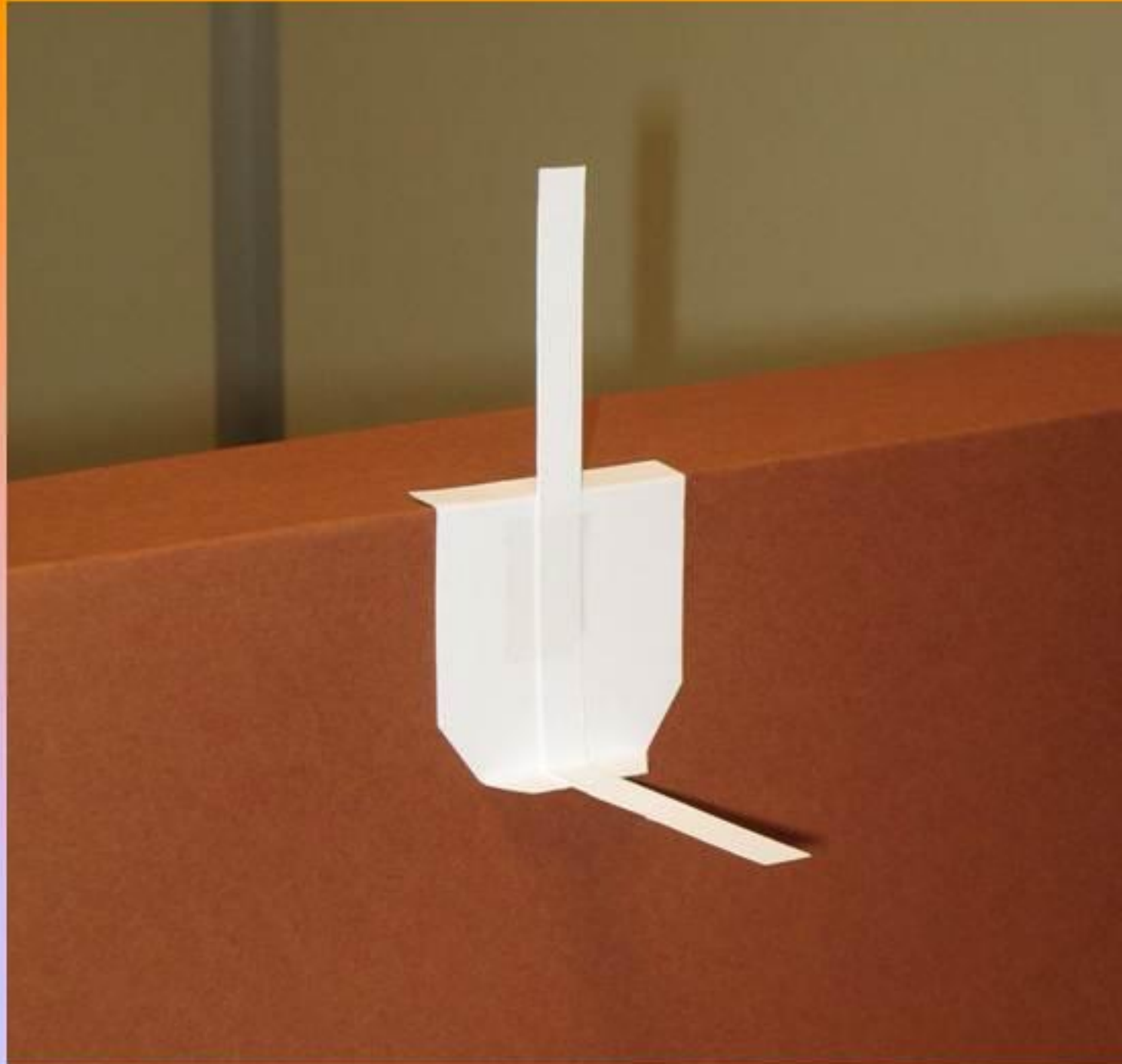
Application on Sites



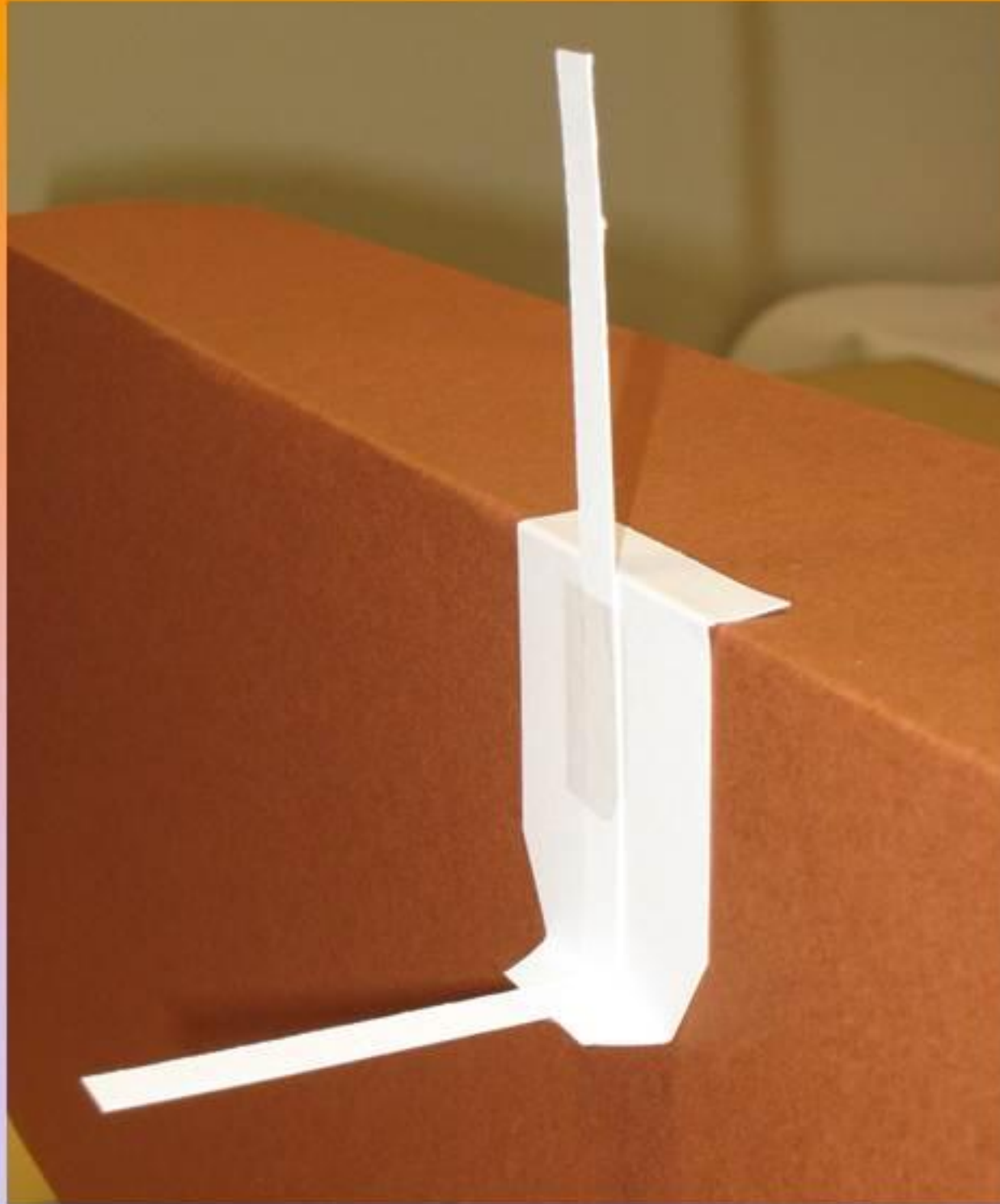
Application on Sites



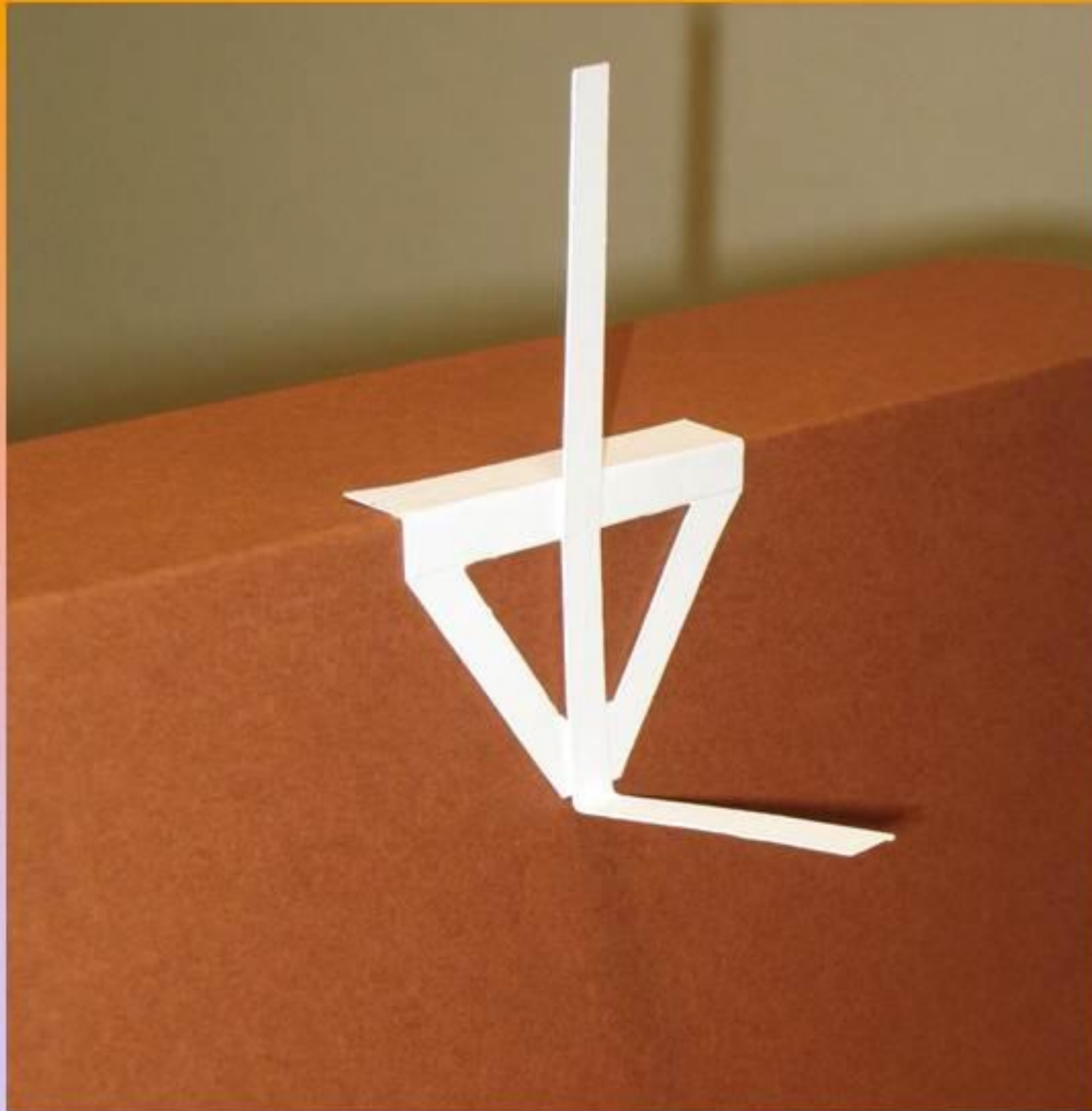
Application on Sites



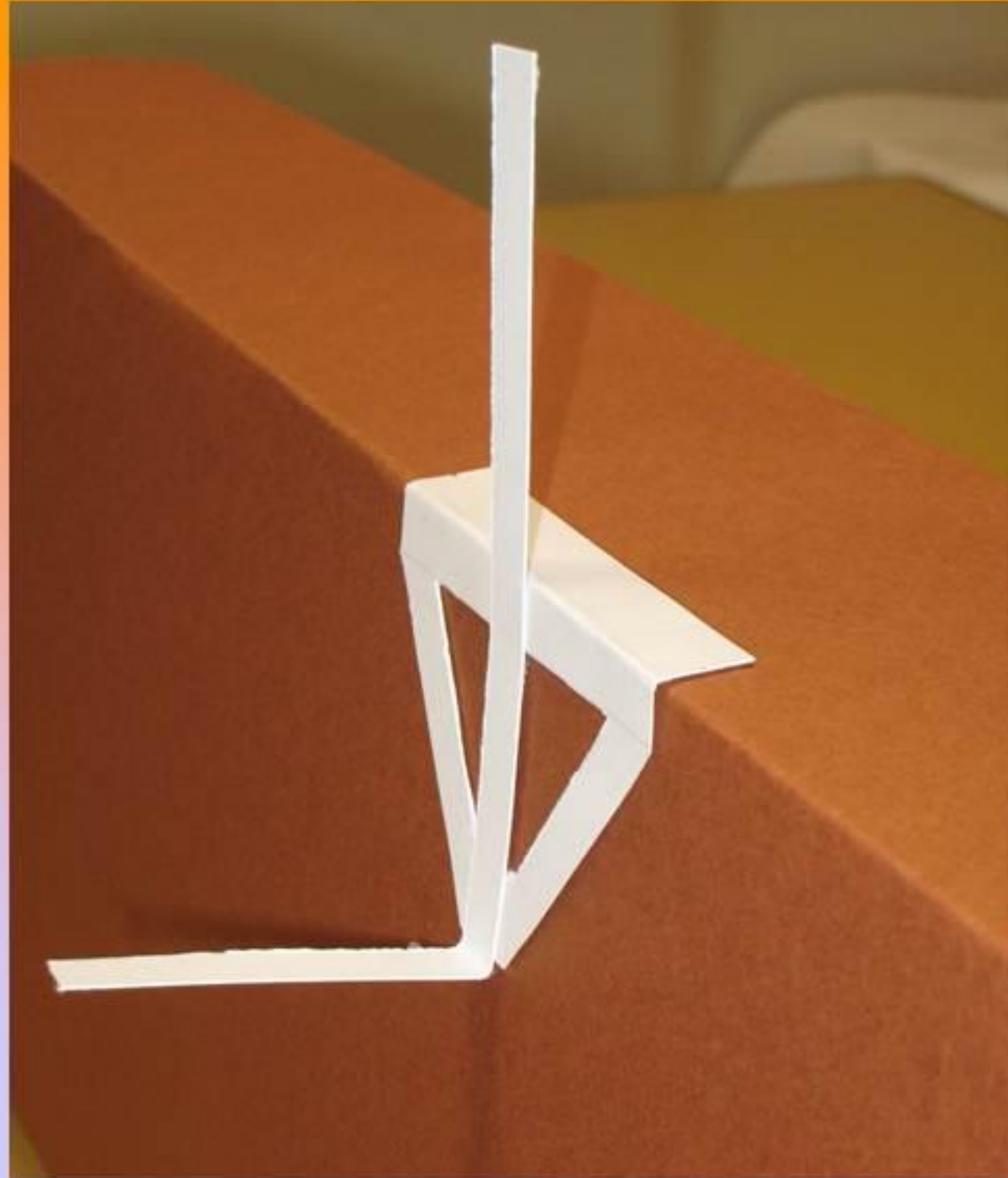
Application on Sites



Application on Sites



Application on Sites



Accident caused by improper anchorage and support

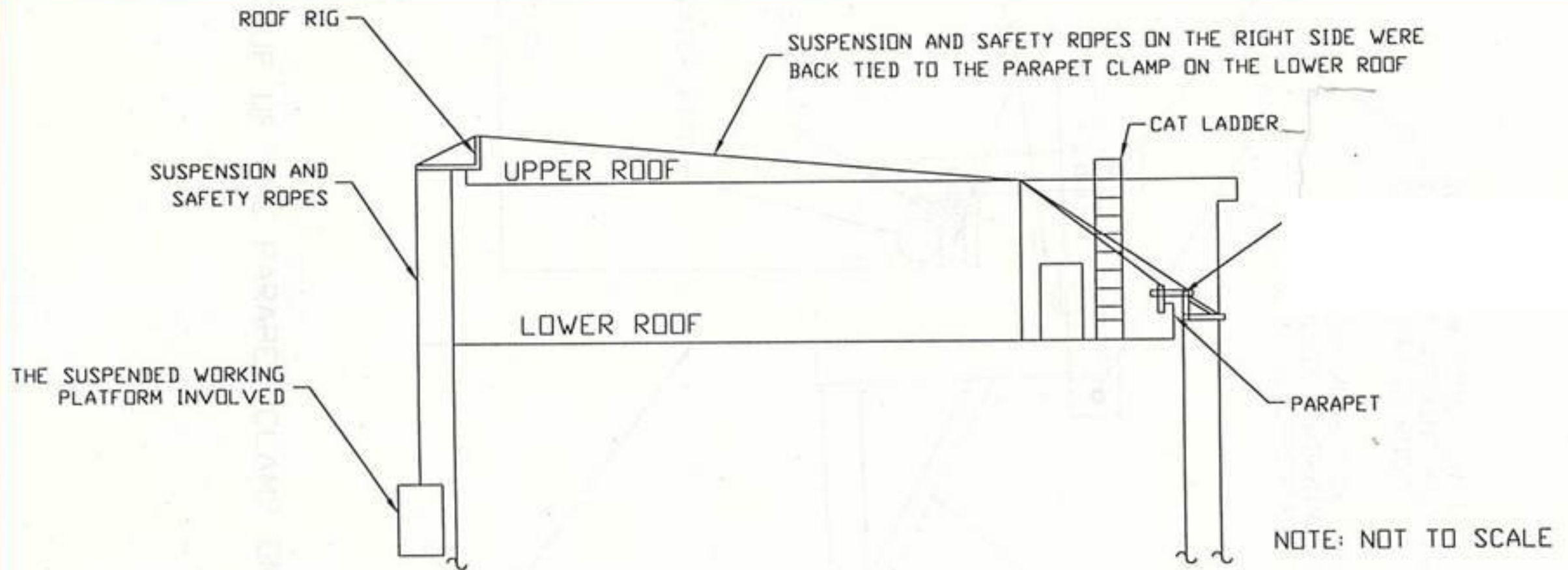
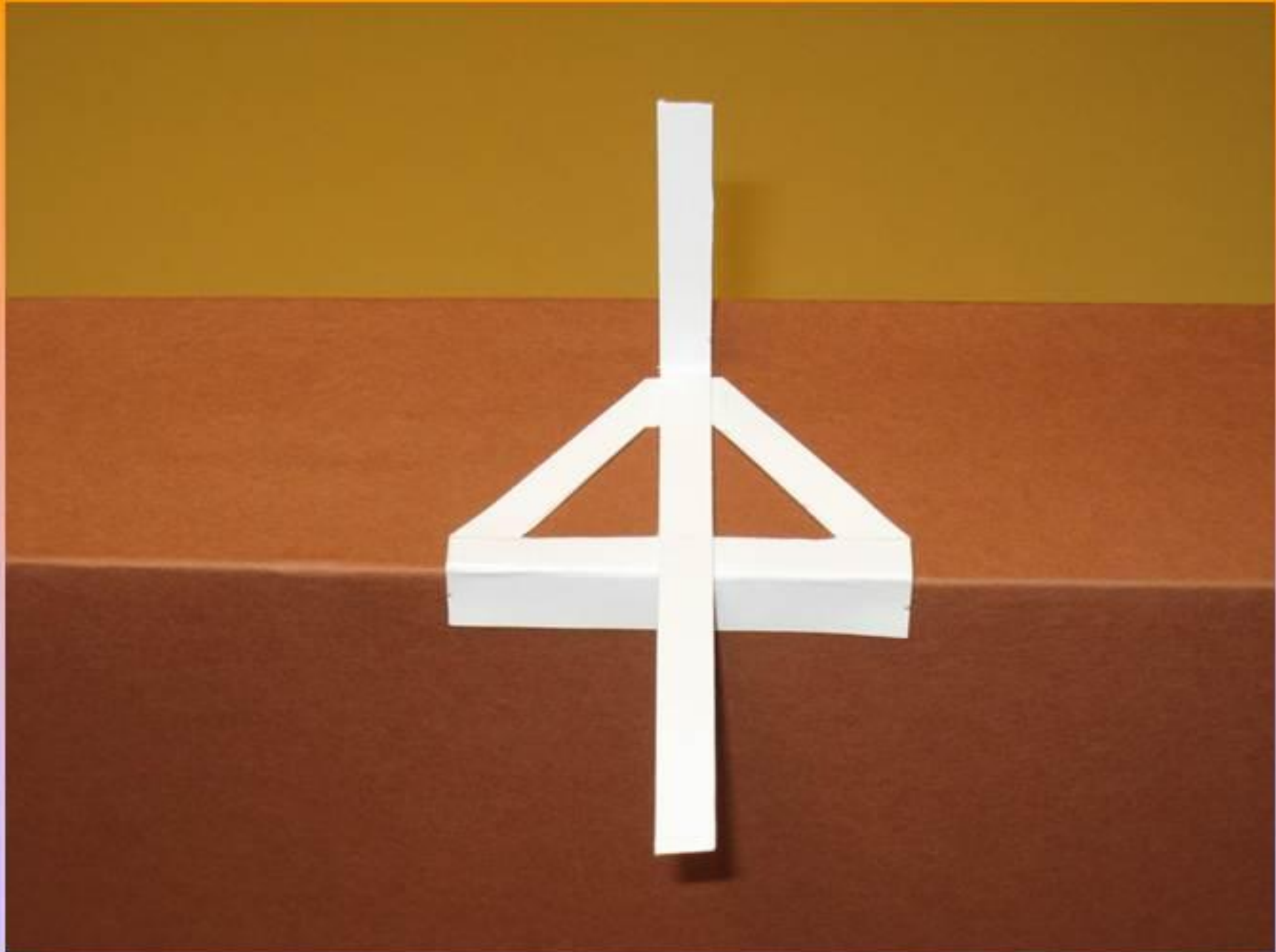
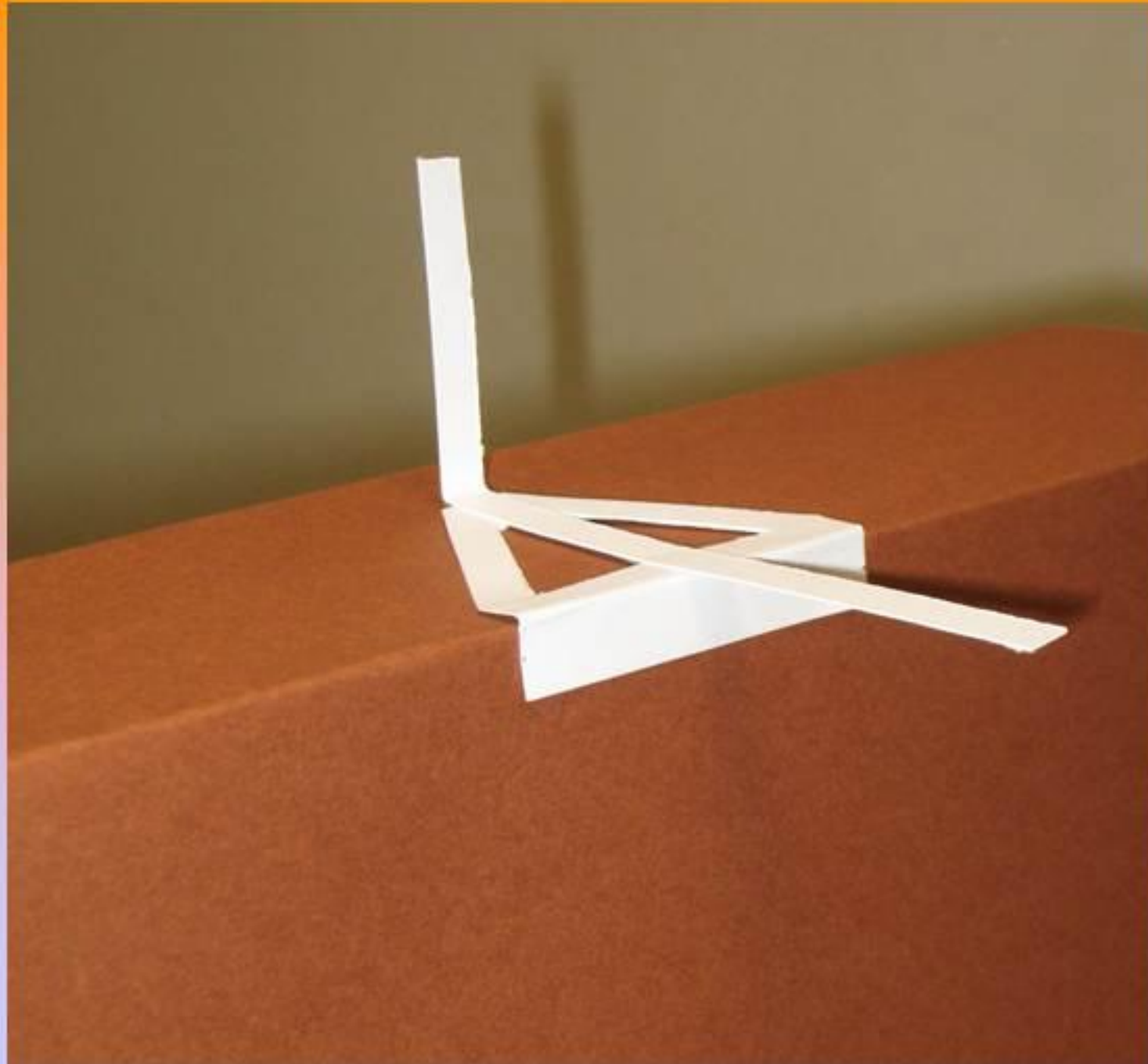


FIGURE 3: SIDE VIEW OF THE SCENE OF THE INCIDENT

Accident caused by improper anchorage and support

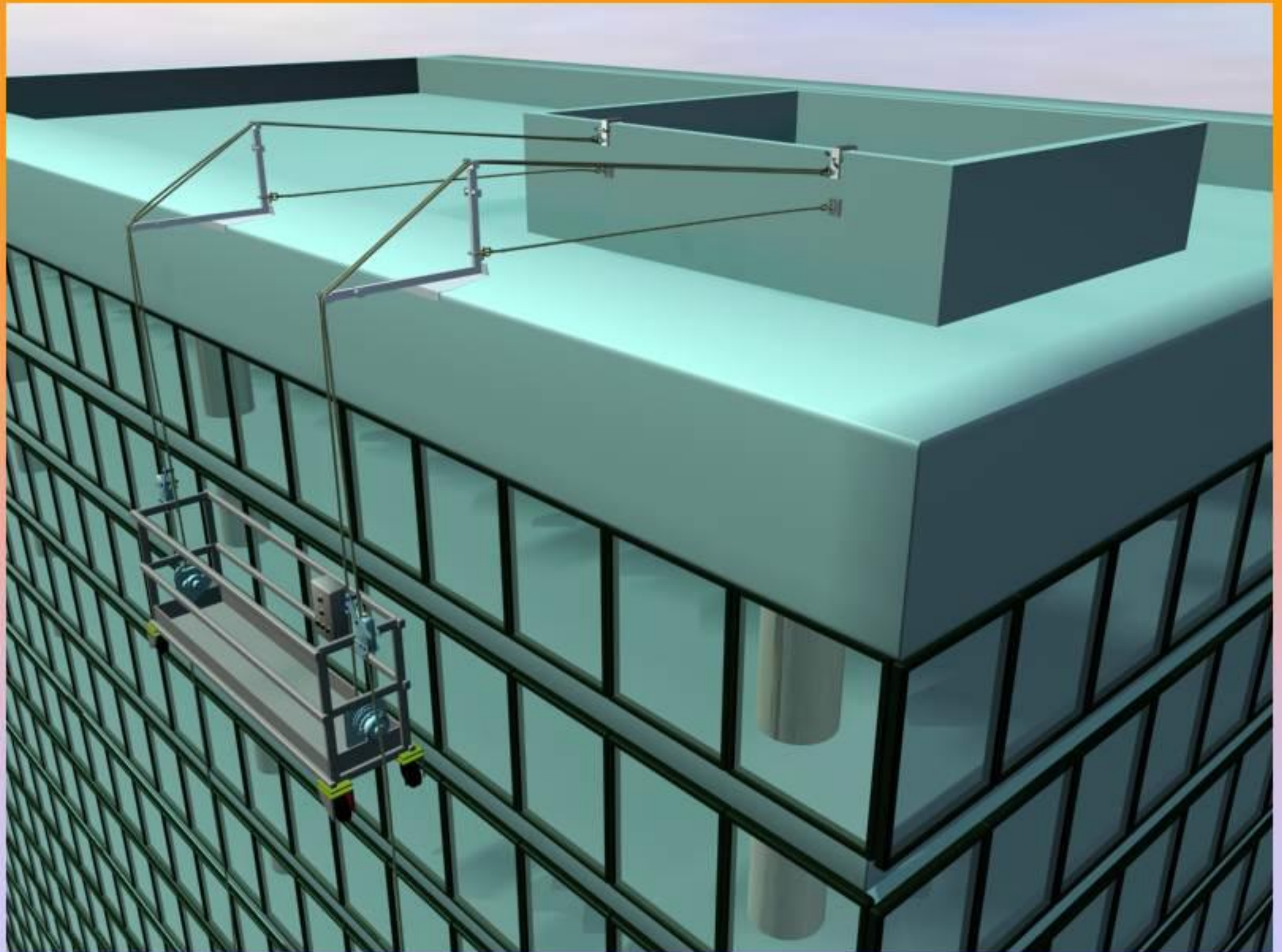


Accident caused by improper anchorage and support



**Guidance governing safe use of
saddle brackets may be issued**





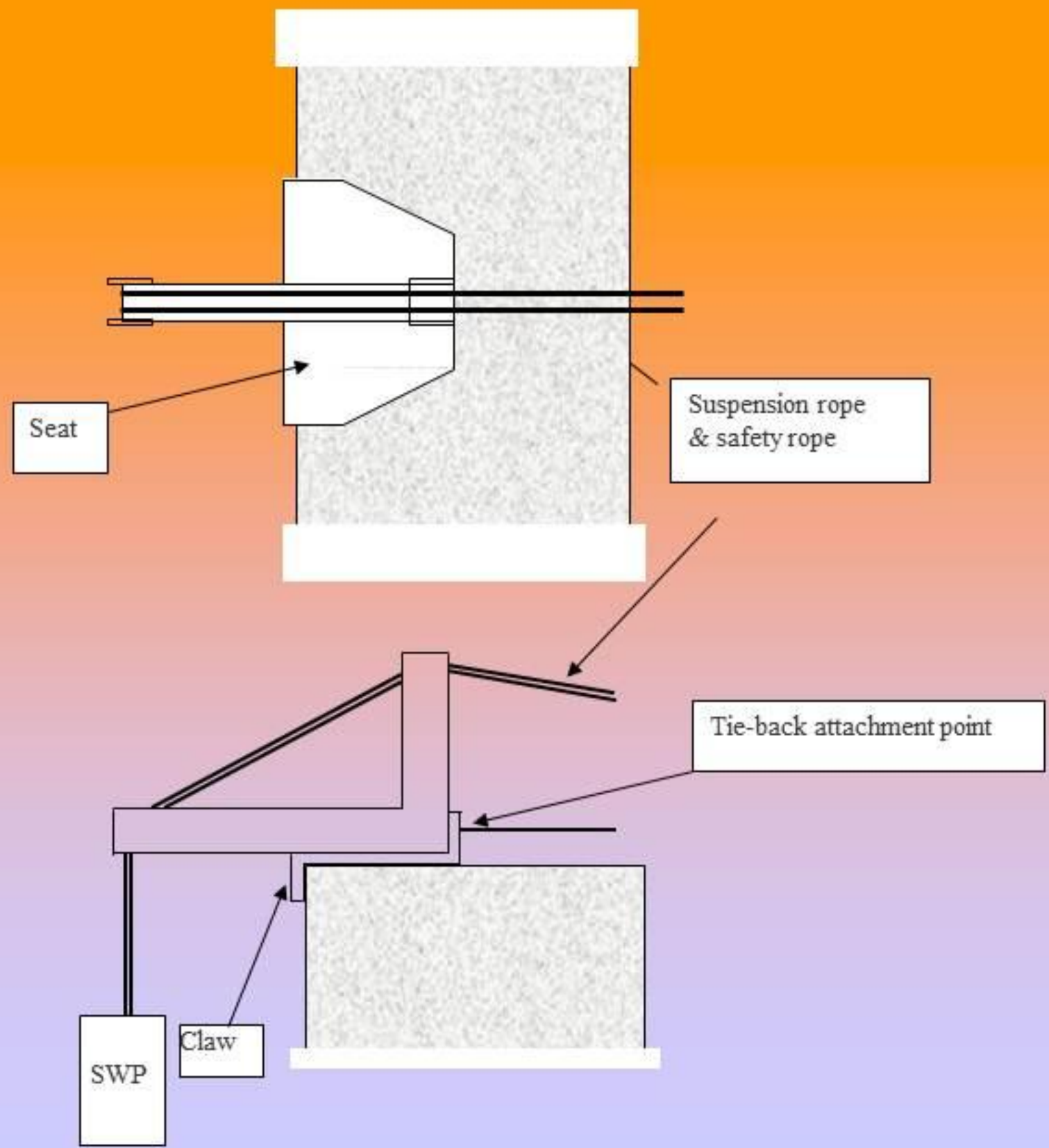


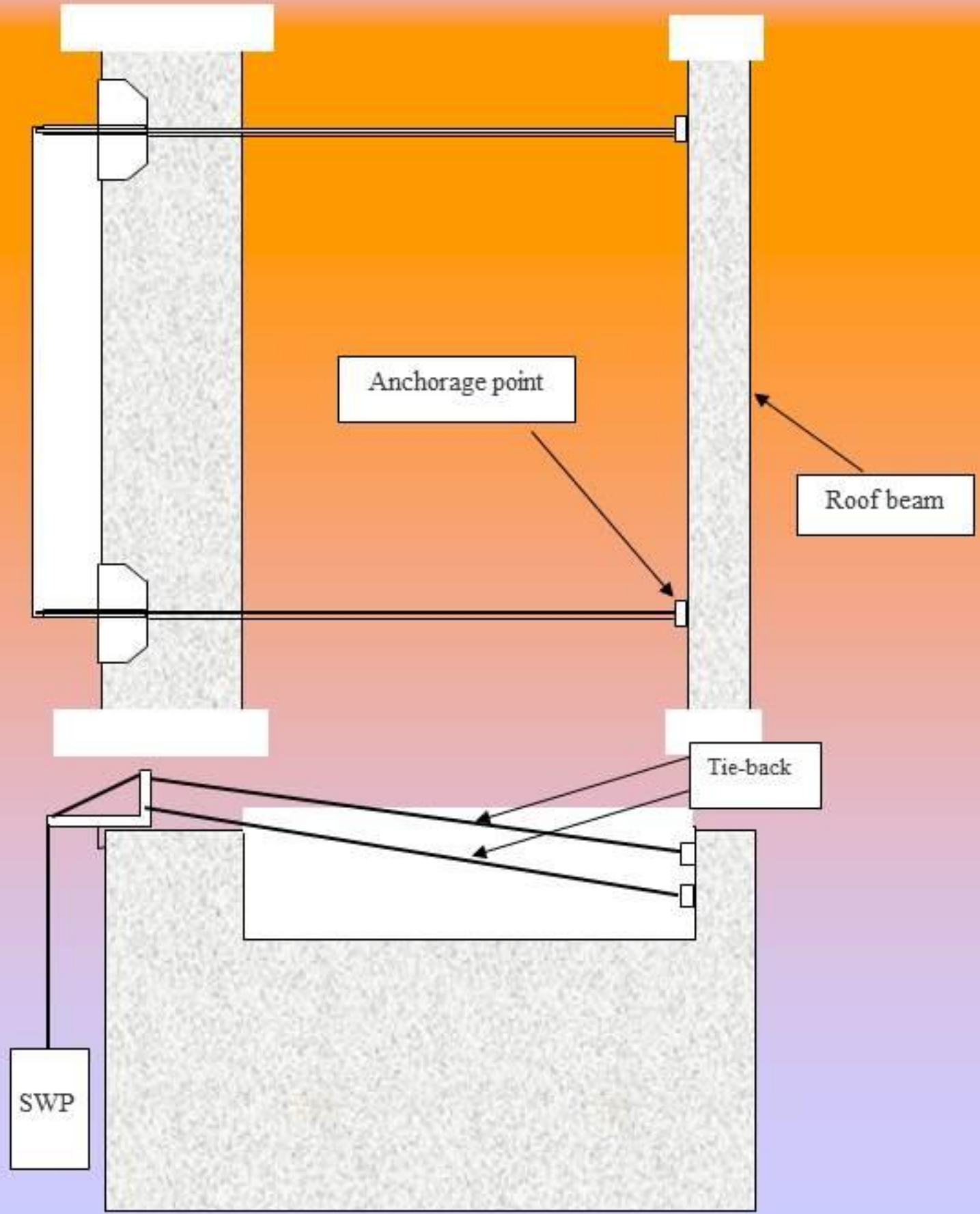
Important Advice

Unbolted Saddle brackets (USB)

should *only be considered* where the use of bolted saddle brackets or the above outriggers / means of support is not practicable









Safe use of USB


- ◆ Design and construction of USB capable of sustaining a combined load of the following:
 - dead load of the SWP installation
 - safe working load of the SWP
 - number of persons
 - any other known weights
 - impact load from operation
 - wind load

(e.g. wind speed up to 14m/sec and gust up to 31m/sec)





Safe use of USB

- ◆ USB should be made of
 - strong and sound materials
 - free from patent defect.
 - ◆ Ensure stability of USB under loaded condition
 - proper ratio in the lengths of vertical strut to horizontal strut
 - ◆ USB's supporting structure
 - rigid structure of adequate strength.
 - structural strength of supporting structure (esp. resting surface) check by a professional engineer, e.g. RPE
- 




Safe use of USB

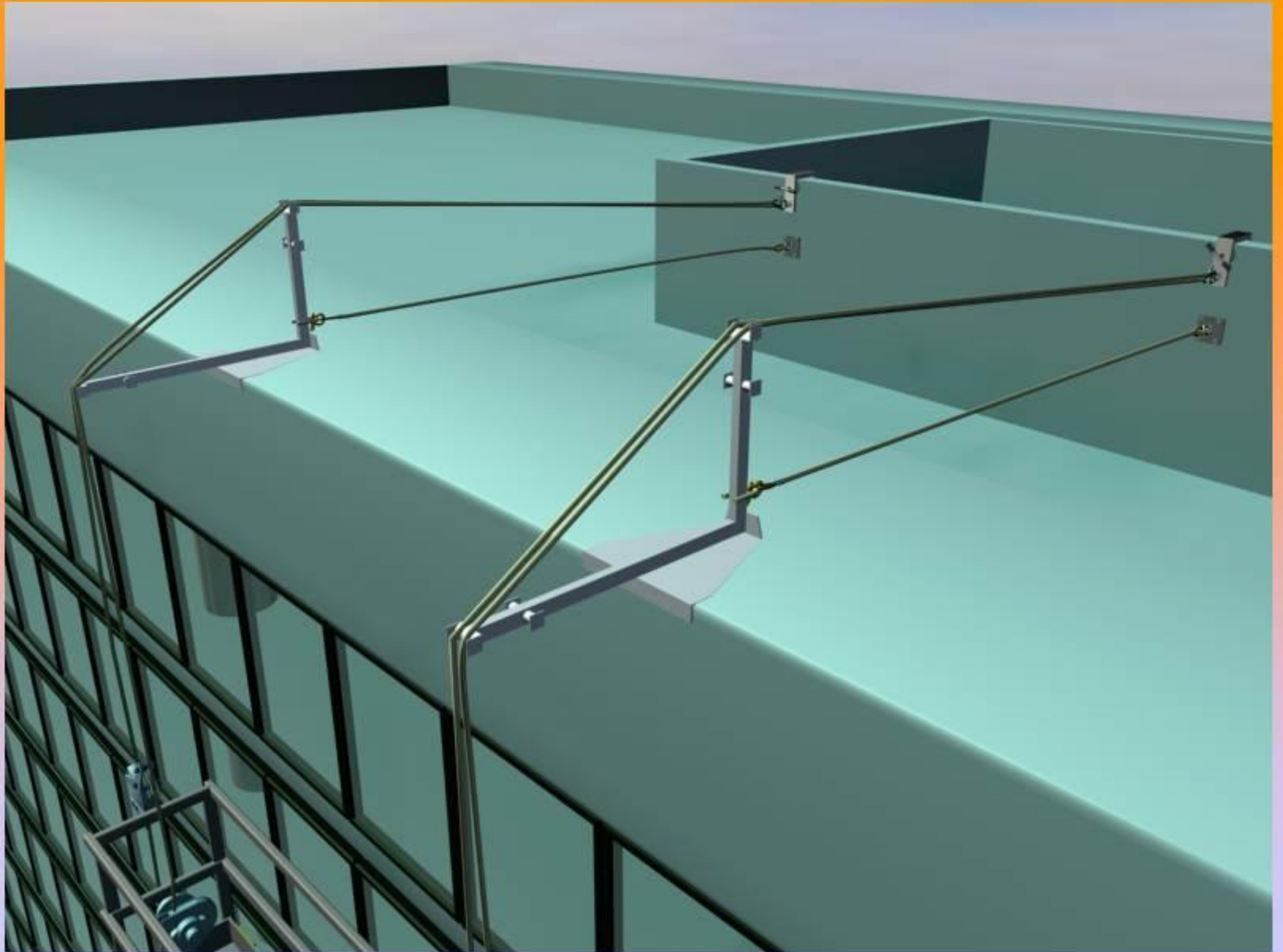
◆ Strength of USB

- Calculations to demonstrate the carrying strength
- Checked by a relevant professional engineer (e.g. RPE)
- Ensure no undue movement, rotation, dipping, structural distortion or deformation during normal use



Safe use of USB

- ◆ Installation of USB
 - **Properly installed** with the seat rests upon the supporting structure
 - Claw placed **immediately in front** of the supporting structure
 - Claw and seat should be at all times kept **in good contact** with surfaces of supporting structure.
 - Resting surface on supporting structure should be **even and level**
- 





Safe use of USB

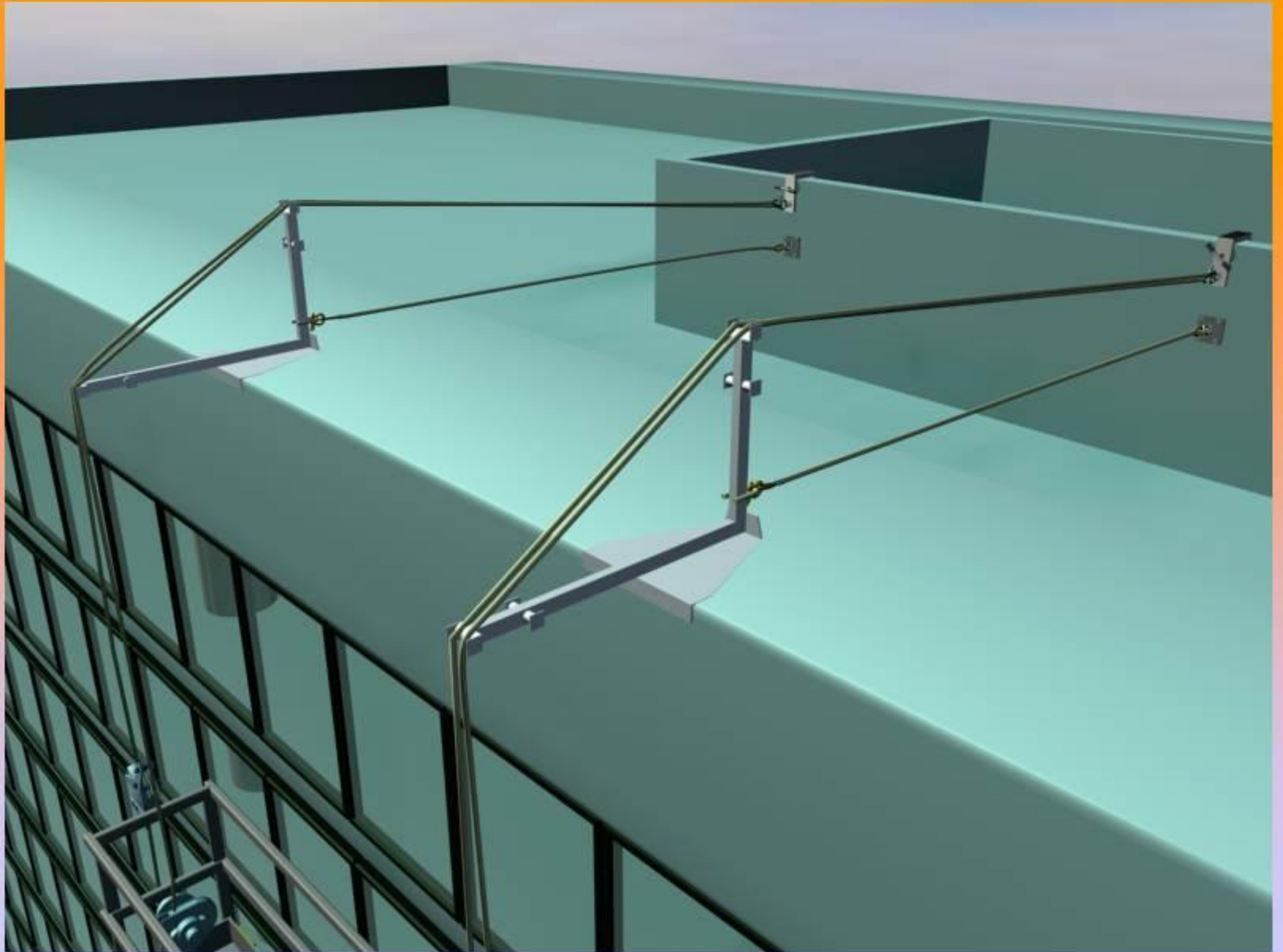
- ◆ Installation of USB (cont')
 - **Strictly follow** manufacturer's instruction on installation and application of USB
 - **No alteration or modification** of USB should be made
 - **Observe manufacturer's instructions** on separation between installed USB
 - Overall length of the working platform **should not deviate** from the recommended length of separation
- 

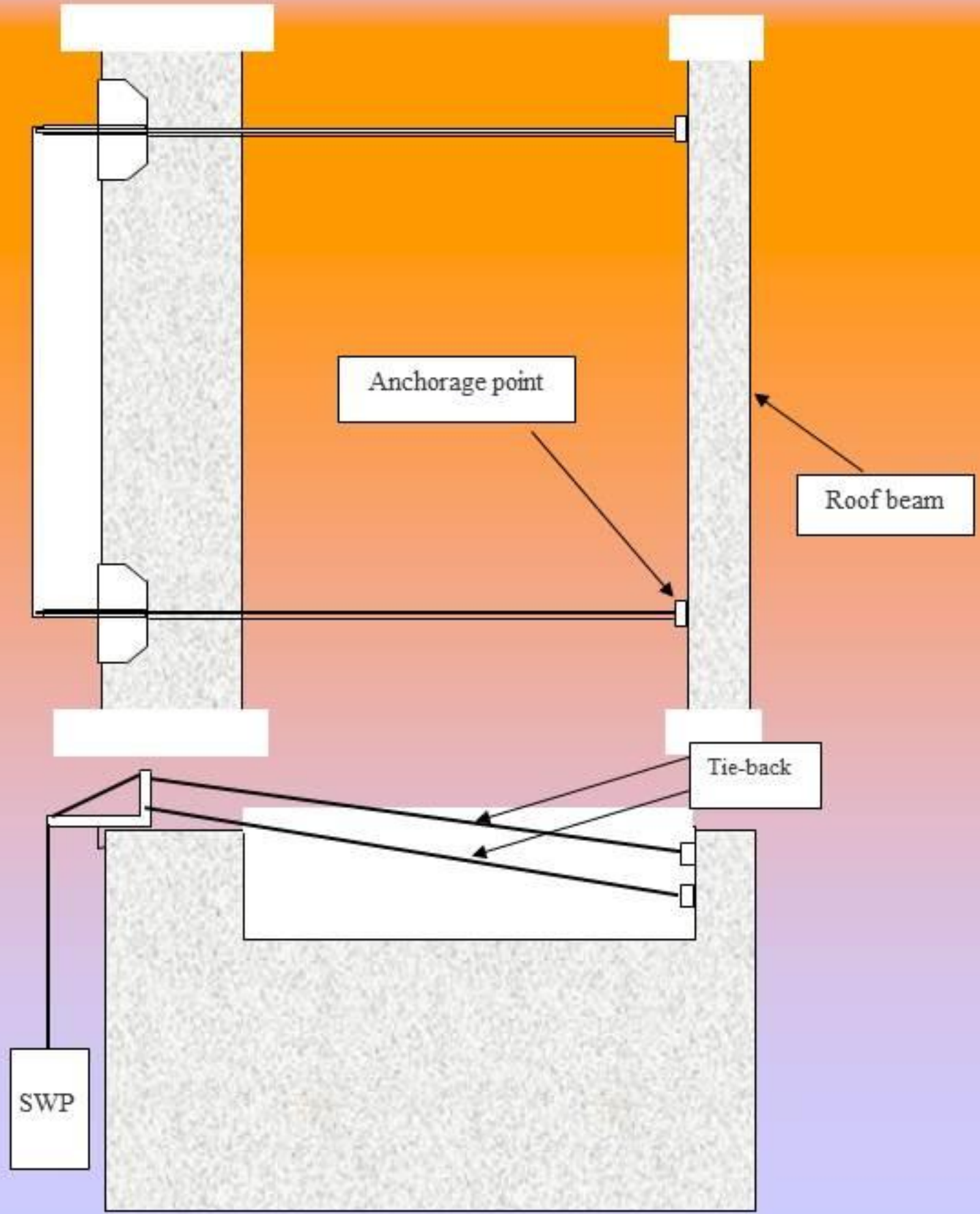


Safe use of USB

- ◆ Suspension ropes and Safety ropes
 - **Securely mounted at the structural part(s) of the building** after passing horizontal strut and the vertical strut of a USB
 - **Kept taut and installed at an angle** according to manufacturer's instruction after passing the vertical strut of a USB







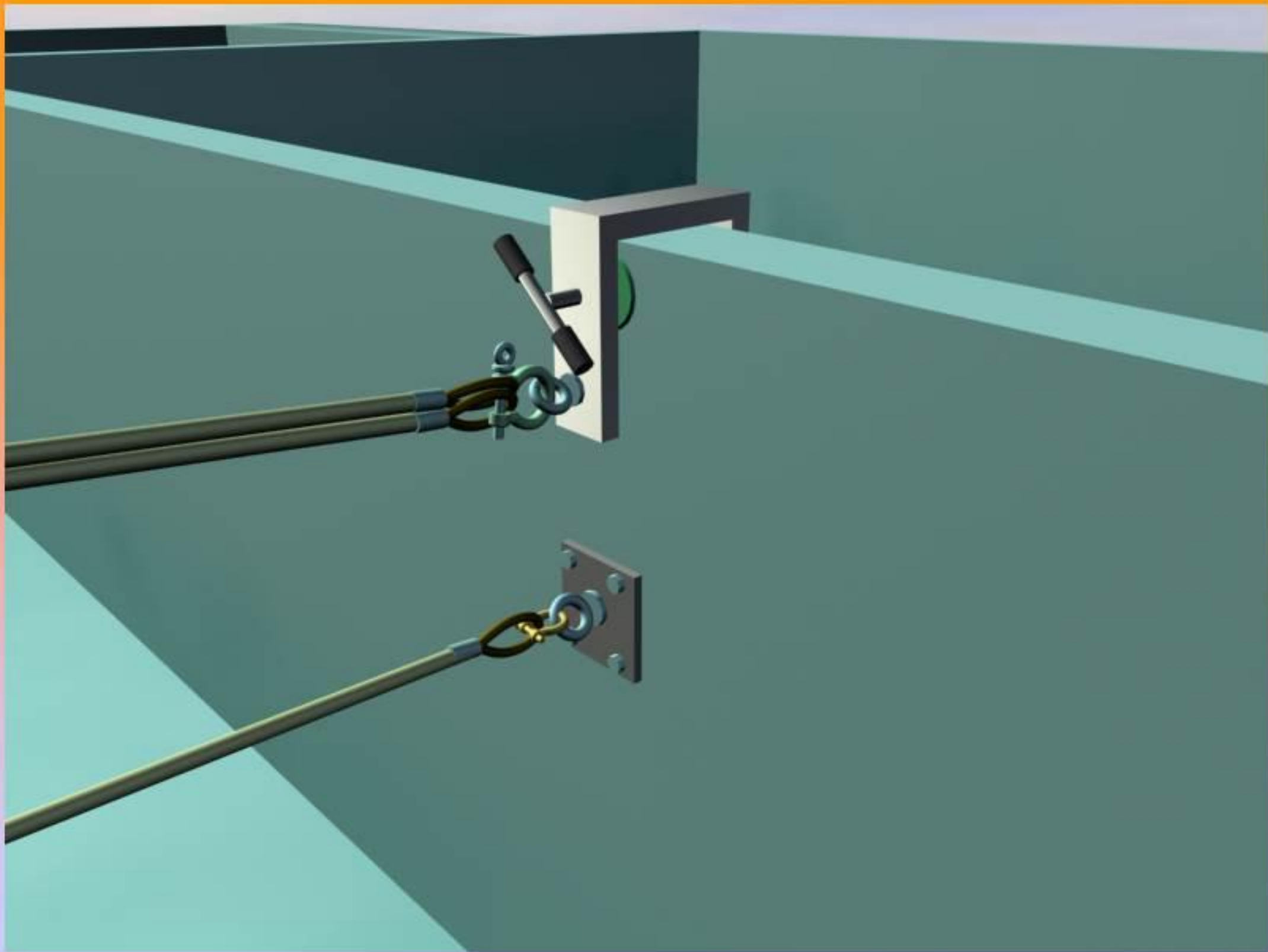


Safe use of USB

◆ Tie-back

- **Wire rope tie-back** attached to each USB
- **Diameter:** tie-back rope \geq suspension rope
- **Securely anchored** on a structural part of the building.
- Ensure **every tie-back rope is taut**
 - Incorporate with **turn-buckle** or other similar device





Thank you

