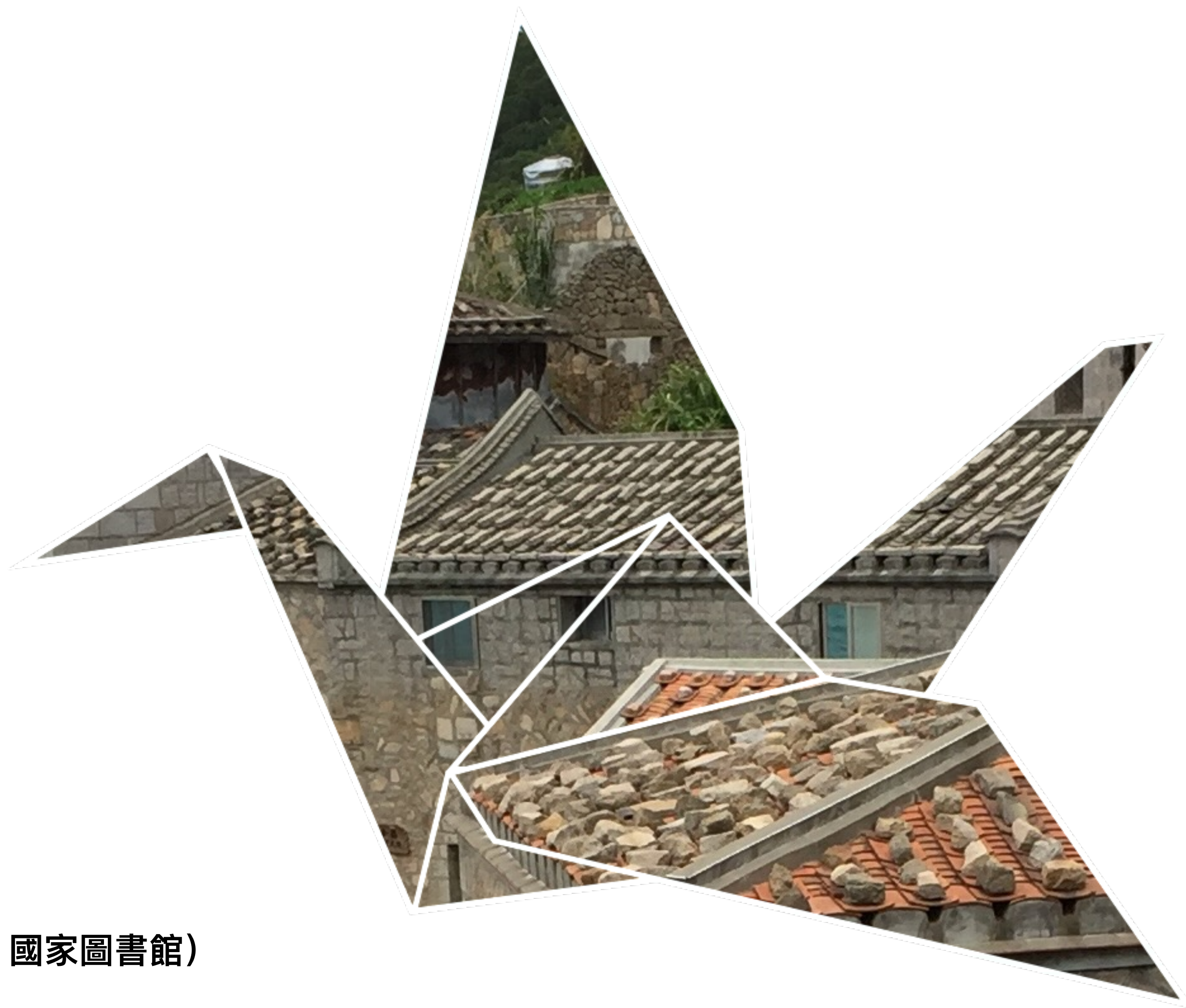


摺。思

摺紙與建築設計



簡聖芬 2025-01-04 (113年冬季閱讀講座：紙的科學 / 國家圖書館)

專任教師

簡聖芬

設計研究 / 副教授 / 大四設計課召集人

學歷

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美國加州州立理工大學 科學碩士
國立成功大學建築學系 學士

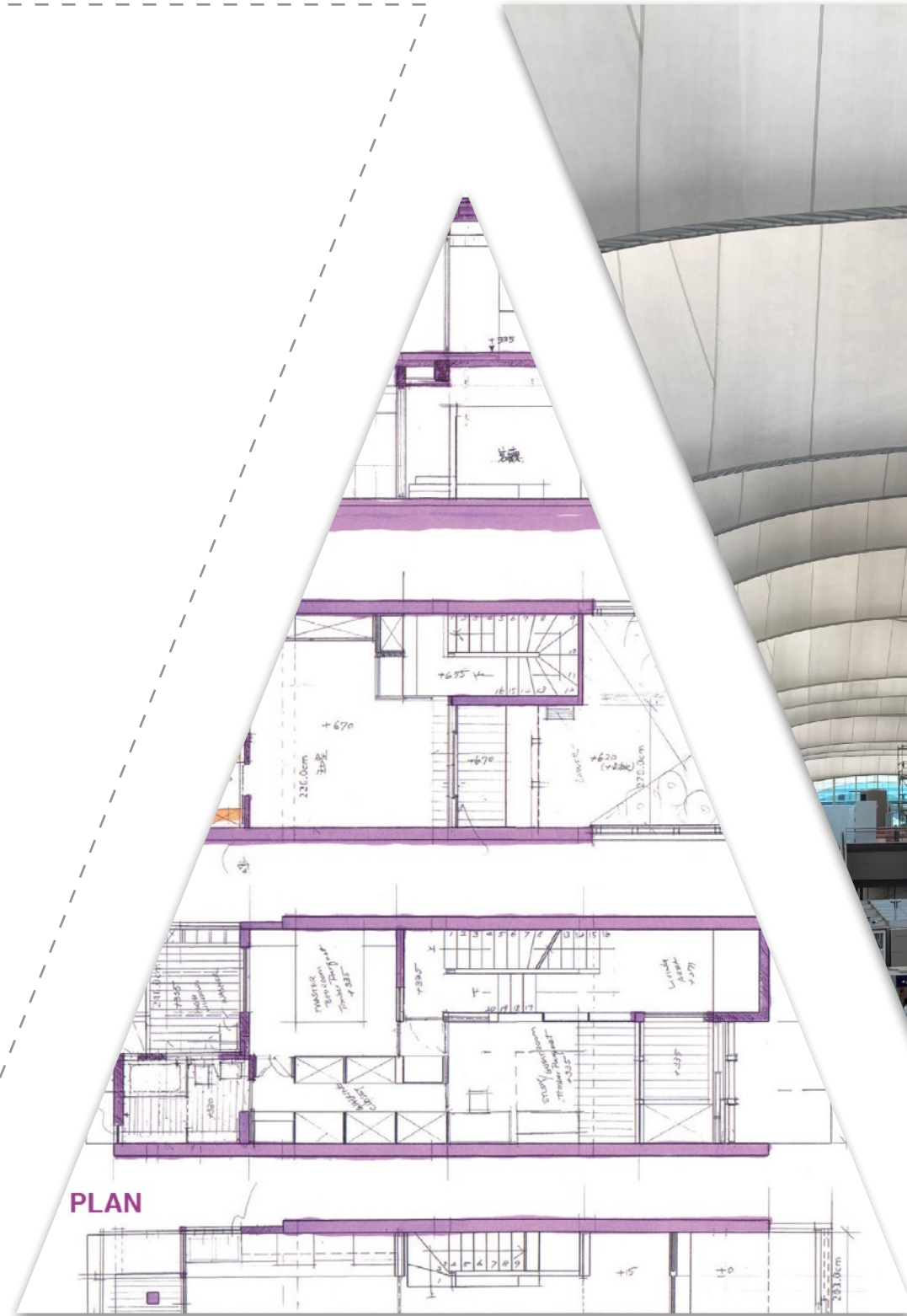
經歷

國立成功大學藝術中心中心主任
國立成功大學圖書館副館長
台灣感性學會理事
社團法人臺灣義築協會理事長

運算設計研究室

運算設計的應用、教學與研究，是個不斷探究與尋求破壞性創新的歷程。破壞性創新的動力來自對於偏遠、少數、非主流市場需求的關注。而這樣的族群也通常是知識、資訊或經濟弱勢、資源匱乏的族群，故破壞性創新的策略著重在成熟、廉價技術的轉化運用。我們關注這樣的對象，在研究中探討人的認知、行為與需求，藉知識彙整與系統開發創新，因應弱勢、非主流者的需求。







Great. Let's start with the crane.

Fantastic choice! The origami crane is a beautiful and meaningful design. Here's a step-by-step guide to folding one:

Materials:

- A square piece of paper (preferably 15 cm x 15 cm / 6 in x 6 in). Any color or pattern you like!

Instructions:

1. Start with the base:

- Begin with the paper's colored side facing up.
- Fold the paper in half diagonally to form a triangle. Crease well and unfold.
- Fold the paper diagonally in the opposite direction. Crease well and unfold.
- Flip the paper over so the white side is facing up.
- Fold the paper in half vertically, then horizontally. Crease well and unfold each time.

2. Collapse into a square base:

- Using the creases as guides, collapse the paper into a square base by bringing the diagonal folds inward. You should end up with a smaller square shape.

3. Create the bird base:

- With the open end of the square base at the bottom, fold both edges of the top layer inward to meet the centerline, creating a kite shape. Crease well and unfold.
- Fold the top corner down to form a horizontal crease at the base of the kite. Unfold.
- Open up the bottom flap and fold it along the creases you just made to form a diamond shape. Flip the model over and repeat this step on the other side.

4. Form the neck and tail:

- With the open ends pointing up, fold the top layers' edges inward to the centerline on both sides to create a skinny kite shape. This forms the "neck" and "tail" of the crane. Repeat on the other side.

5. Shape the head:

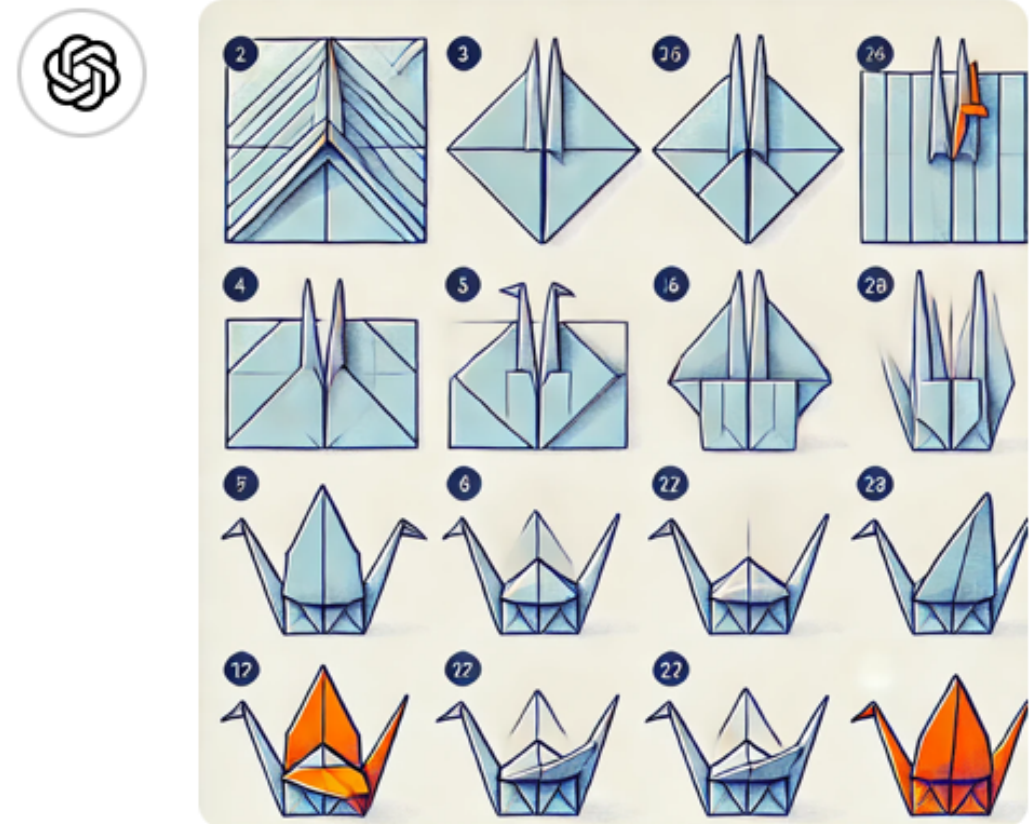
- Choose one end of the model to be the head. Fold it down to create a small crease, then reverse-fold it to form the crane's head.

6. Finish the wings:

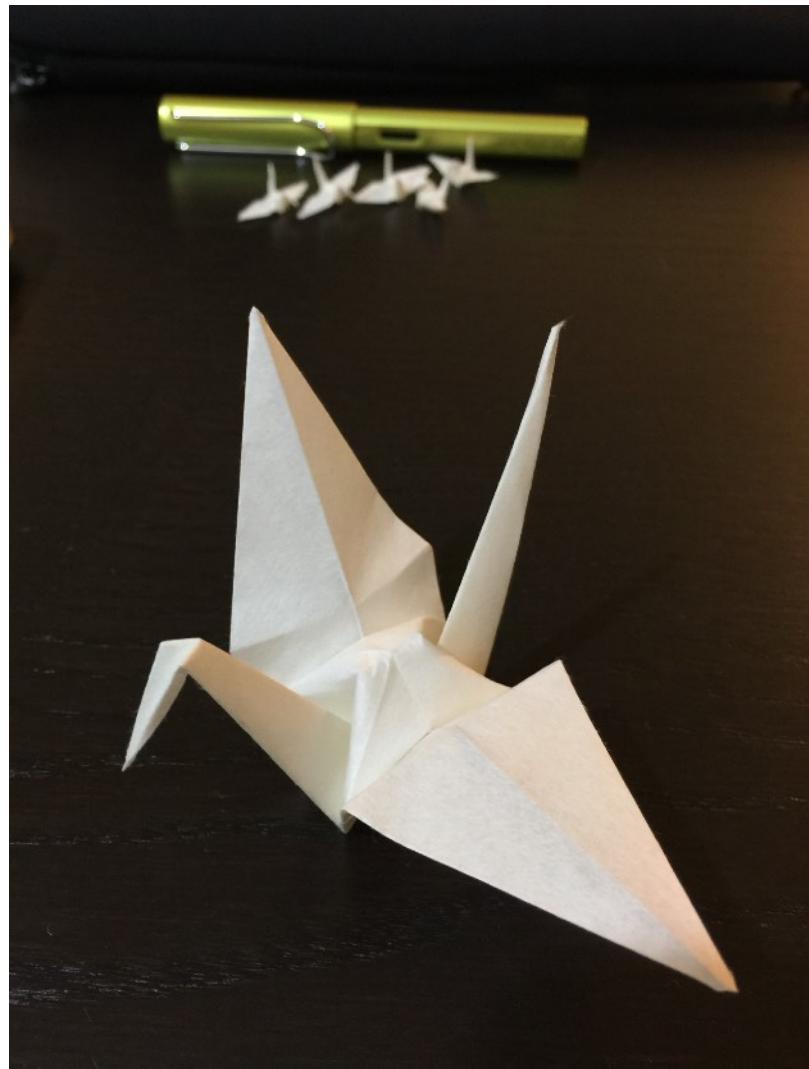
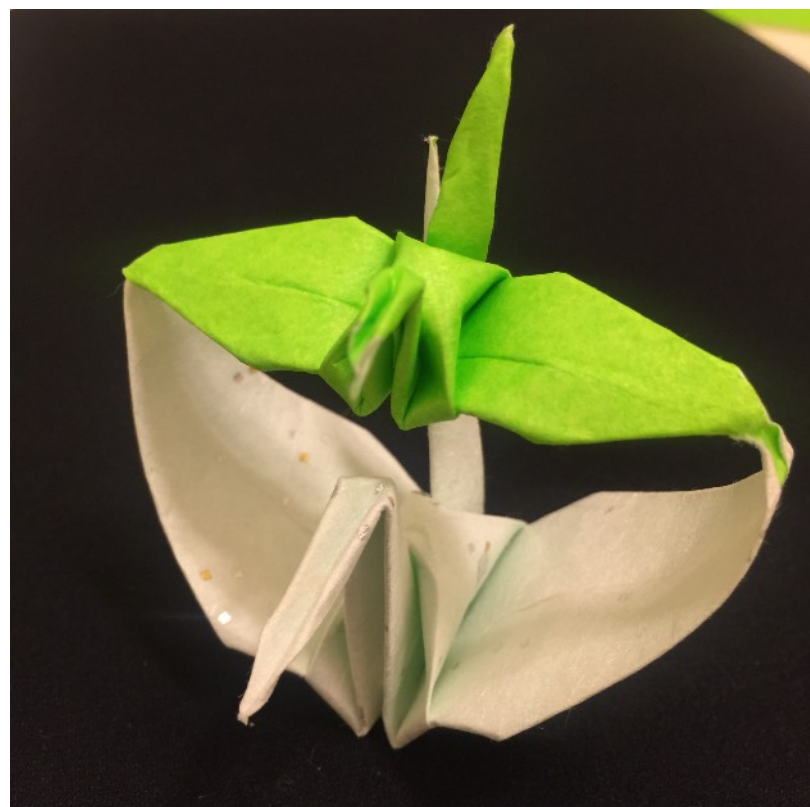
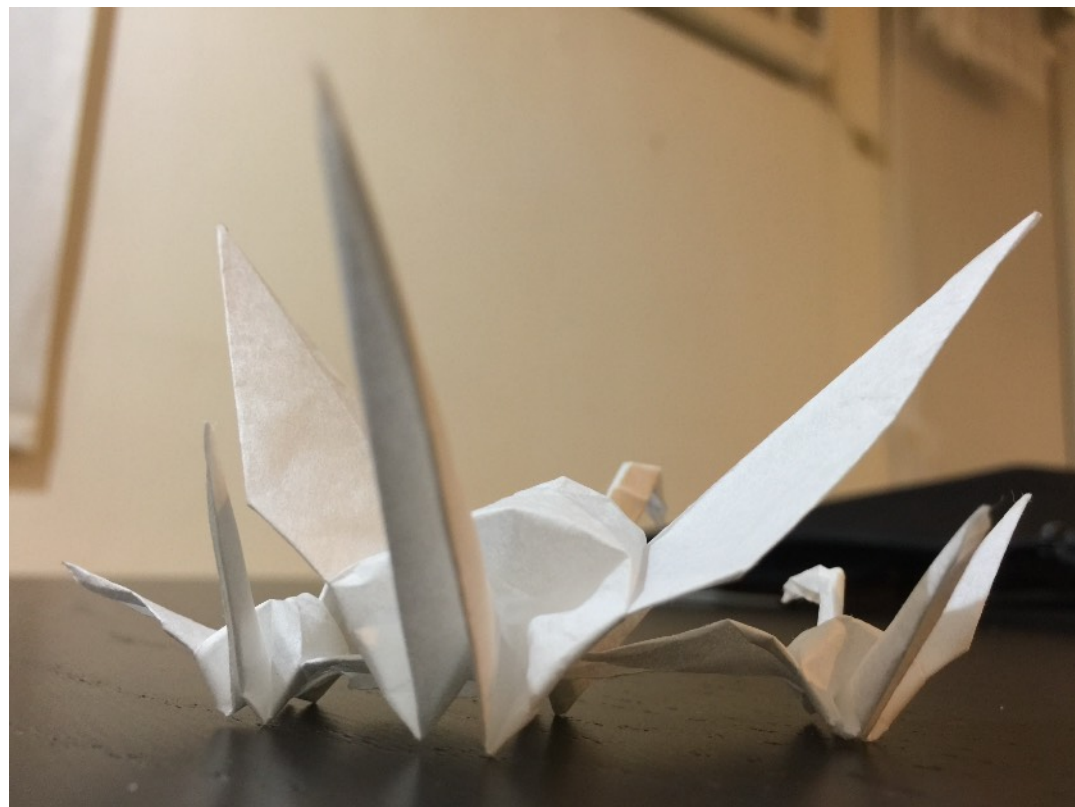
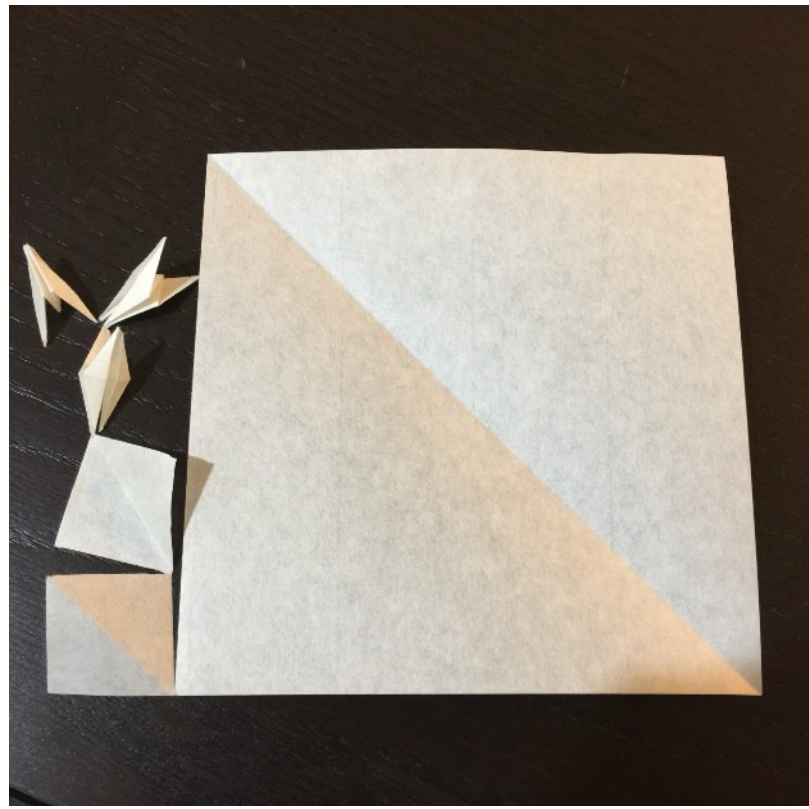
- Gently pull down the upper flaps (the wings) to complete your crane. Adjust the wings for symmetry.

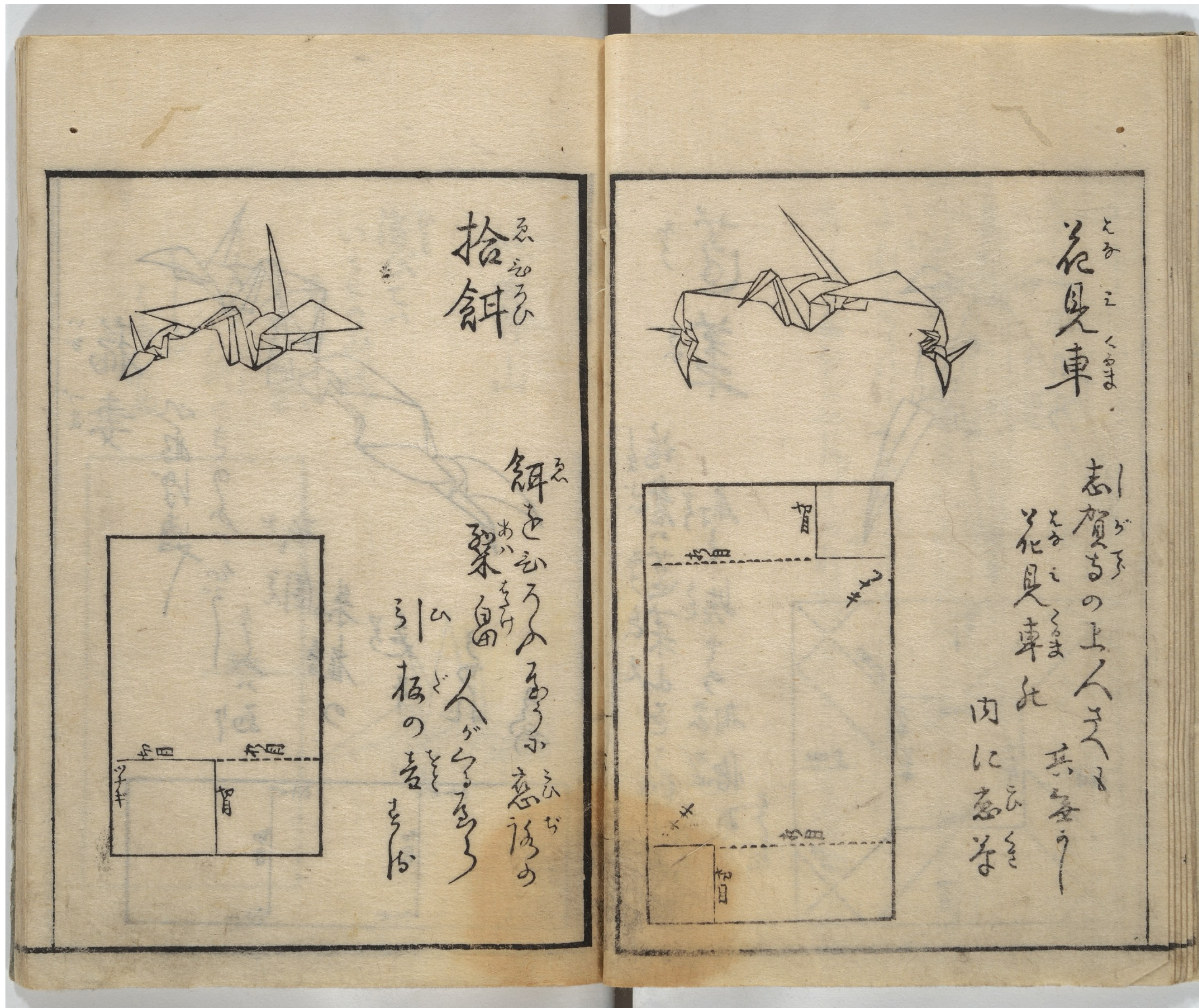
Your origami crane is complete! Let me know if you need clarification on any step, or if you'd like a visual aid.

I do need a visual aid, please.



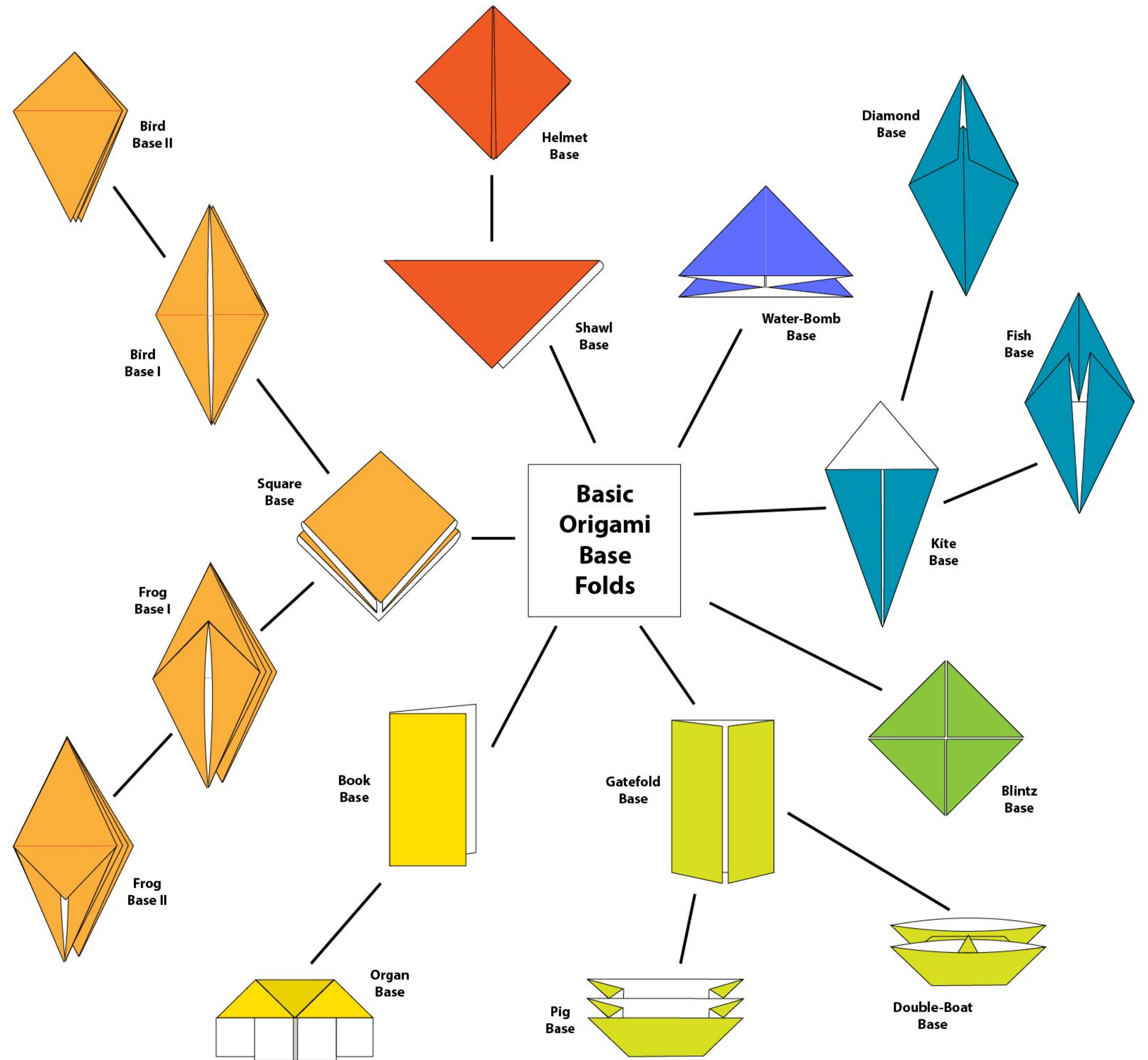
Here is a visual guide to help you fold an origami crane step-by-step. Let me know if you need further explanation for any of the steps!



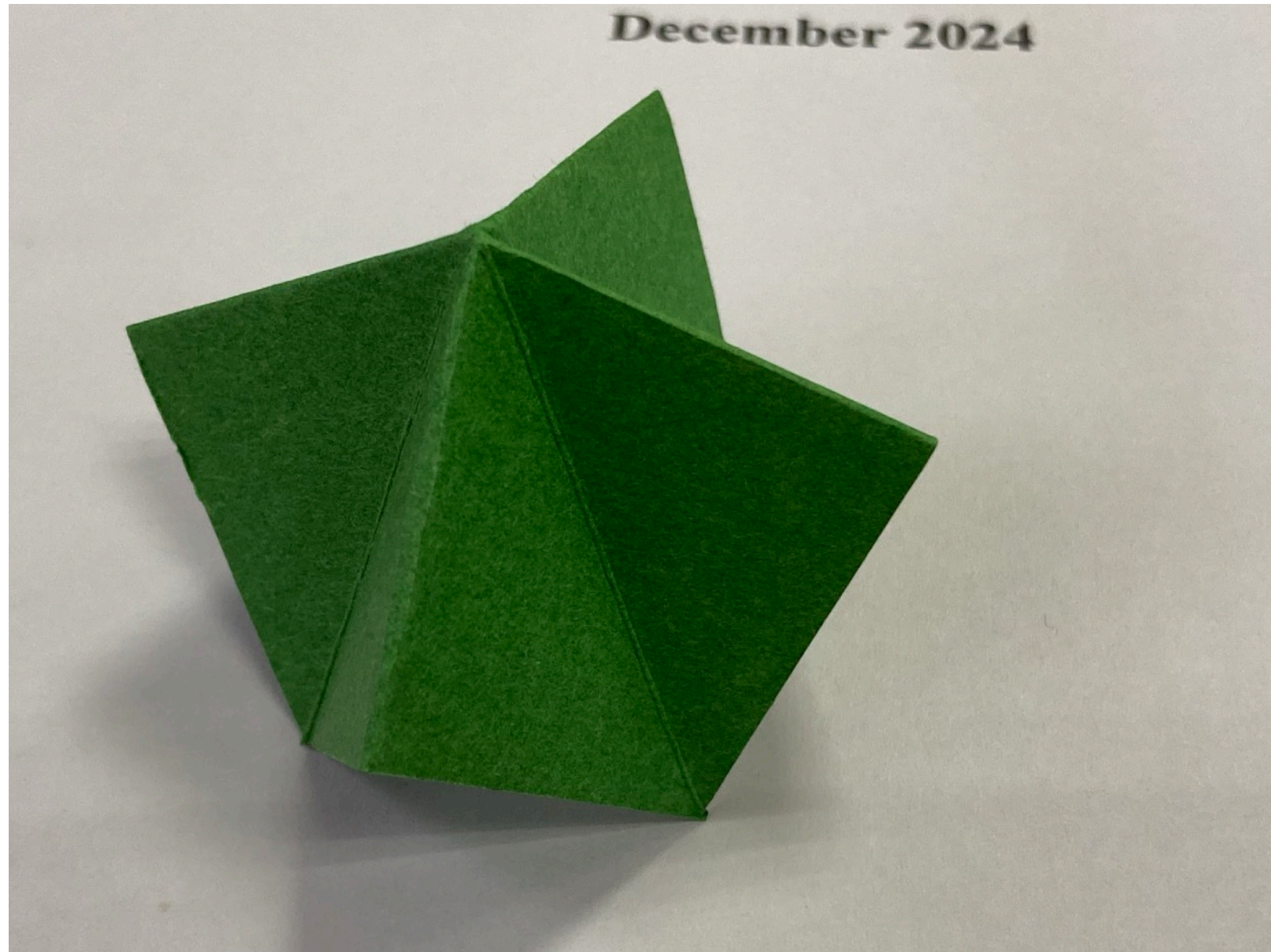


《秘傳千羽鶴折形》 義道一円 / 1797

(圖片來源：<https://www.metmuseum.org/art/collection/search/78714>)



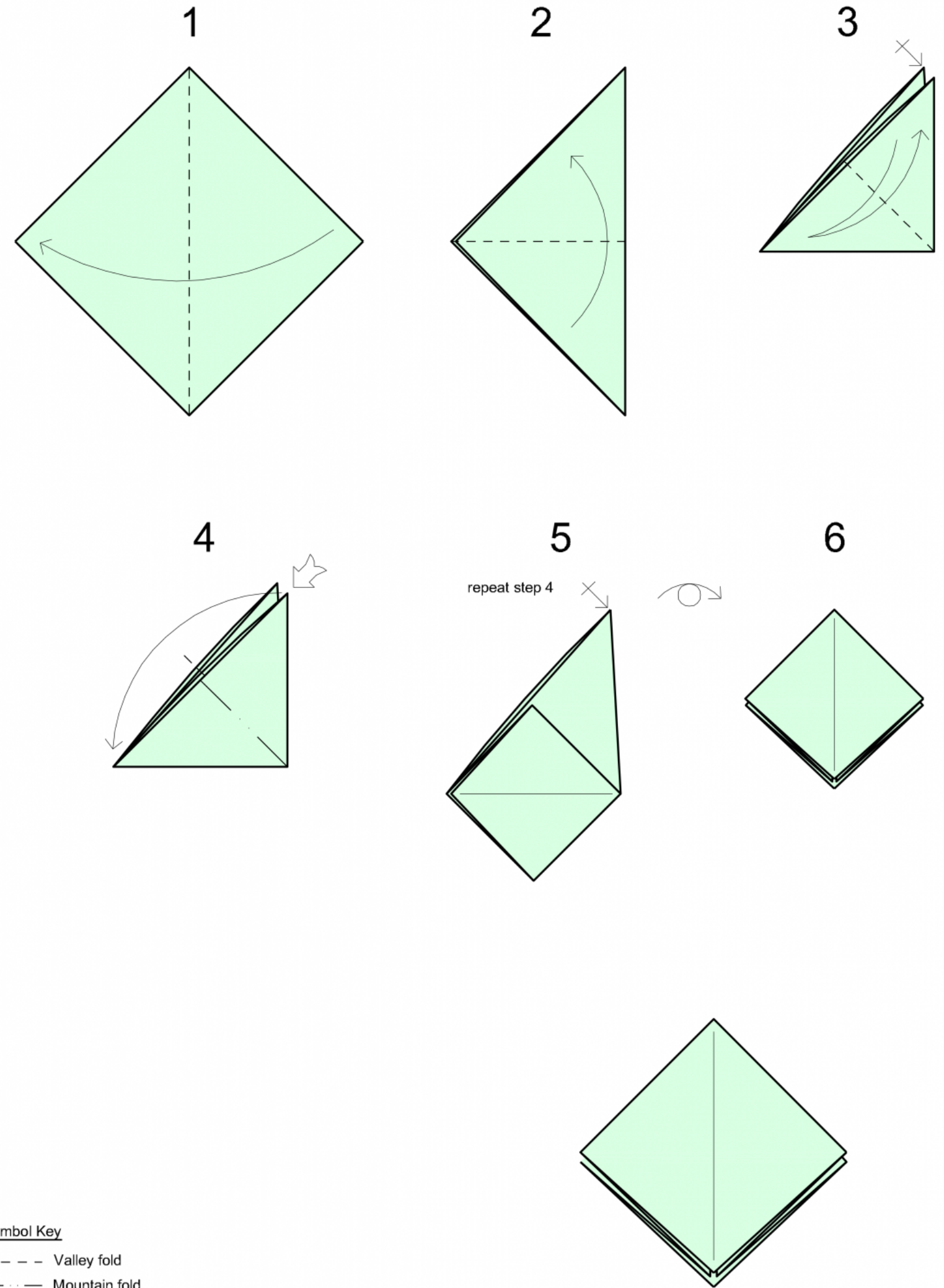
Origami base folds
 Robert C. Williams Museum of Papermaking
 (圖片來源：<https://paper.gatech.edu/kinetic-joy/origami>)



Square base

(右圖片來源：<https://draftsperson.net/origami/preliminary-base/>)

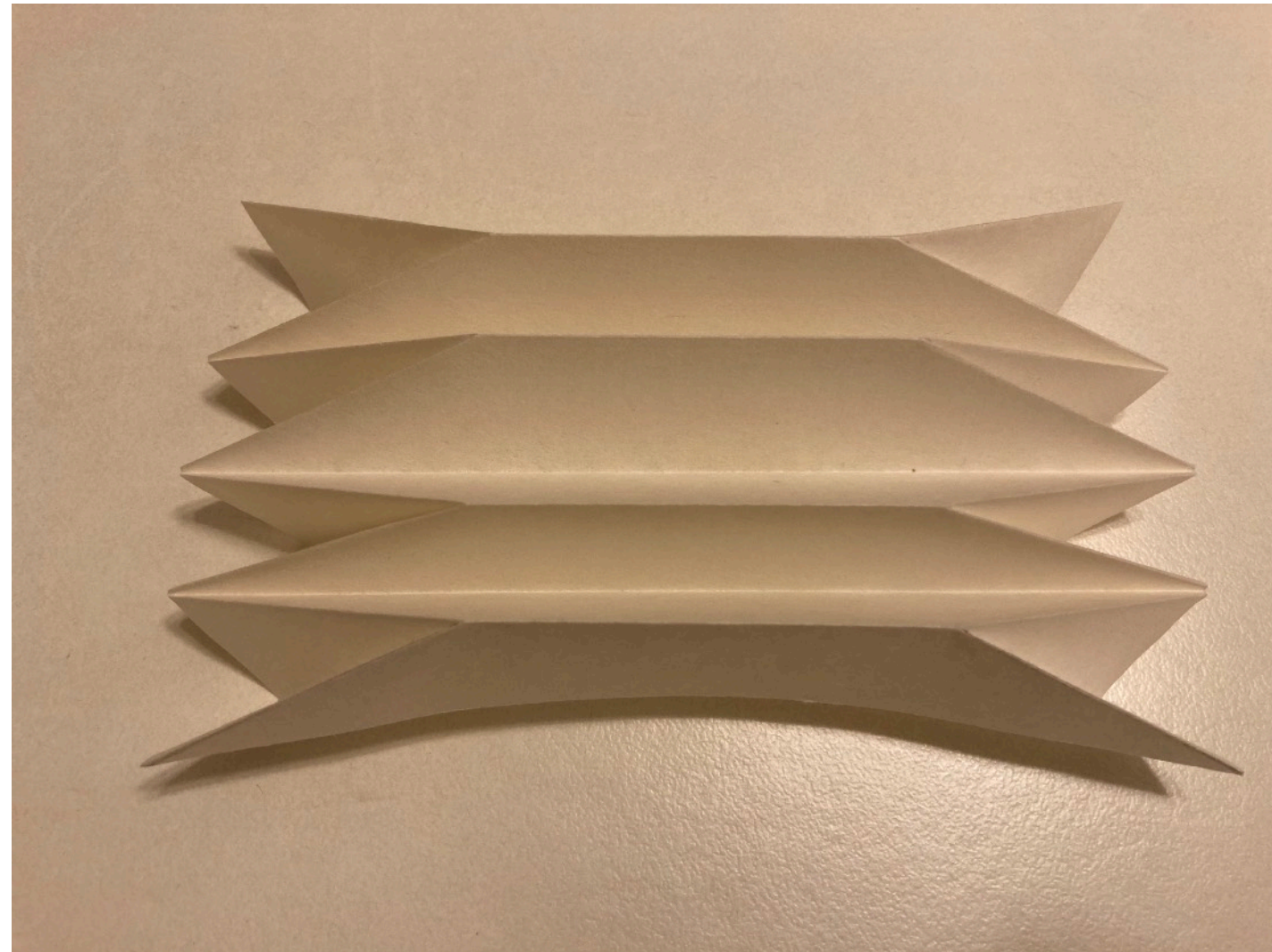
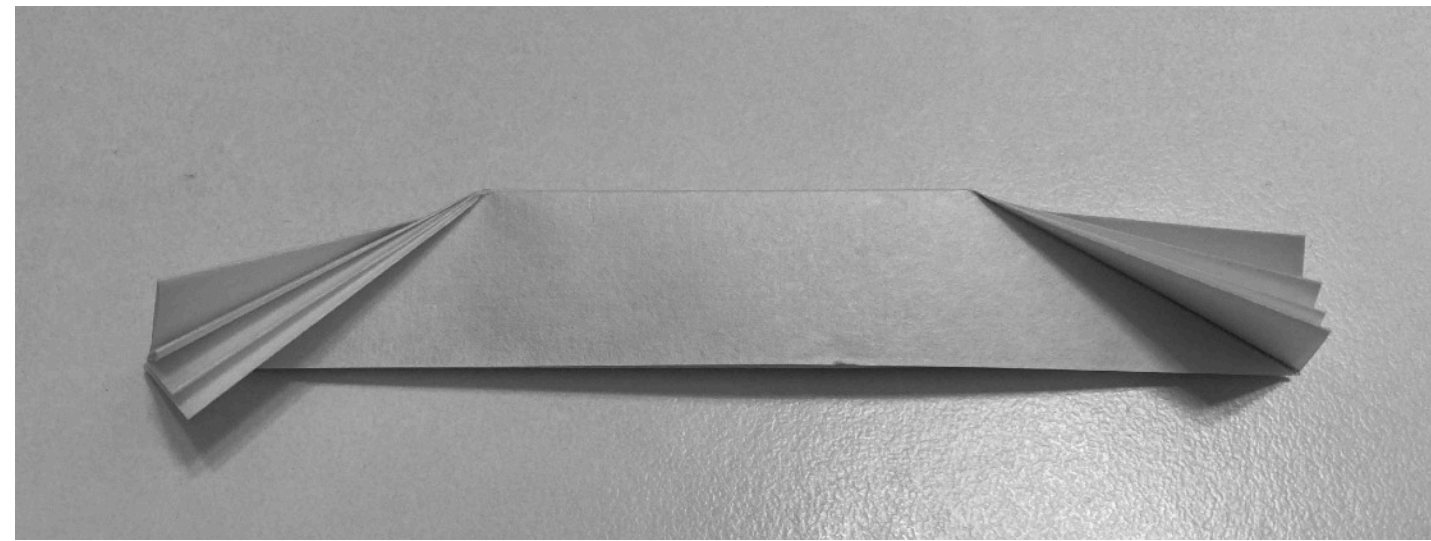
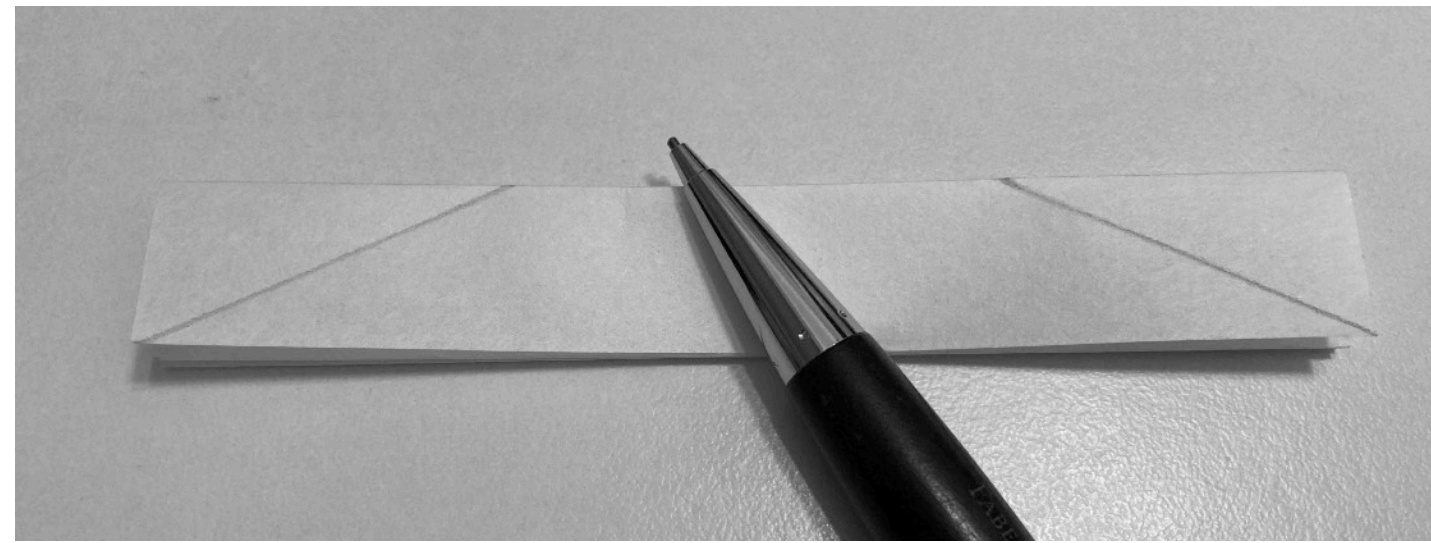
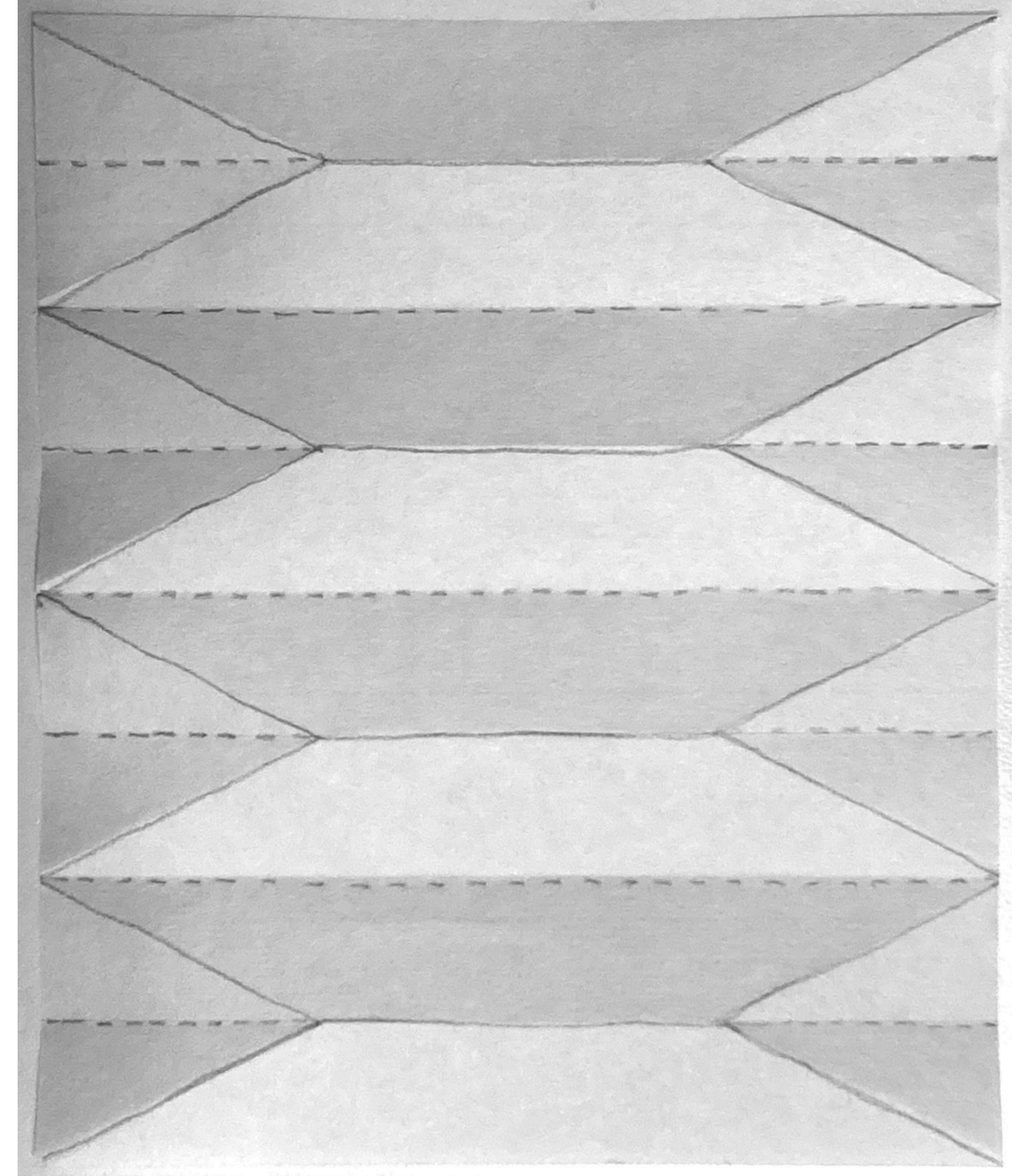
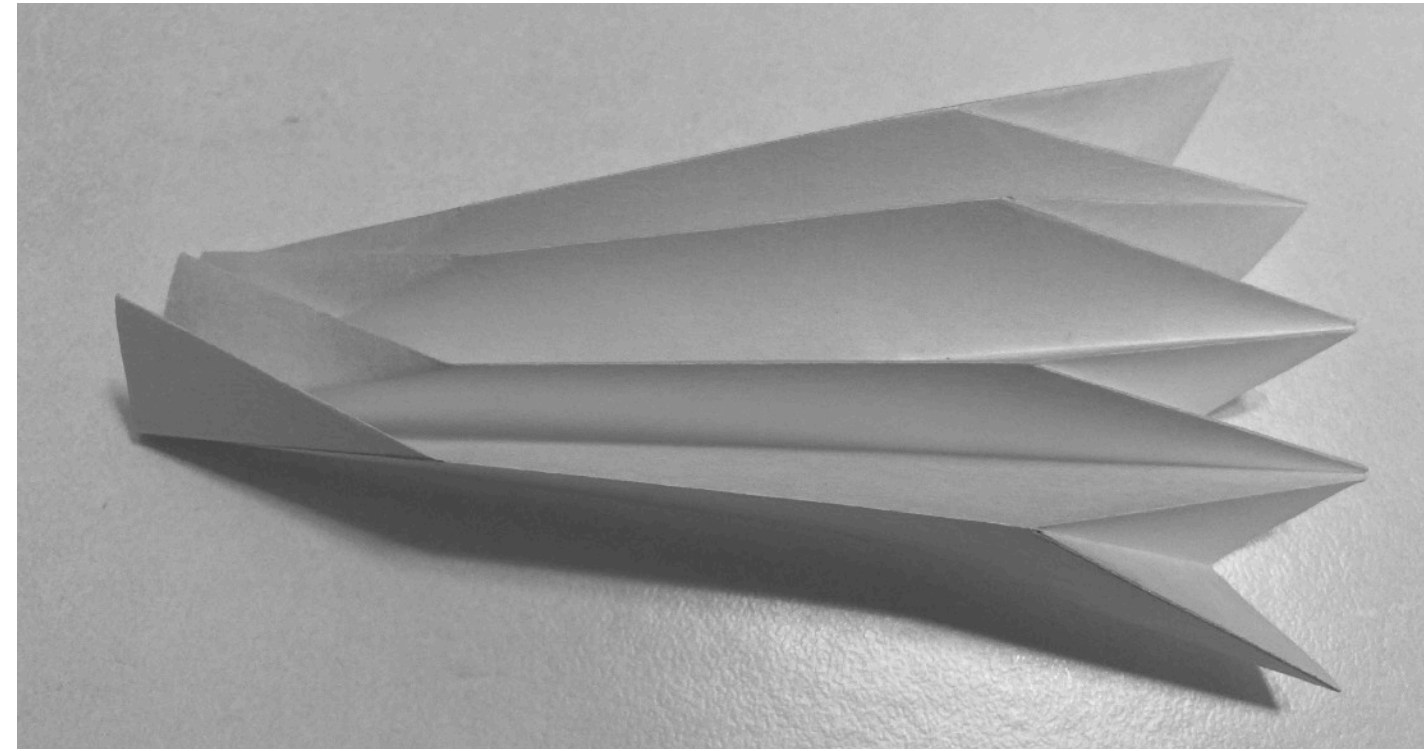
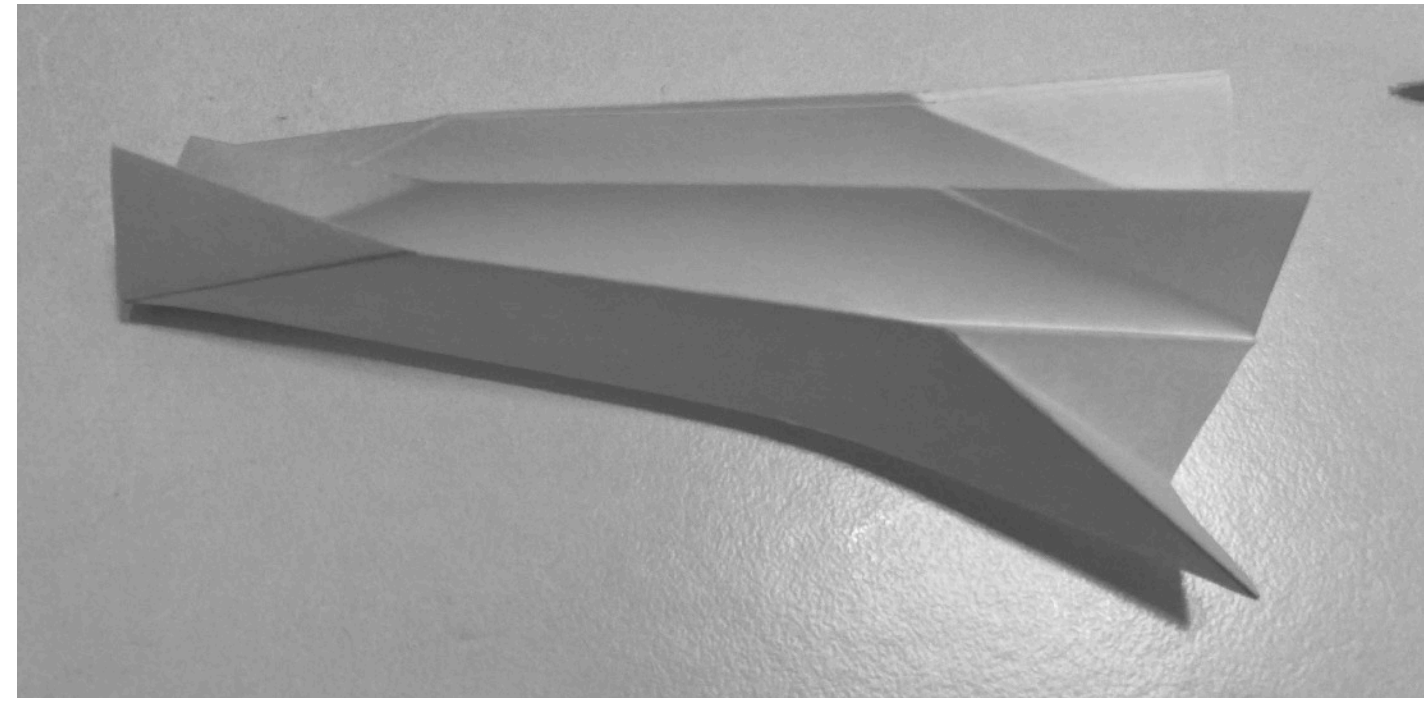
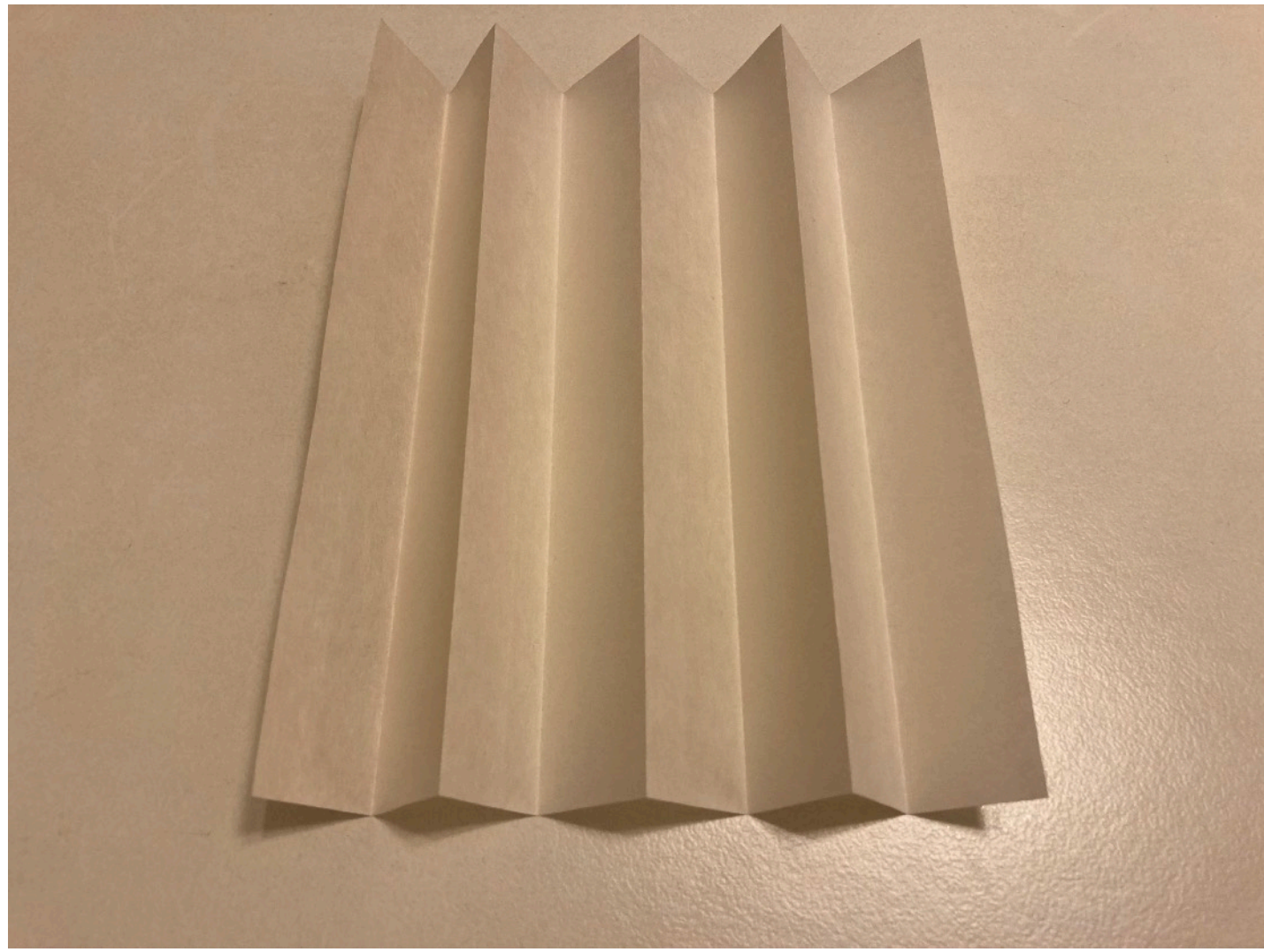
Preliminary Base

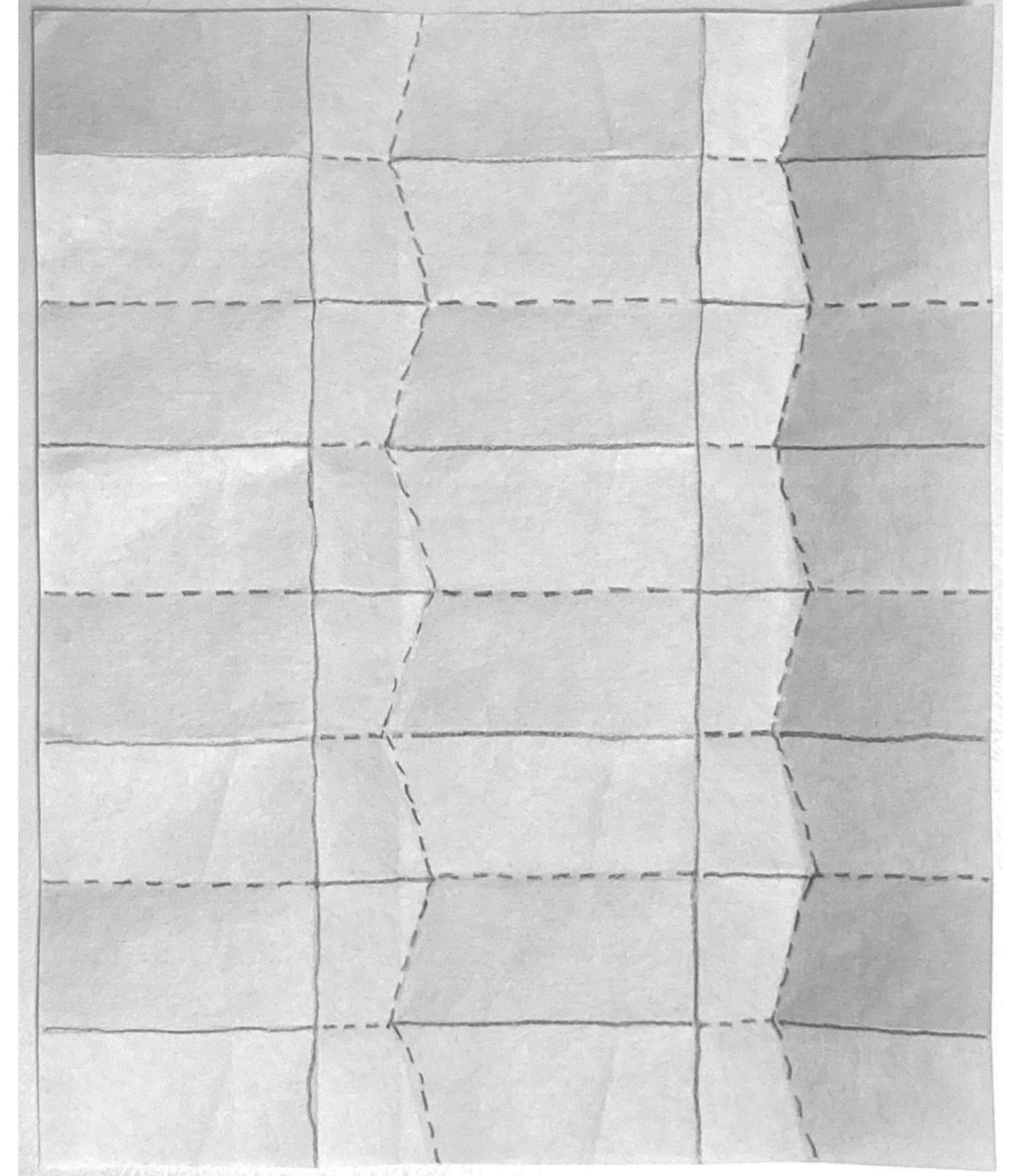
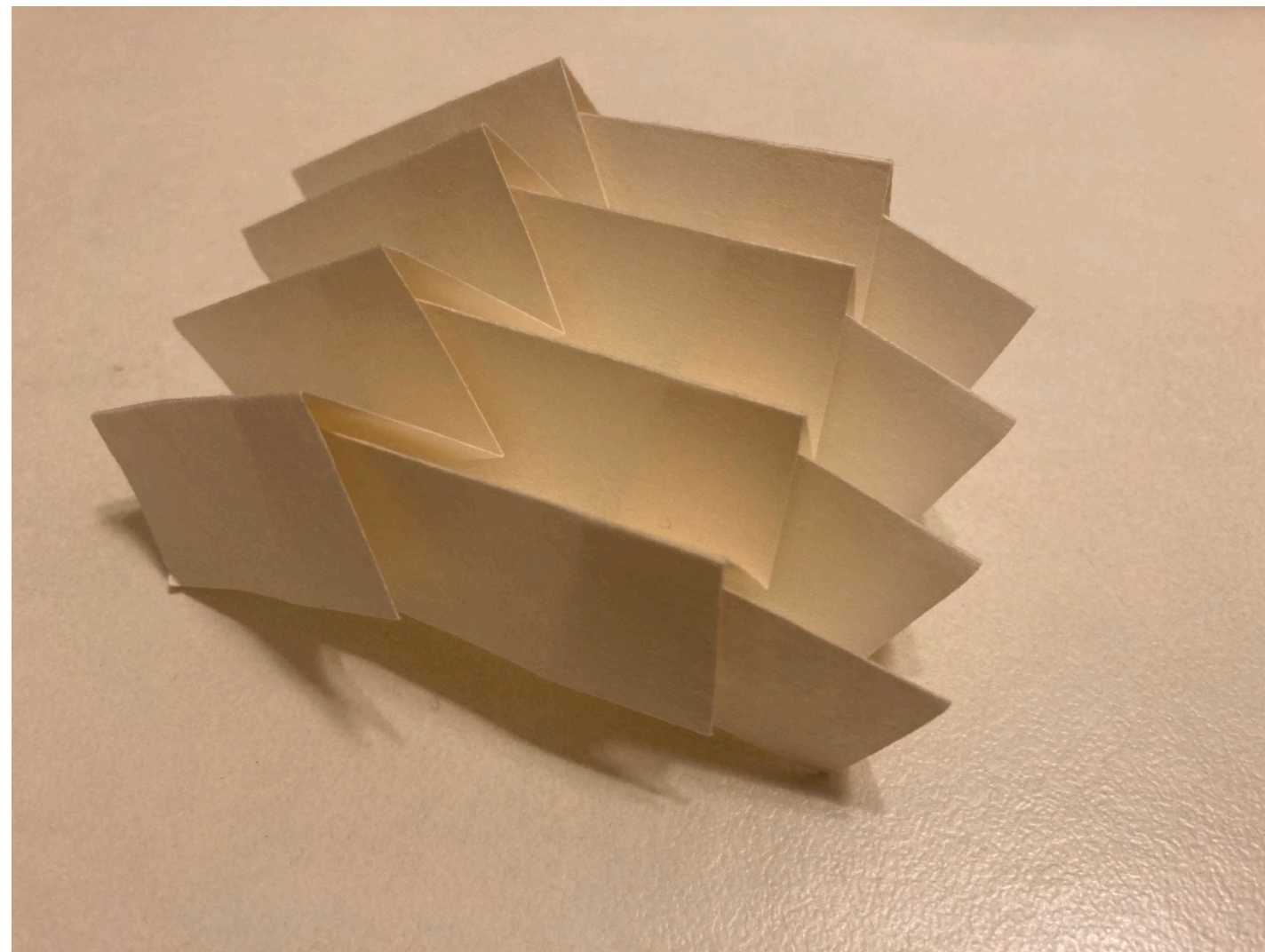
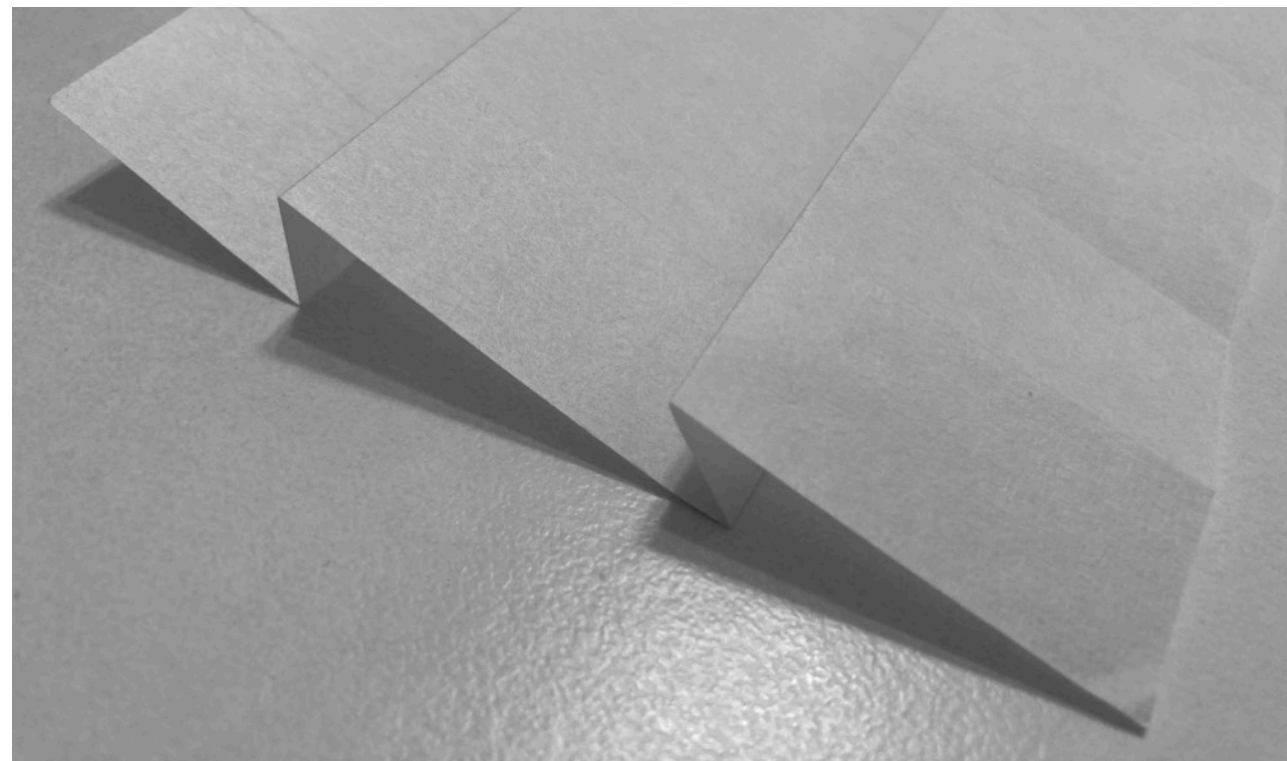
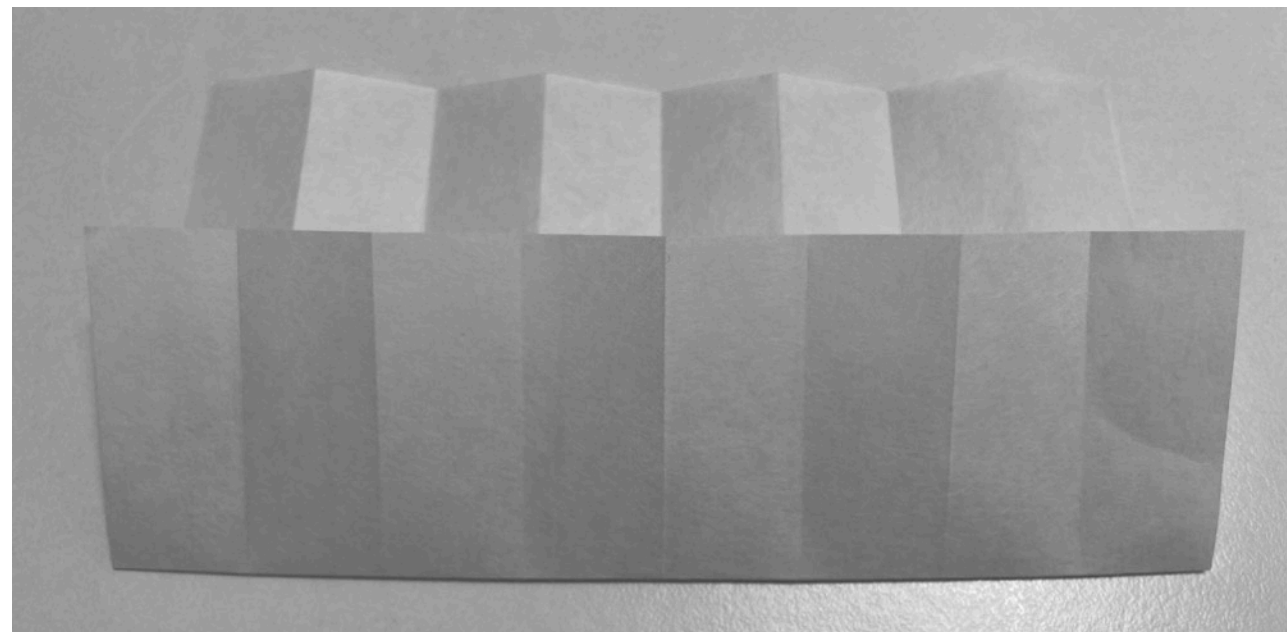
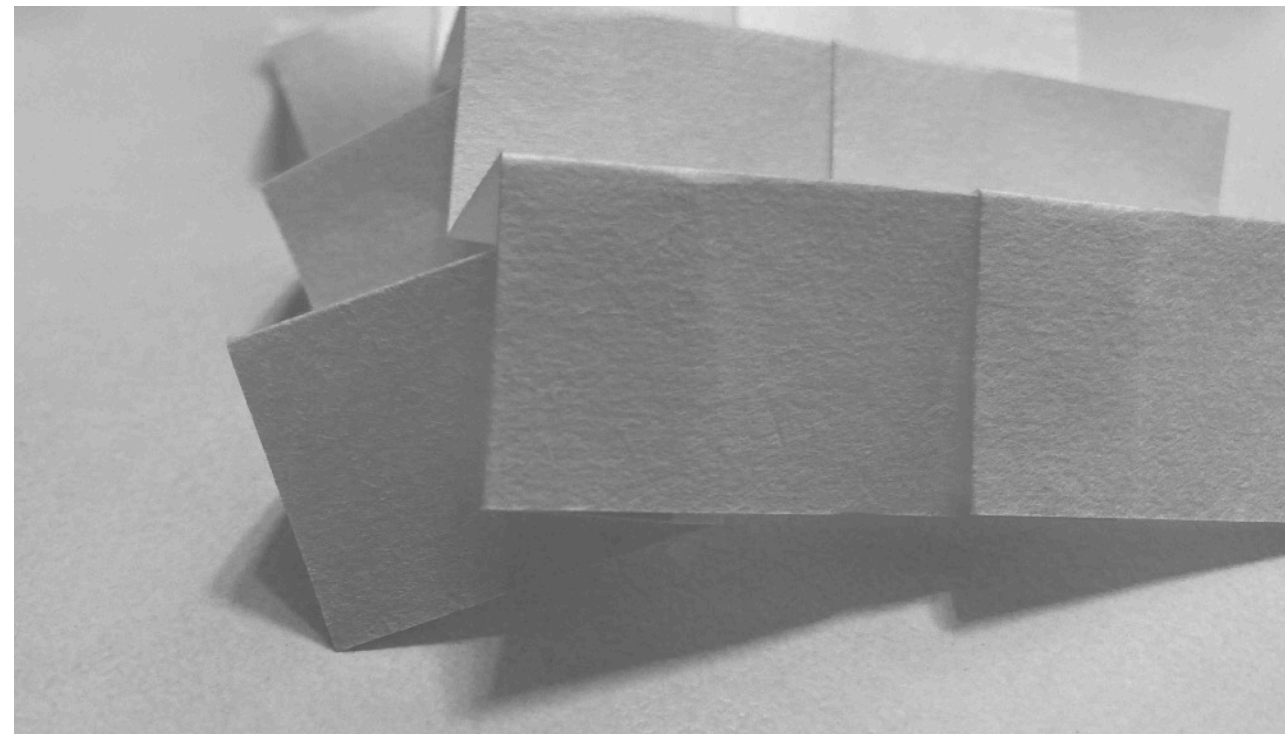
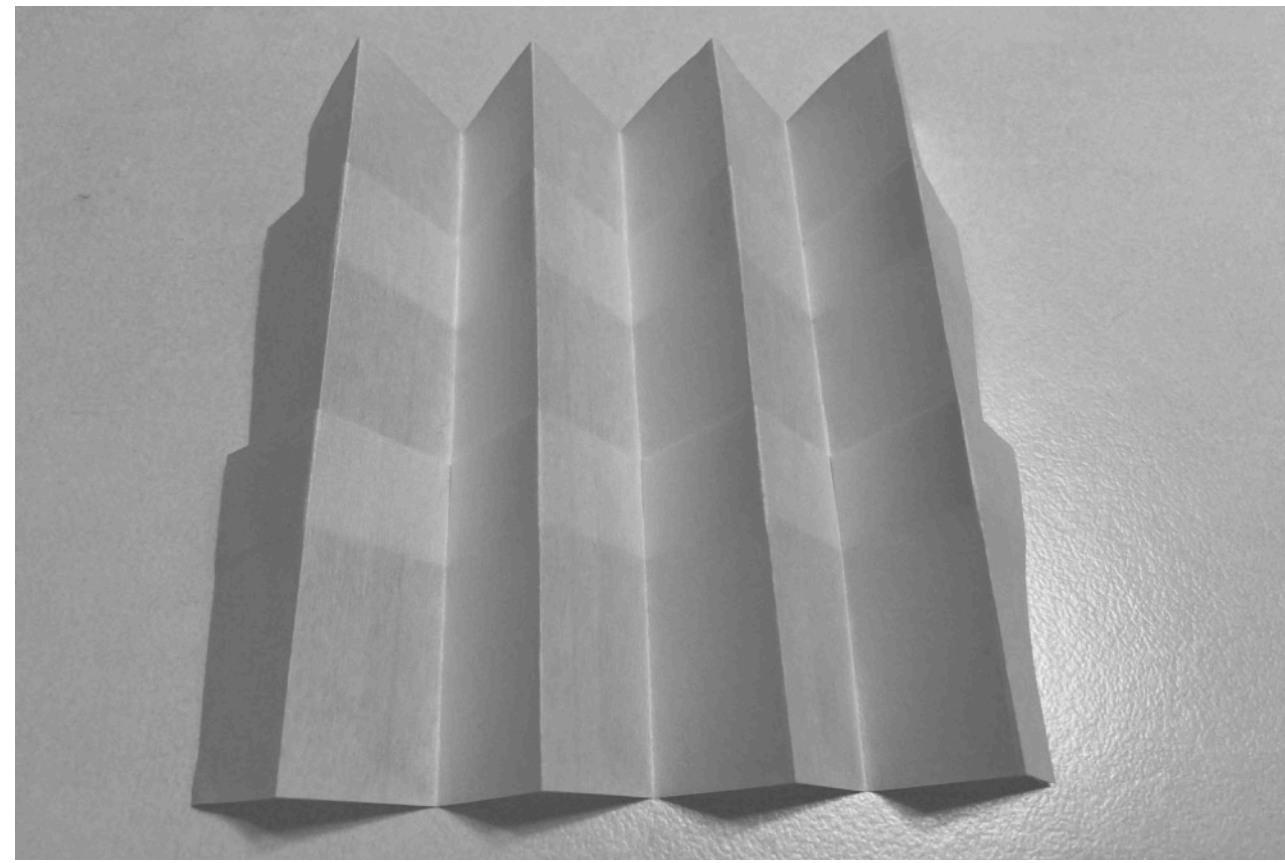
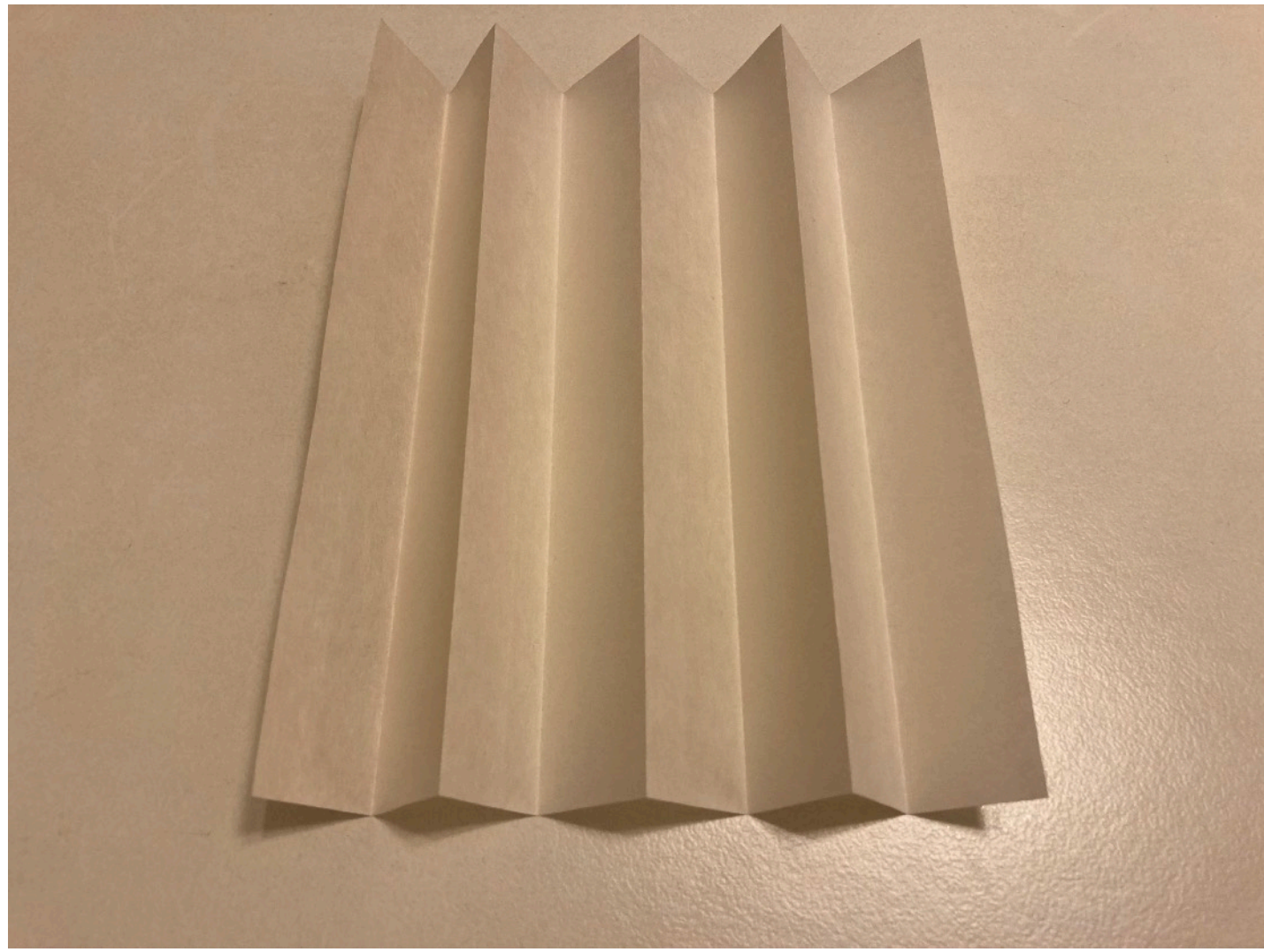


- Symbol Key**
- Valley fold
 - - - Mountain fold
 - ↪ Fold movement path
 - ↪ Fold movement path away from view
 - ✦ Push, squash or reverse fold
 - ↺ Repeat steps
 - 🌀 Rotate model

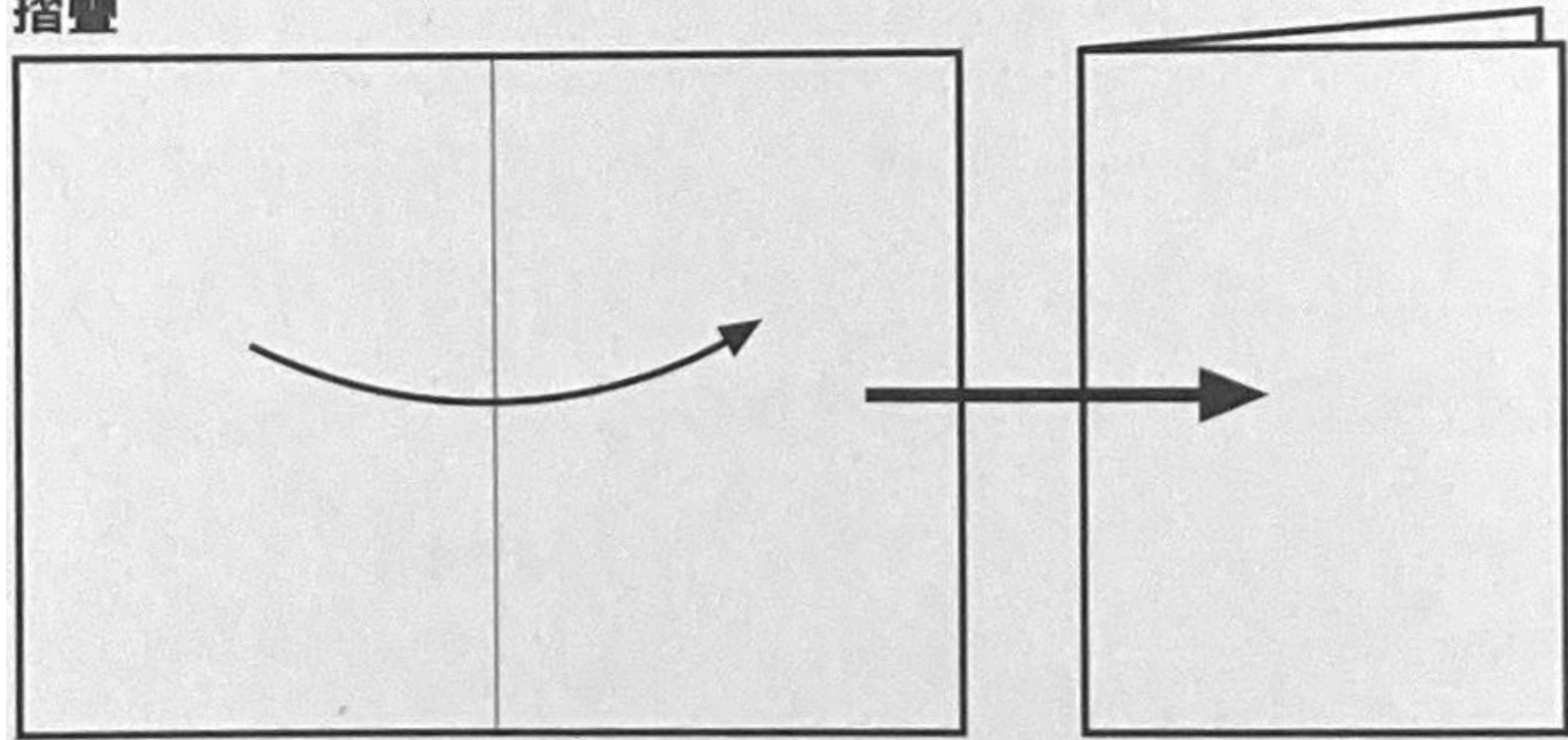
Diagram: Allan Wise
 © March 2007.
www.draftsperson.net/origami

Finished Preliminary Base

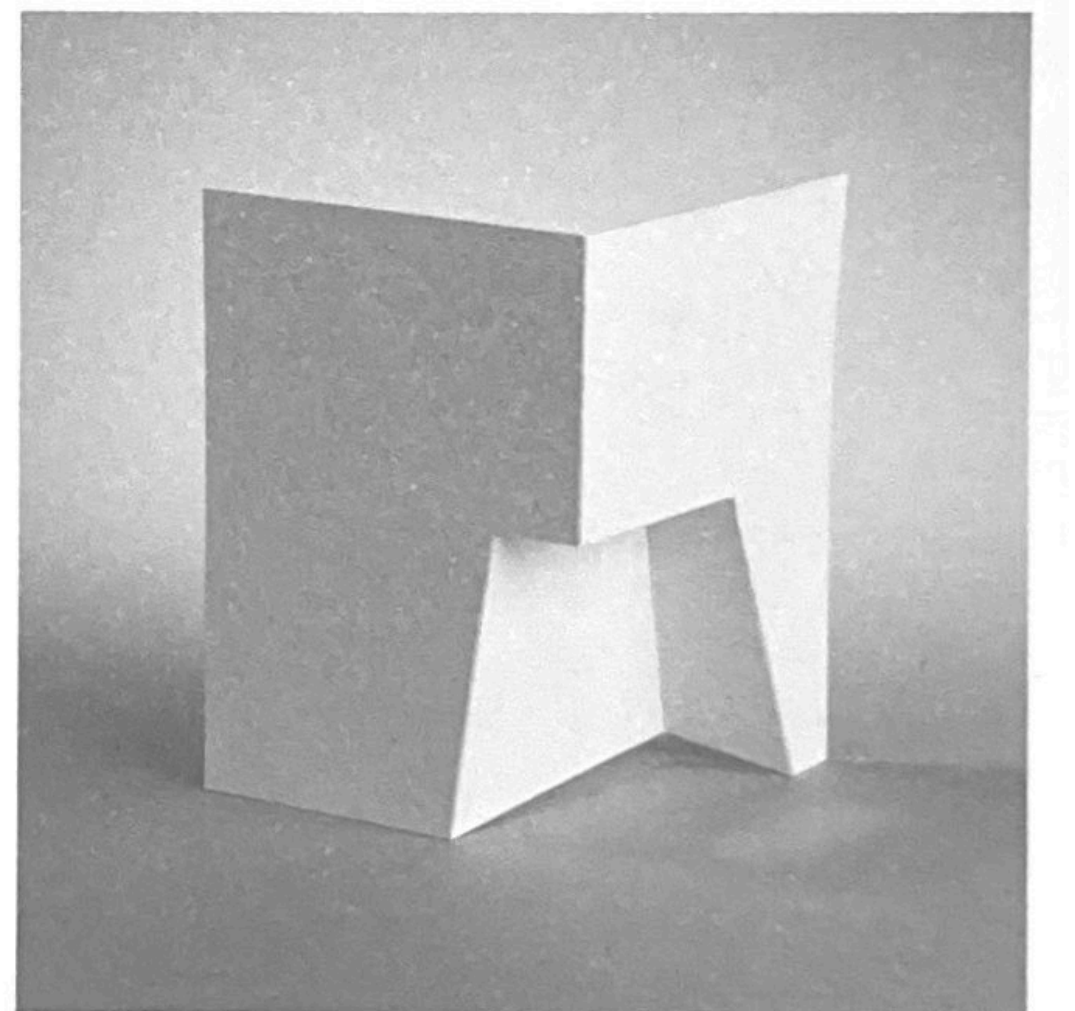
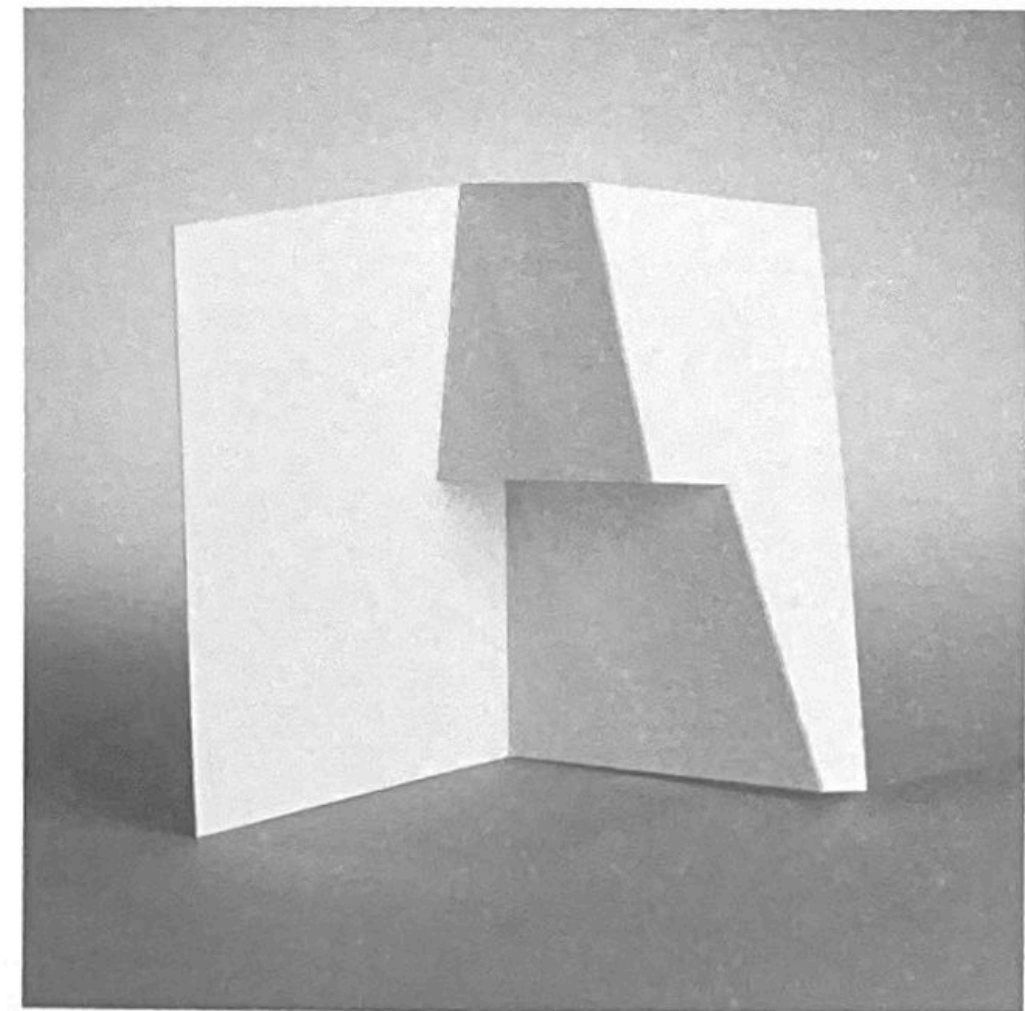
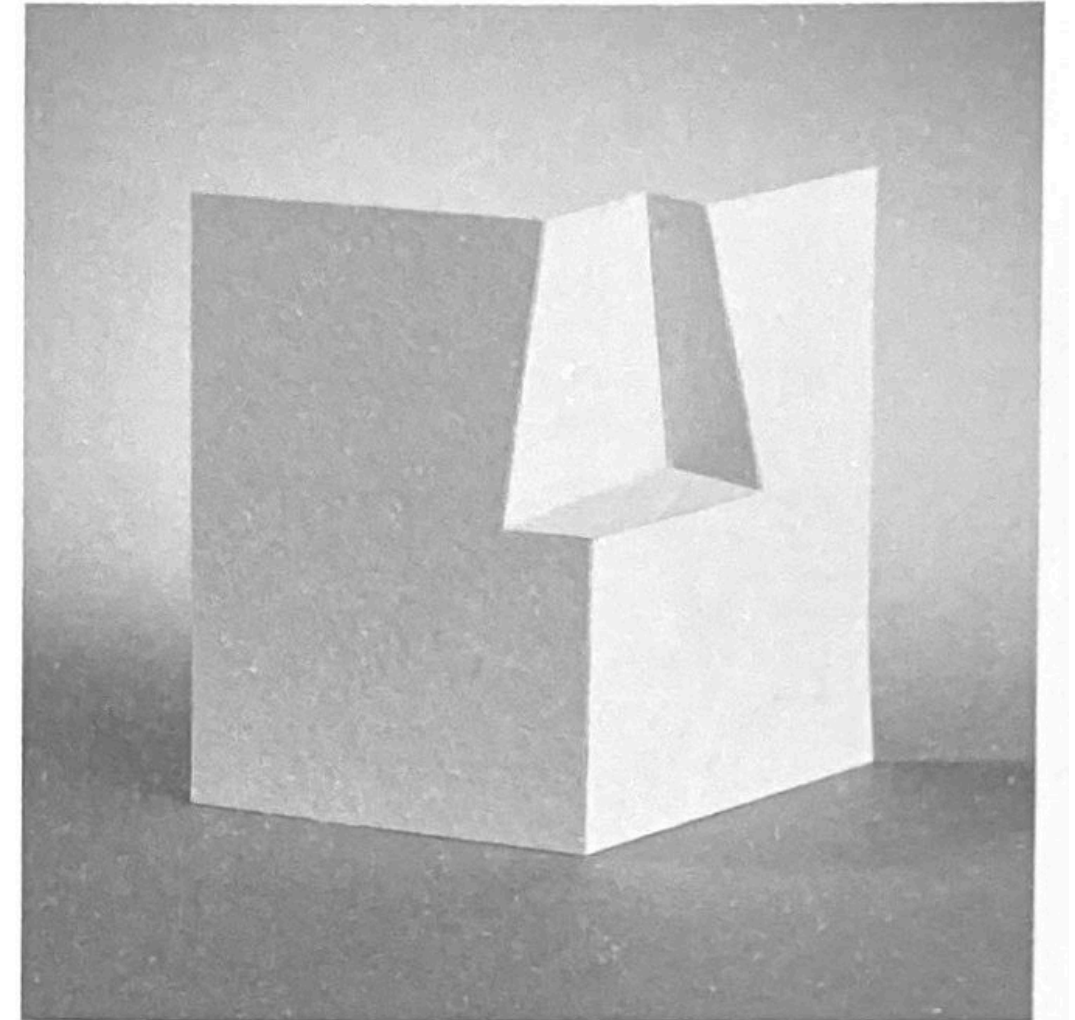
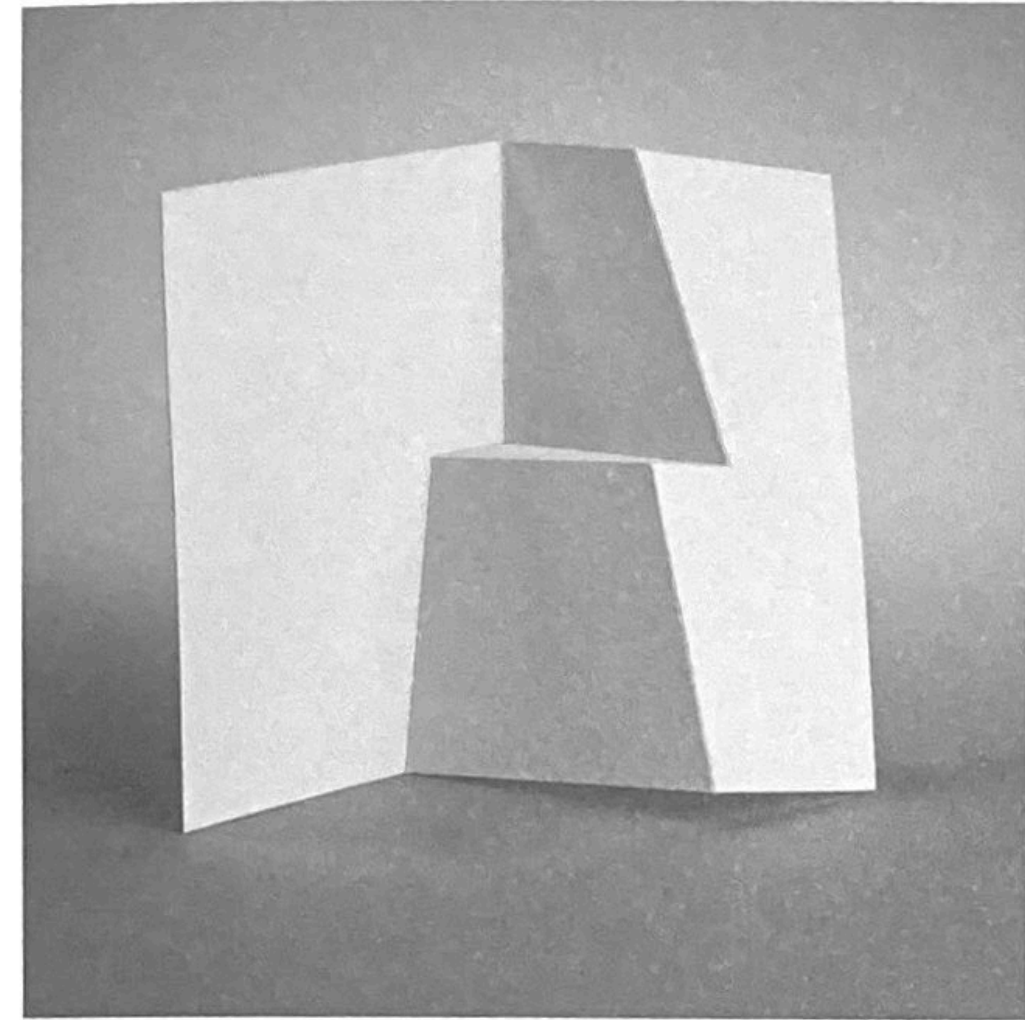
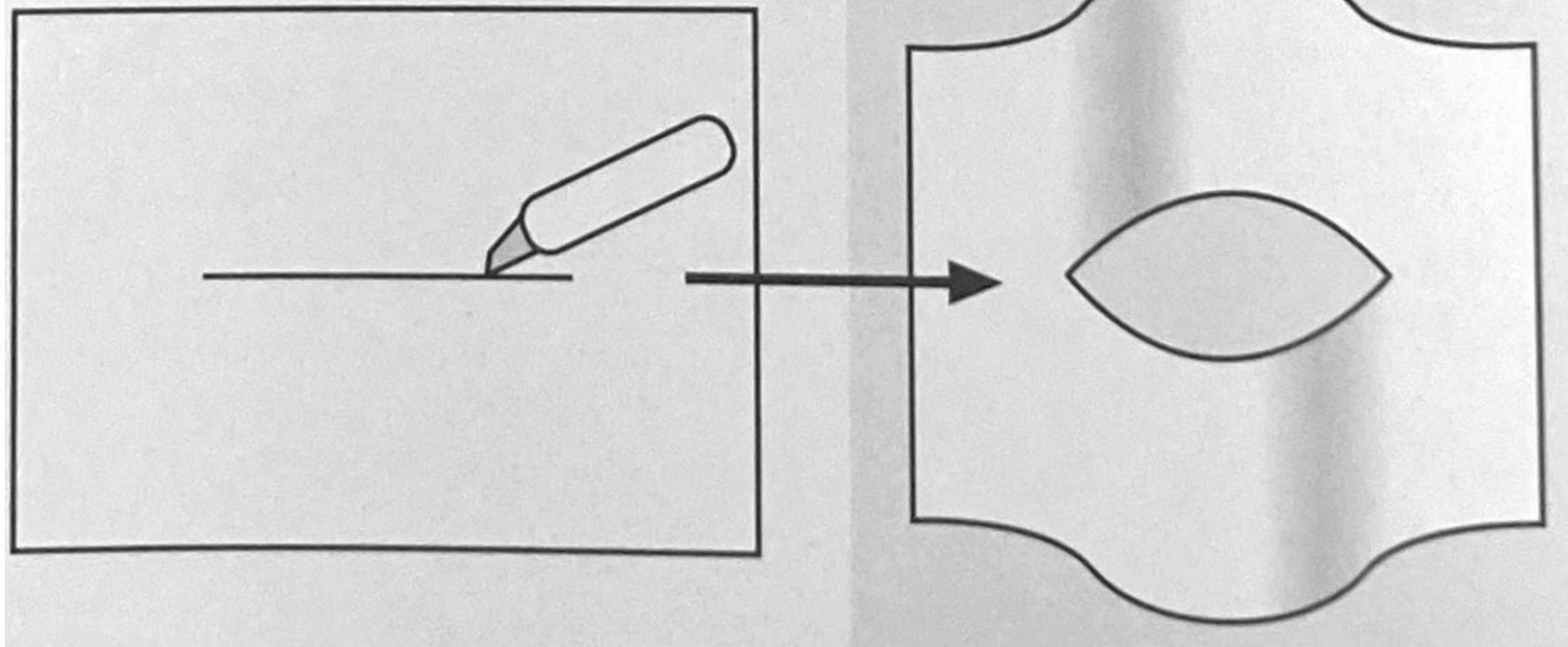




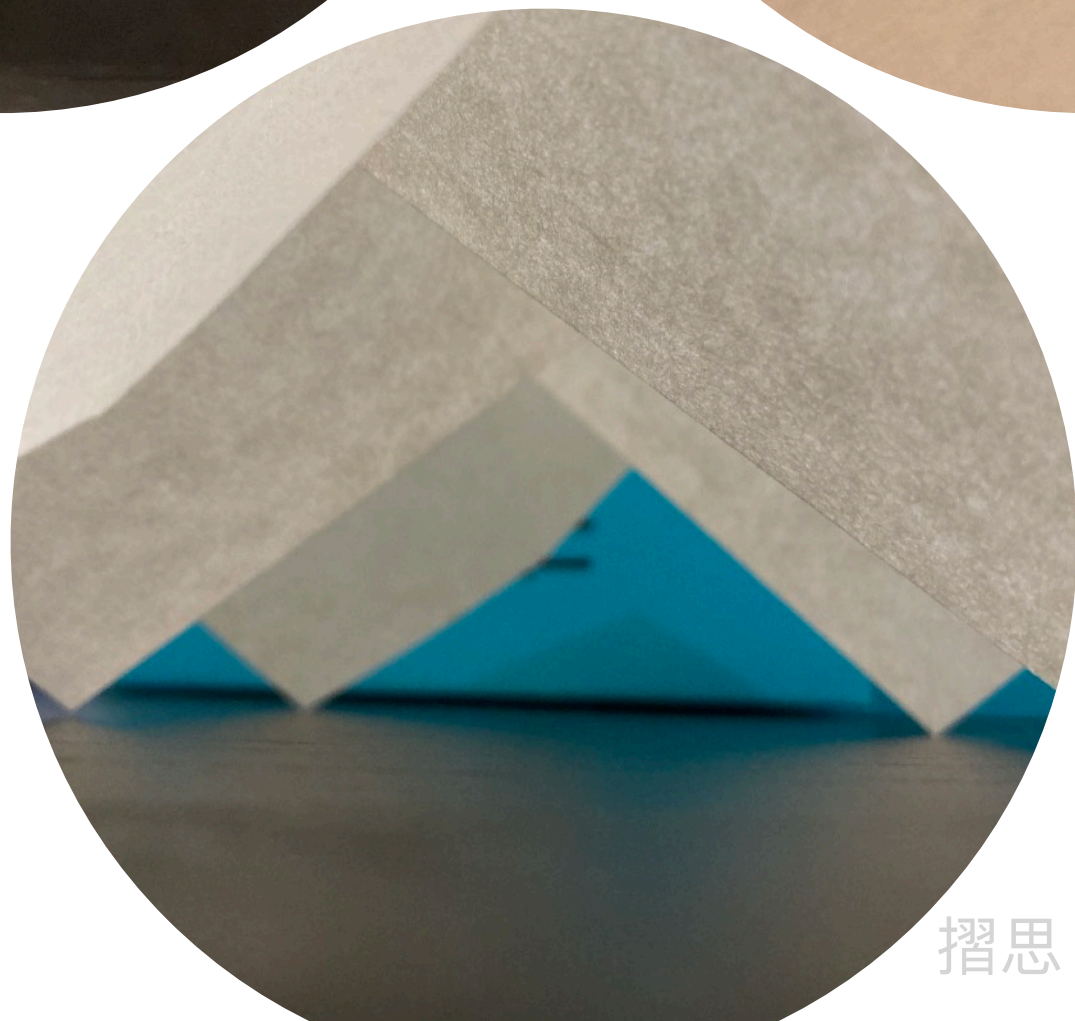
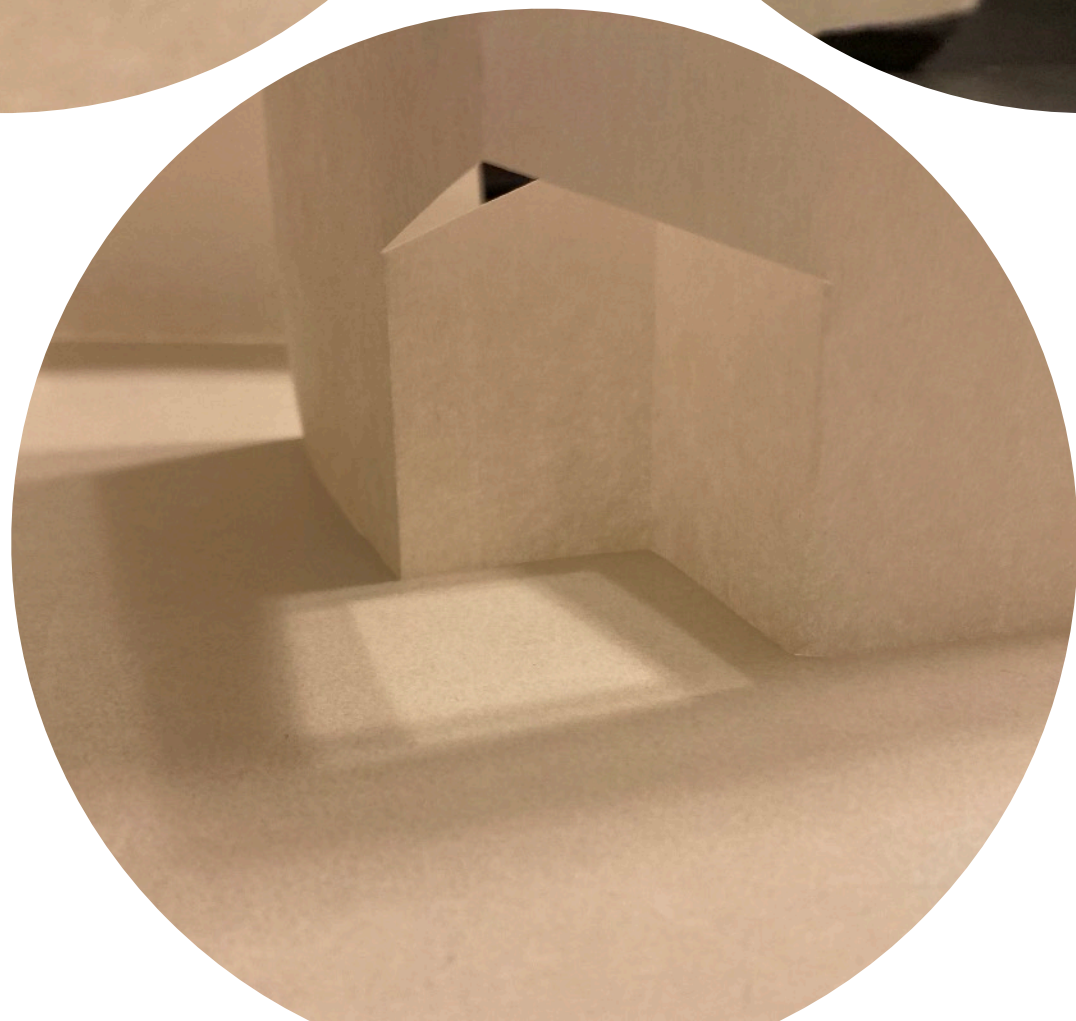
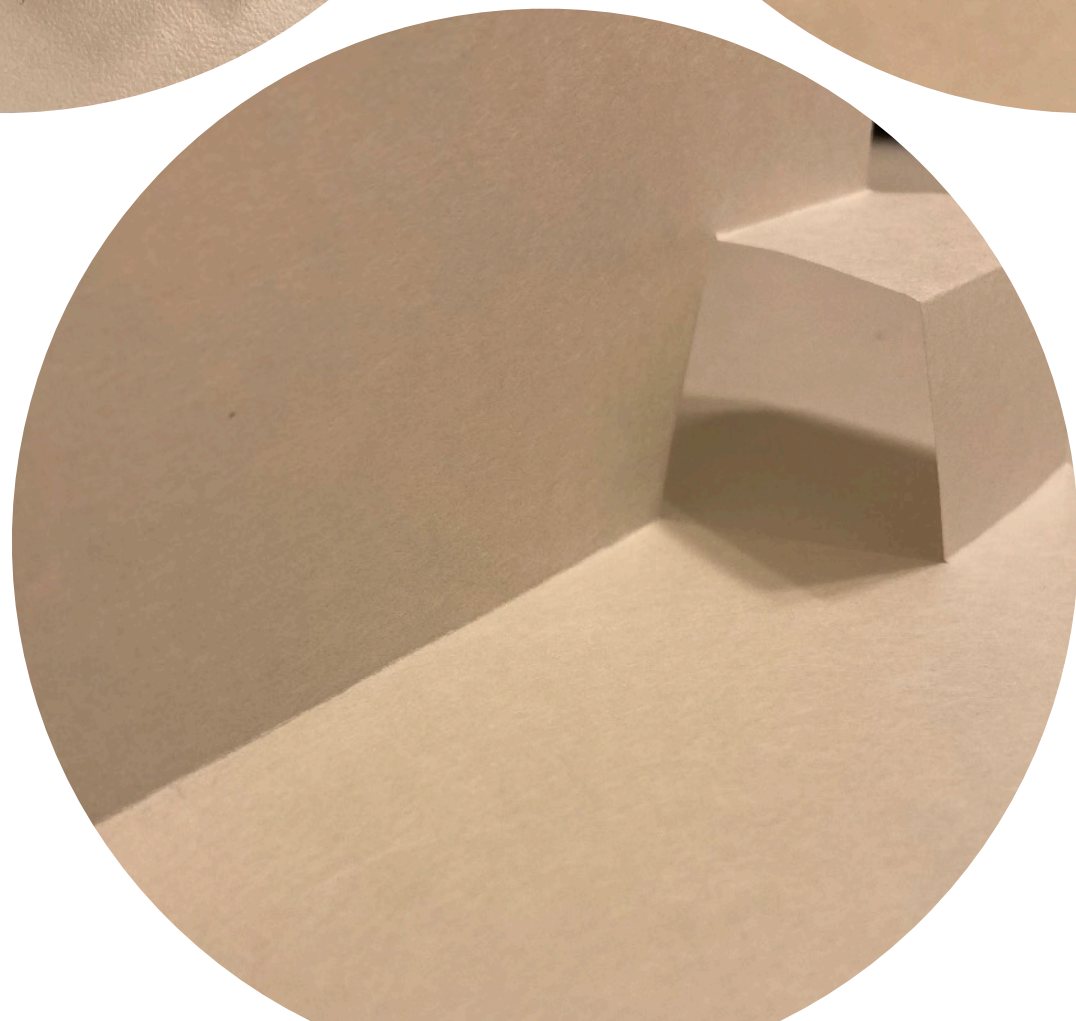
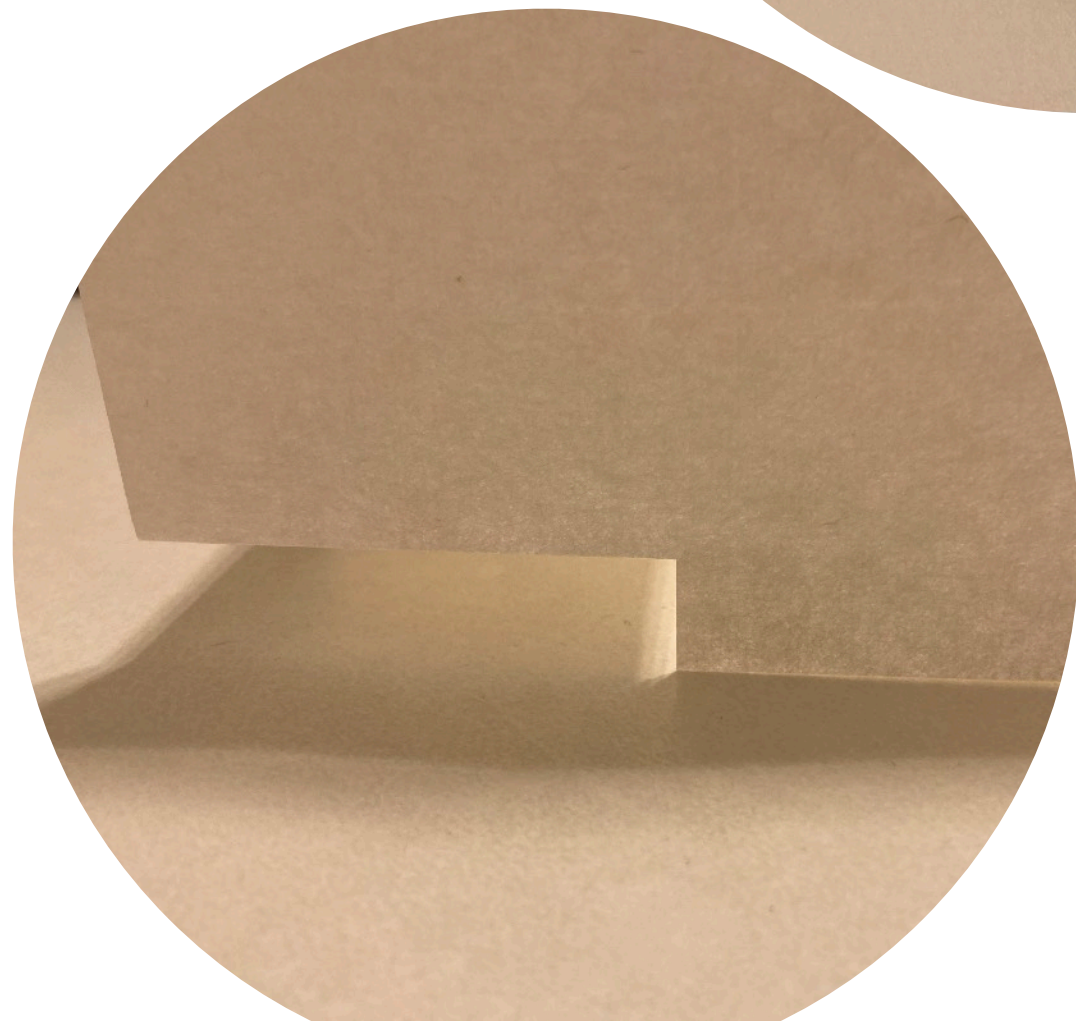
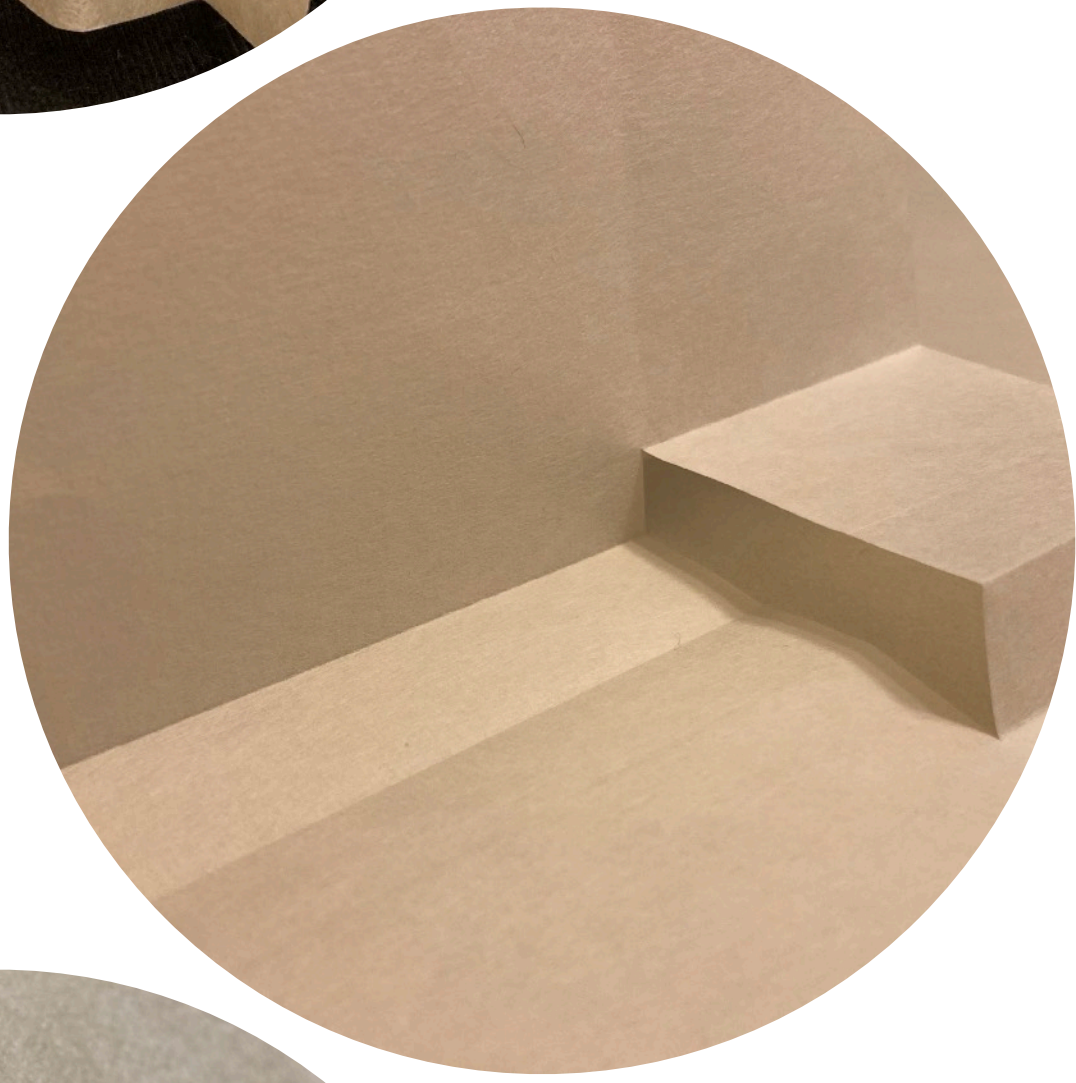
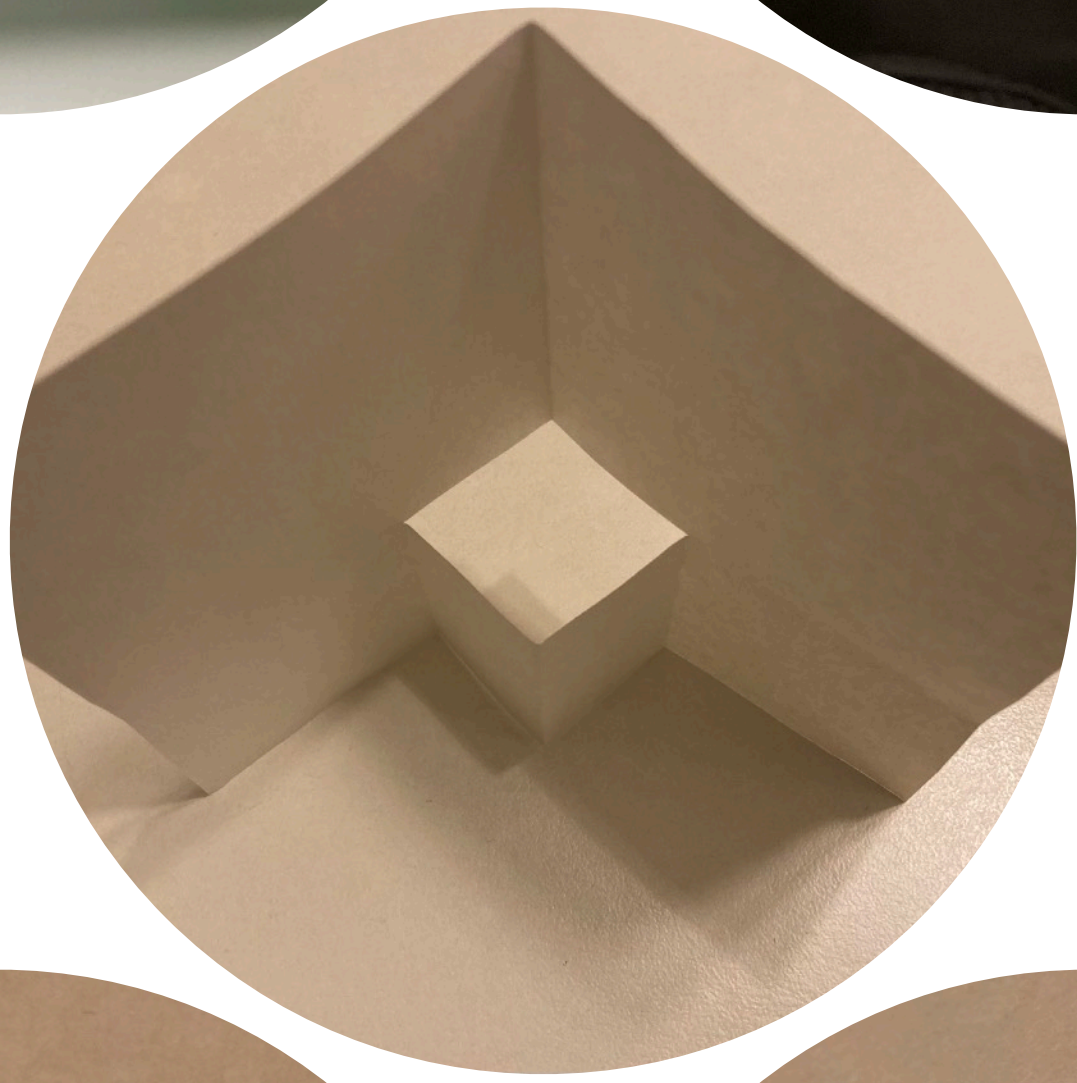
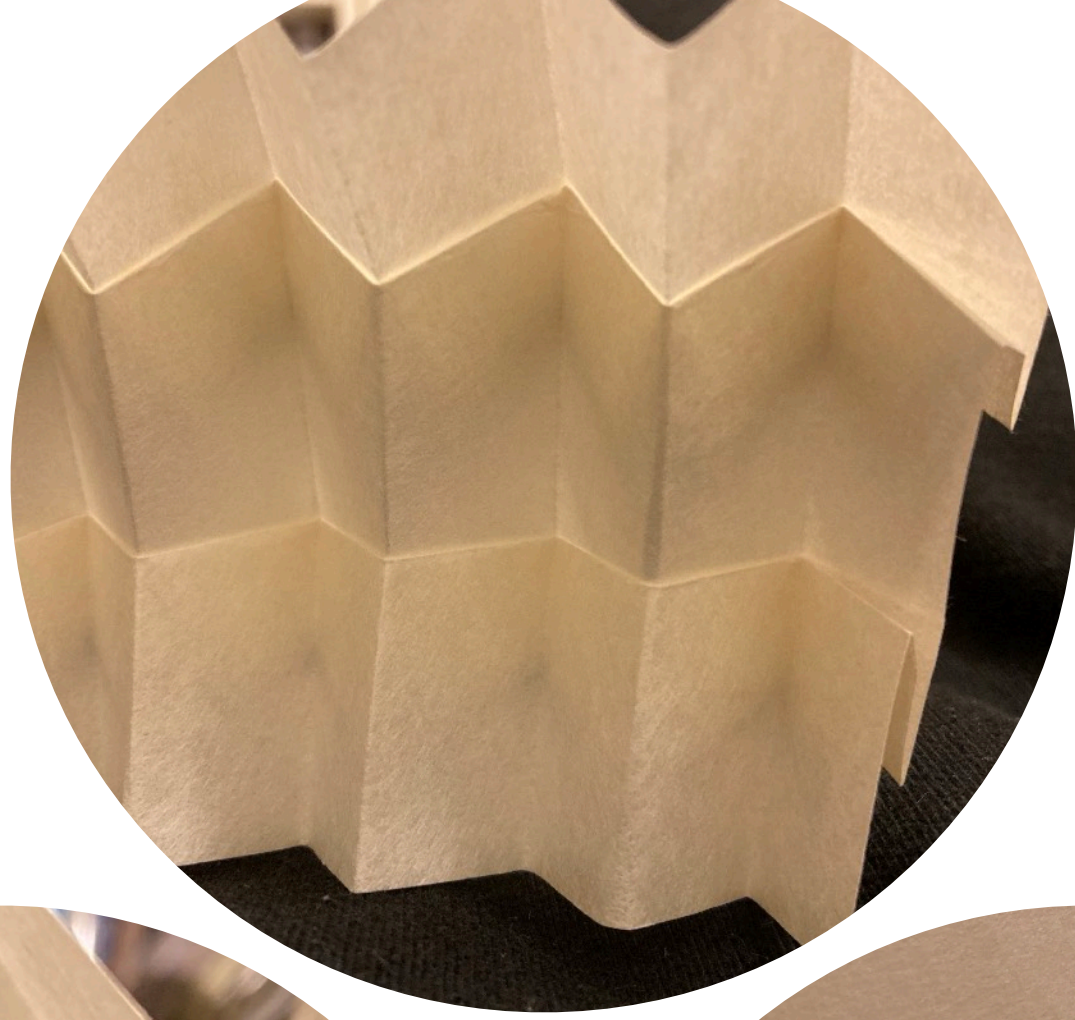
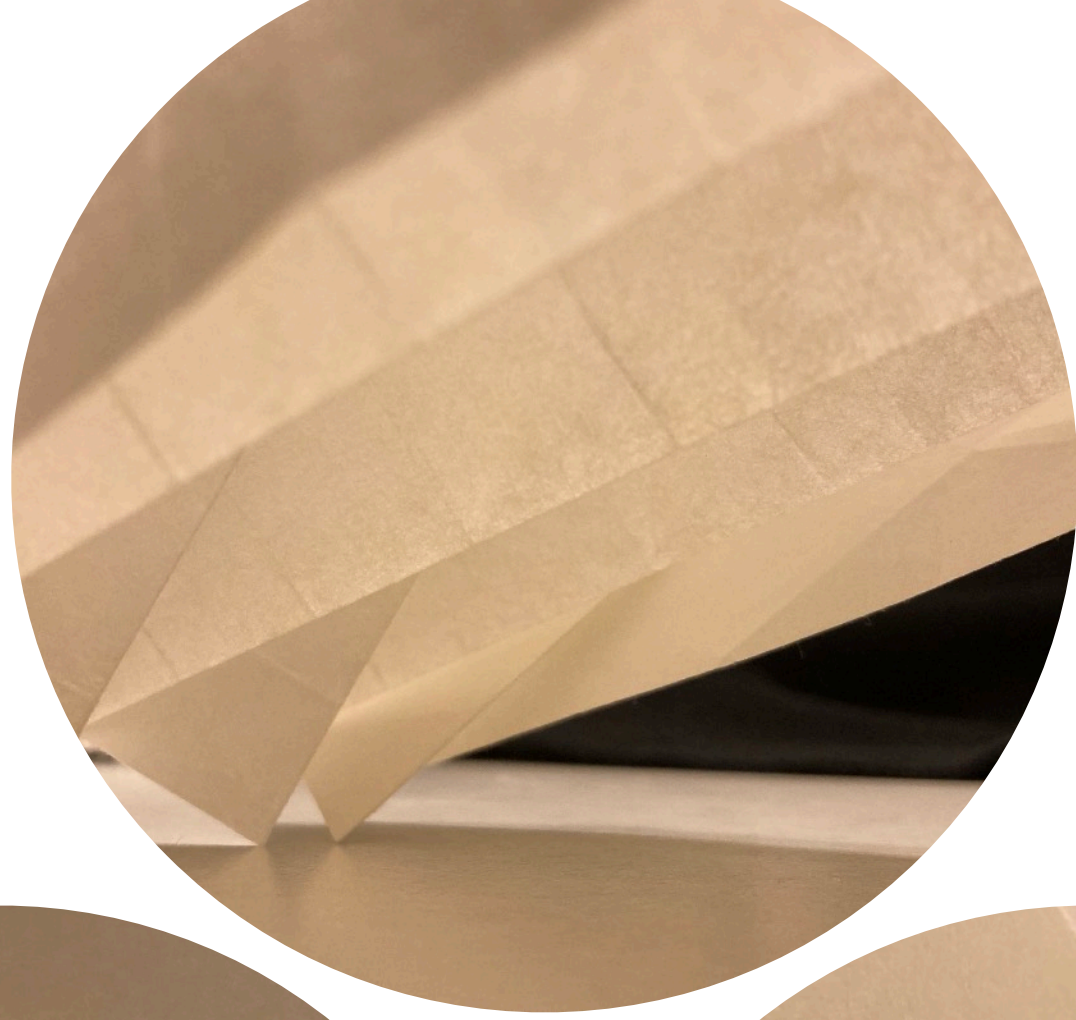
摺疊

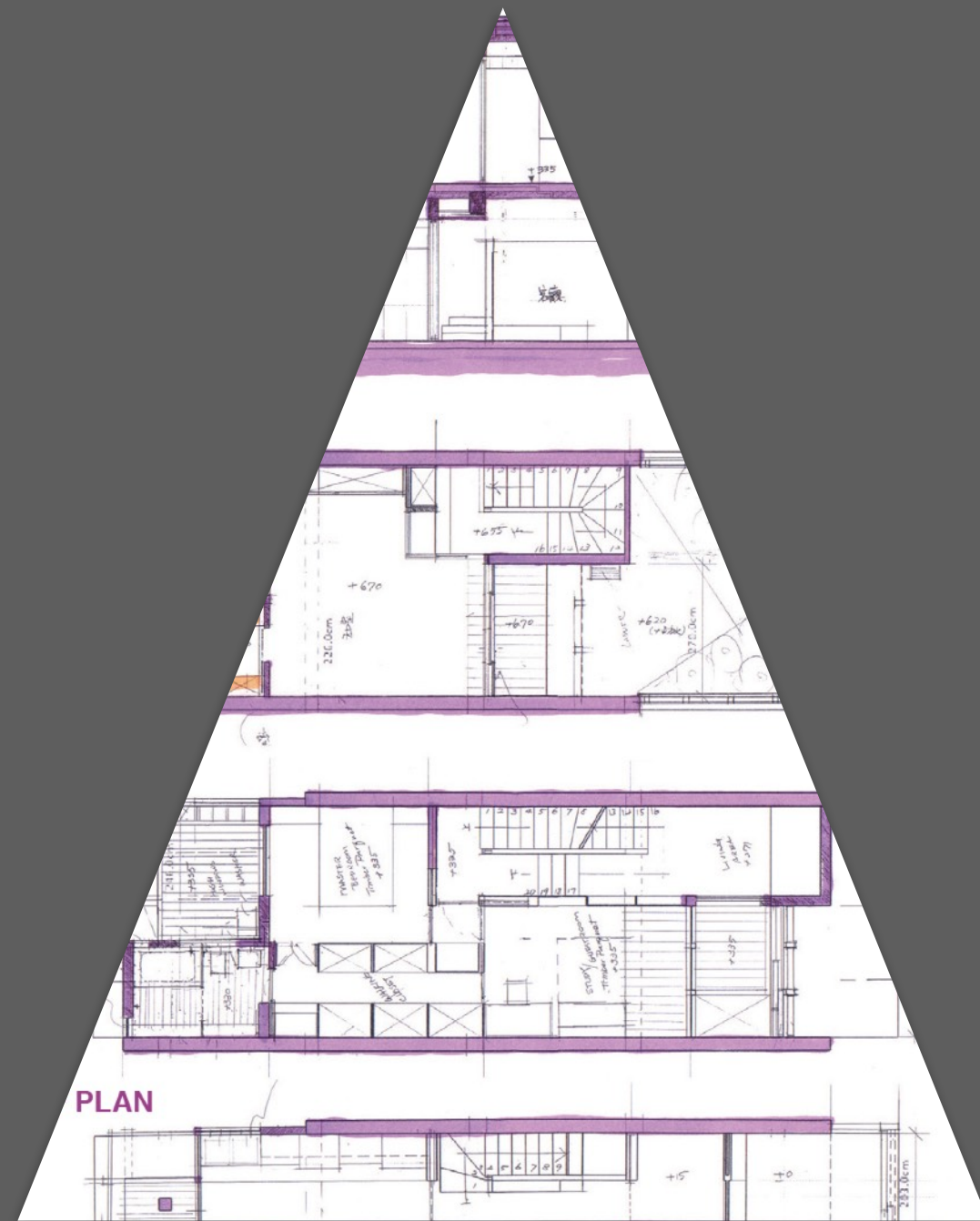


切割

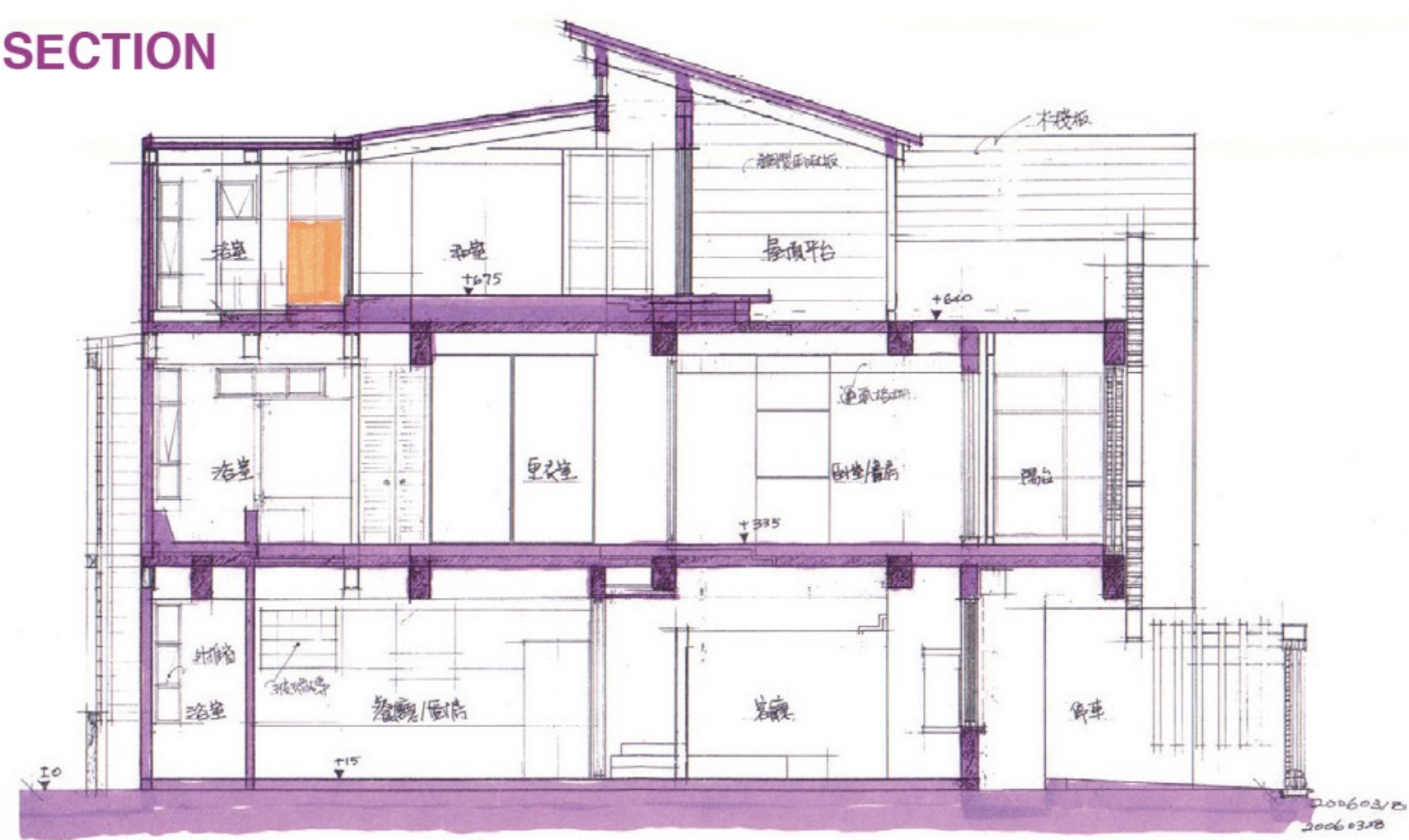


《設計摺學4》 Paul Jackson / 2018

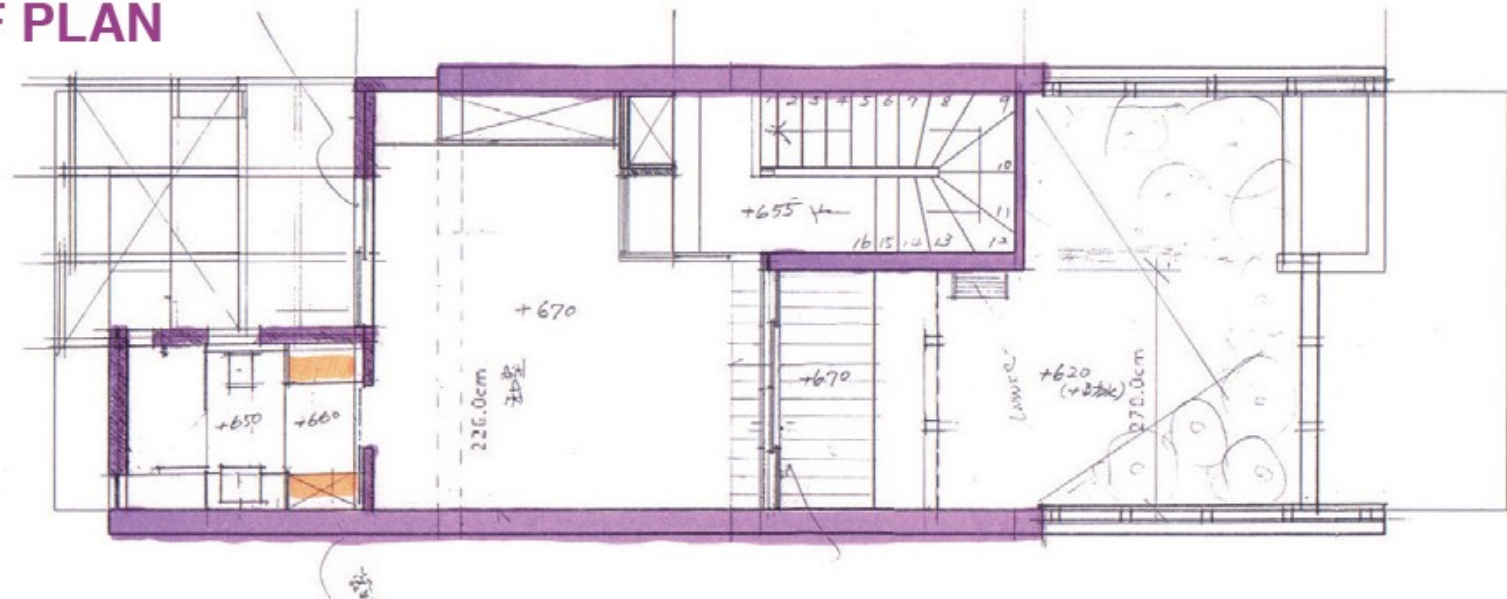




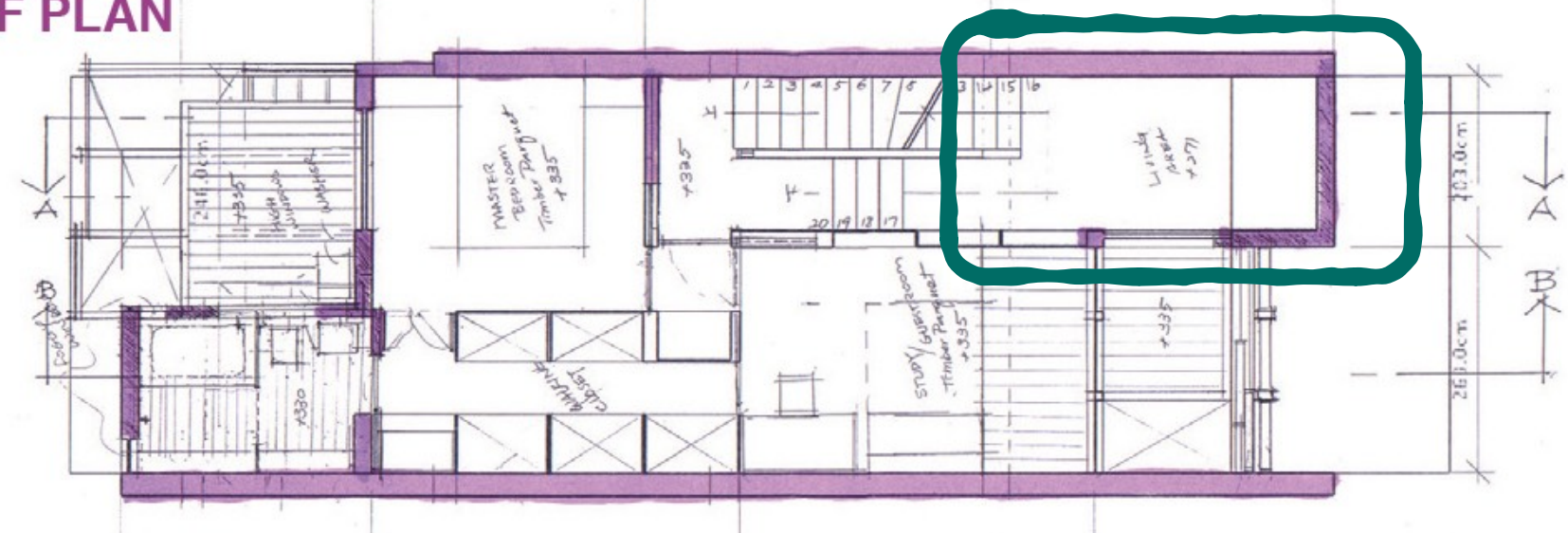
SECTION



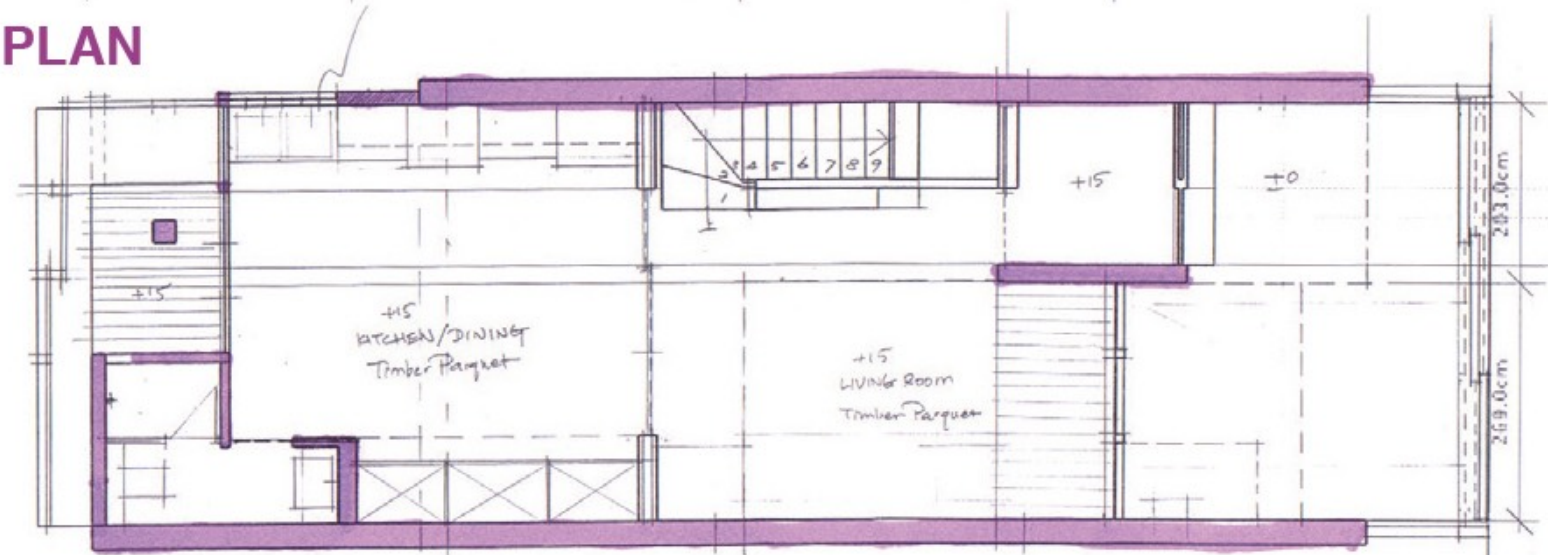
3F PLAN



2F PLAN



1F PLAN





Currency Exchange

Epic Mountain Express

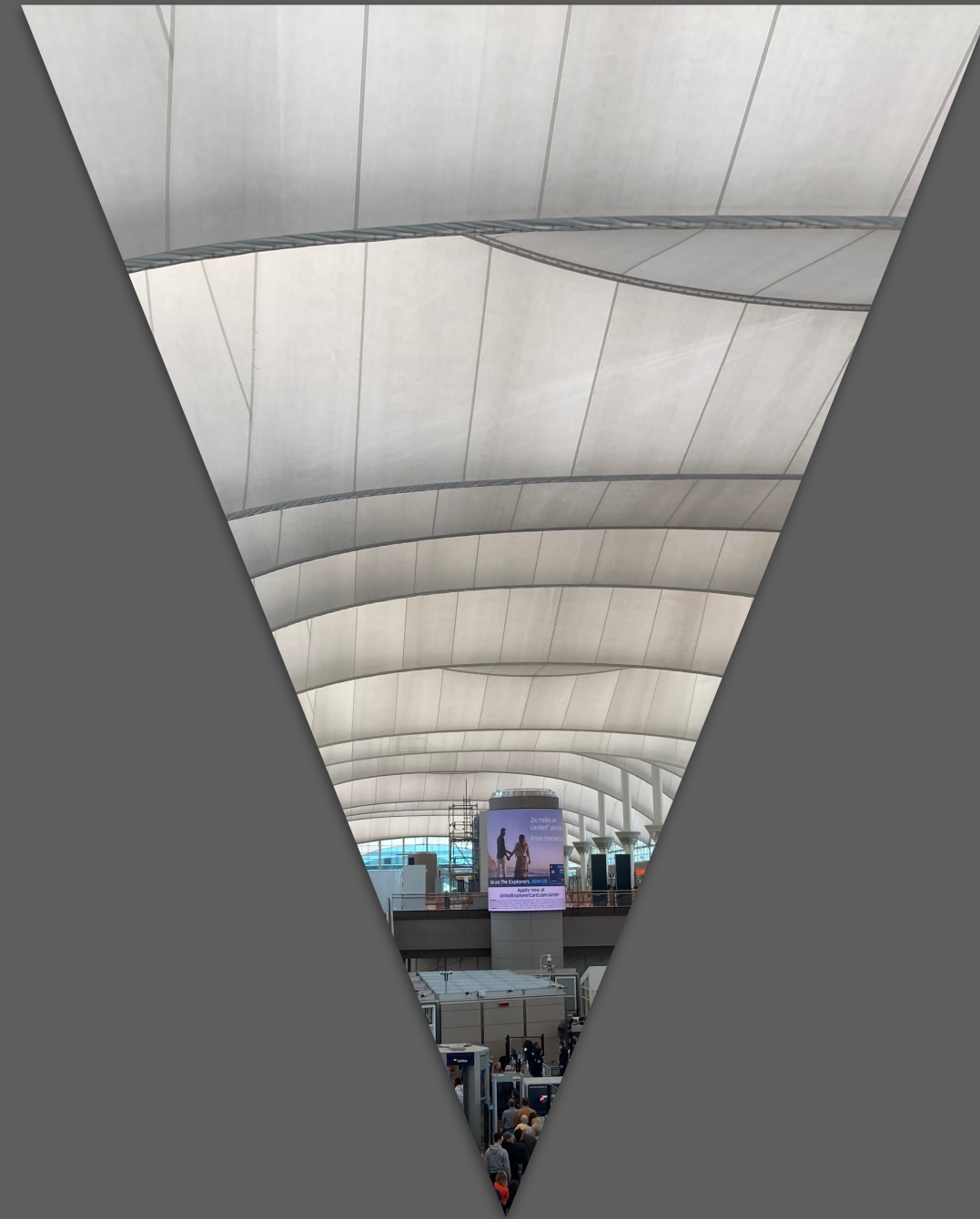
Terminal East

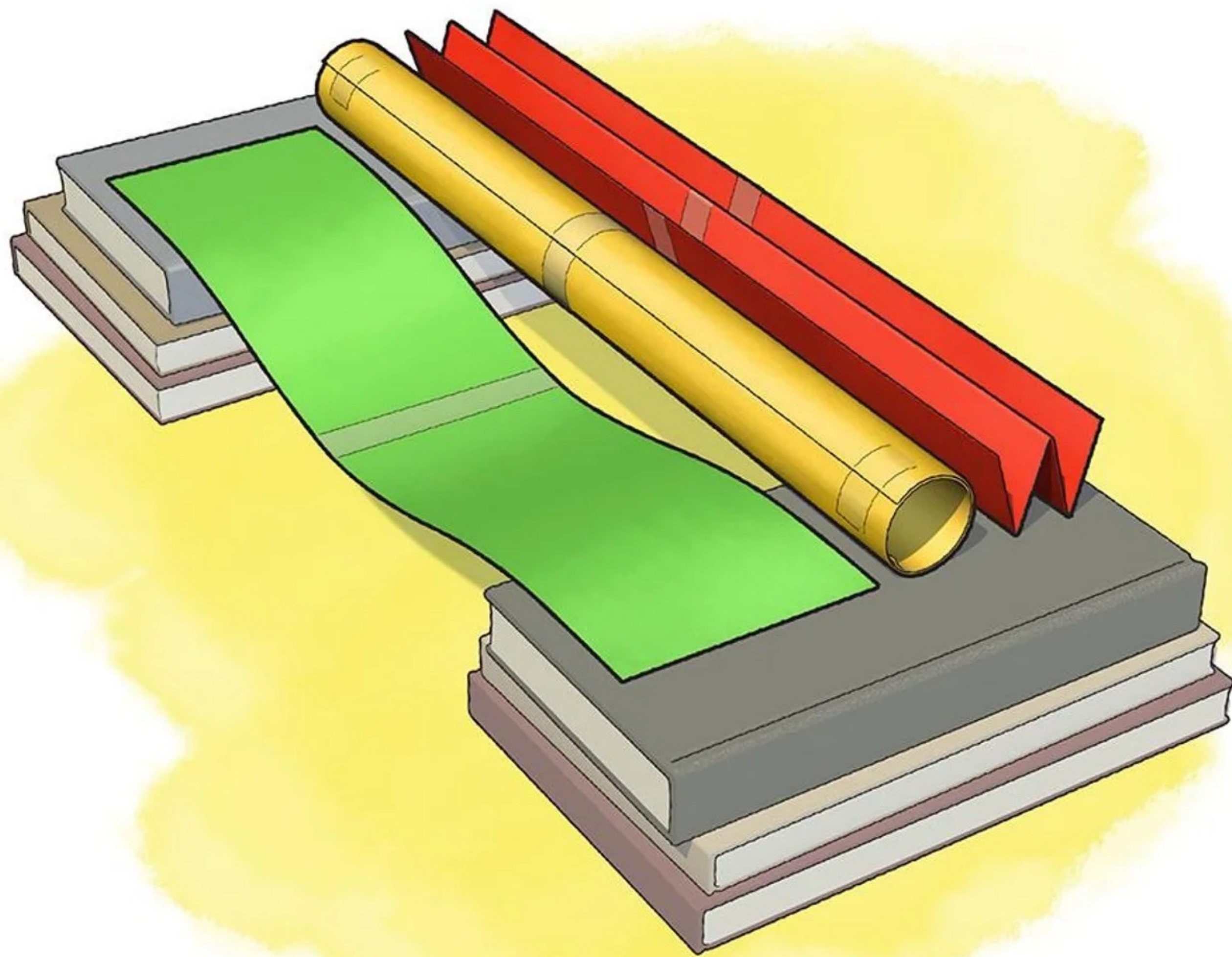
to all Gates

2x miles on United* per \$1,000 purchase. Free checked bags. We are The Explorers. JOIN US. Apply now at UnitedExplorerCard.com/Airport

2x miles on United* per \$1,000 purchase. Free checked bags. We are The Explorers. JOIN US. Apply now at UnitedExplorerCard.com/Airport







彎摺而成形抗結構

(圖片來源：<https://www.scientificamerican.com/article/paper-bridges/>)



基礎摺疊/造型 潘冀聯合建築師/新日光能源總部大樓 新竹 2007.02/2009.11

(圖片來源：<https://www.jjpan.com/en/project/commercial/neo-solar-power-office-building-complex>)



基礎摺疊/造型 山水秀建築設計/青松外苑 上海 2004.10/2005.07

(圖片來源：<http://scenicarchitecture.com/m/project.html#id=49>)



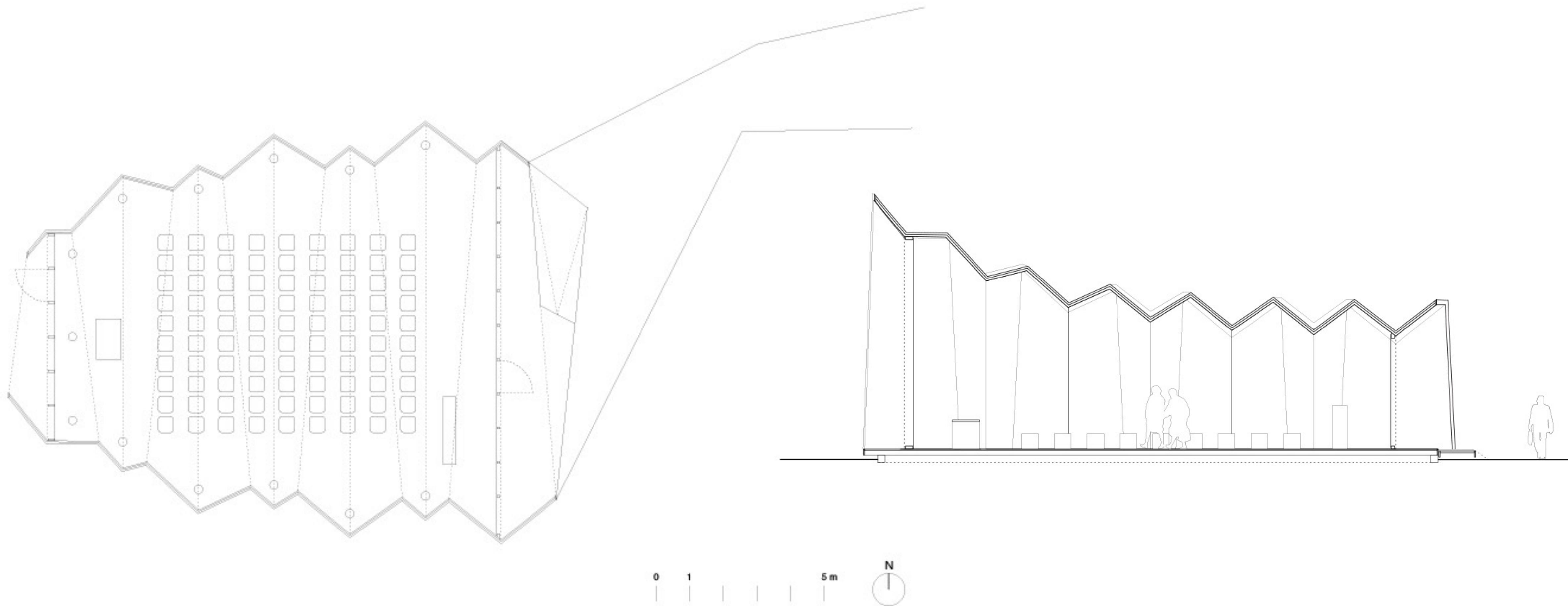
基礎摺疊/造型 Hironaka Ogawa & Associates Saitama 2012

(圖片來源：<https://www.ogaa.jp/project/PLTM/PLTM01.htm>)



V摺/造型+結構系統 LOCALARCHITECTURE/CHAPEL OF SAINT-LOUP POMPAPLES 2007/2008

(圖片來源：<https://localarchitecture.ch/projects/chapelle-de-st-loup/>)



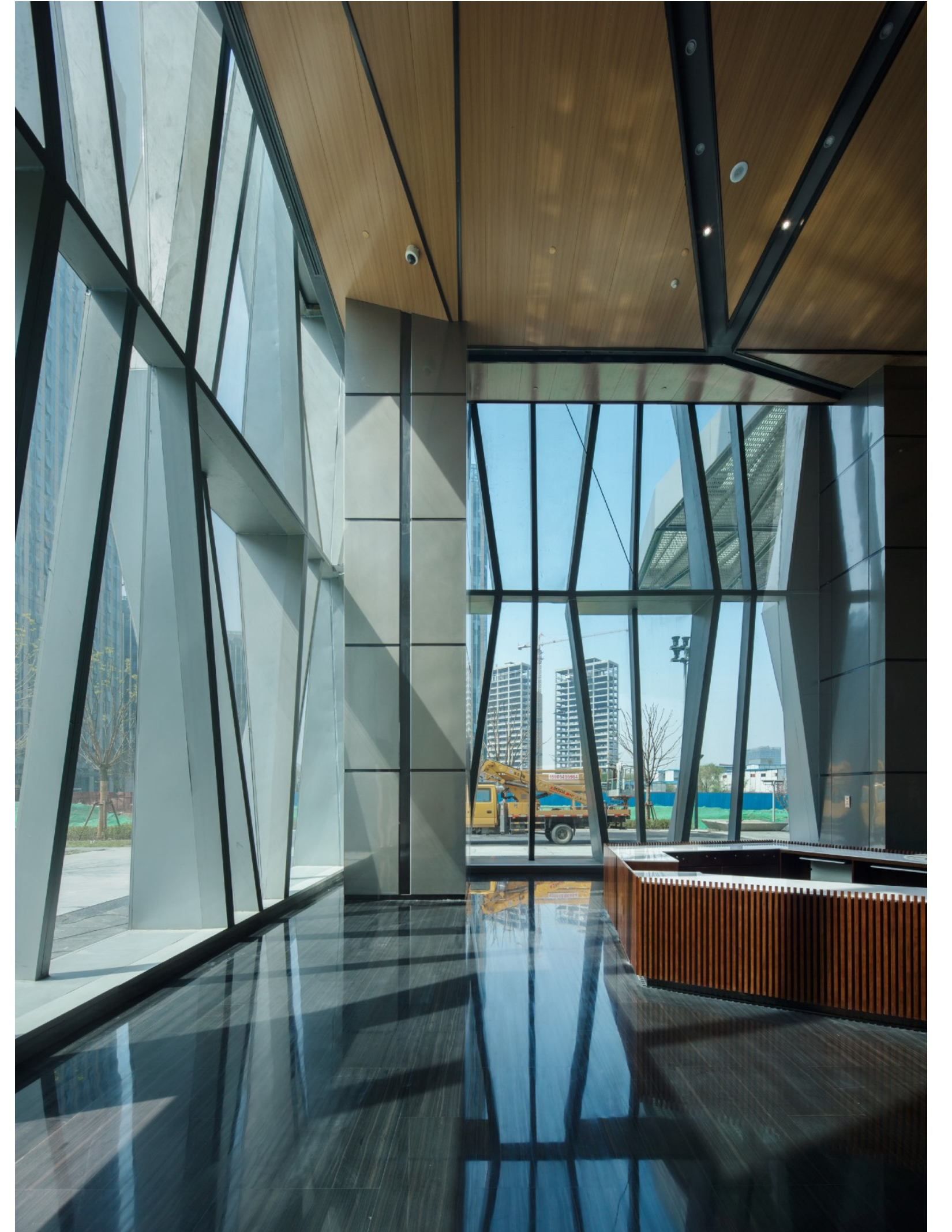
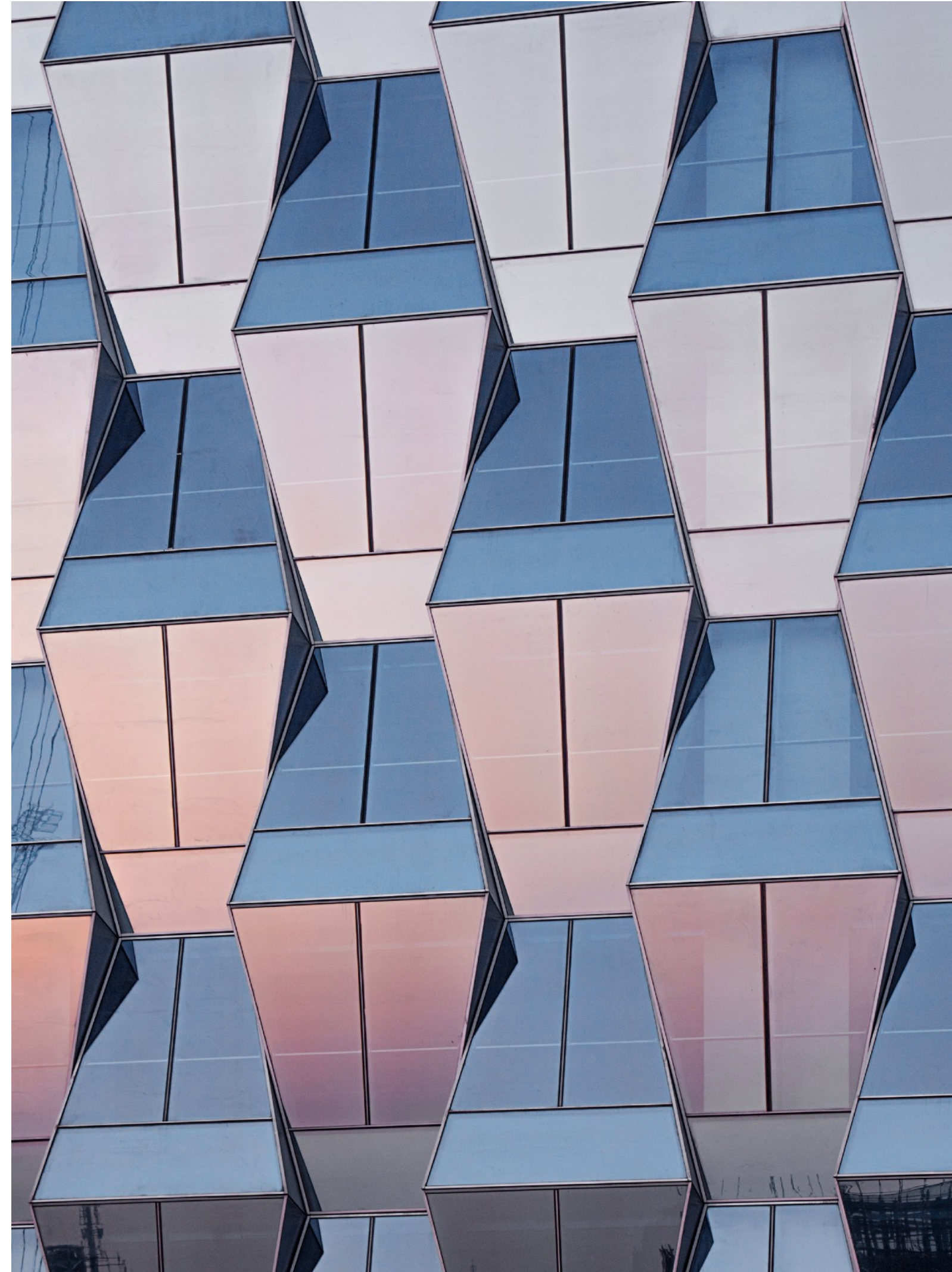
V摺/造型+結構系統 LOCALARCHITECTURE/CHAPEL OF SAINT-LOUP POMPAULES 2007/2008

(圖片來源：<https://localarchitecture.ch/projects/chapelle-de-st-loup/>)



基礎摺疊/造型+結構系統 Eladio Dieste/Terminal de Ómnibus Salto Uruguay 1973

(圖片來源：<https://www.fadu.edu.uy/eladio-dieste/obras/terminal-municipal-de-omnibus/>)



基礎摺疊/造型+建築性能 S.O.M./Beijing Greenland Center Beijing 2012/2016

(圖片來源：https://www.detail.de/de_en/eye-catcher-in-beijing-greenland-center-by-som-29621；攝影：Lv Hengzhong)





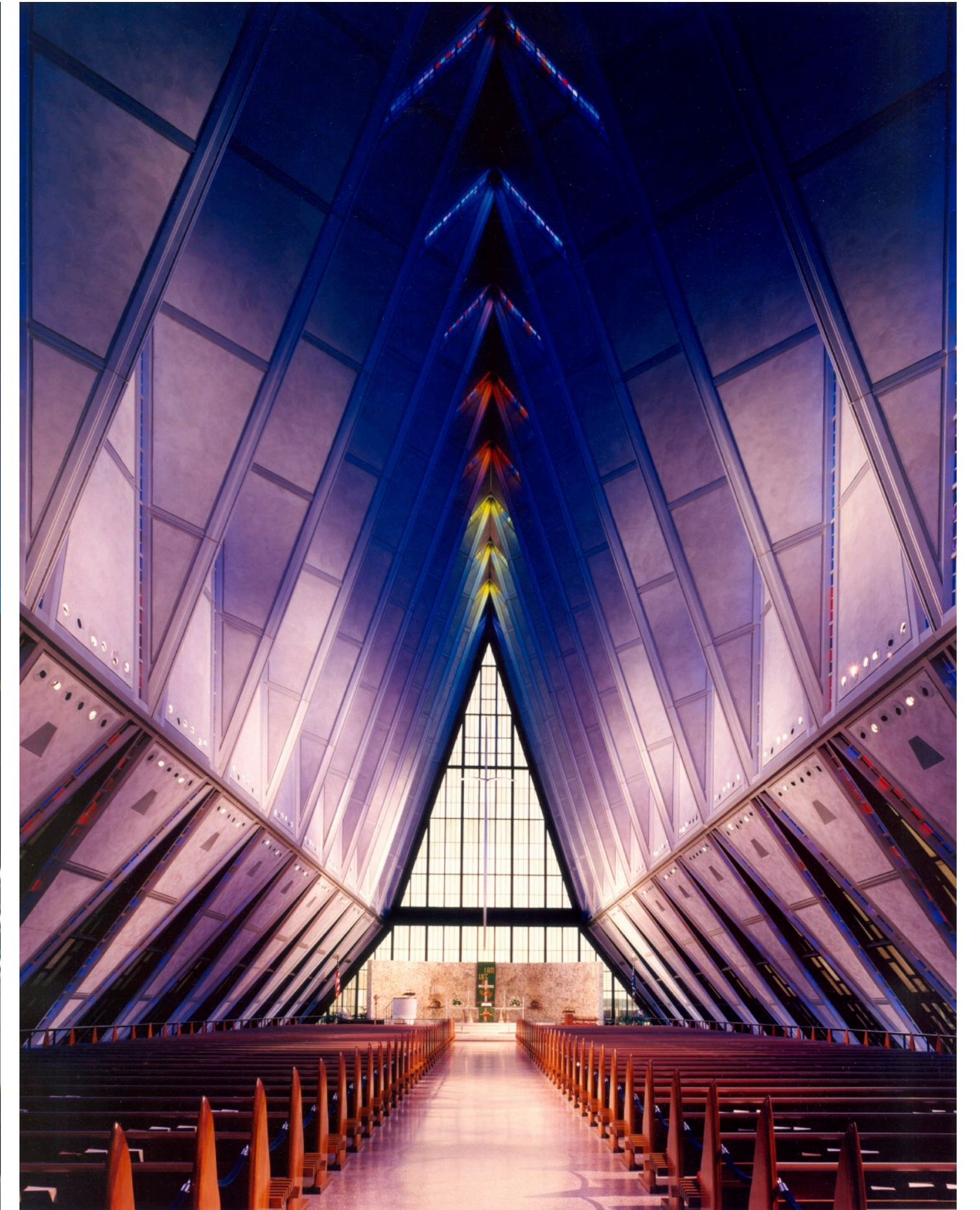
V摺/造型+結構系統+空間 Eladio Dieste/Iglesia de Atlántida Canelones Uruguay 1958/1960

(圖片來源：<https://www.fadu.edu.uy/eladio-dieste/obras/iglesia-atlantida/>)



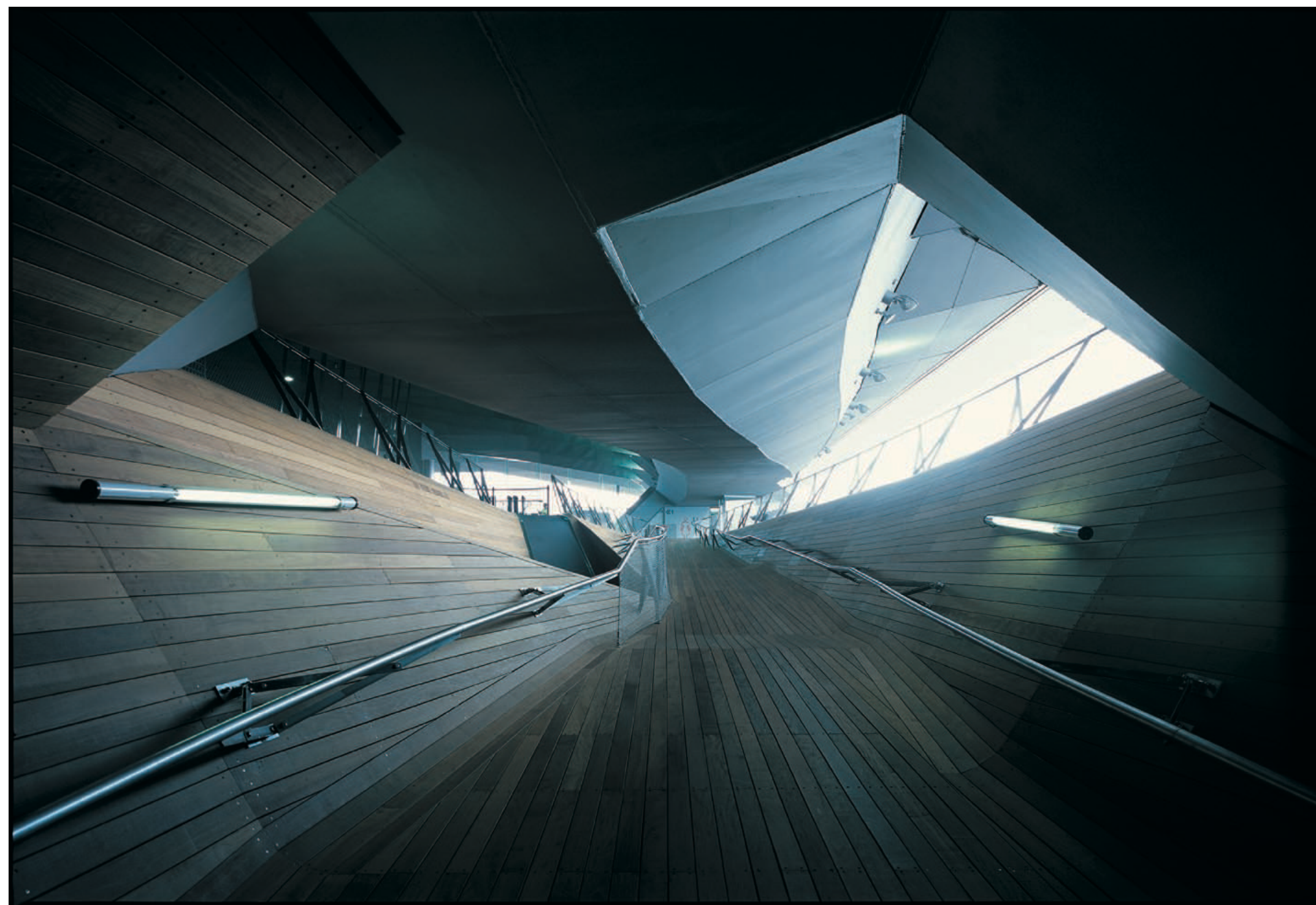
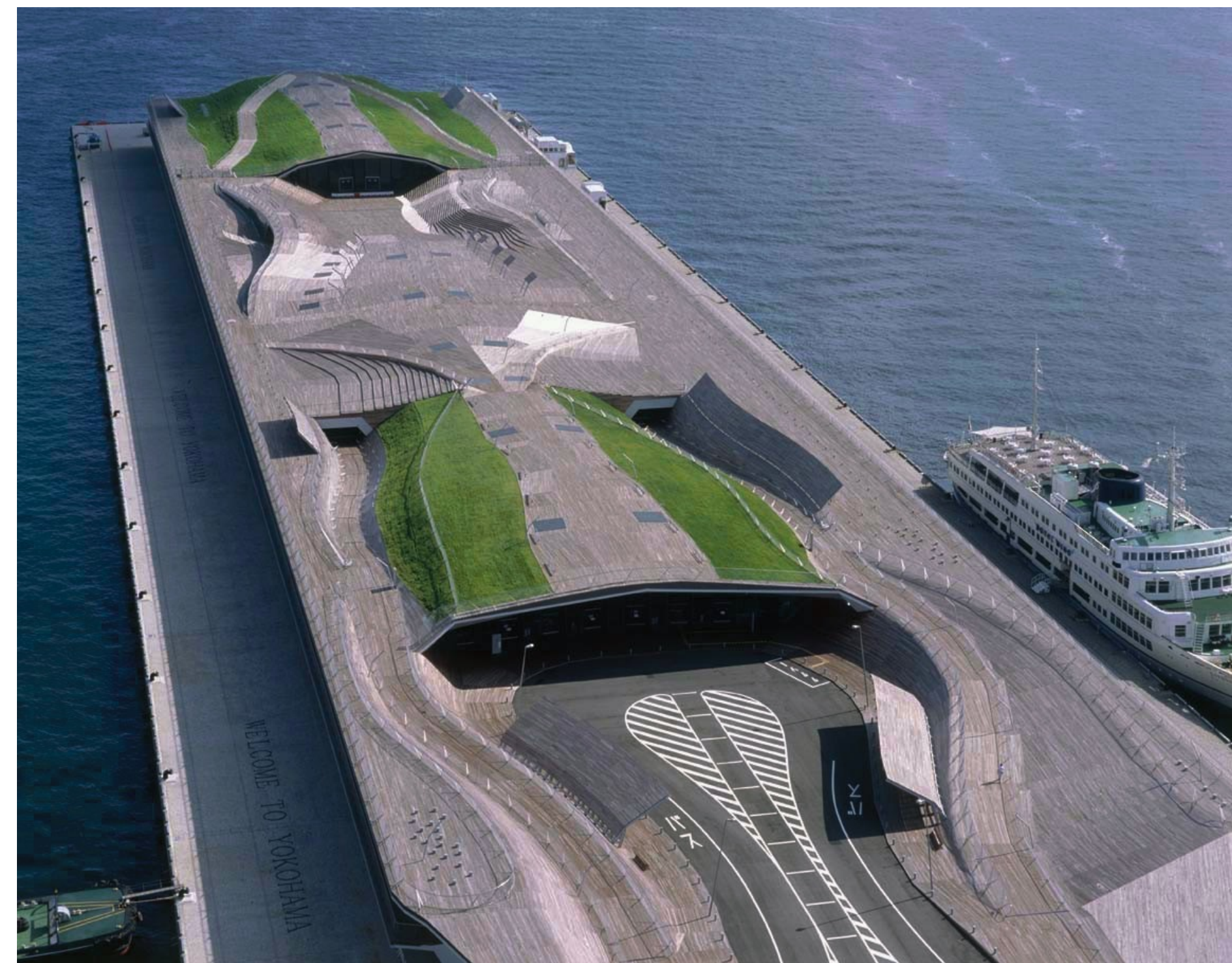
V摺/造型+結構系統+空間 Eladio Dieste/Iglesia de Atlántida Canelones Uruguay 1958/1960

(圖片來源：<https://www.fadu.edu.uy/eladio-dieste/obras/iglesia-atlantida/>)



摺疊/造型+空間 S.O.M/U.S. Air Force Cadet Chapel Colorado Spring 1954/1962

(圖片來源：<https://www.som.com/projects/u-s-air-force-academy-cadet-chapel/>)



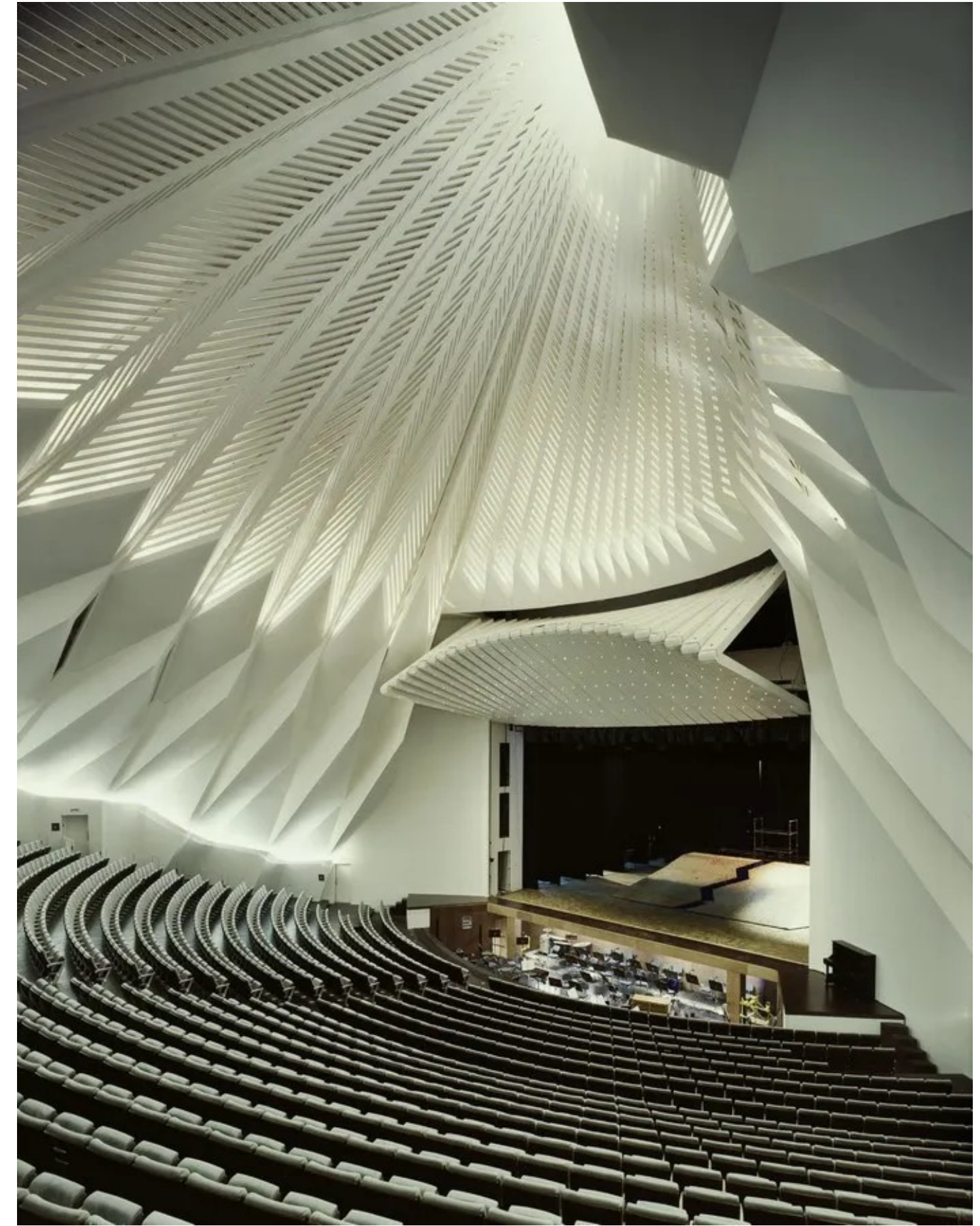
摺疊/造型+空間 FOA/Yokohama International Passenger Terminal Yokohama 1995/2002

(圖片來源：<https://www.archdaily.com/554132/ad-classics-yokohama-international-passenger-terminal-foreign-office-architects-foa>；攝影：Satoru Mishima / FOA)



摺疊/造型+空間 Santiago Calatrava/Lisbon Orient Station Lisbon Spain 1993/1998

(圖片來源：<https://architectuul.com/architecture/lisbon-orient-station>)



摺疊/造型+空間 Santiago Calatrava/Adan Martin Auditorio de Tenerife Spain 1991/2003

(圖片來源：<https://calatrava.com/projects/adan-martin-auditorio-de-tenerife-santa-cruz-de-tenerife.html>)



摺疊/造型+空間 Santiago Calatrava/Mediopadana Station Reggio Emilia Italy 2002/2014

(圖片來源：<https://parametric-architecture.com/mediopadana-station-by-santiago-calatrava/>；攝影：Oscar Ferrari)



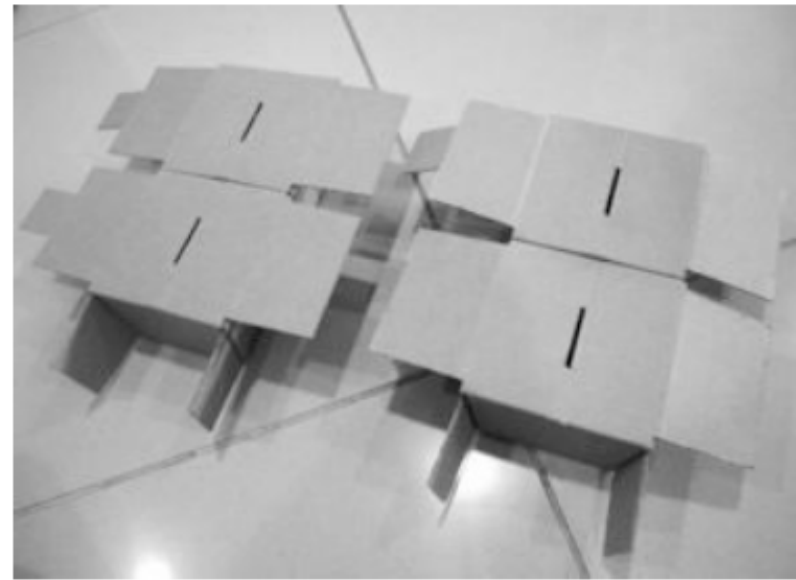


圖 2.34 組裝前紙箱



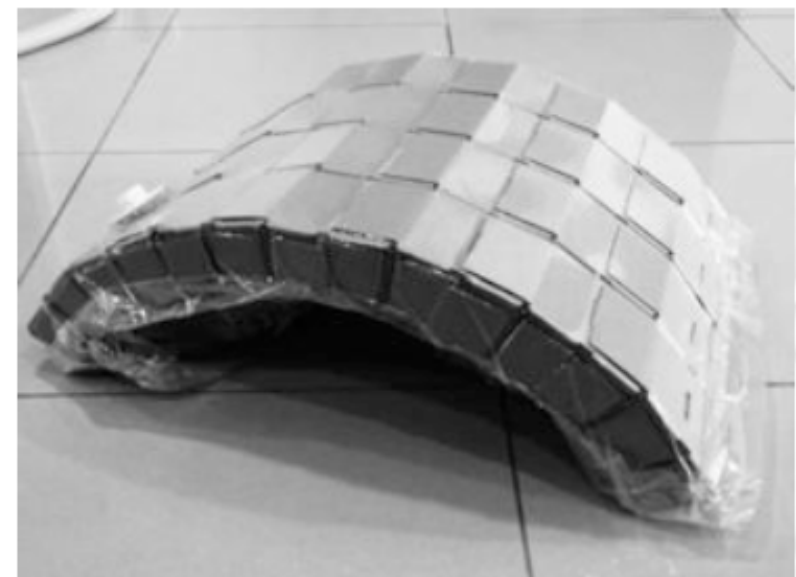
圖 2.35 真空前令紙箱單元緊靠



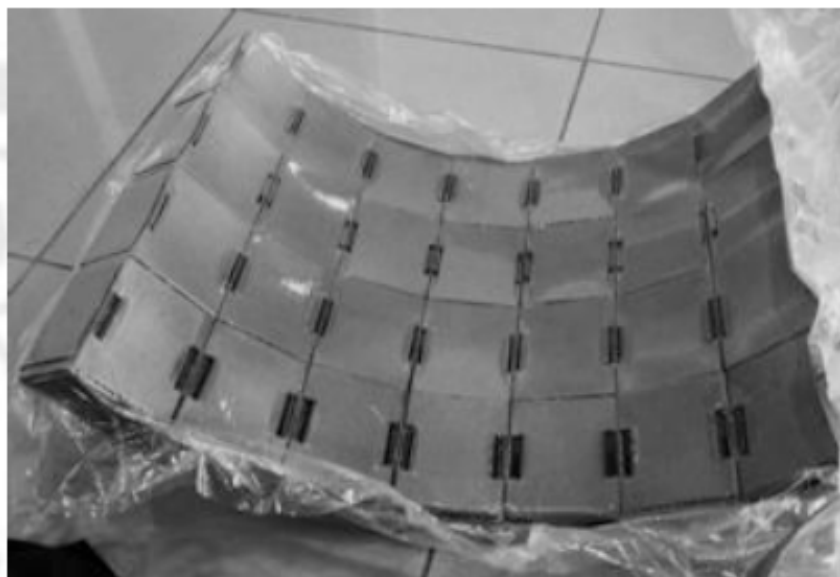
(a) 基礎滲水處下雨第一天抽真空情形



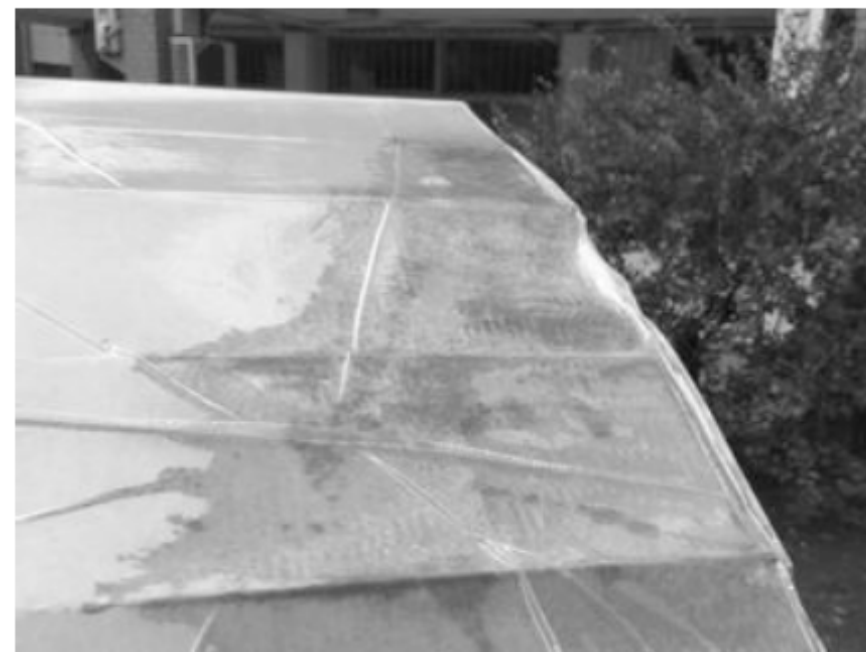
(b) 基礎滲水處下雨三天後抽真空情形



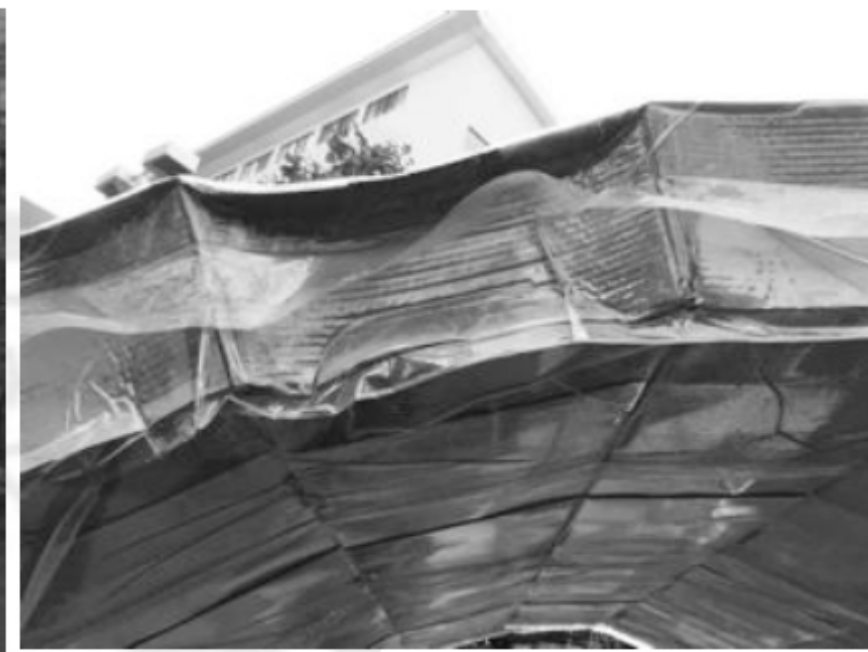
(a) 紙箱頂面



(b) 紙箱底面



(c) 下雨三天後尖拱漏水處



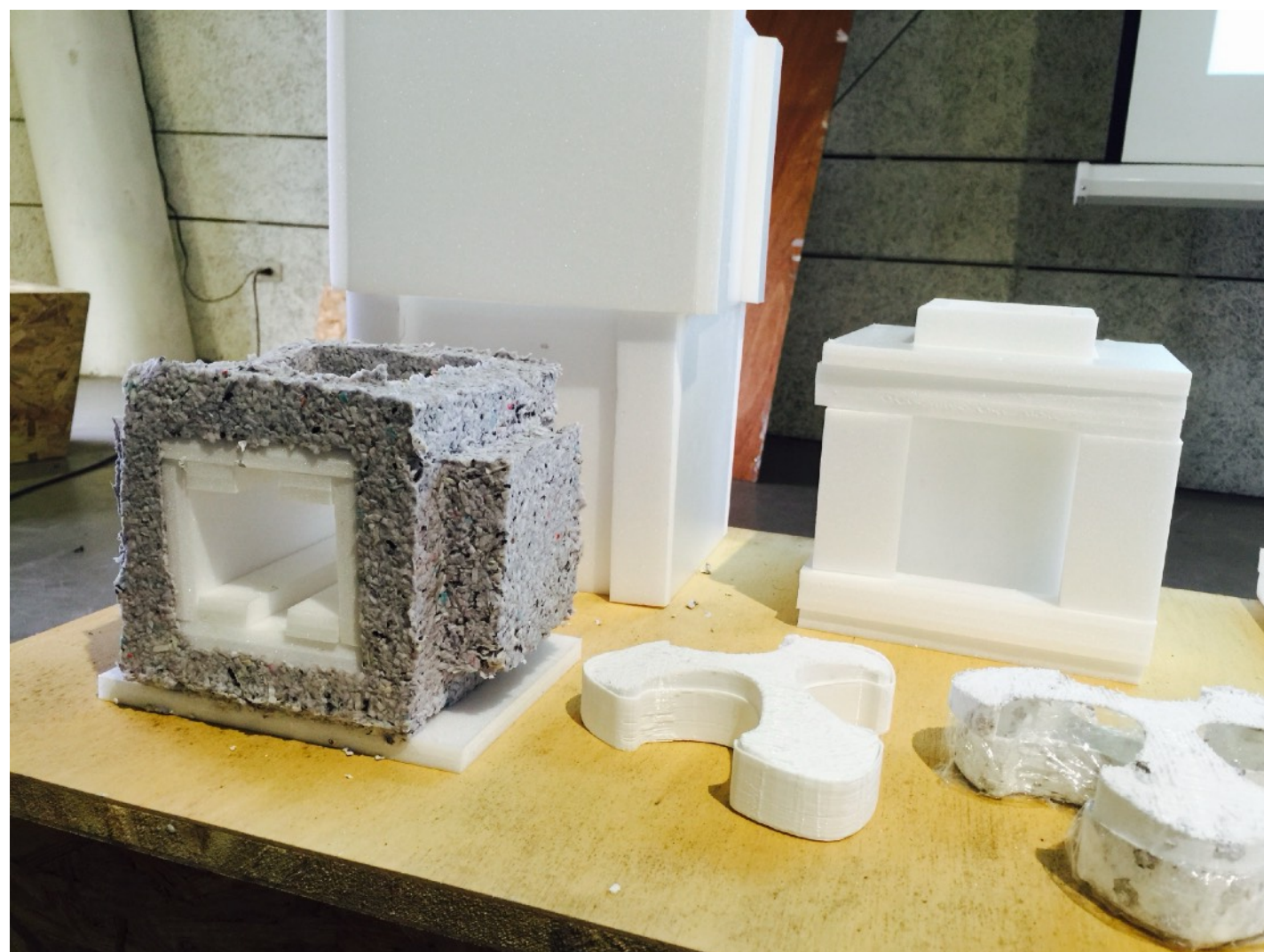
(d) 紙箱因潮濕而發生紙潰

圖 2.36 抽真空後模型



瓦楞紙構造 張雅智/瓦楞紙盒+真空預力 2016

(部分圖片來源：張雅智《真空預力應用於紙結構之研究》成功大學建築學系碩士論文，2016)



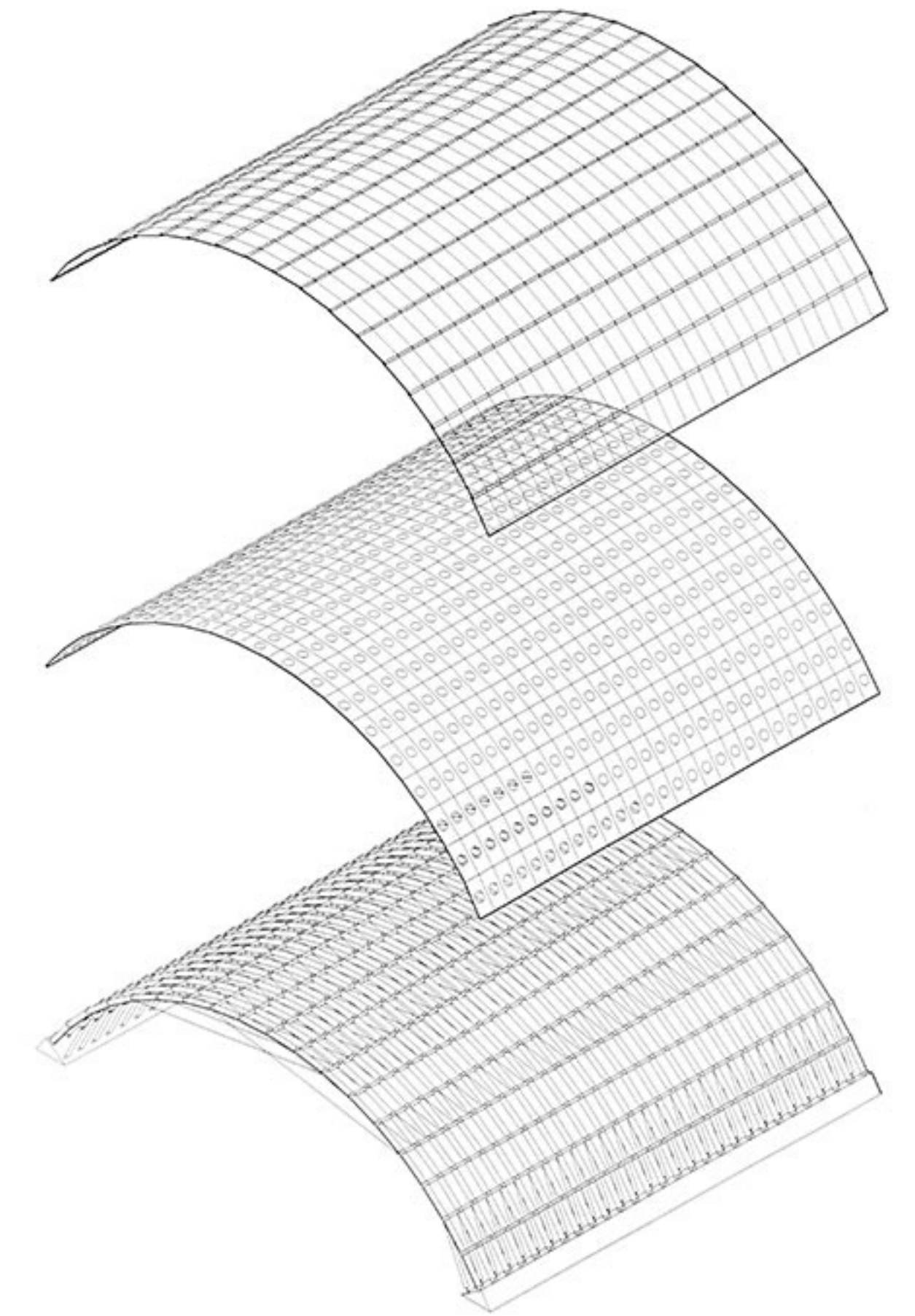
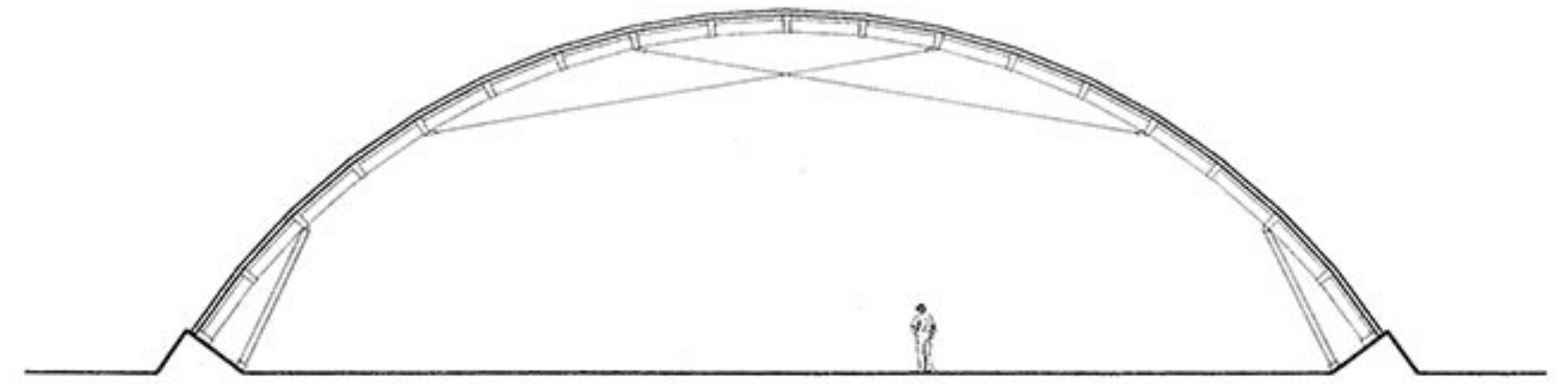
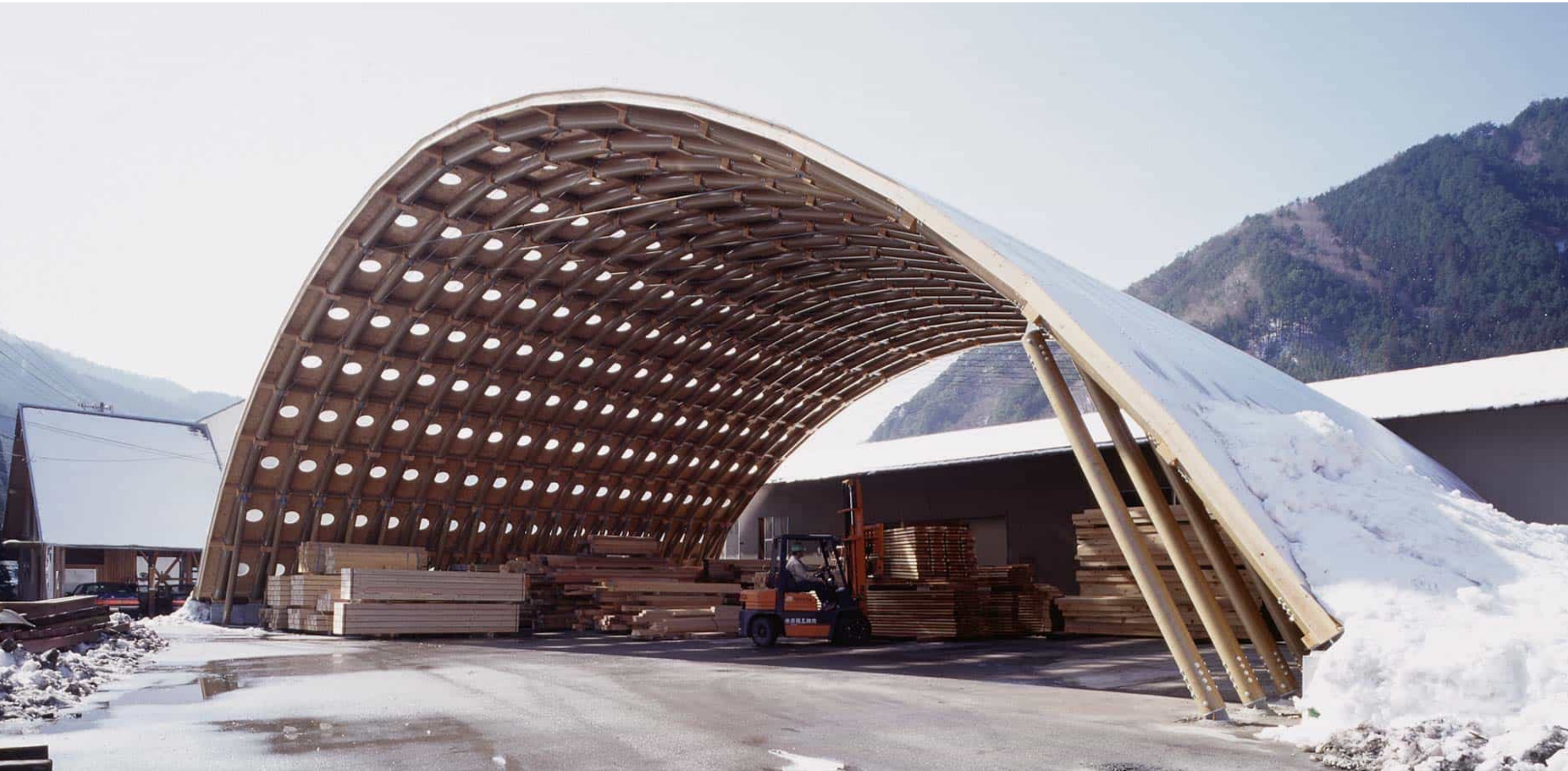
紙磚構造 陳俊安/紙漿材料特性探討 2016

(部分圖片來源：陳俊安《臨時且永續》成功大學建築學系碩士論文，2016)



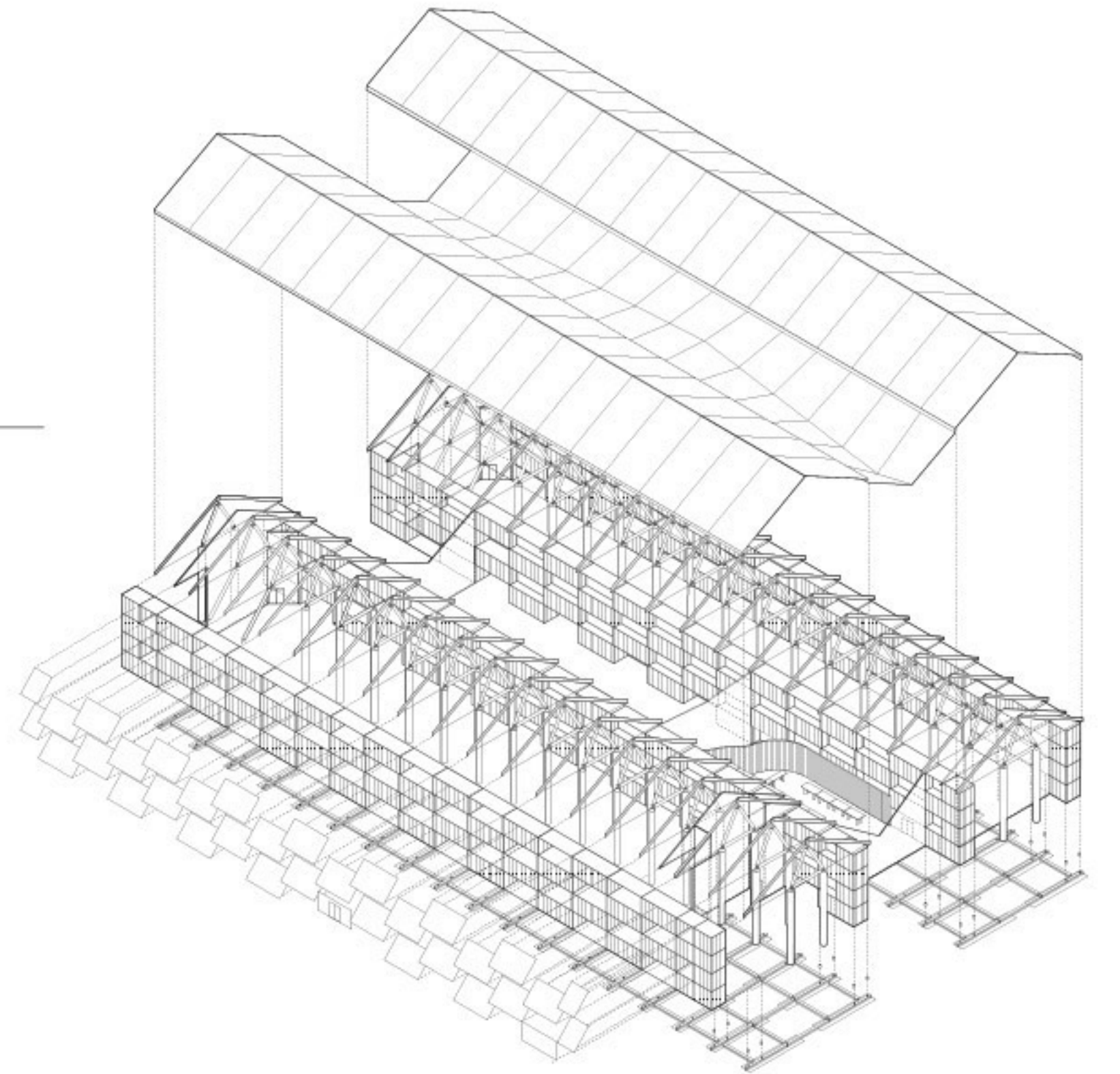
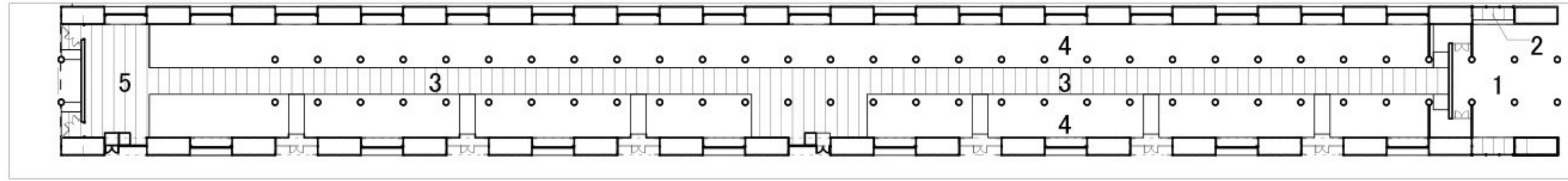
紙管構造 阪茂/紙教堂 神戶 1995

(圖片來源：<https://shigerubanarchitects.com/works/cultural/paper-church-kobe/>)



紙管構造 阪茂/Paper Dome 日本 1998

(圖片來源：<https://shigerubanarchitects.com/works/cultural/paper-dome/>)



紙管構造 阪茂/Nomadic Museum 東京 2007

(圖片來源：<https://shigerubanarchitects.com/works/cultural/nomadic-museum-tokyo/>)



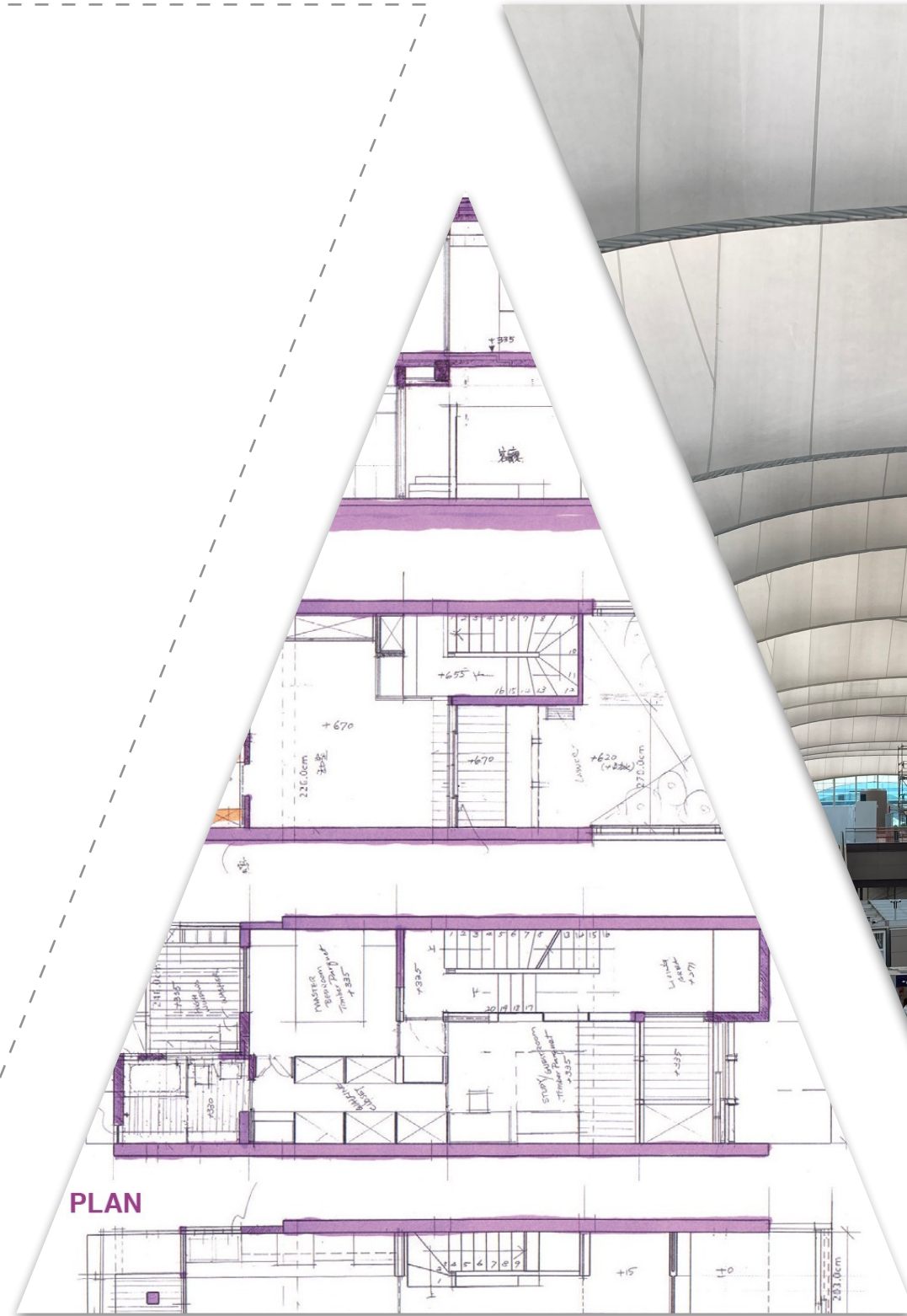
紙管構造 阪茂/賑災 土耳其 2023

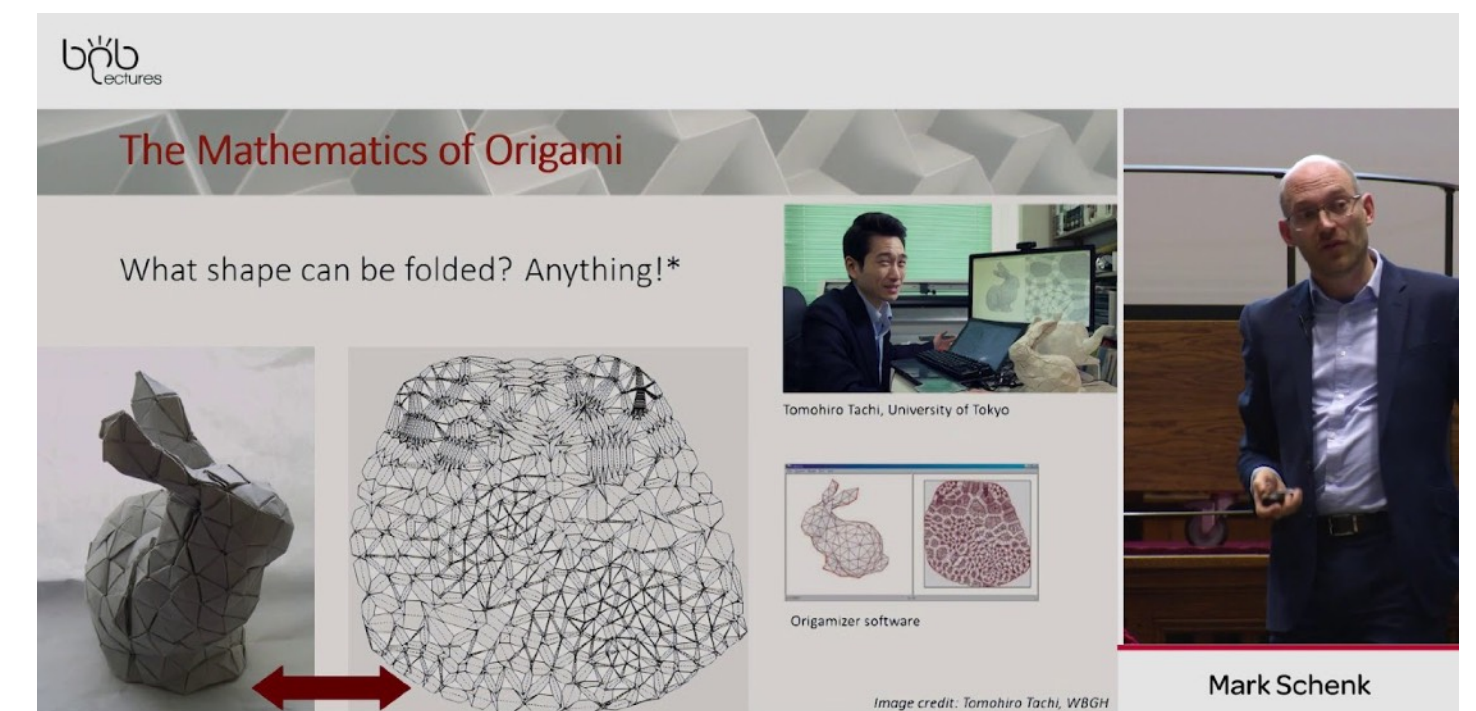
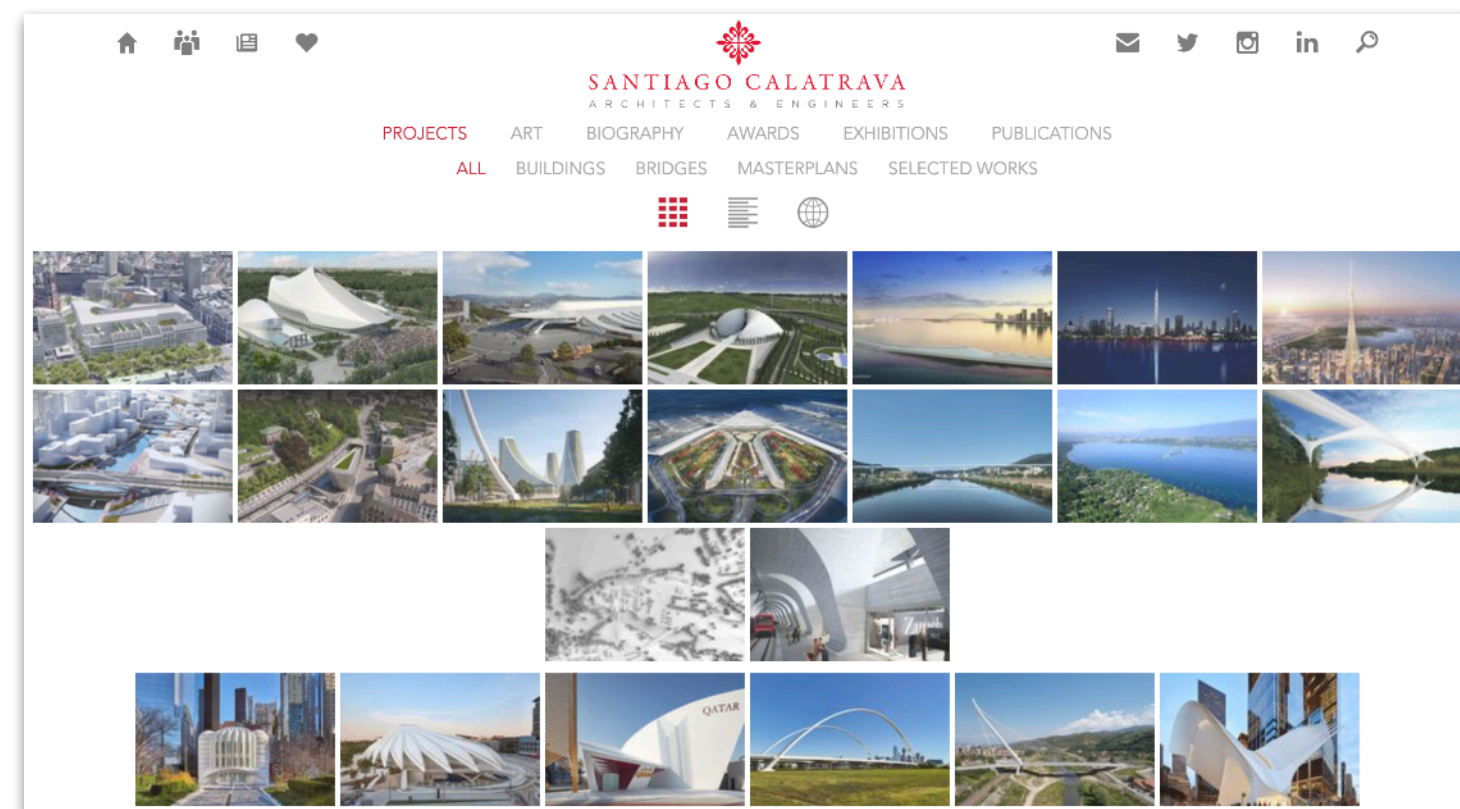
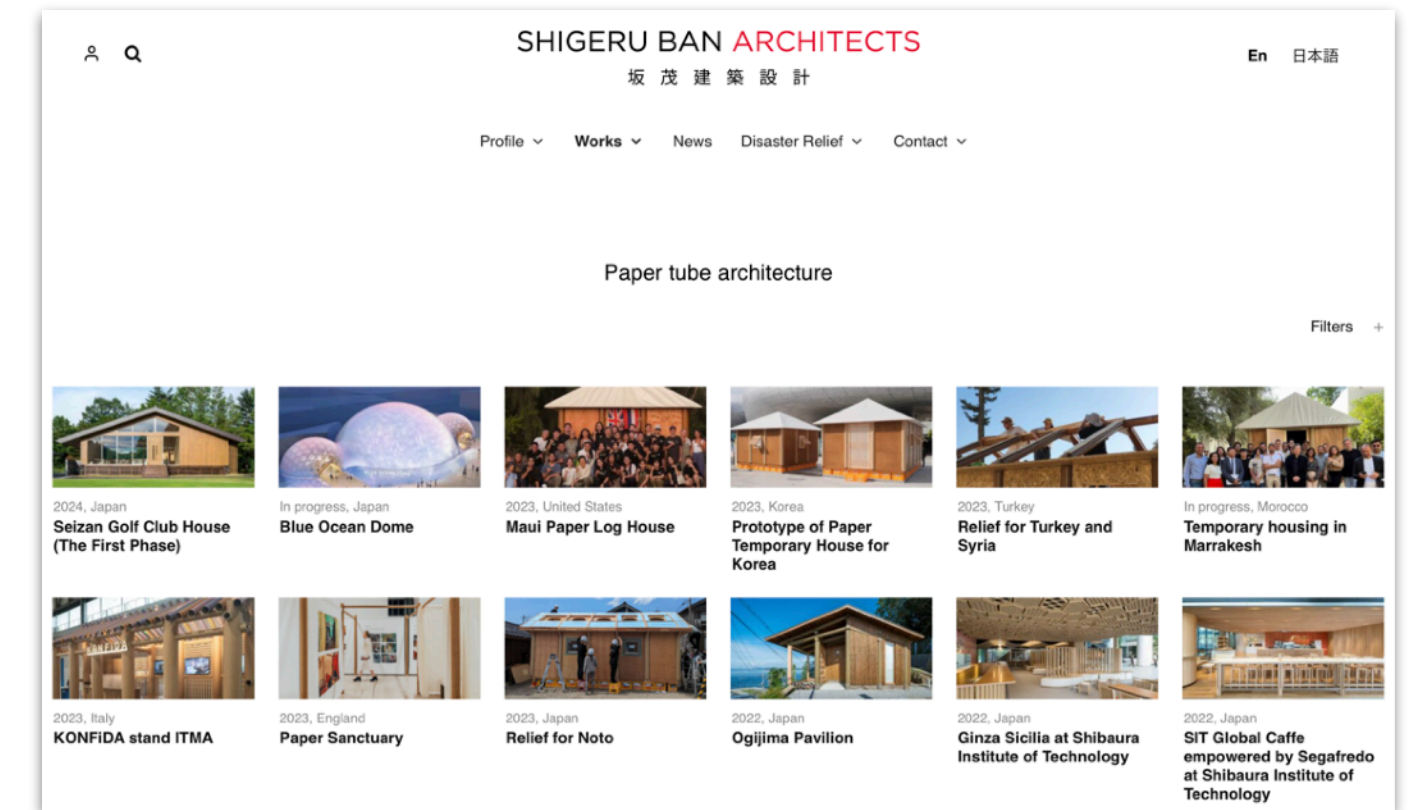
(圖片來源：<https://shigerubanarchitects.com/news/relief-for-turkey-and-syria/>)



紙構造 Cottrell & Vermeulen architecture/Westborough Cardboard Building Westcliff-on-Sea 2001

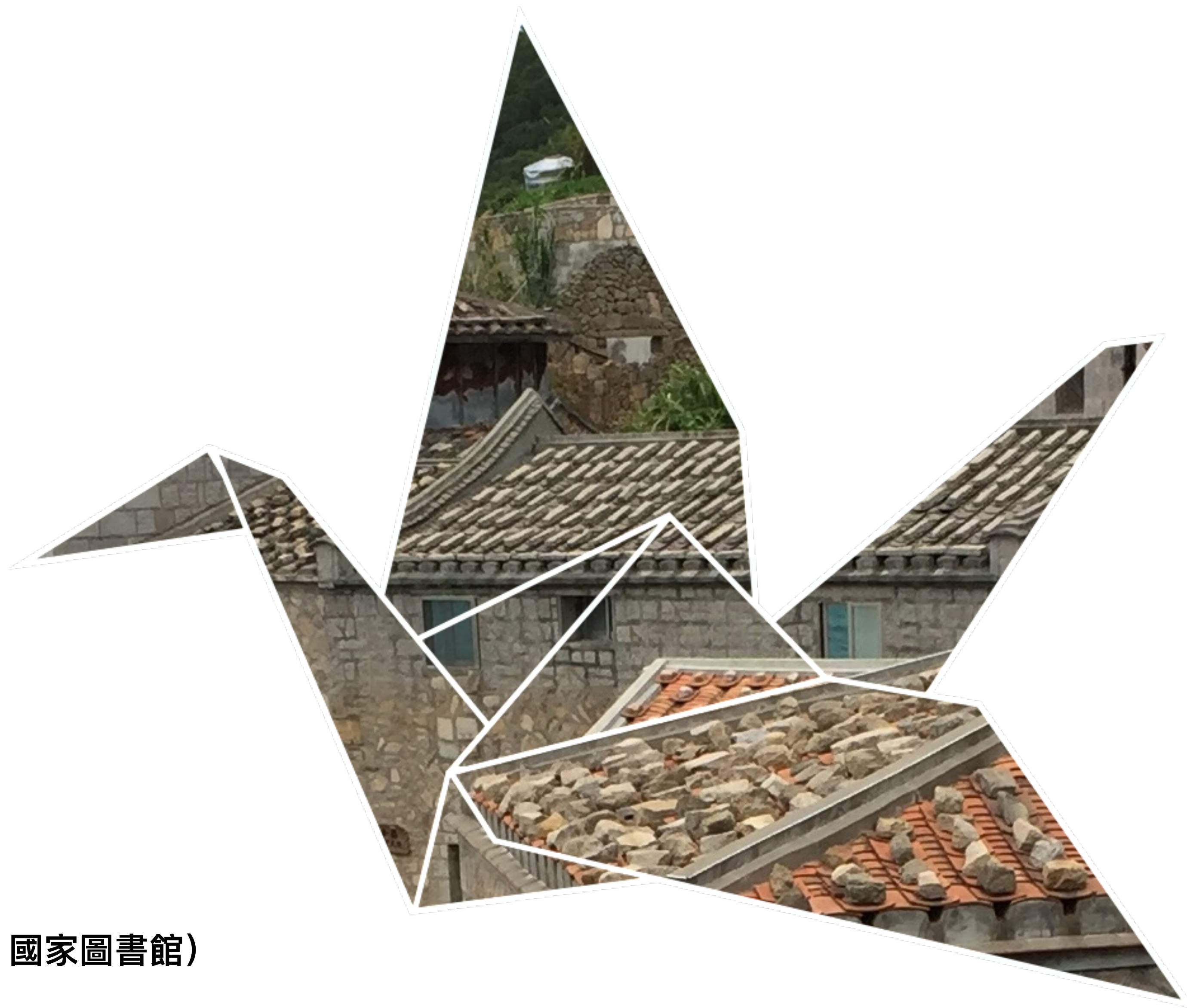
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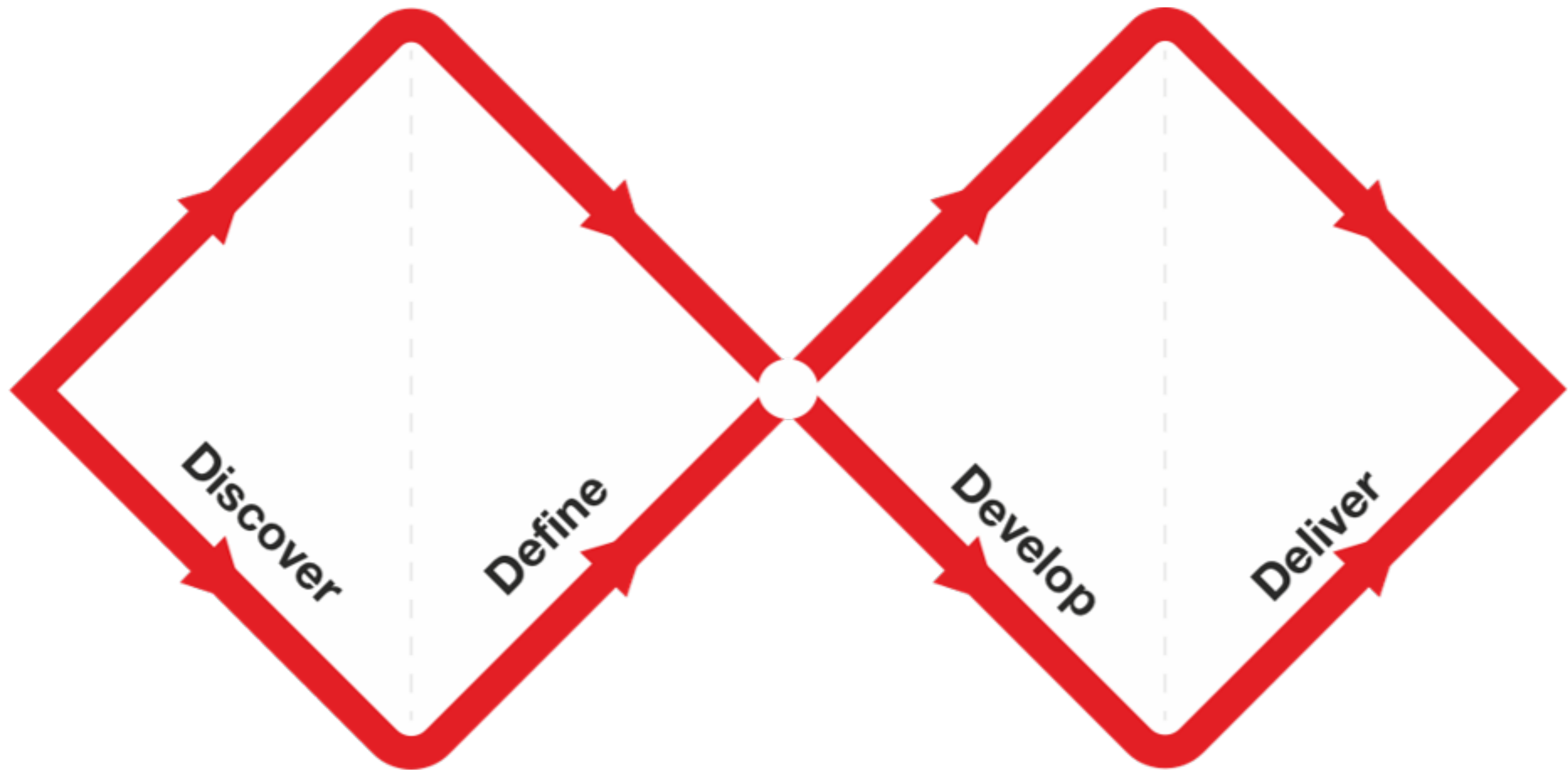


摺。思

摺紙與建築設計



簡聖芬 2025-01-04 (113年冬季閱讀講座：紙的科學 / 國家圖書館)



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ENGAGEMENT

Connecting the dots and building relationships between different citizens, stakeholders and partners

DESIGN PRINCIPLES

- 1. Be People Centered
- 2. Communicate (Visually & Inclusively)
- 3. Collaborate & Co-Create
- 4. Iterate, Iterate, Iterate

CHALLENGE

Discover

Define

Develop

Deliver

OUTCOME

METHODS BANK

Explore, Shape, Build

Creating the conditions that allow innovation, including culture change, skills and mindset

LEADERSHIP



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