

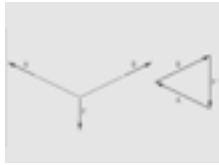
Structural Design II

Philippe Block · Joseph Schwartz

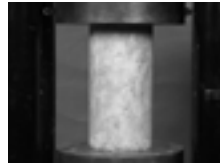
Structural design I



Structural design II



2. Equilibrium and graphic static



6. Materials and dimensioning



1. Introduction



3.+4. Cables



7. Arches



10. Arch-cable-structures



12.+13. Trusses



14.+15. Beams and frames



20. Columns



5. Cable-net and membrane structures



8.+9. Vaults, domes and shells



11. Spatial arch-cable-structures



12. Spatial trusses



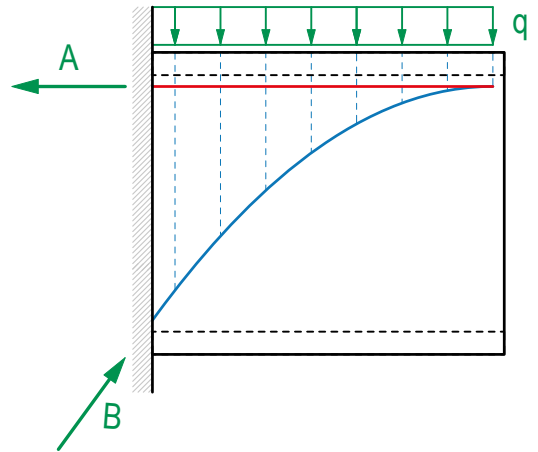
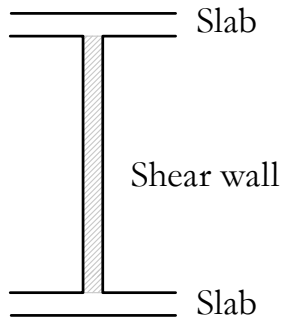
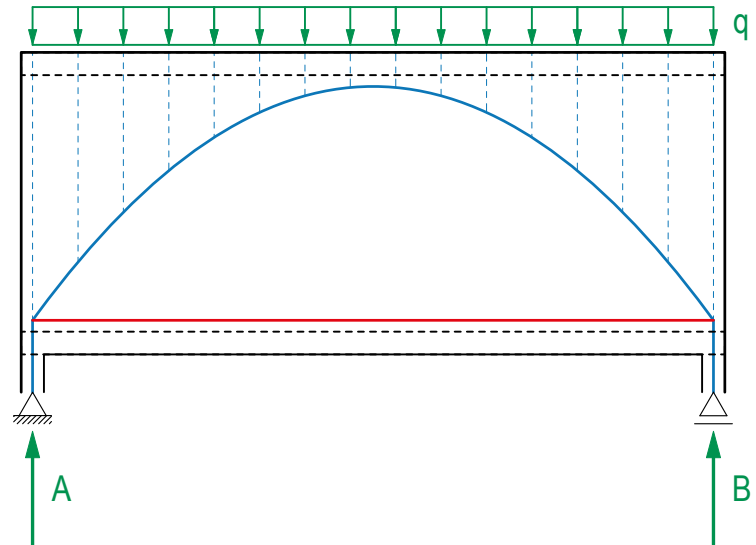
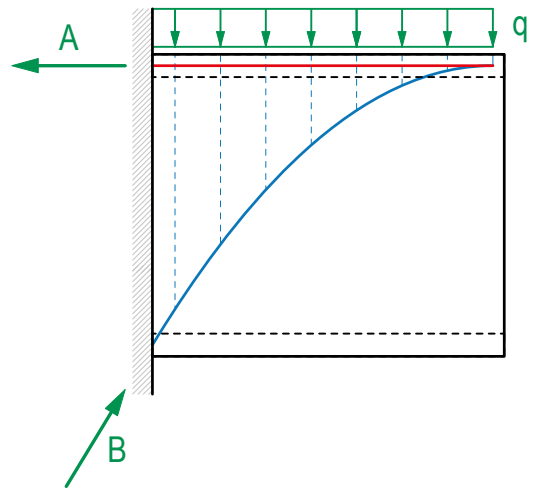
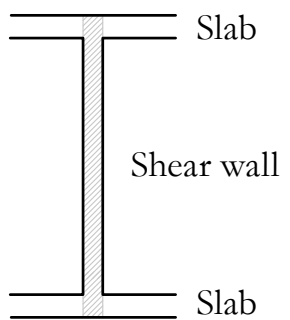
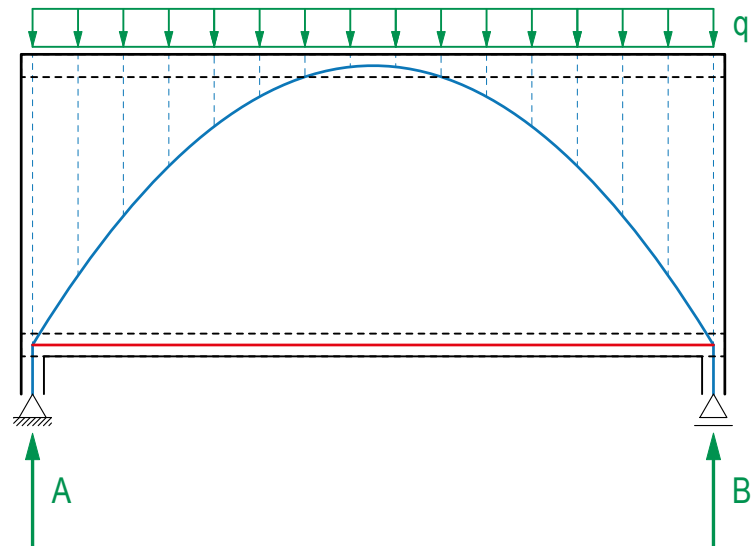
16. Shear walls and plates

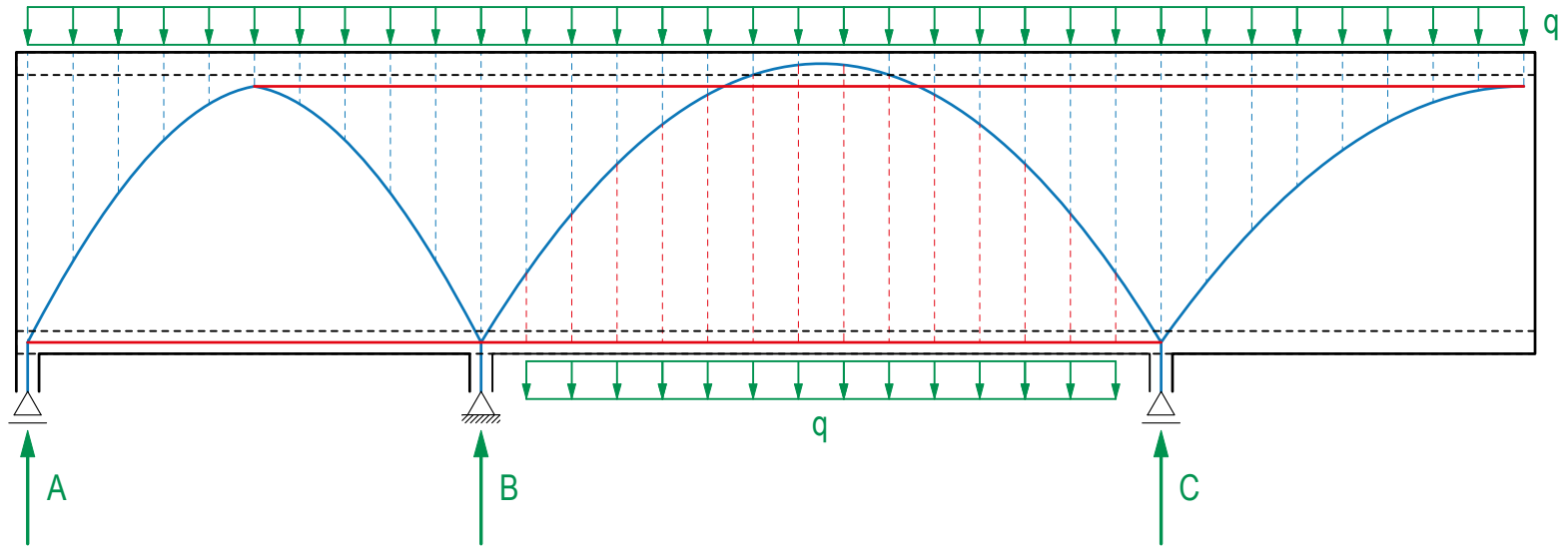


17.+18.+19. Bending

Shear walls and plates

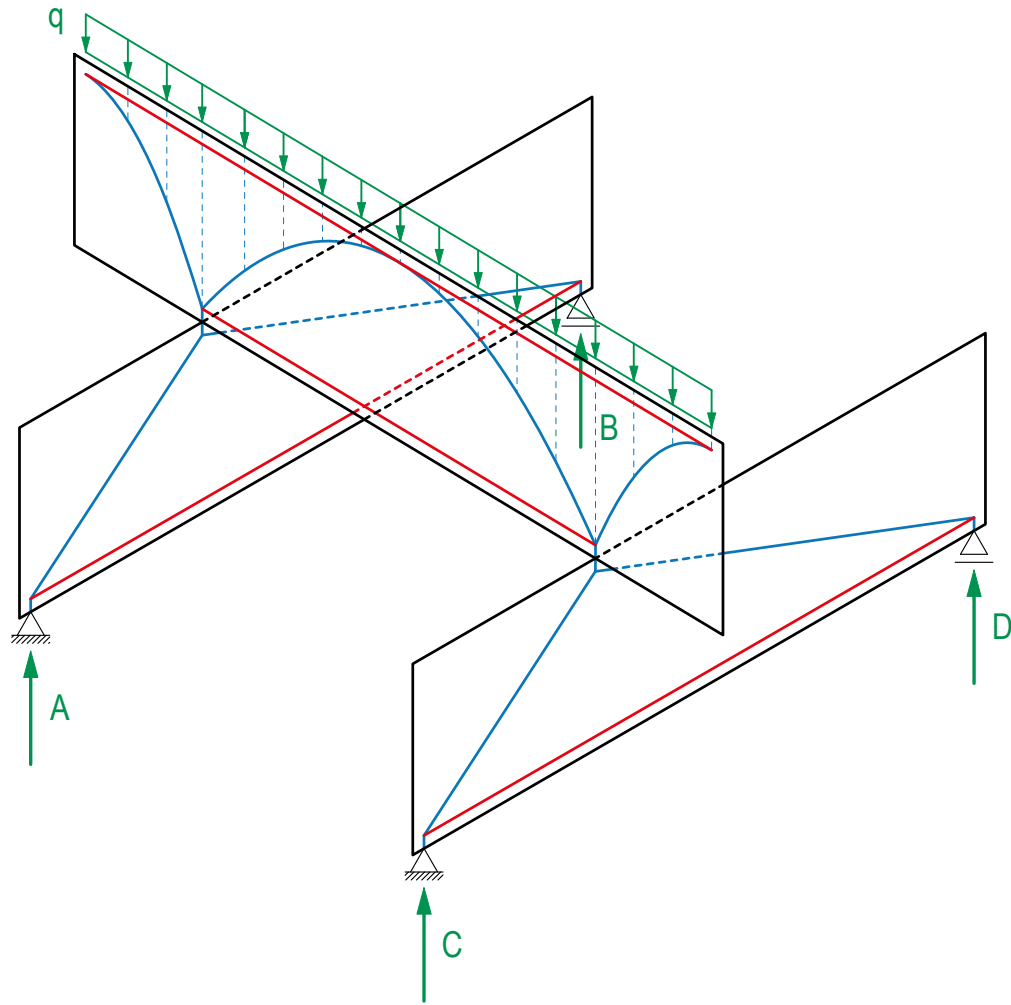
- Shear walls
 - Beam grid
 - Plate
 - Folded plate
 - Hybrid structures

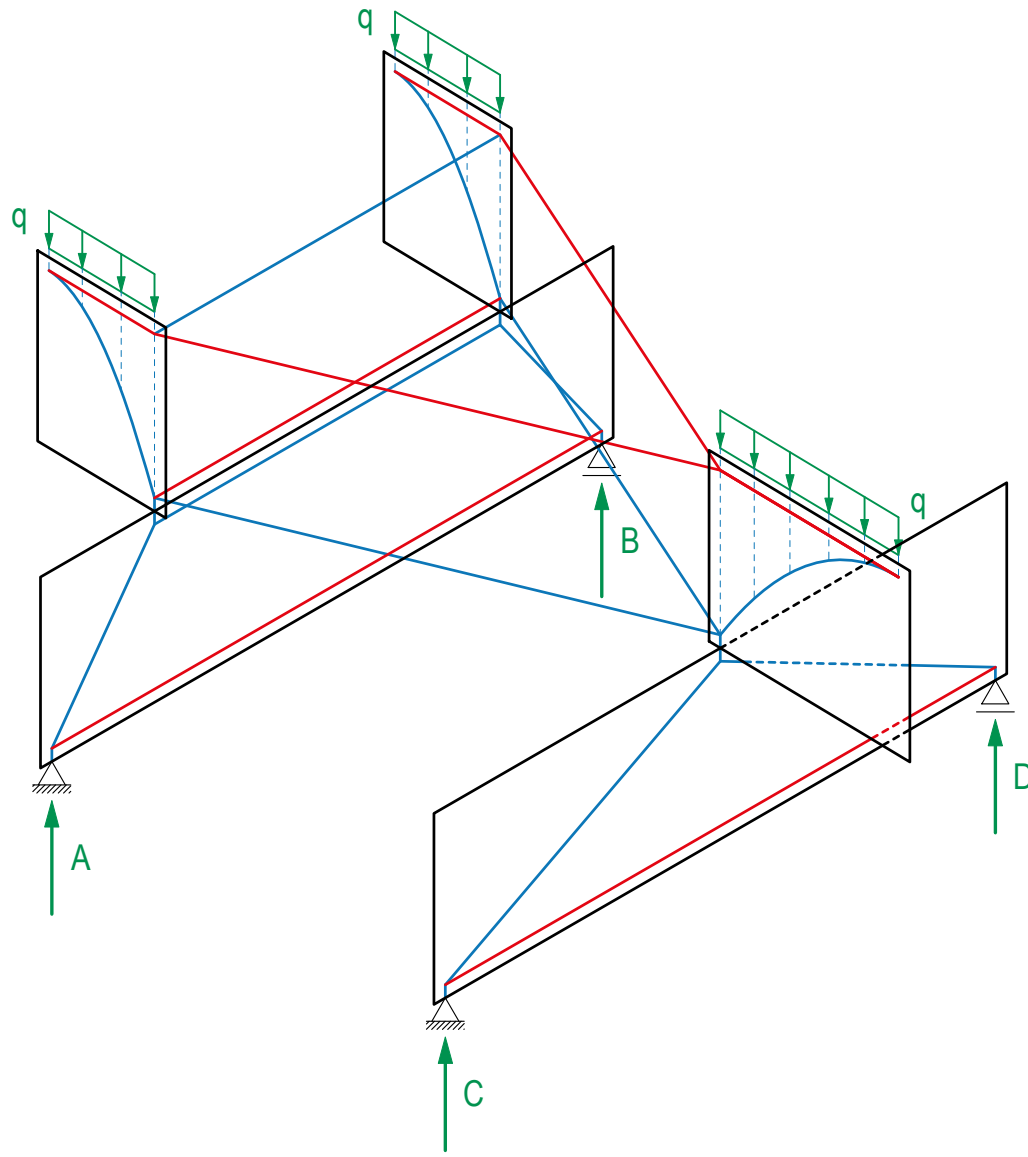


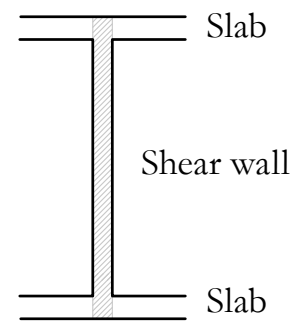
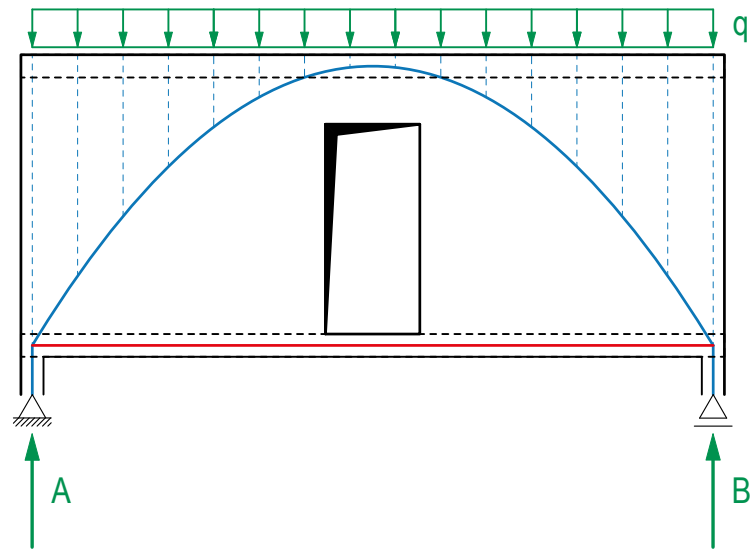


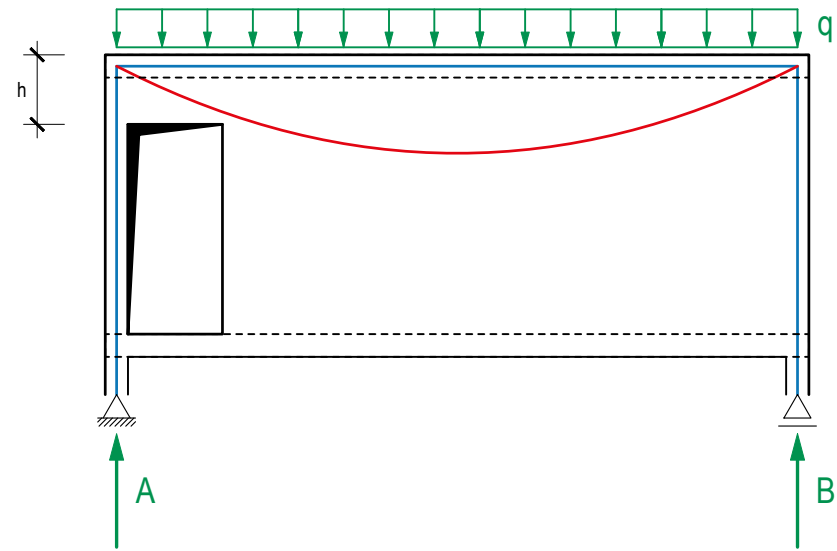
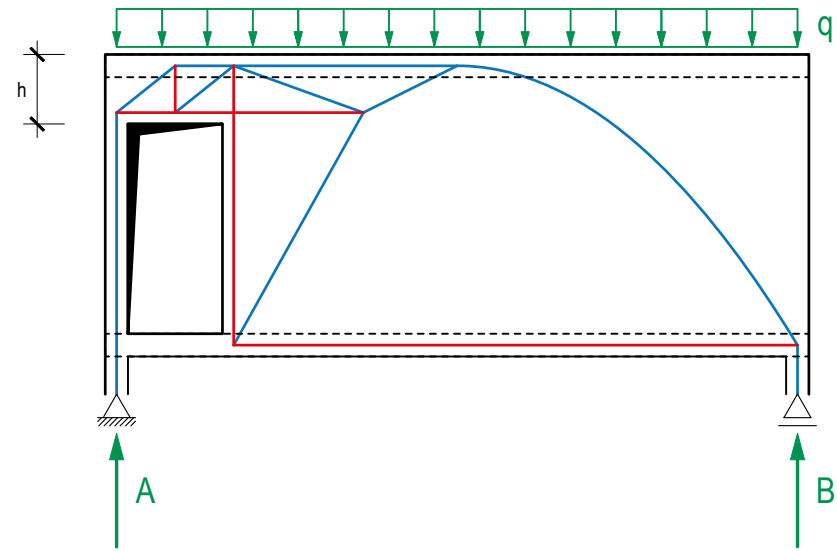


Multiple dwelling Forsterstrasse, Zurich, 2003, Arch.: Christian Kerez, Ing.: Joseph Schwartz









Shear walls and plates

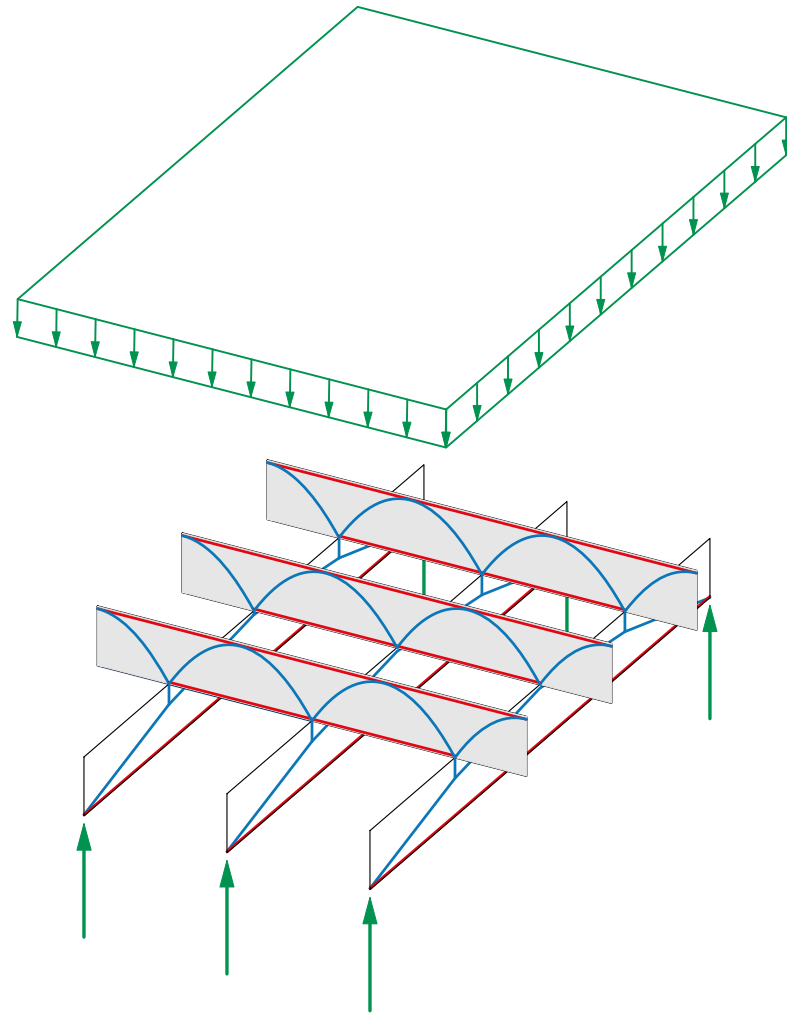
Shear walls

- Beam grid

Plate

Folded plate

Hybrid structures

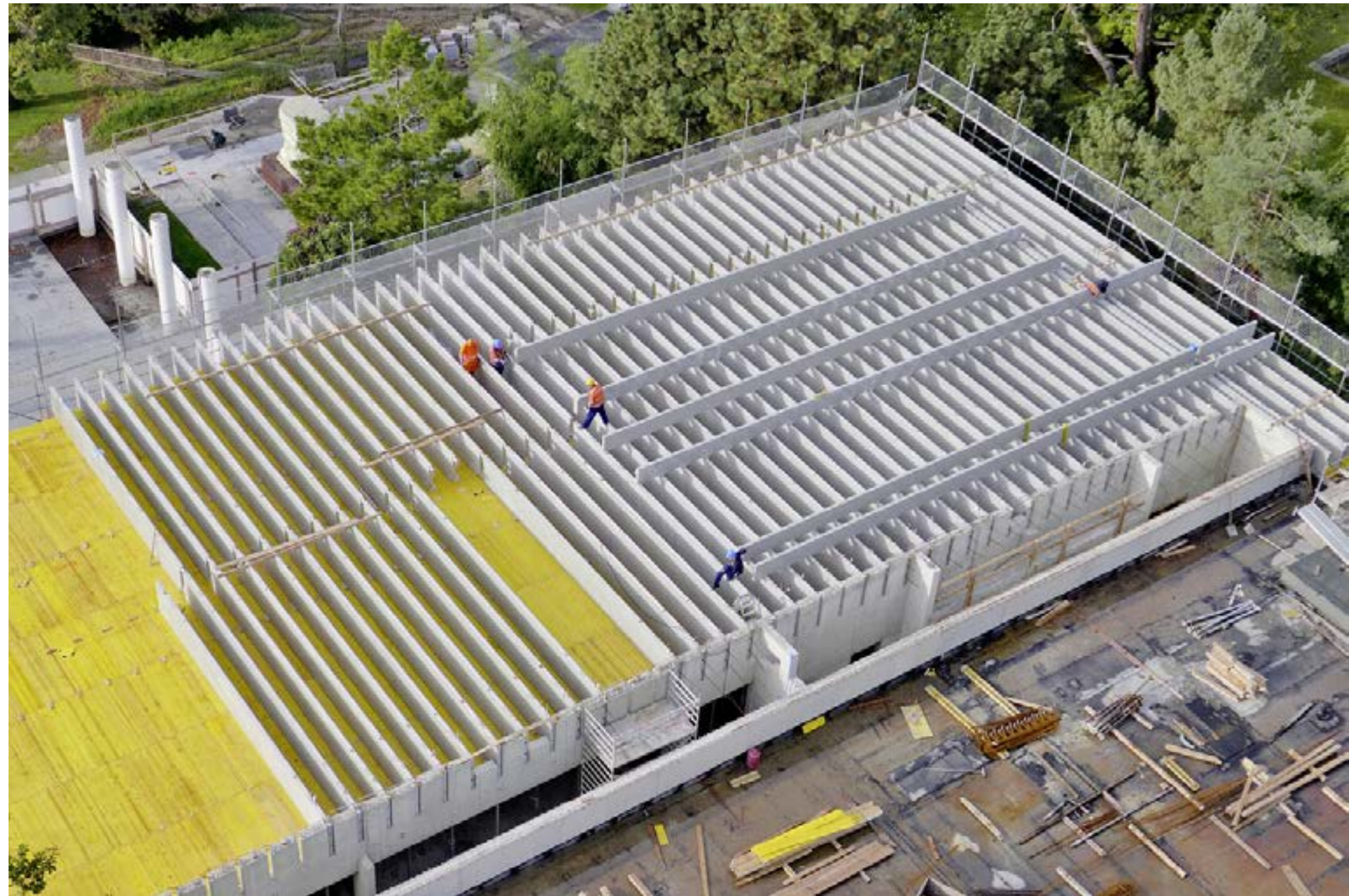




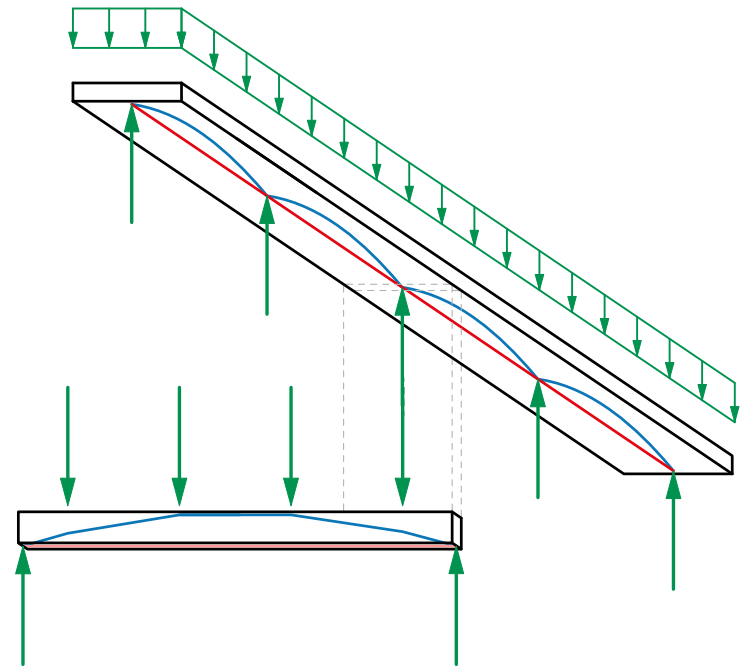
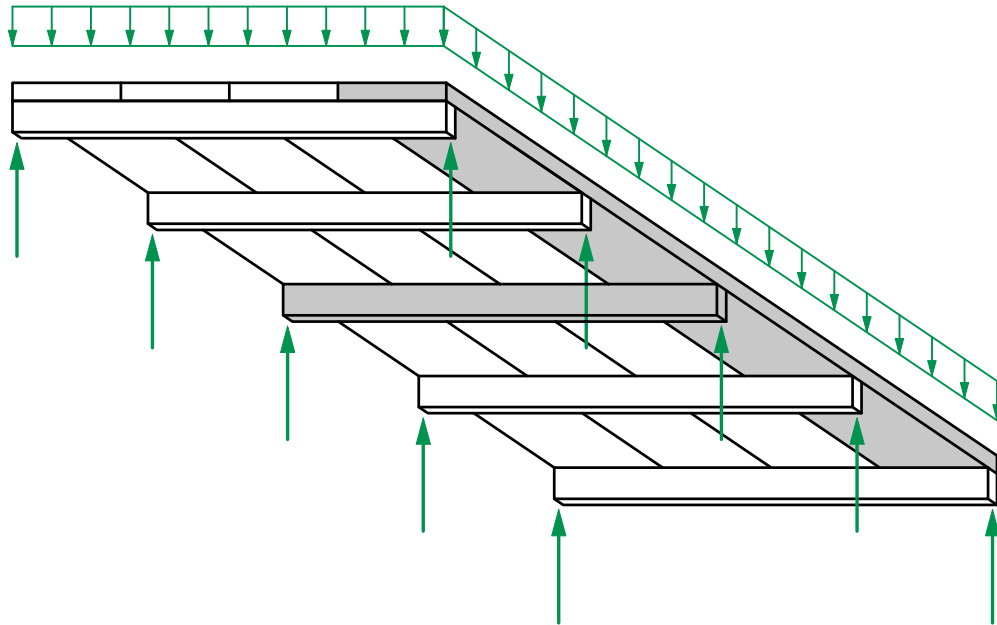
Sverre Fehn: Nordic Pavillon, Venice, 1958-1962



Brauen Wälchli, A. Muttoni: extension olympic museum, Lausanne, 2014



Brauen Wälchli, A. Muttoni: extension olympic museum, Lausanne, 2014

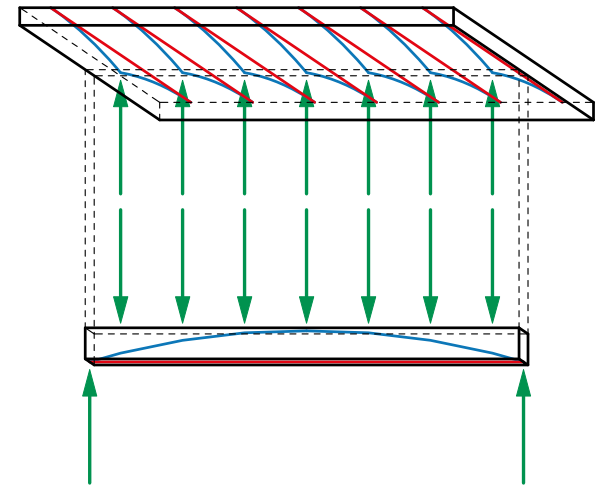
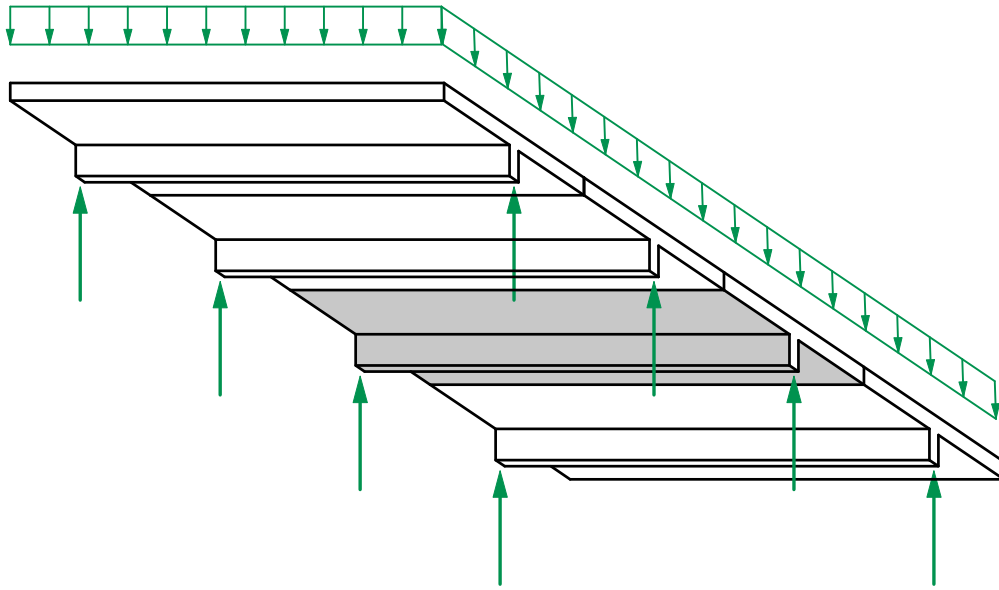


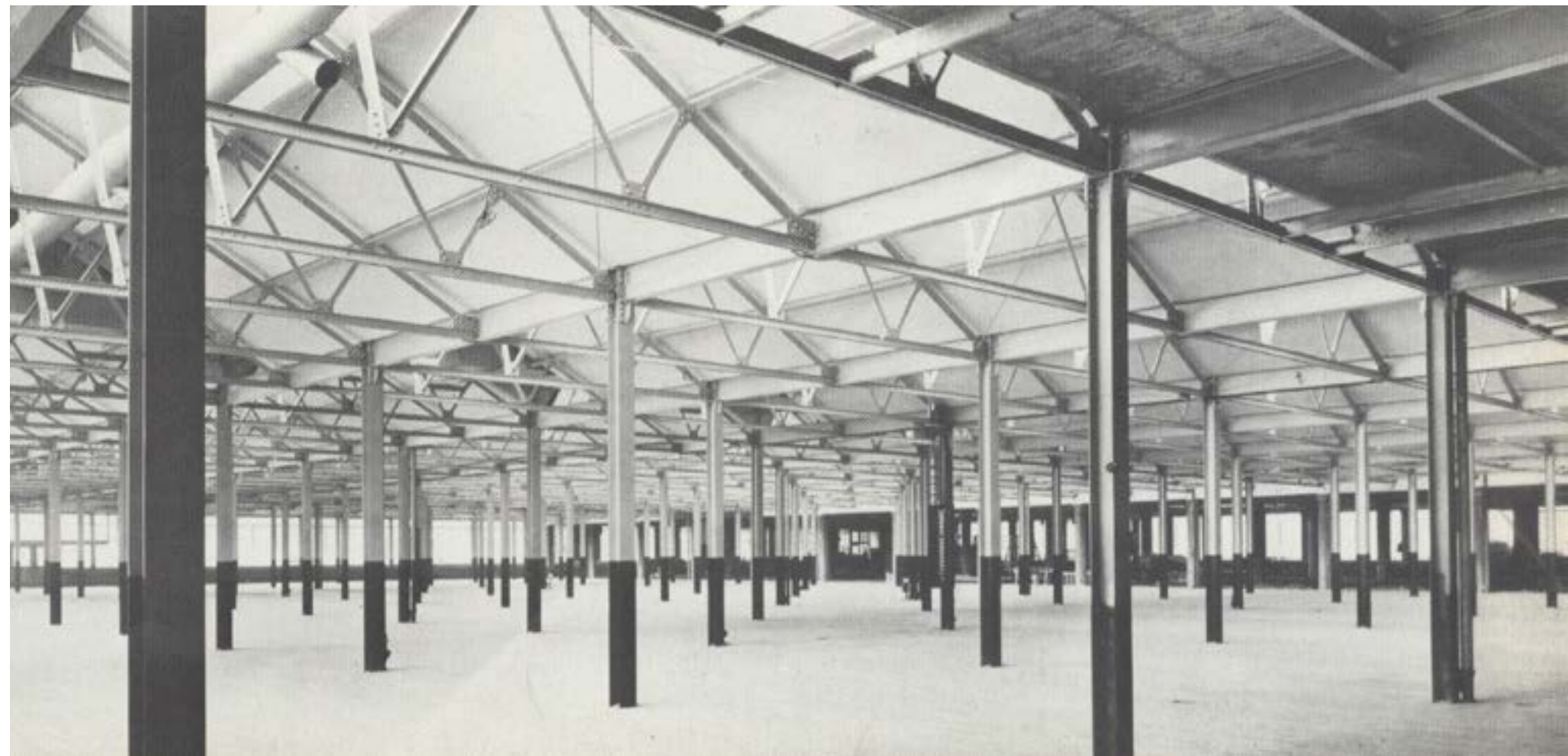


Martínez Lapeña-Torres Arquitectos, Esteyco: solar power plant Forum, Barcelona, 2004

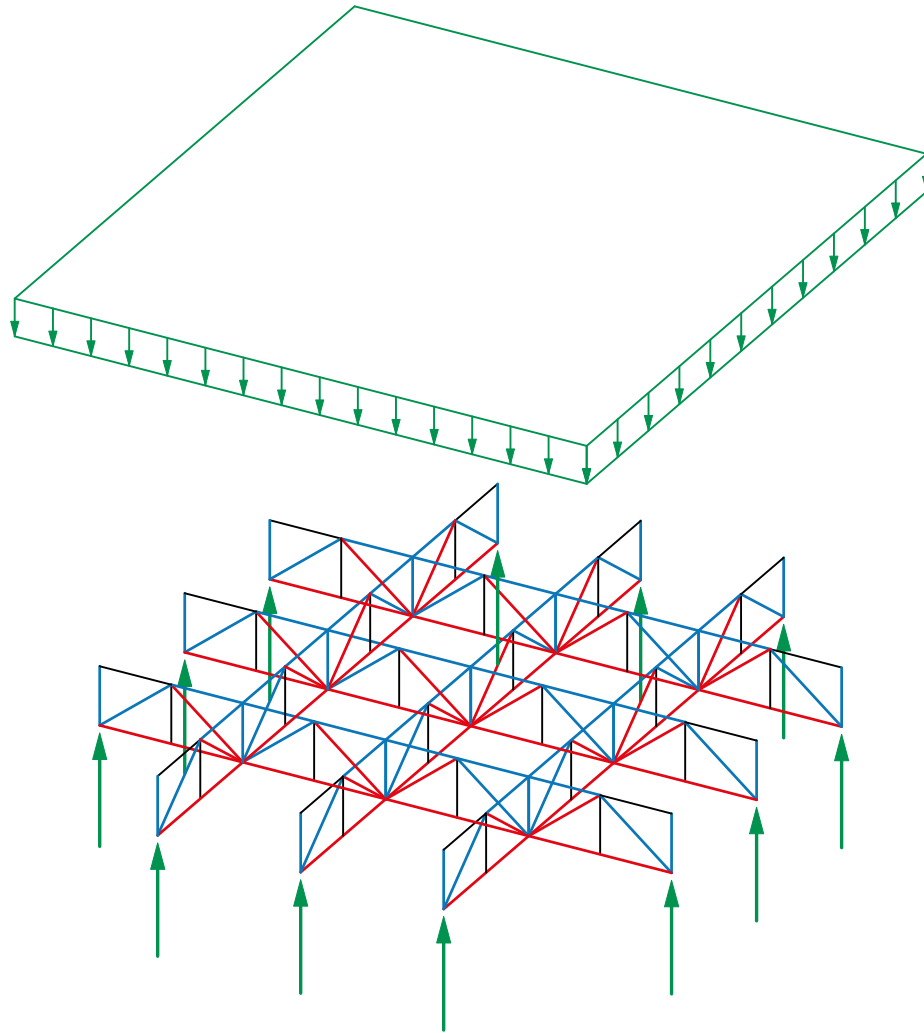


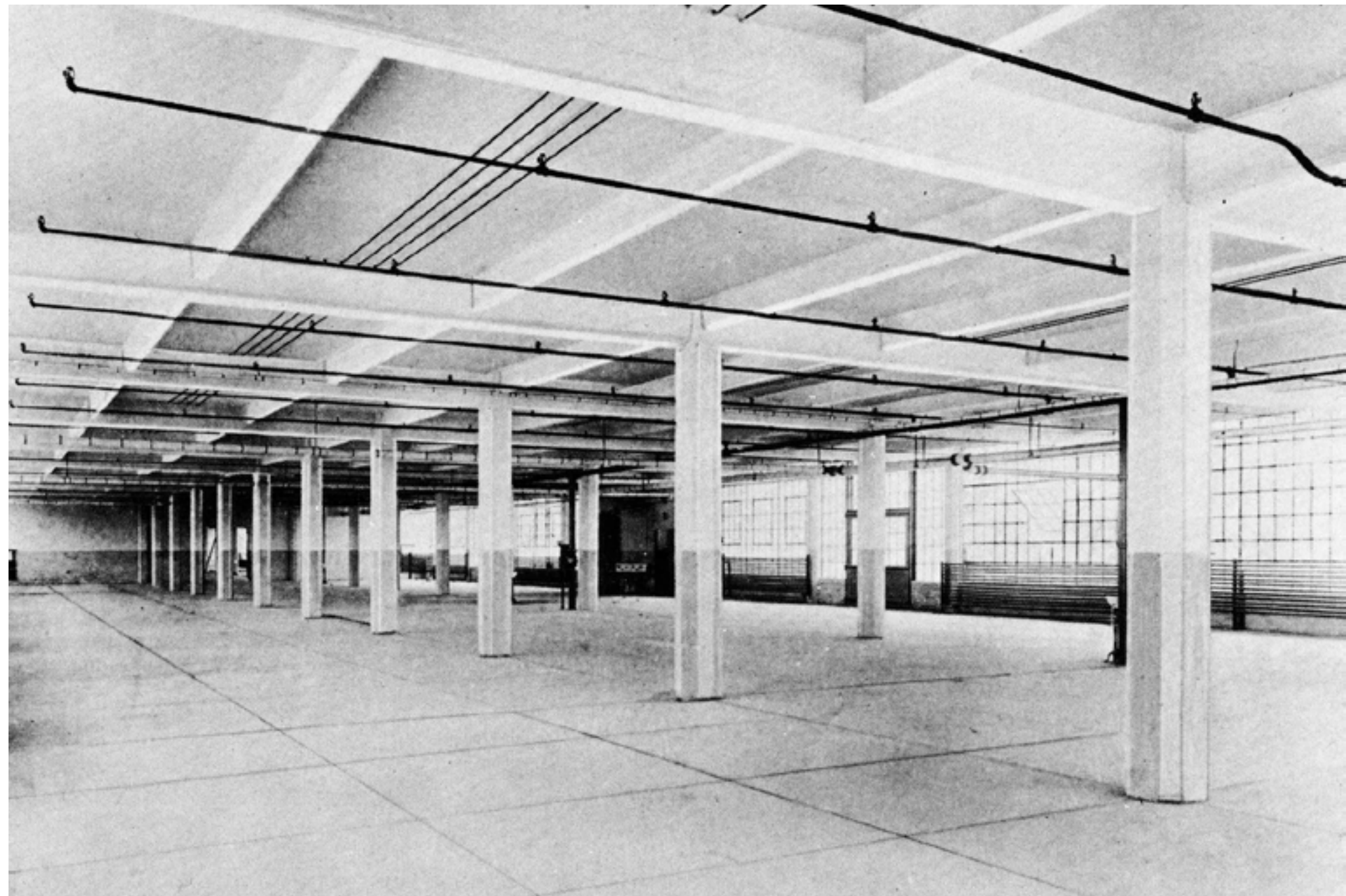
Hollow-gauged brick floor



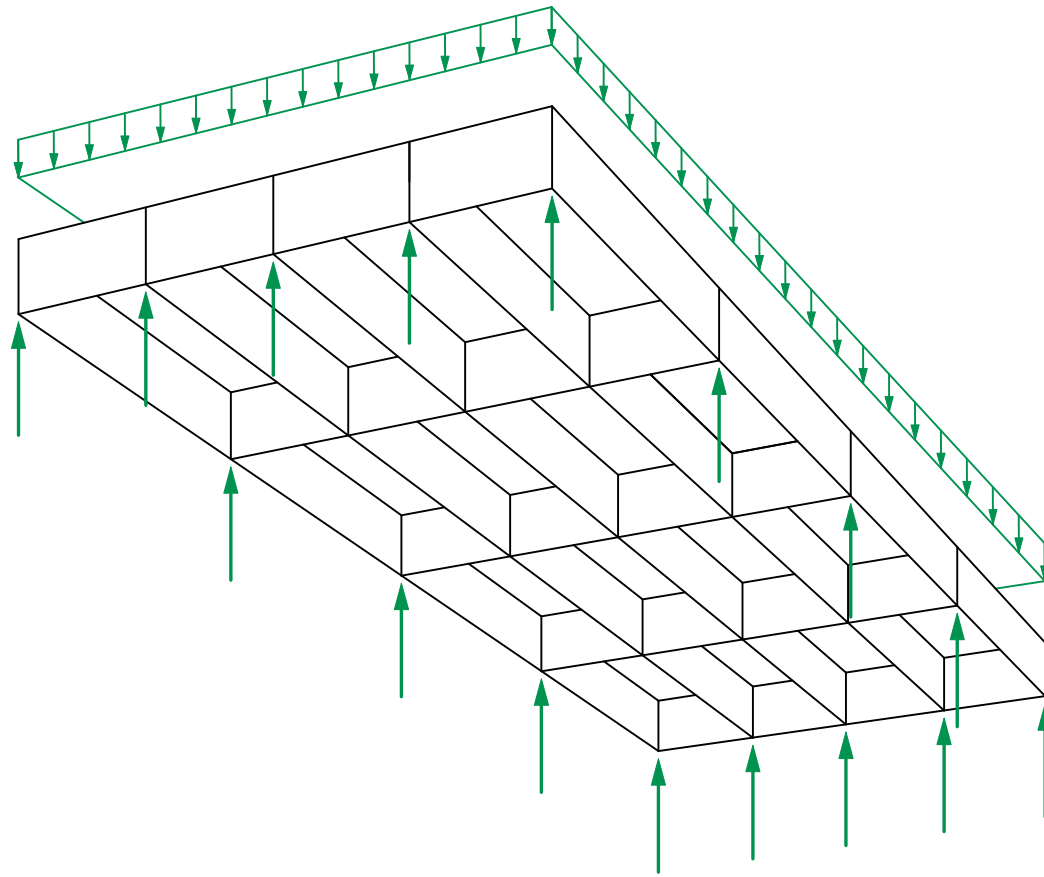


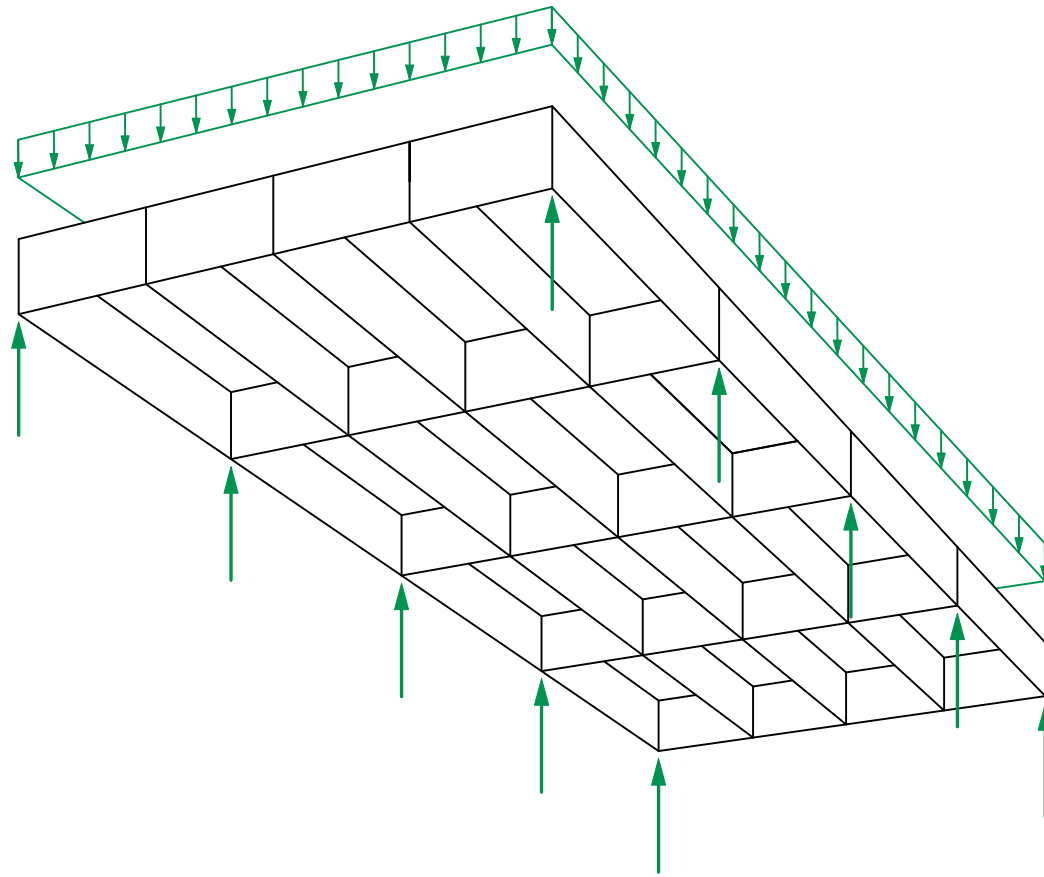
Albert Kahn: Continental Motors Corporation, Detroit, 1912





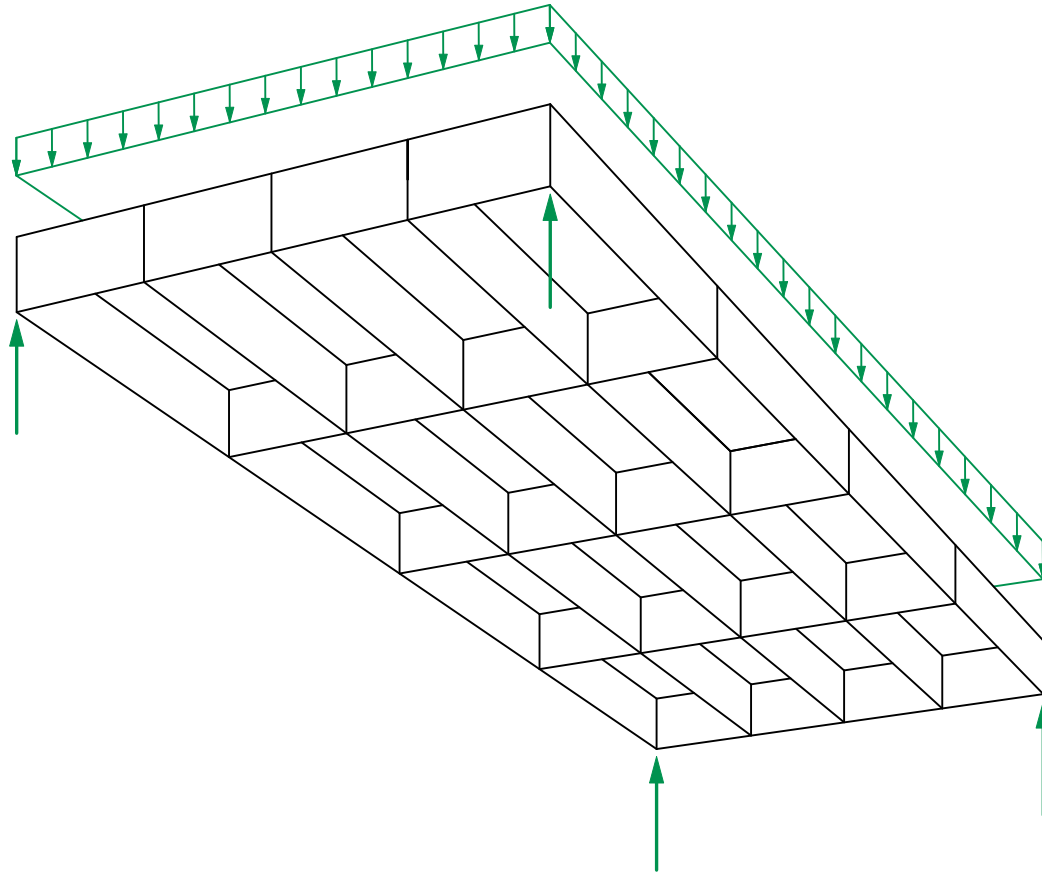
Albert Kahn: Ford motor company plant, Highland Park, 1909

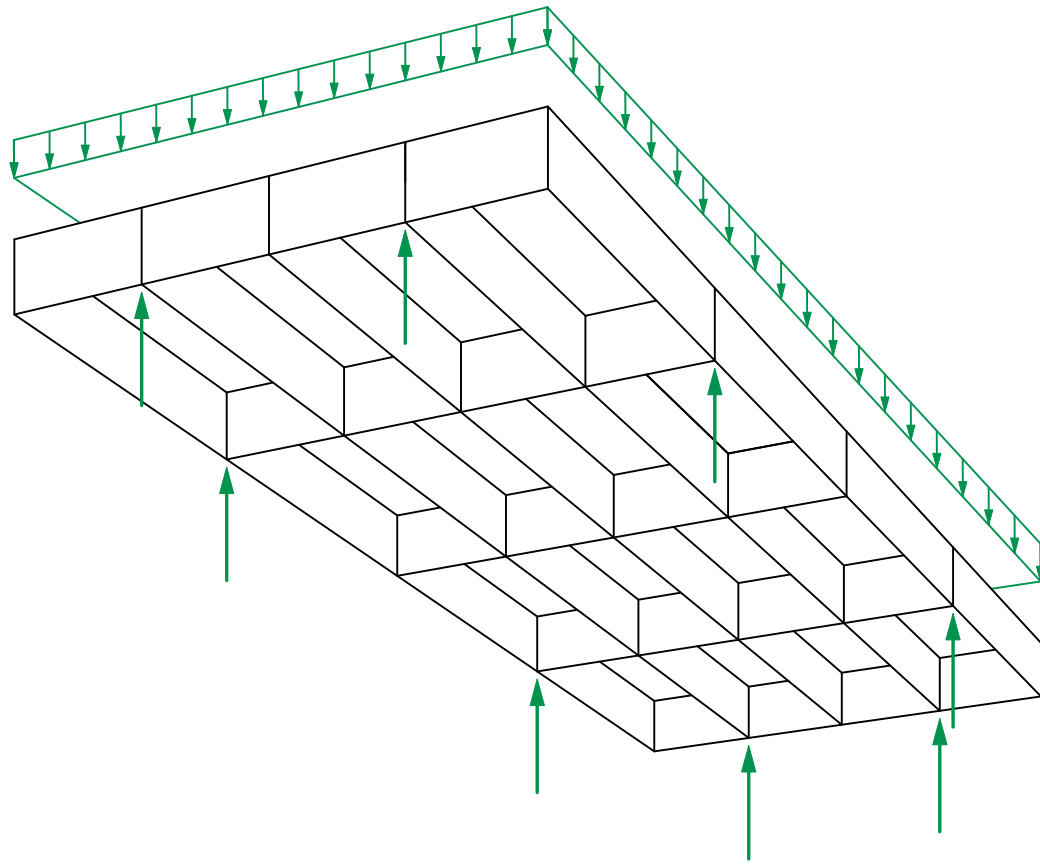






Livio Vacchini, R. Rossi: Multipurpose hall, Losone, 1997







Ludwig Mies van der Rohe, H. Dienst: New National Gallery, Berlin, 1968



Louis Kahn, Henry A. Pfisterer: Art Gallery, Yale University, New Haven, 1953



Heinrich Degelo, Joseph Schwartz: Extension congress centre, Davos, 2011



Pier Luigi Nervi: Wool Factory Gatti, Rome, 1953

Shear walls and plates

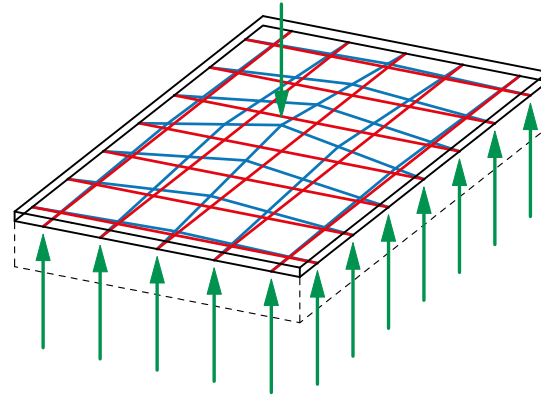
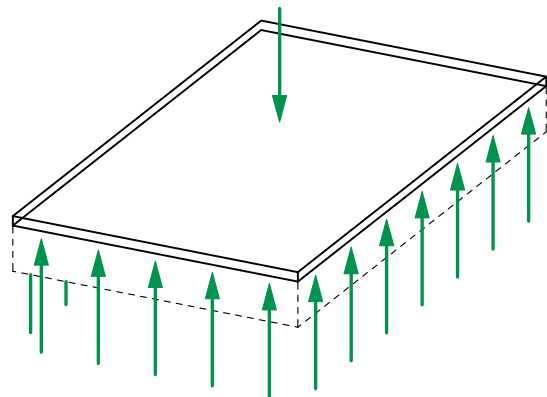
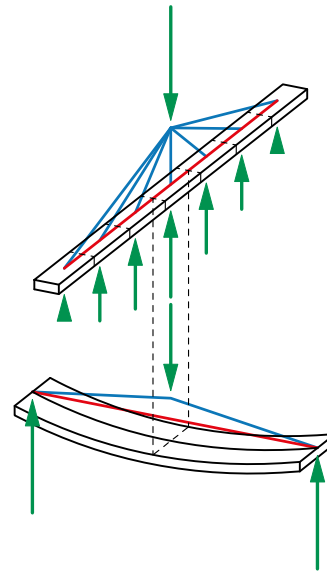
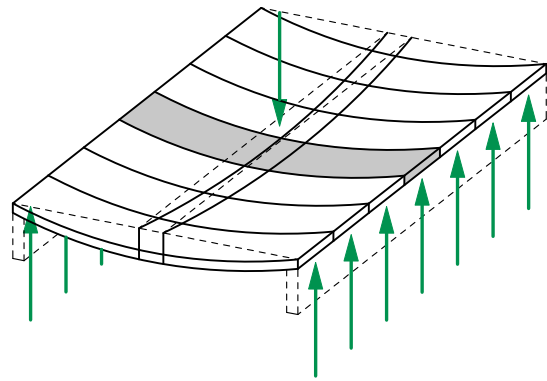
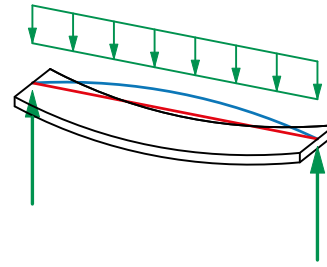
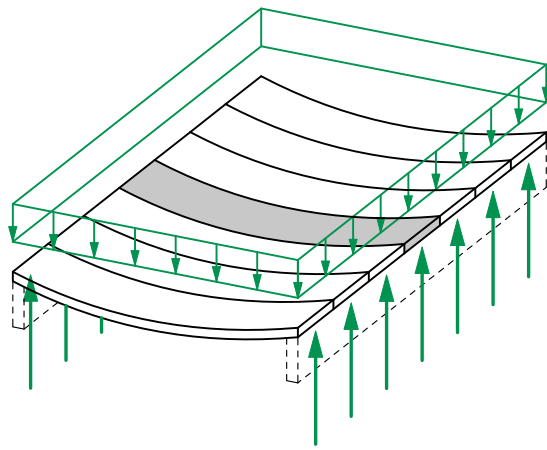
Shear walls

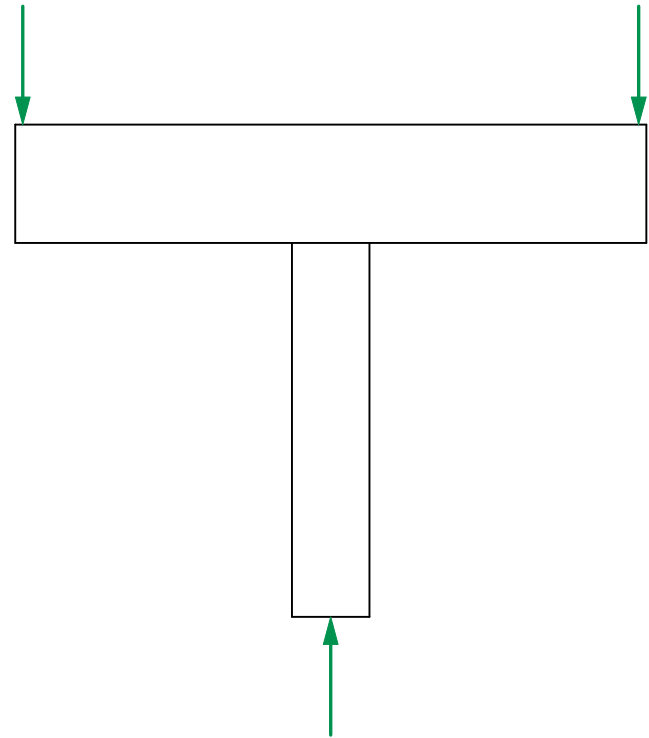
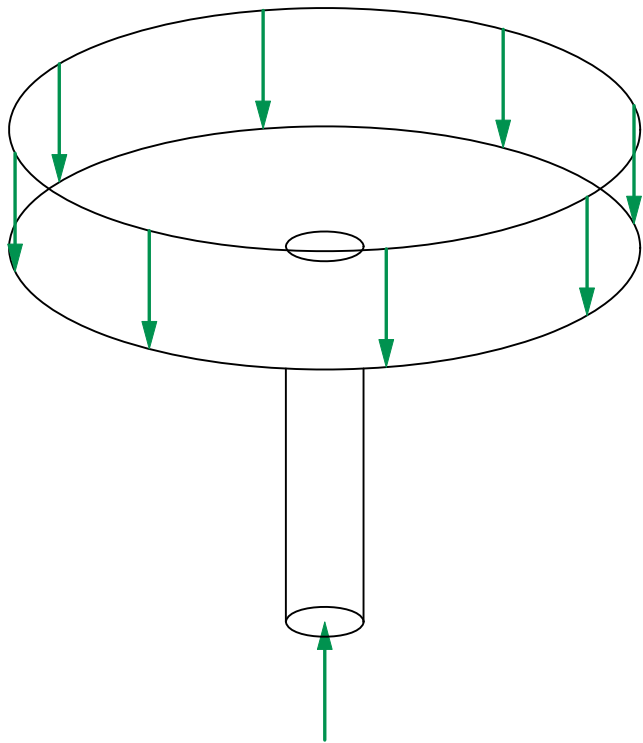
Beam grid

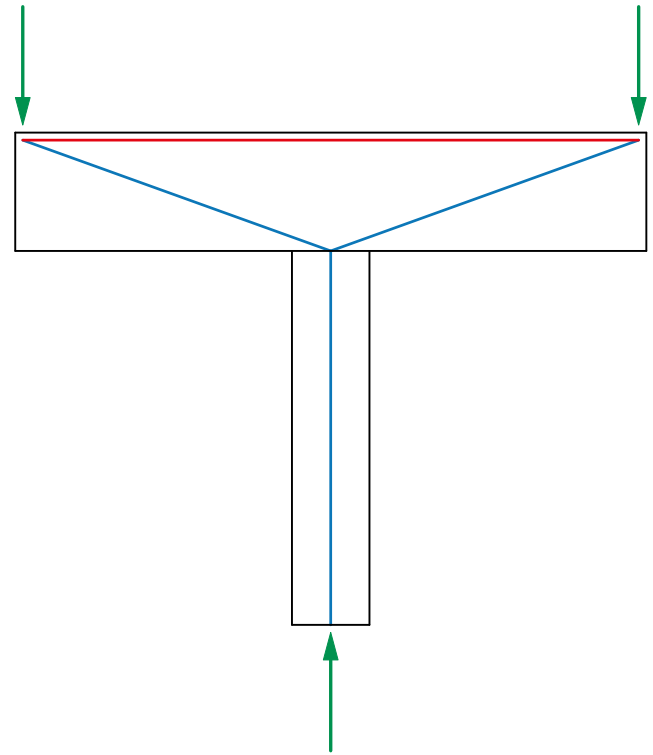
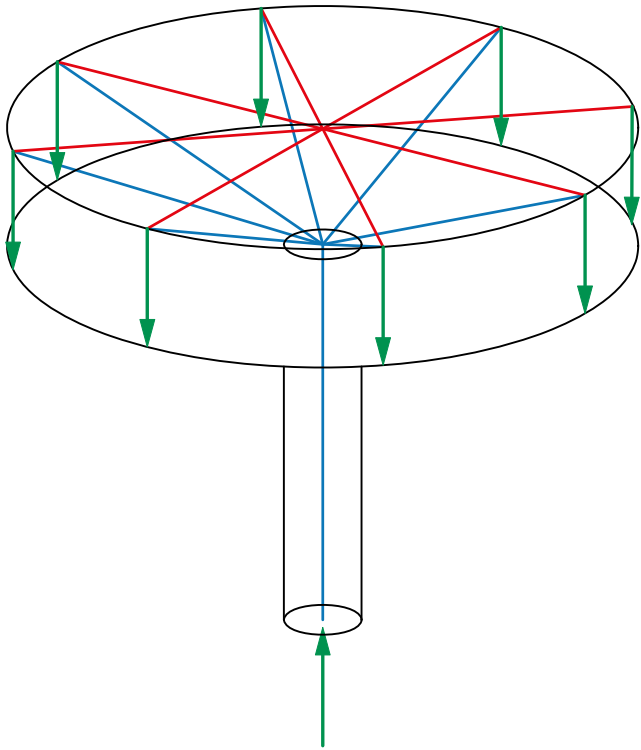
- Plate

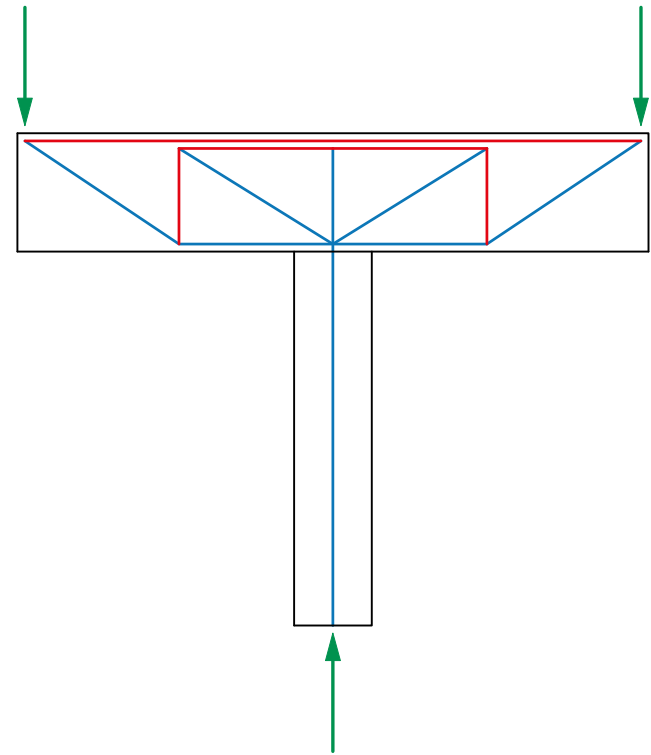
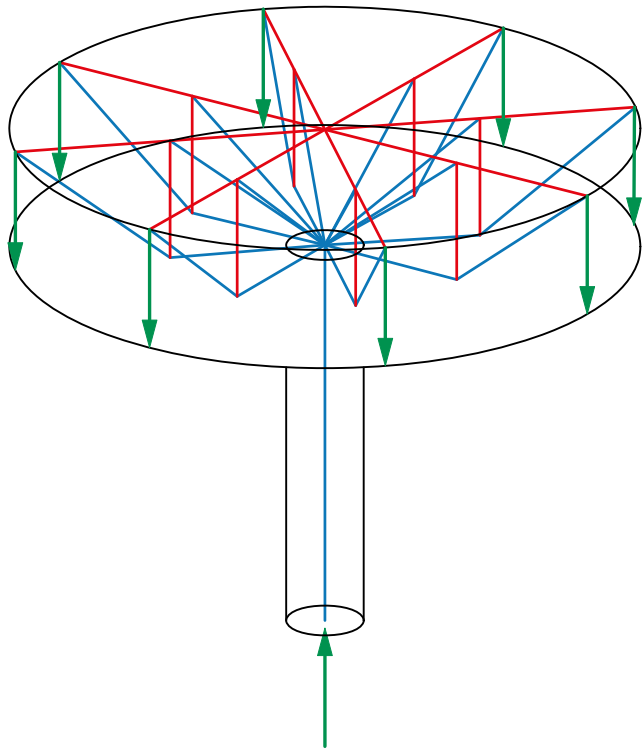
Folded plate

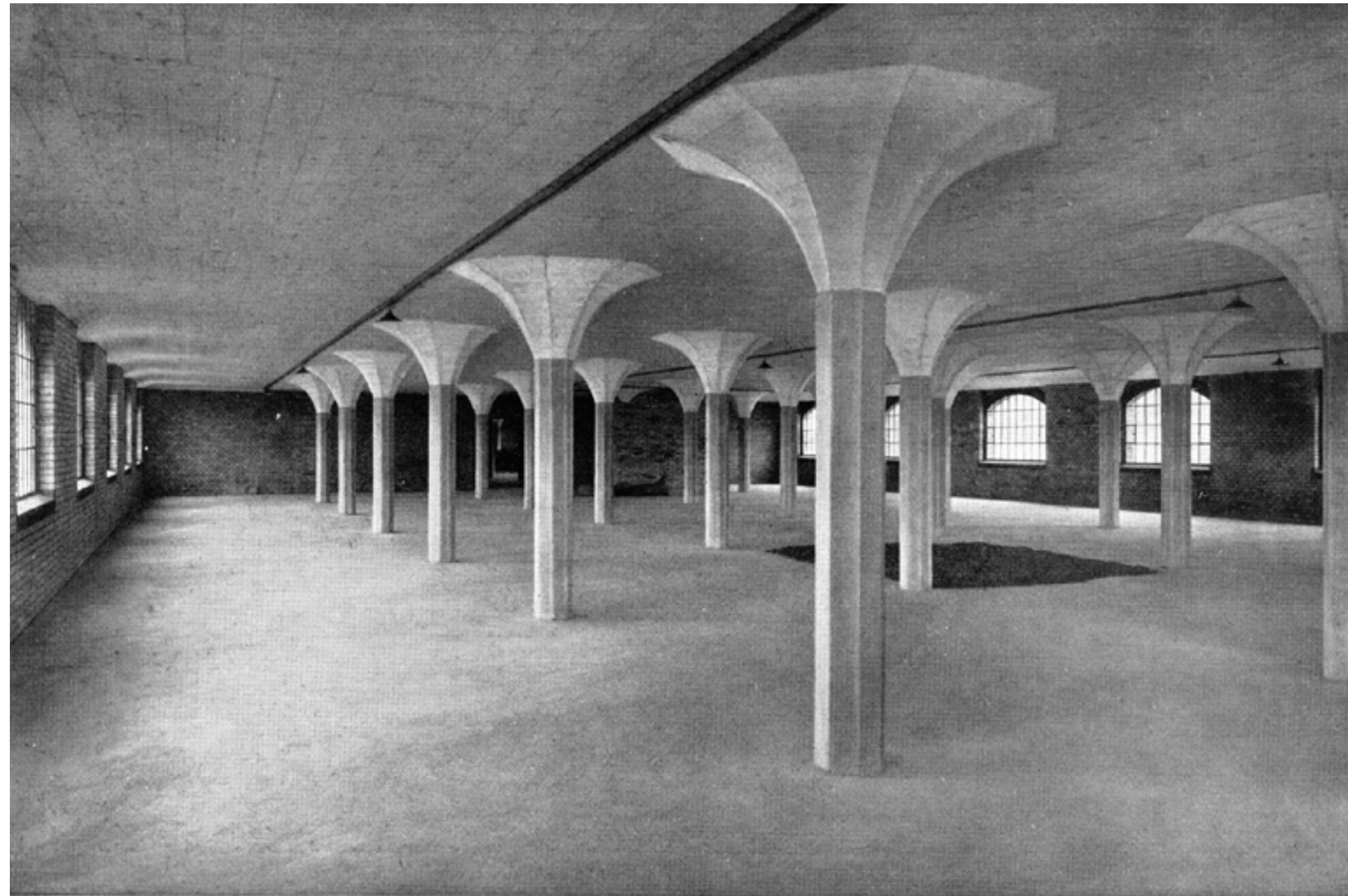
Hybrid structures



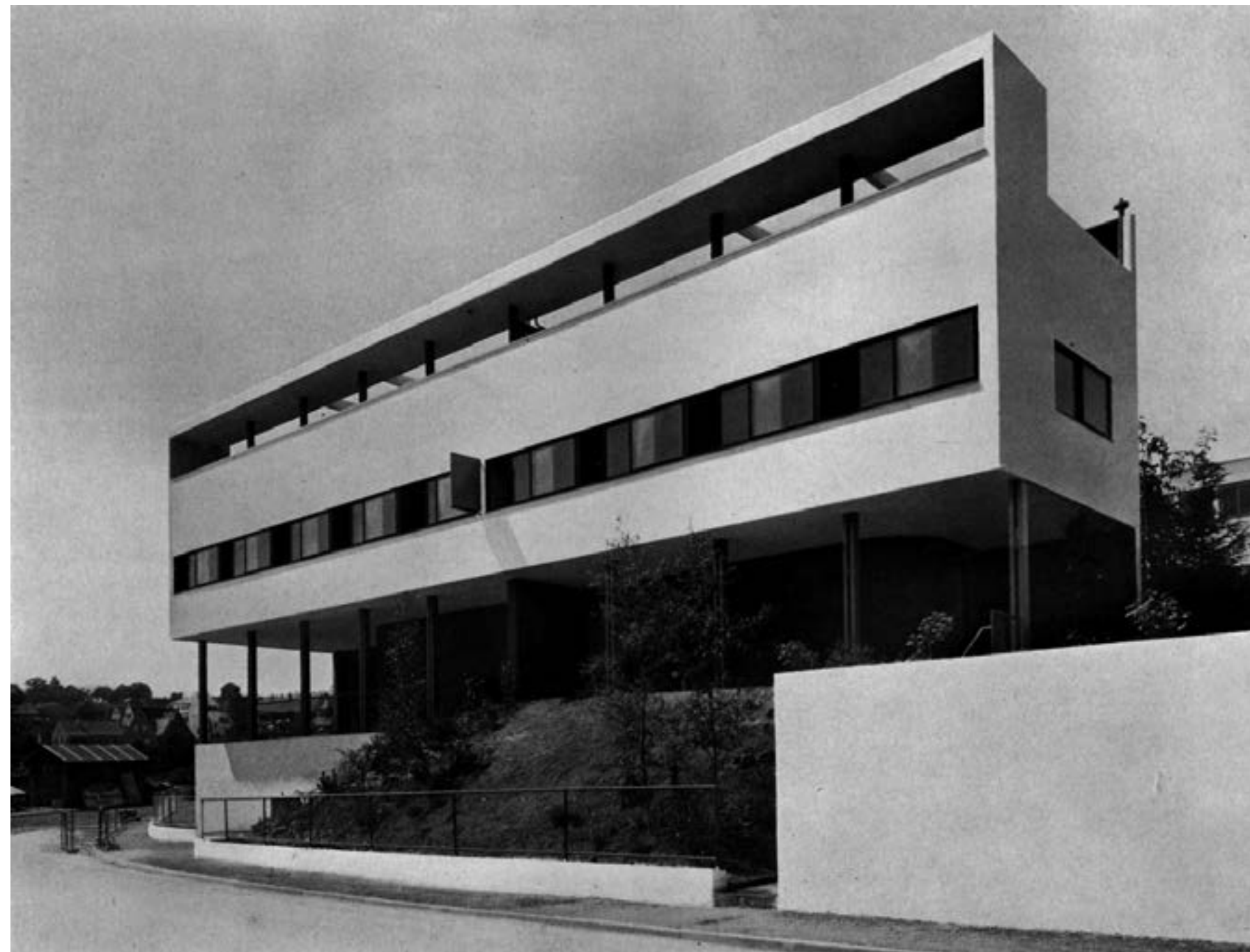








Pier Luigi Nervi: Wool Factory Gatti, Rome, 1953



Le Corbusier & Pierre Jeanneret: two family house, Weissenhof housing estate, Stuttgart, 1926



Frank Lloyd Wright: Johnson Wax Building, Racine, 1939

Shear walls and plates

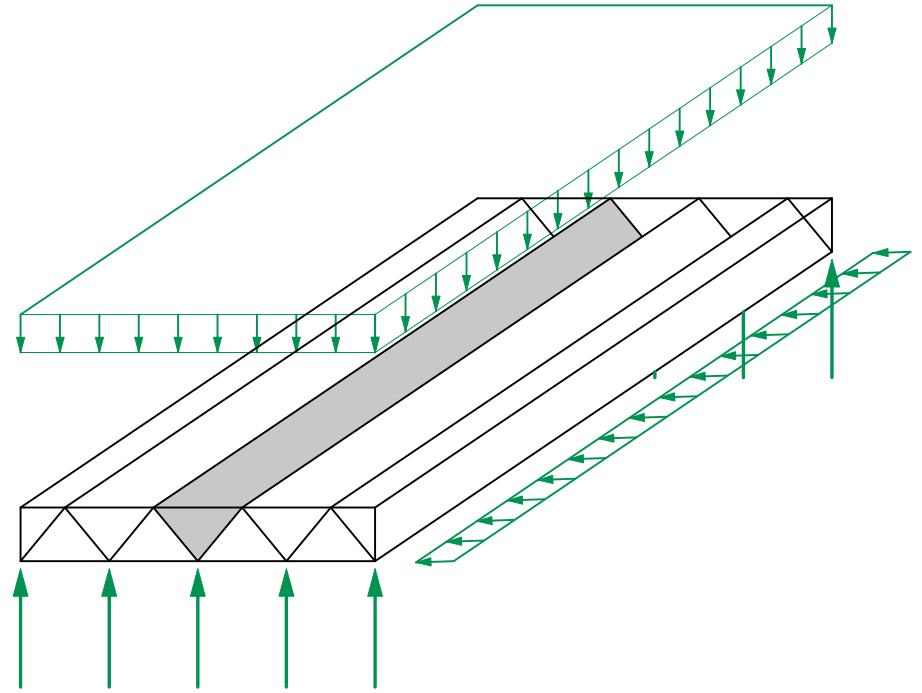
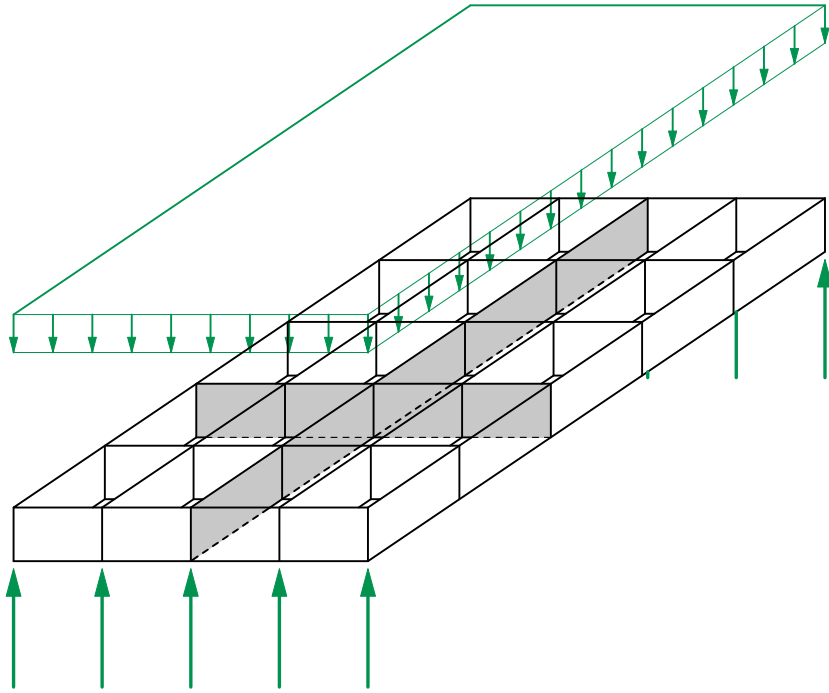
Shear walls

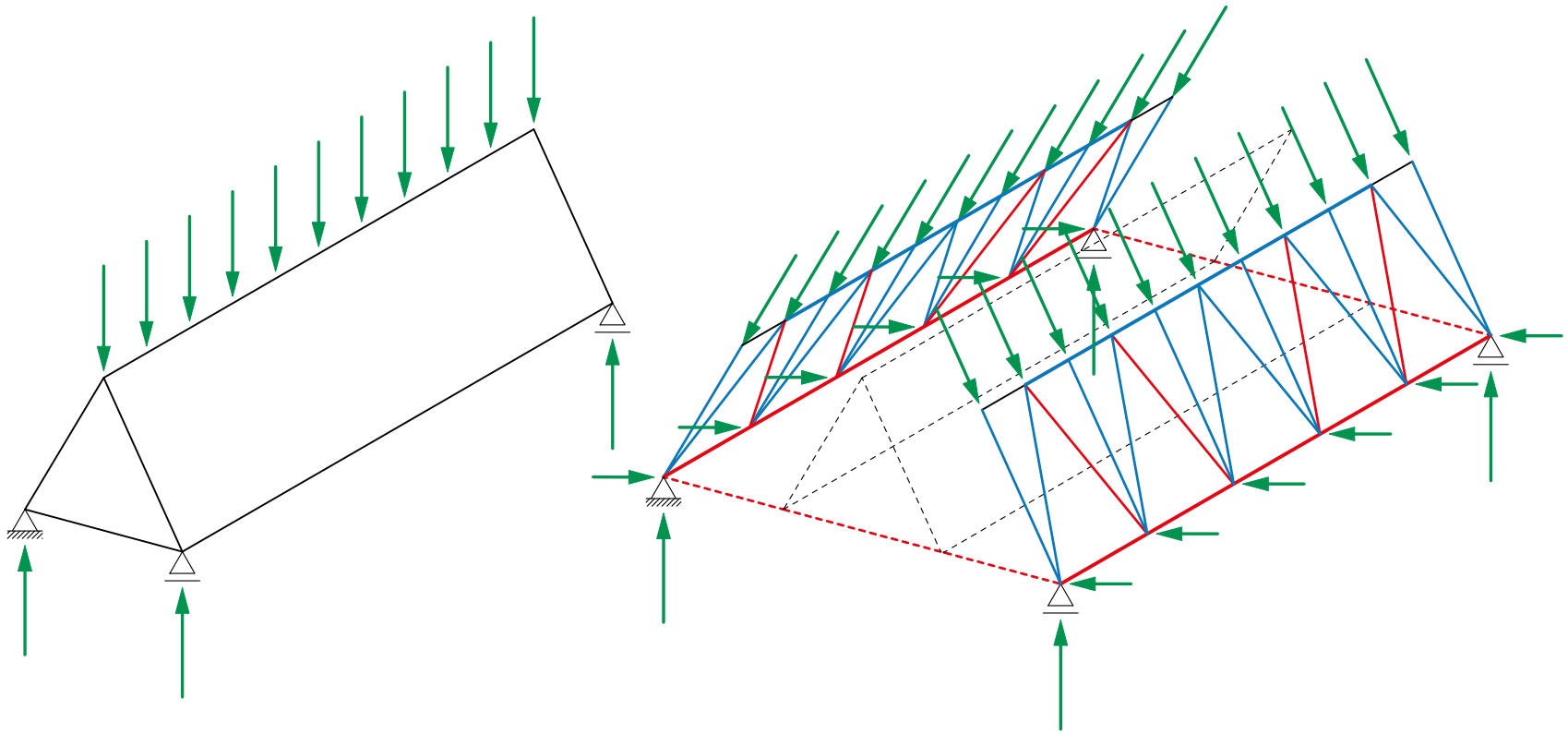
Beam grid

Plate

- Folded plate

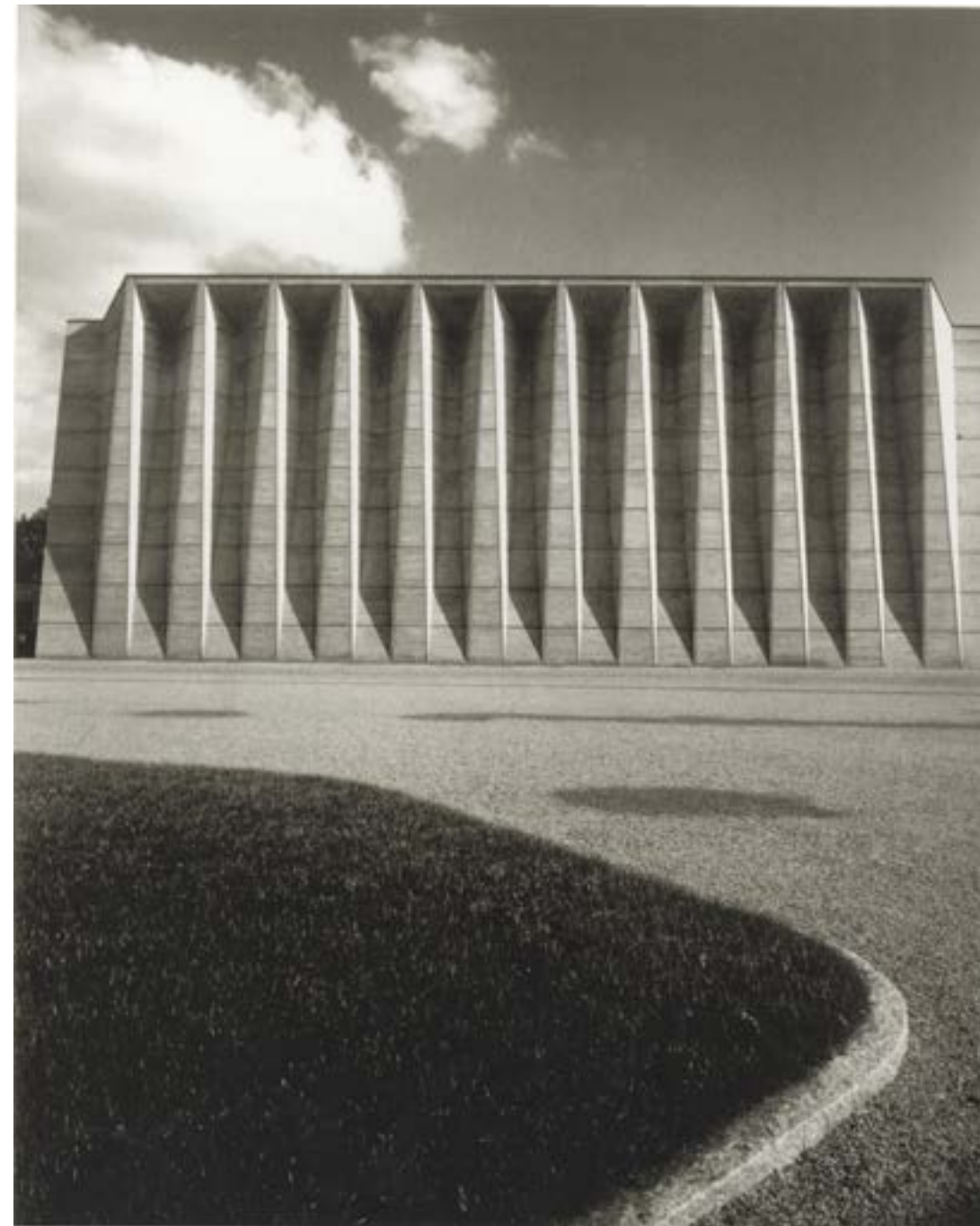
Hybrid structures



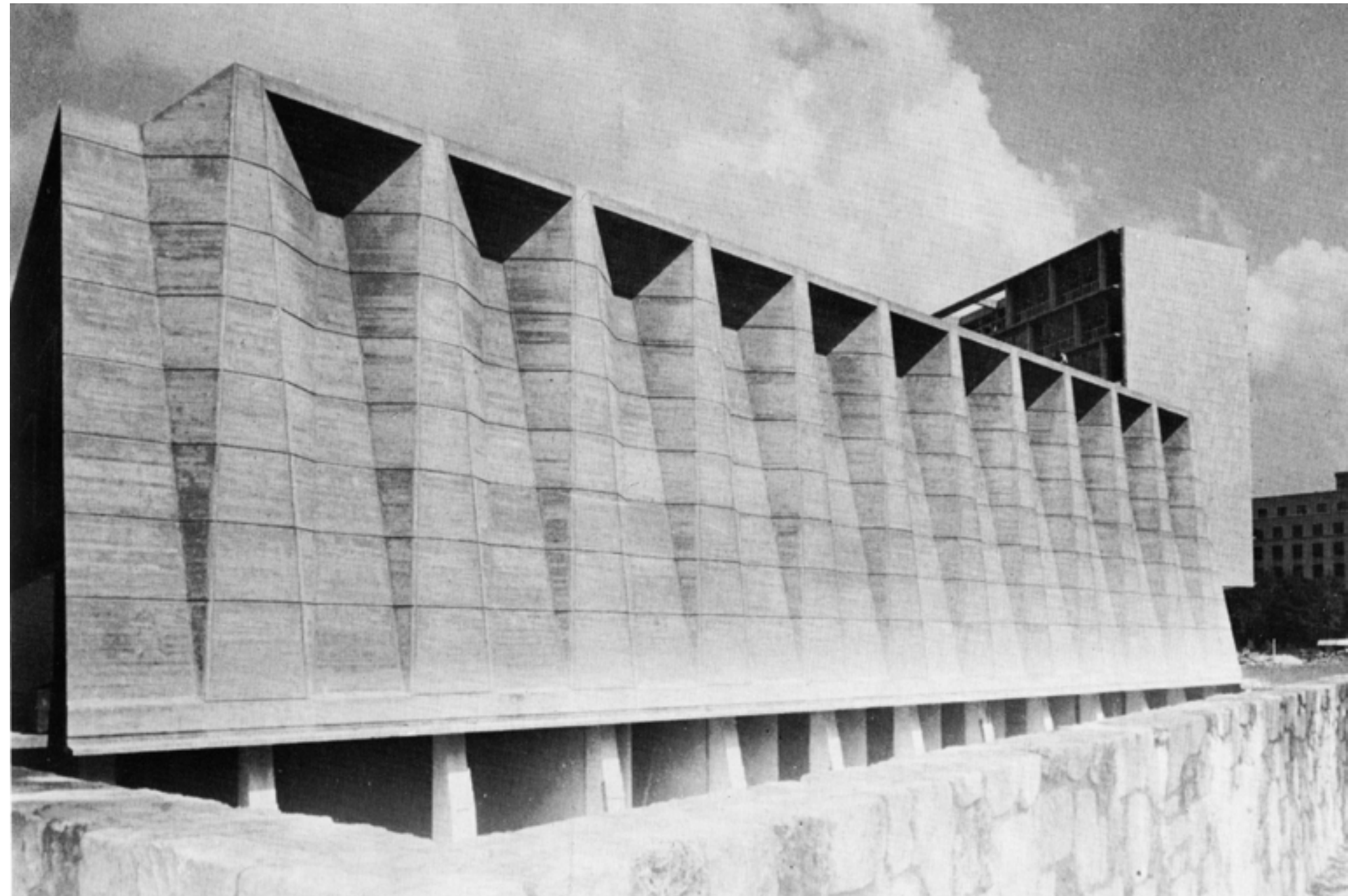




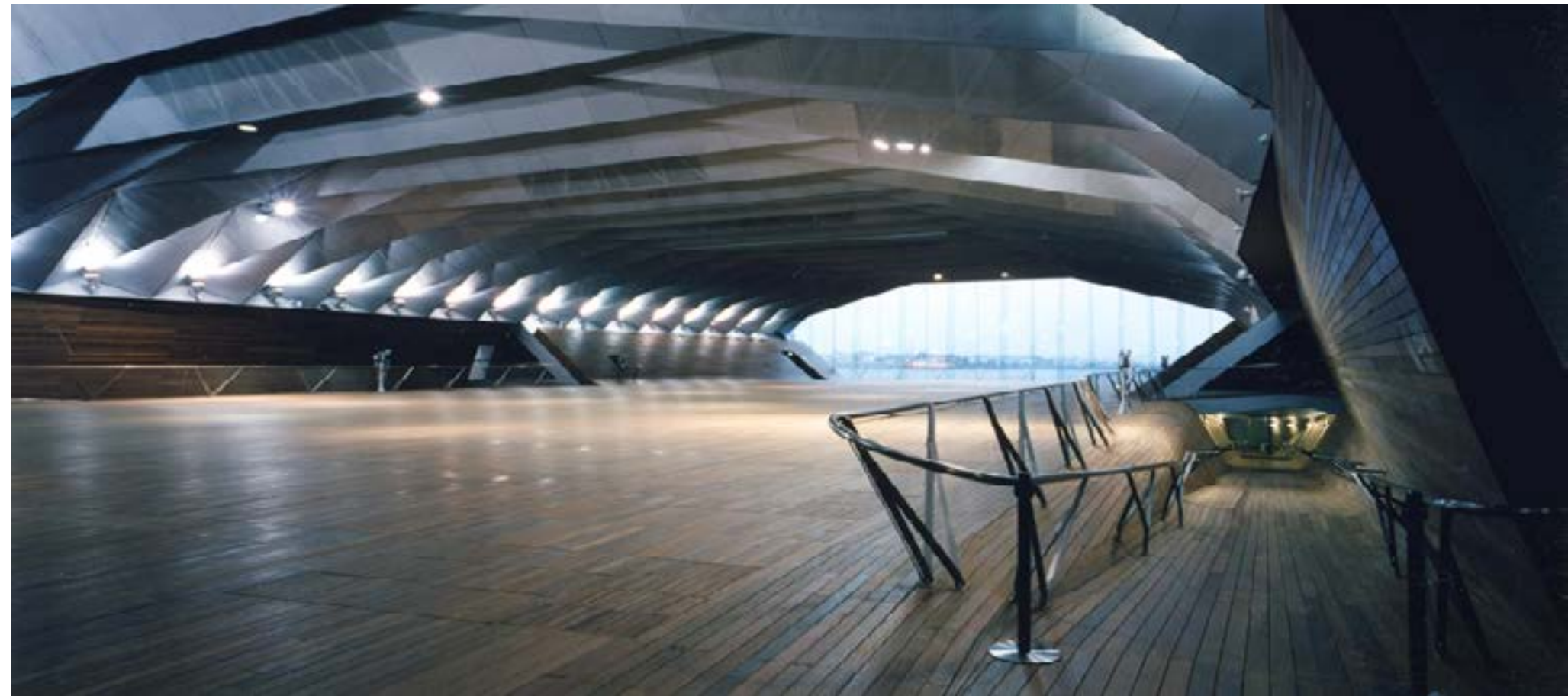
Marcel Breuer, Bernhard Zehrfuss, Pier Luigi Nervi: conference hall, UNESCO headquarters , Paris, 1952



Marcel Breuer, Bernhard Zehrfuss, Pier Luigi Nervi: conference hall, UNESCO headquarters , Paris, 1952

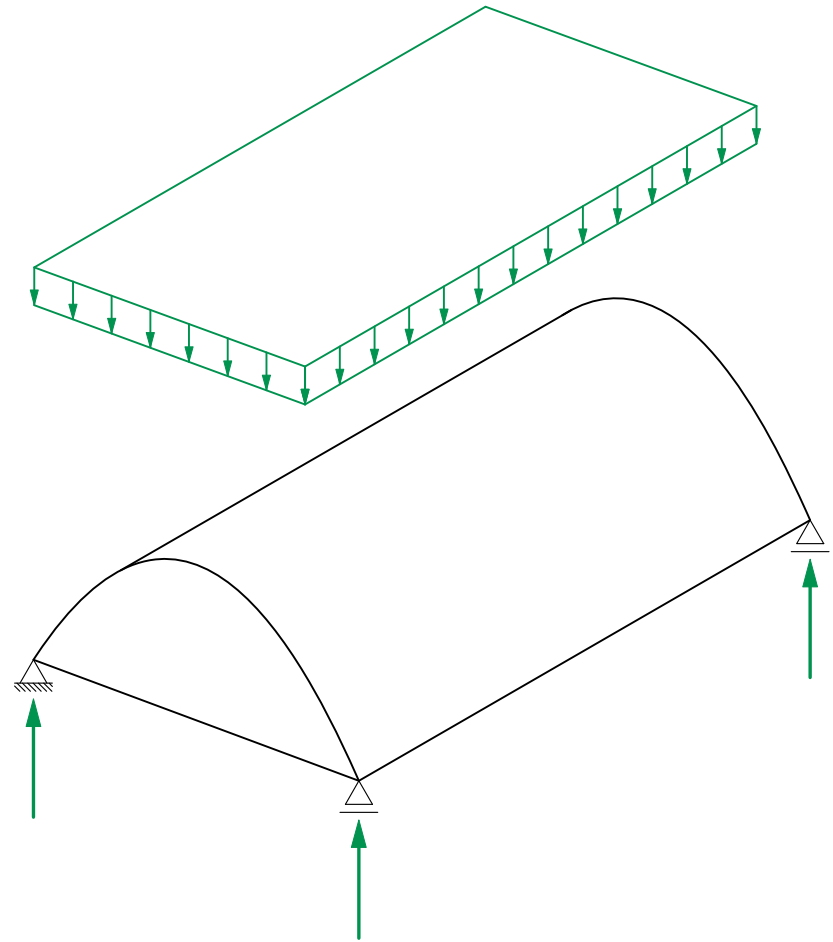
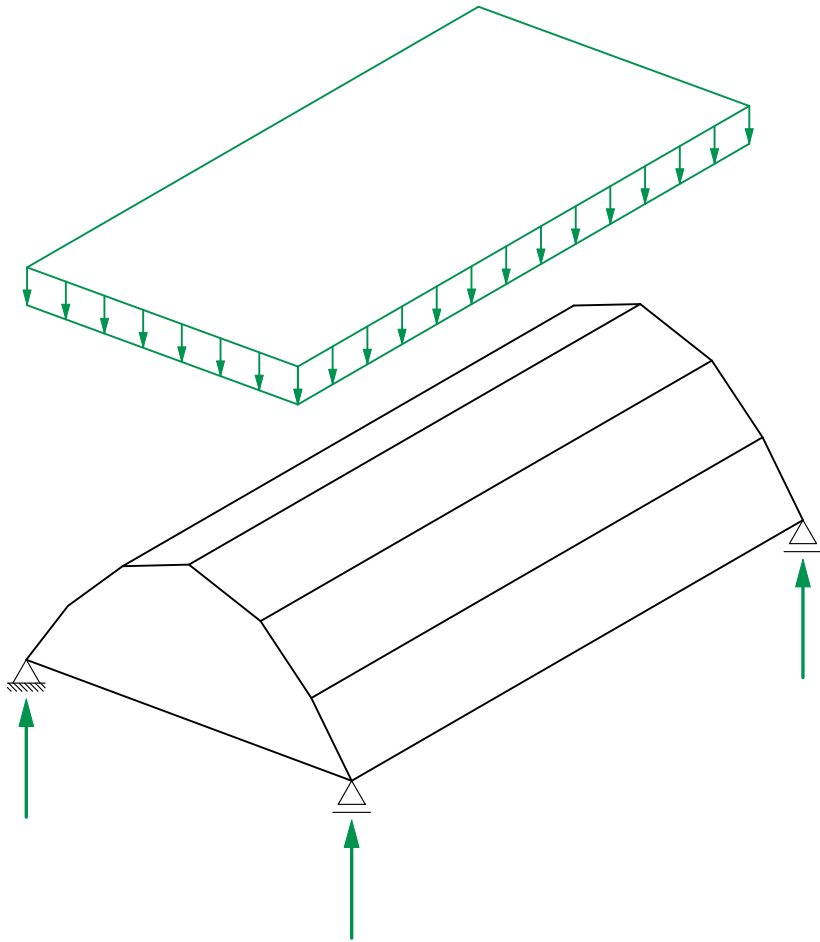


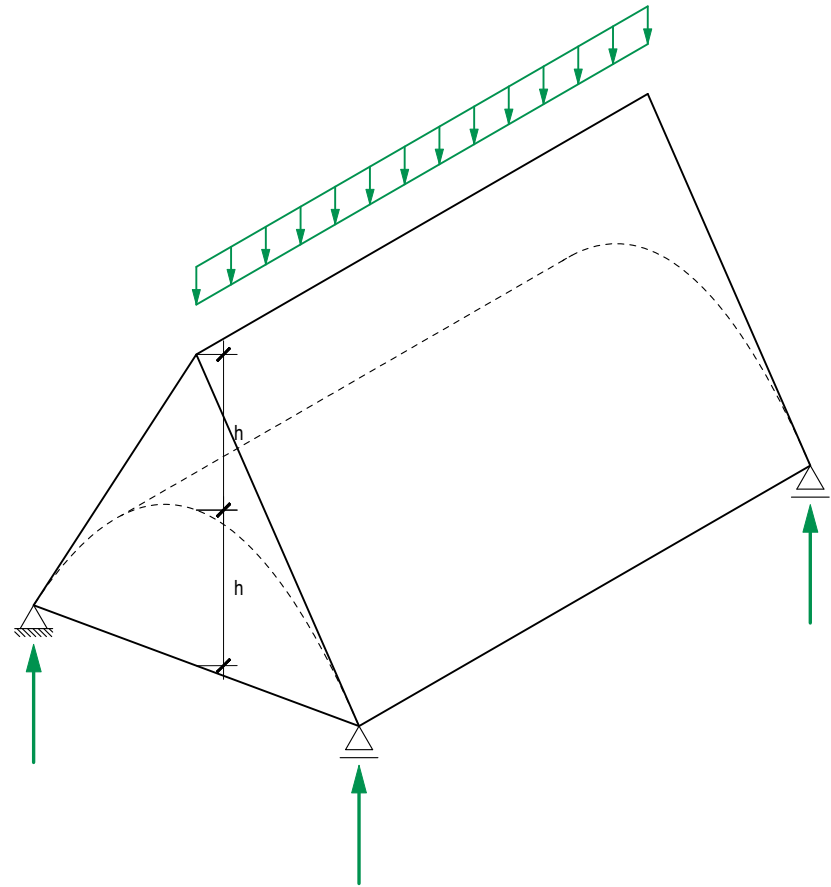
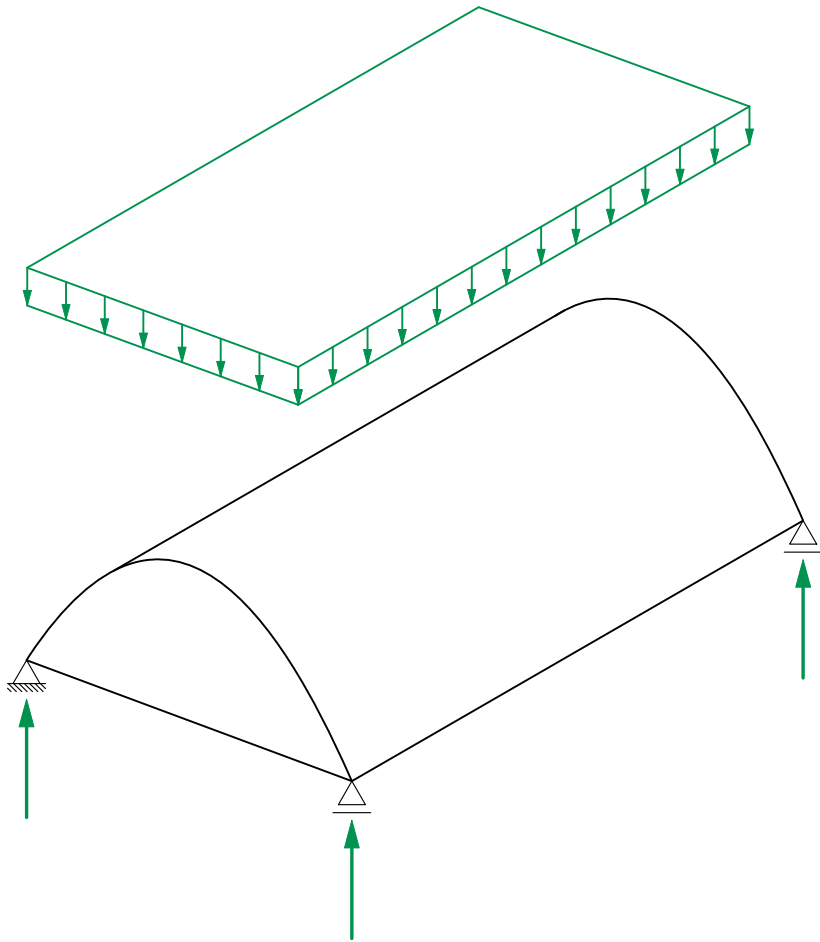
Marcel Breuer, Bernhard Zehrfuss, Pier Luigi Nervi: conference hall, UNESCO headquarters , Paris, 1952

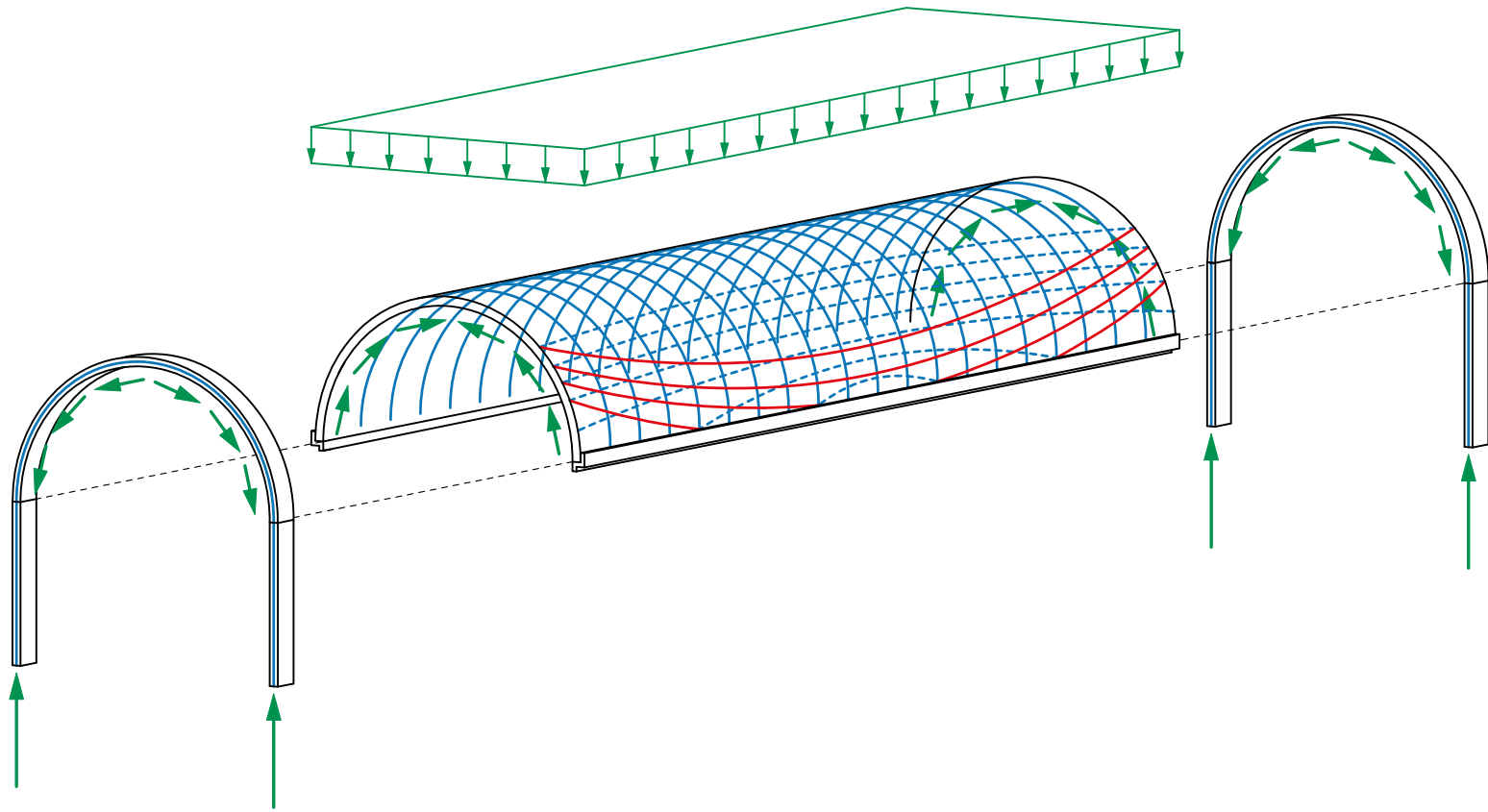




Howard Ashley & Hisham Albakri & Baharuddin Kassim: Masjid Negara Mosque, Kuala Lumpur, 1965









Louis Kahn, August Komendant: Kimbell Art Museum, Forth Worth, 1972

Shear walls and plates

Shear walls

Beam grid

Plate

Folded plate

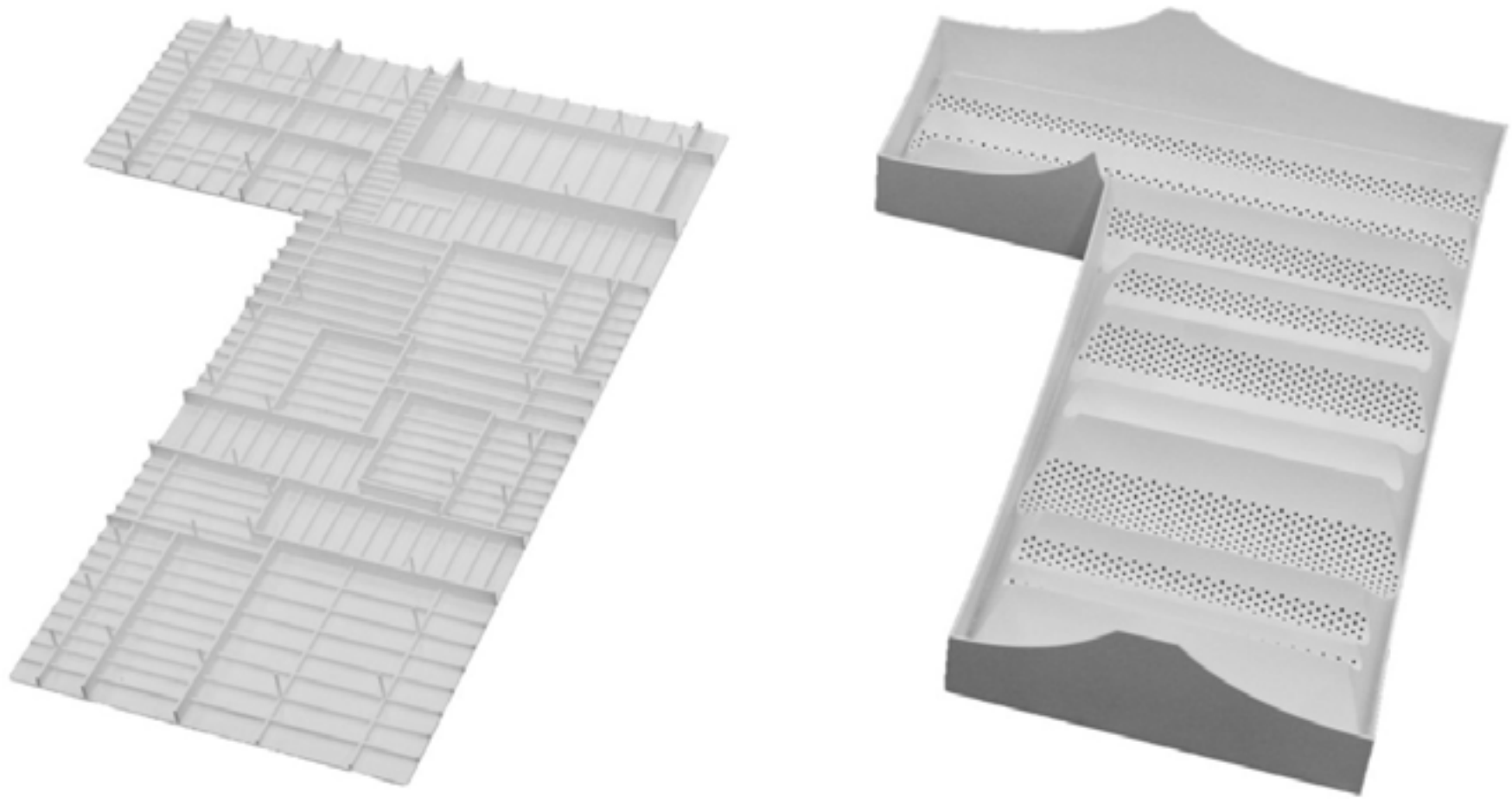
- Hybrid structures



Christian Kerez, Joseph Schwartz: Art Museum Warsaw, Competition, 2007



Christian Kerez, Joseph Schwartz: Art Museum Warsaw, Competition, 2007





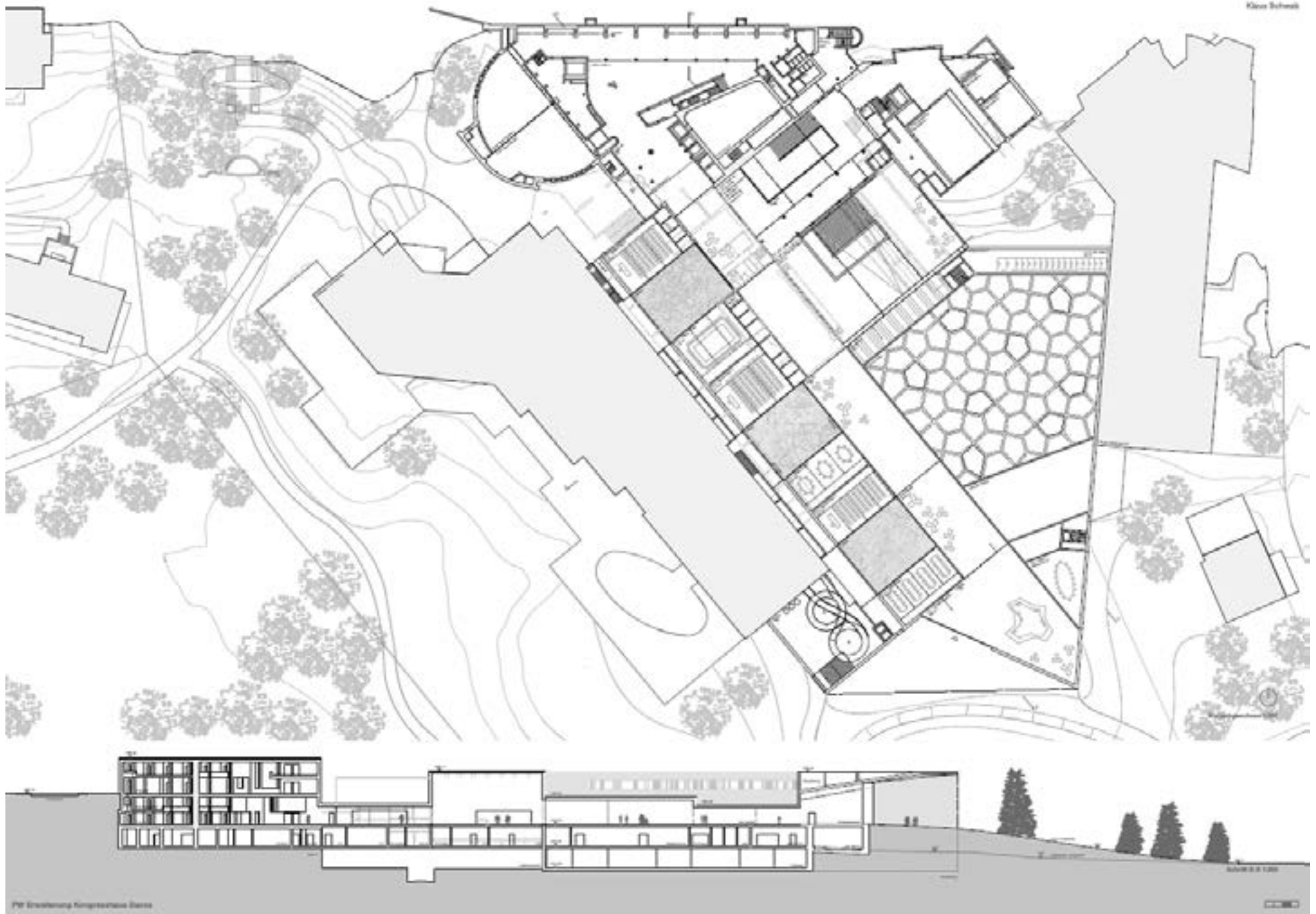
Christian Kerez, Joseph Schwartz: Art Museum Warsaw, Competition, 2007



Christian Kerez, Joseph Schwartz: Art Museum Warsaw, Competition, 2007



Heinrich Degelo, Joseph Schwartz: Extension congress centre, Davos, 2011



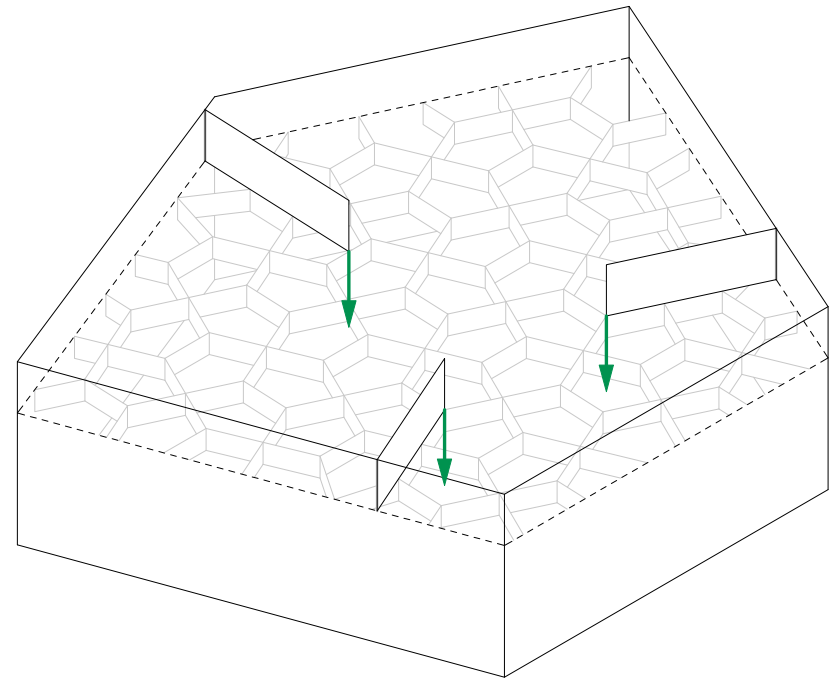
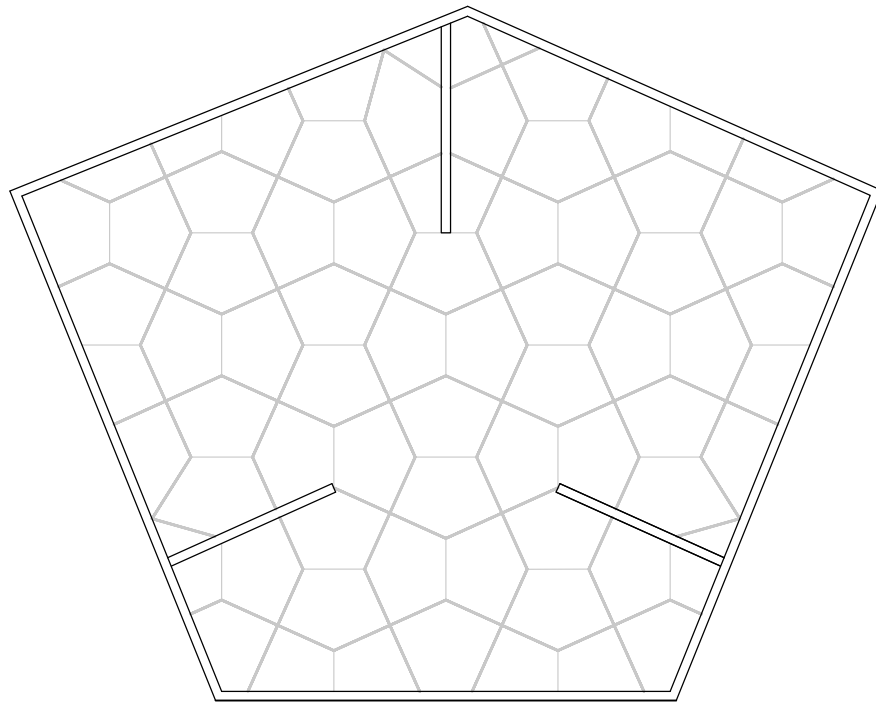
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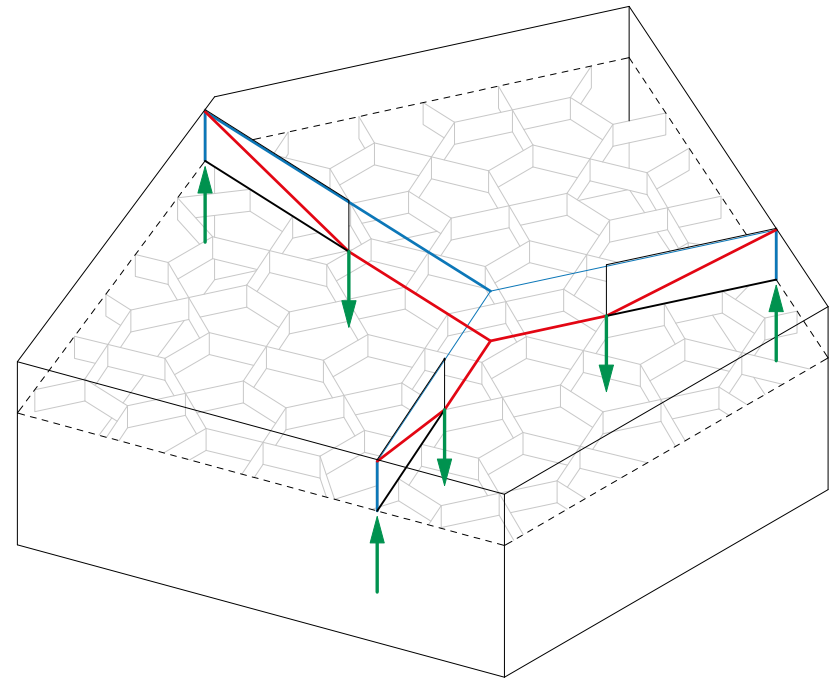
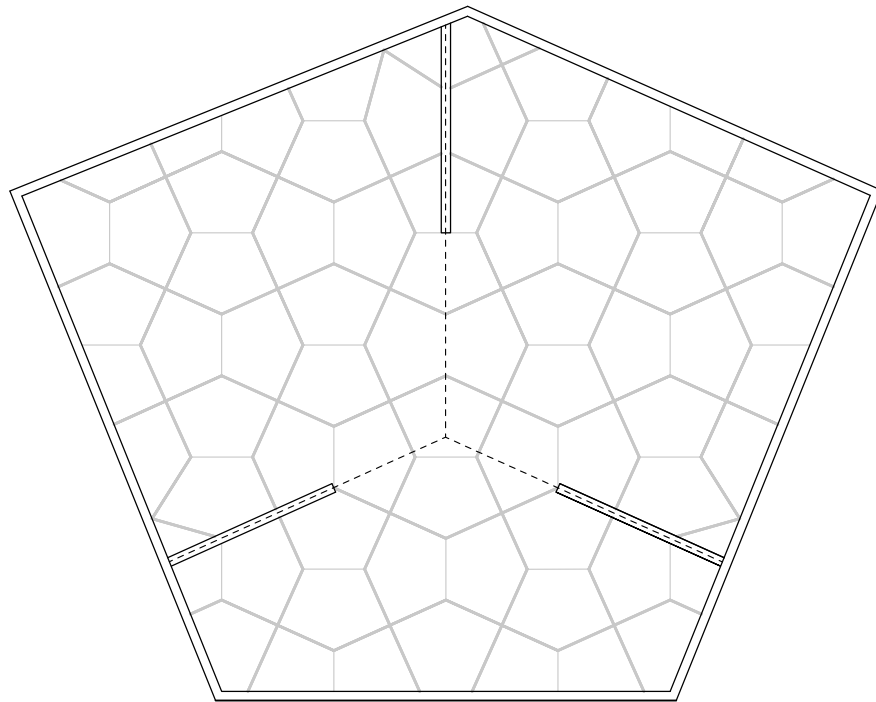


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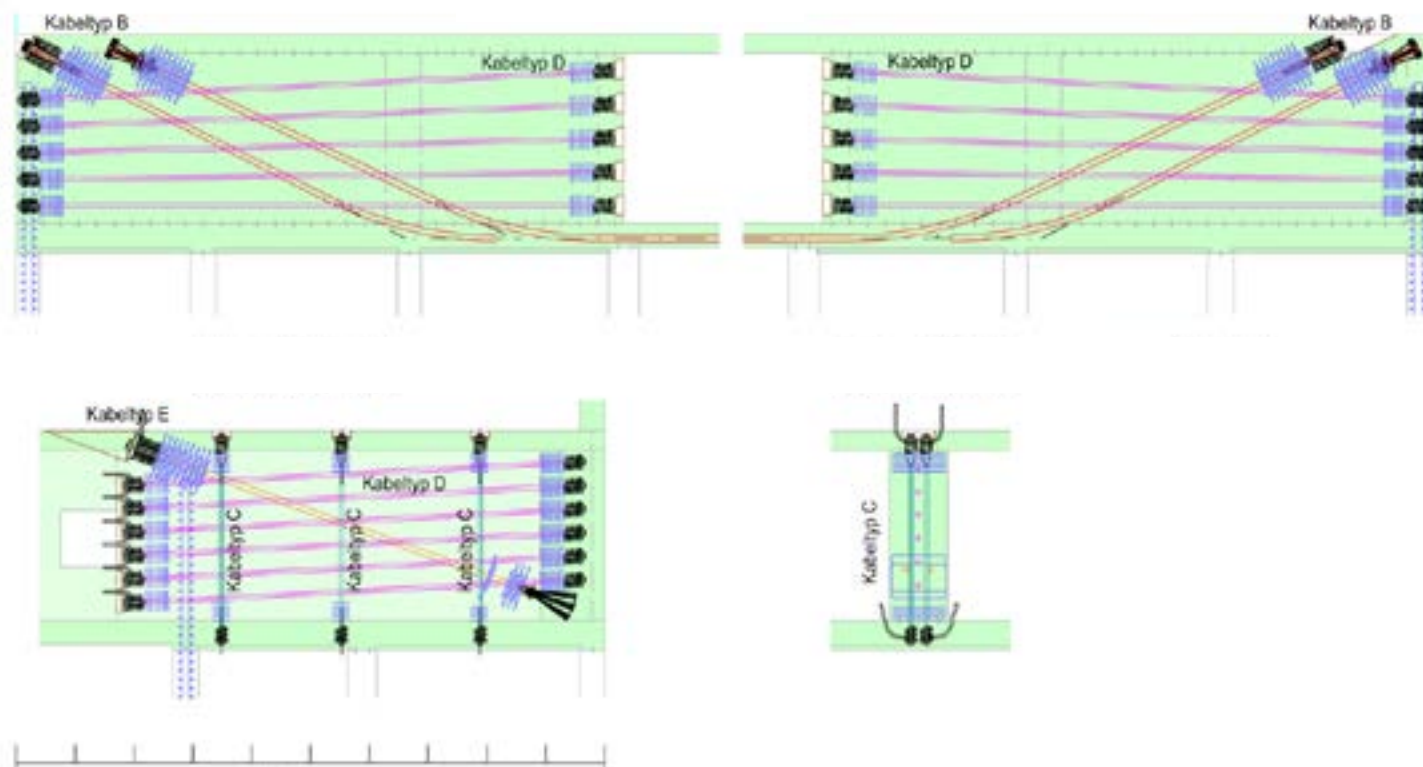
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