

Trusses

Architecture

Why triangles span further than beams, and the patterns to recognise.

A truss is a deep beam with the unused middle removed.

Why it works

A triangle cannot change shape without stretching

Members carry axial force, not bending

Depth is bought cheaply by using air

Typical depth is span over 8 to 12

Services can pass through the web

Patterns to know

Warren — alternating diagonals

Pratt — diagonals in tension

Howe — diagonals in compression

Fink — for pitched roofs

Vierendeel — rectangles, no diagonals

The Vierendeel has no triangles, so its joints carry bending. It is heavier, and used where an opening is needed.