

# CHELTENHAM & G.W. UNION RAILWAY.

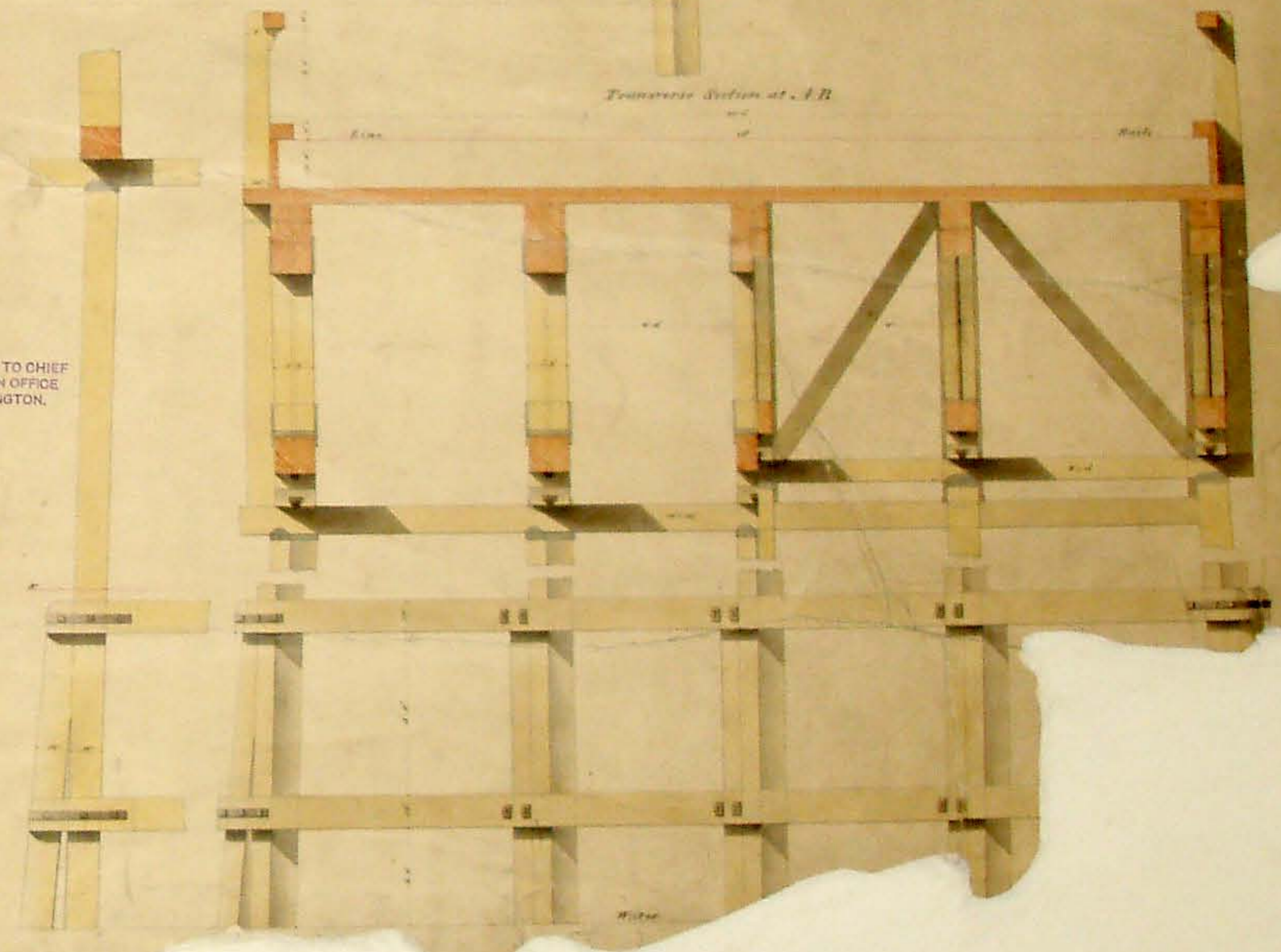
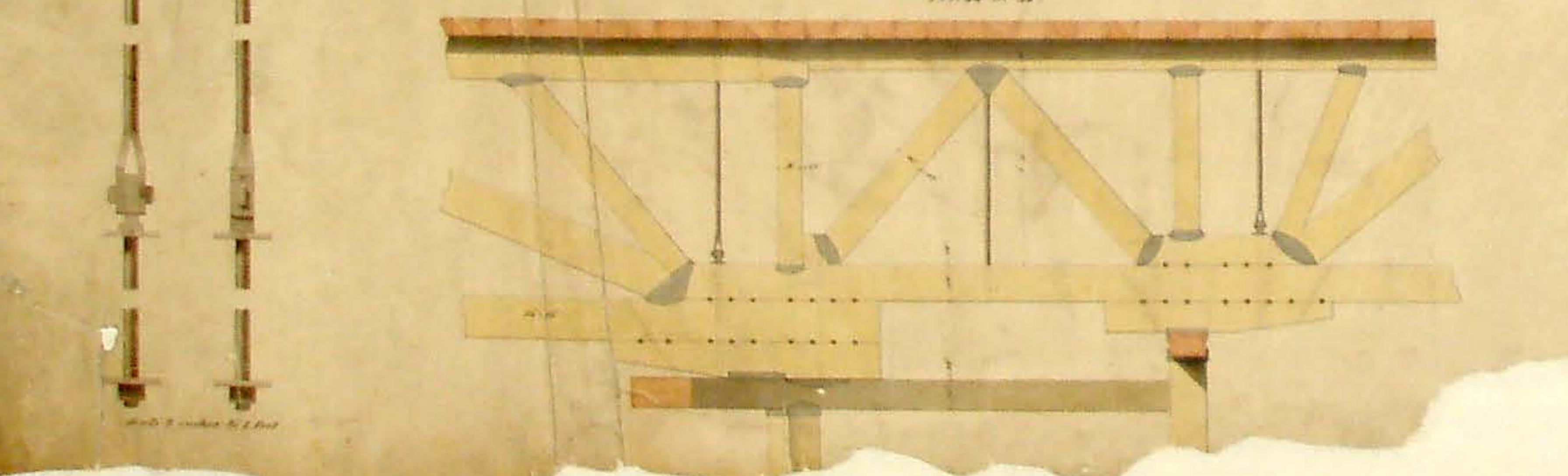
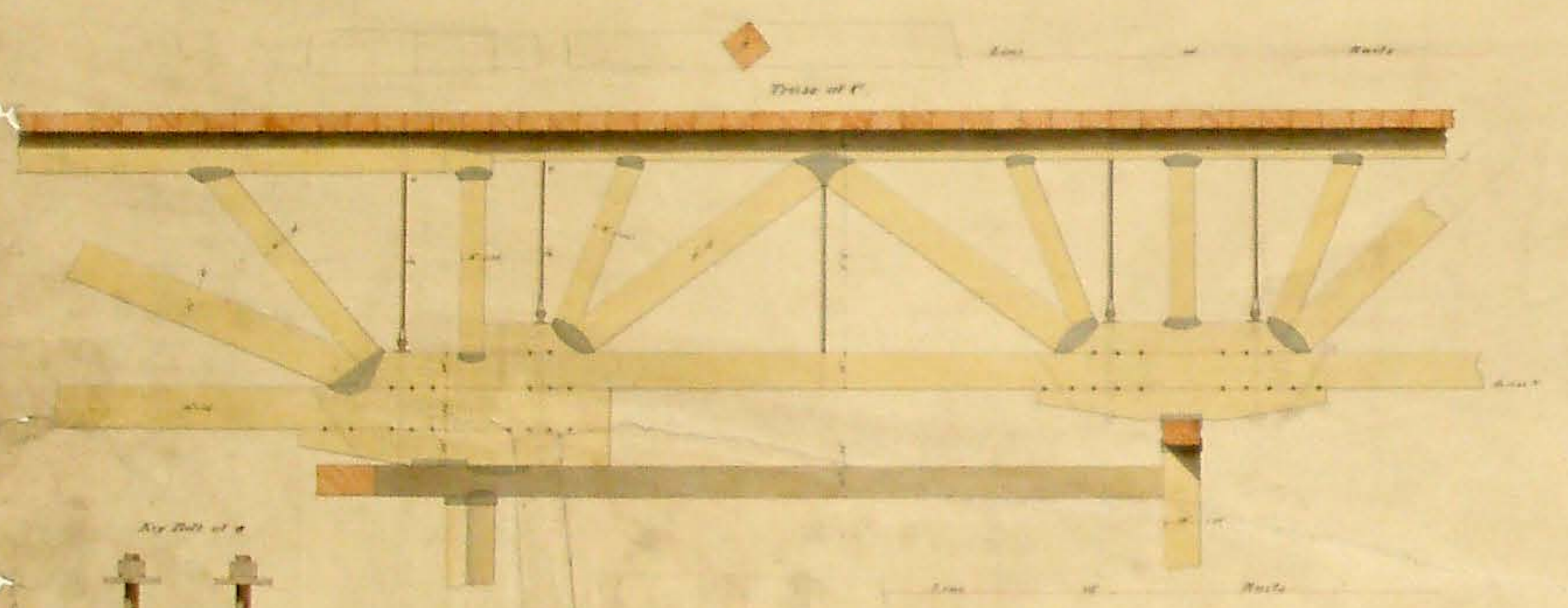
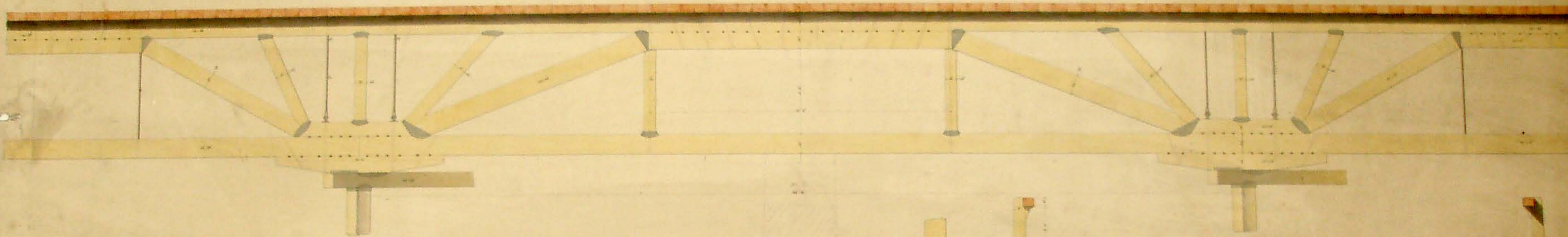
12712

CONTRACT N<sup>o</sup>

CAPELS VIADUCT.

DRAWING N<sup>o</sup>

Outside Trusses



SCALE 1 inch to 1 foot.

TO BE RETURNED TO CHIEF ENGINEER'S PLAN OFFICE G. W. R. PADDINGTON.

Key Bolt of a



Key Bolt of a



## Capels viaduct (caption)

Brunel employed timbers known as braces which were used to connect the various primary structural members together both diagonally and longitudinally. Some of the bracing used at Capels viaduct is shown above.

The cross bracing greatly increases the stability of the structure with a relatively small increase in material used. Much of the timber used was yellow pine from Memel in the Baltic. Timbers with relatively large cross-sections were used as this substantially reduced the hazards of decay and fire as well as the obvious advantage of increased strength. The main longitudinal beams were often fabricated from a pair of 12in by 12in baulks which were joined by suitable means such that the resulting 'laminated' beam had virtually the strength as a single timber of the same cross-section (12in by 24in).

Brunel conducted careful experiments where he measured the deflection and therefore the suitability of particular arrangements of primary structural components and secondary (bracing) components. He also investigated different ways of joining the timbers so that they did not separate under heavy loads in service.