A3D MAX CASE STUDY

Sprowston Diamond Centre, Norwich

TSI STRUCTURES LTD

ABOUT TSI STRUCTURES

For over twenty years TSI Structures has designed, fabricated and erected structural steelwork throughout the UK. With an enviable reputation for delivering cost-effective, high quality structures, TSI works on projects of all sizes; from large scale developments such as Europe's largest Tesco Woolwich Central superstore, to smaller innovative projects such as the Sprowston Diamond Centre described below.

THE PROJECT

Following acceptance of their competitive alternative design, TSI Structures were appointed by Omnis Construction Ltd, the main contractor, to design and construct the steel frame for a new multi-purpose hall to be added to the Sprowston Diamond Centre in Norwich, which houses a number of serviced rooms for hire.

In contrast to the typical 19th century school style of the existing buildings, the new hall adopts a bold modern design. The hall structure is essentially a simple cube consisting of two low pitch single span internal portal frames and two flat top braced end frames, forming a very low pitched hipped near pyramidal roof with overhanging eaves.

ABOUT A3D MAX

A3D Max is a frame analysis program which enables engineers to quickly model 2D and 3D building frameworks, whether simple or complex, with no limit to the number of members or load combinations.

BENEFITS OF USING A3D MAX ON THIS PROJECT

The technical challenge facing designer Andy Cullum during this project was provided by the high clerestory glazing occupying the upper third of each elevation. This meant that no vertical bracing was permissible above the top of the brickwork lower cladding.

CADS CUSTOMER:
TSI Structures

OWNER:
Sprowston Town Council

LOCATION:
Norwich

SIZE:
3,000 sq ft

COMPLETION DATE:
2018

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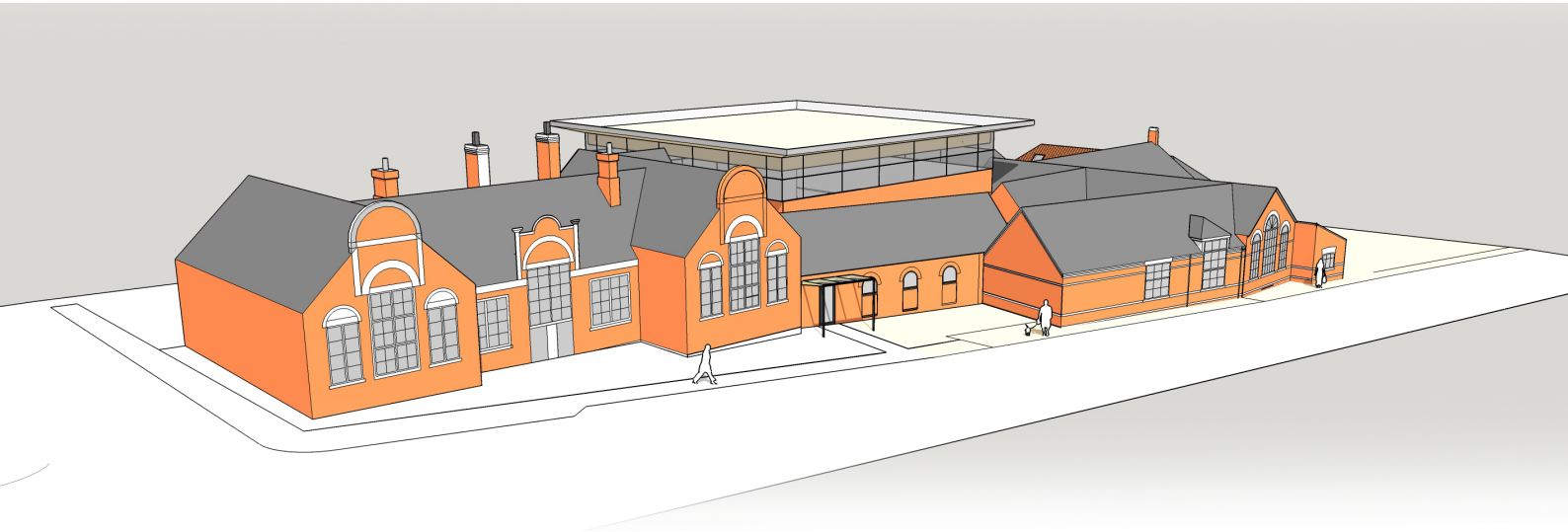
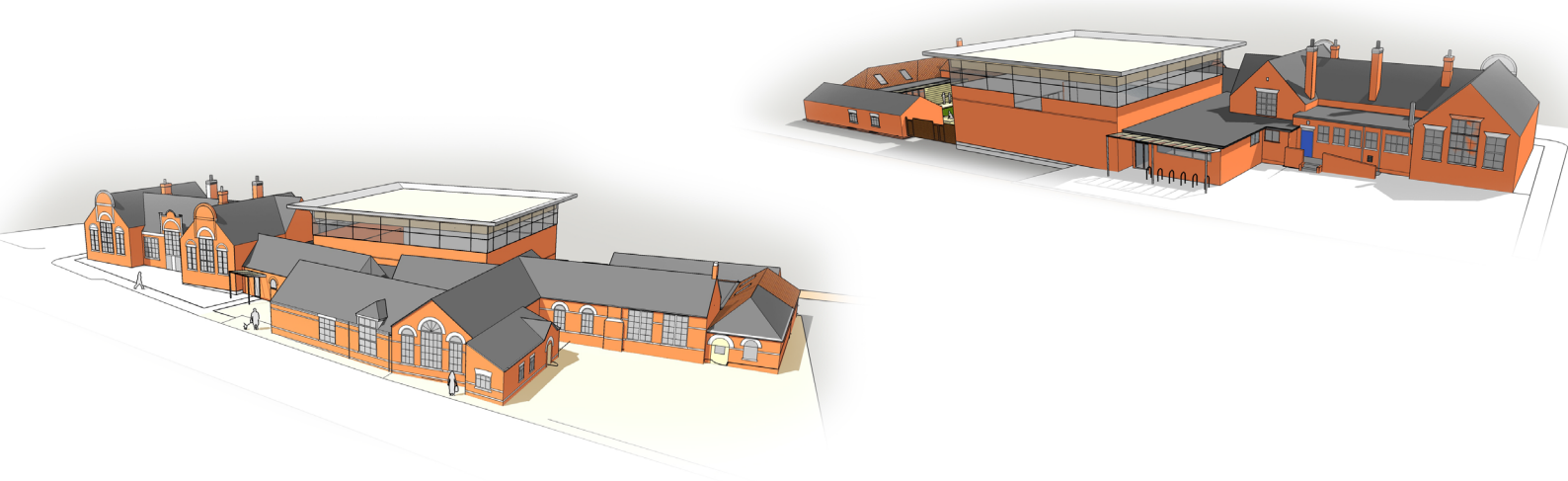
Andy used the partial fixity options in CADS A3D Max to satisfy the stringent deflection constraints imposed by the glazing design criteria whilst minimising the sizes of the columns and eaves members.

CADS VelVenti was used to derive the design wind loads, with CADS Steelwork Member Designer and Steelwork Moment Connection Designer used to check the steel member sizes and connections in accordance with BS 5950.

"The use of A3D Max 3D analysis was an essential tool enabling the inherent stiffness of the pyramidal roof shape to be exploited whilst ensuring the glazing restraints were within deflection limits. We were able to tweak member sizes and end fixities until the optimum sizes were achieved."

Andy Cullum, Designer at TSI Structures





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