DTE case study

KINGSWAY GARDENS

Project
Kingsway Gardens

Location
Ossett, West Yorkshire

Client
Kirkstall Timber Ltd for Orion Homes

Product
Roof trusses and loose rafters

Size
26 1&2 bedroom apartments

We recently worked with Kirkstall Timber to provide roof trusses and loose rafters for an Orion Homes development in Ossett, West Yorkshire.

Kirkstall originally provided us with concept drawings for the roof of the one and two-bedroom apartment buildings. The Cramlington team designed several alternatives, with the final design comprising a low roof with high-level, double-stubbed ridge trusses onto parallel box trusses, and an upper roof designed to be a true cone with a diameter of over 19.000m and a height of nearly 6.000m

Andrew Lee, general manager at Cramlington, said: "We designed a solution to accommodate the offset Velux window positions on the low roof by using loose rafters to continue the slope down from the box trusses to eaves level, with a separate floor formed in the loose joists. The hexadecagonal (16-sided) supporting walls on the upper roof required a design solution as they did not lend any symmetry to the cone-shaped roof above. There were also manufacturing and delivery height restrictions and a lift shaft to take into consideration."

The cone-shaped roof required 100 individually labelled span-specific monos, arranged in an outer ring, with the spacing at the overhang extents positioned every 600mm centres. This outer ring of mono pitch trusses were supported by skewed internal walls and where these walls were not available, parallel box girder trusses were introduced as a replacement. The oncoming trusses were “top hung” to avoid using expensive and specialist made skewed-angle joist hangers and the internal webbing was standardised for factory continuity purposes.

Andrew comments: "The central core was similarly restricted by overall height dimensions, as it was necessary to construct the nearly 6.000m high, 3-ply integral central girder truss as two units, and build it on site using field splice plates."

The full design was completed using Mitek’s 20/20 layout software, and it was then exported to AutoCAD 2015 to be dimensioned and detailed to meet Kirkstall’s checking and erection requirements.