Head Office at Halifax

For the Halifax Building Society

Architects

BUILDING DESIGN PARTNERSHIP

Structural Engineers

BUILDING DESIGN PARTNERSHIP

Steelwork Contractor

ROBERT WATSON & CO.
(CONSTRUCTIONAL ENGINEERS) LTD

Judges Comments

The structure is a practical combination of steel and concrete to provide an economical solution. The use of the space in the steel frame on the first floor to house the air handling plant is economic both in terms of space and air conditioning. The building fits well into its surroundings, and although from certain angles appears to dominate them, the overall scale is not obtrusive in what is a small scale town. The way in which the ground floor has been restricted to allow for well landscaped pedestrian access around the building is highly commendable and helps to integrate the building with its surroundings.

The Halifax Building Society is the largest in the world and as befits such an organisation its new HQ at Halifax incorporates the most up-to-date thinking on office building. The main offices and directors' suites are carried on a storey-deep structural steel frame which is also the service floor.

Three main recommendations emerged from a re-appraisal of the functioning of the Society and these formed the basis of the brief: a general office, 4,645 sq.m. in area, located on one level; an automatic retrieval system for the 2 million files which should be situated below ground for maximum security; a completely air-conditioned building.

Several structural forms were investigated but the most satisfactory was found to be twin, 4.267 metres deep plate girders inboard of the perimeter, spanning between reinforced concrete towers in each of the four corners and cantilevering to the face of the building. The design of the plate girders was complicated by the need for large openings through their webs for services, the main plant room being located within the depth of the girders.

The complexity of the stress distribution around the holes prompted the use of a photo-elastic model test undertaken at Imperial College, London. A second photo-elastic model test was undertaken by Sharples Photomechanics Limited, on one of the eight main girder support brackets – two at each of the four tower positions. The most heavily loaded bracket accommodates a vertical reaction of 833 tonnes.

The flange plates vary up to a maximum of 1,524mm × 76mm and there are four 508mm square solid forged steel columns.

The quality control, handling and fabrication of such large pieces of steel created many problems and certain novel welding procedures were adopted after seeking the advice of the Welding Institute. Thorough test procedures were followed; all under the supervision of Lloyds Register Industrial Services.

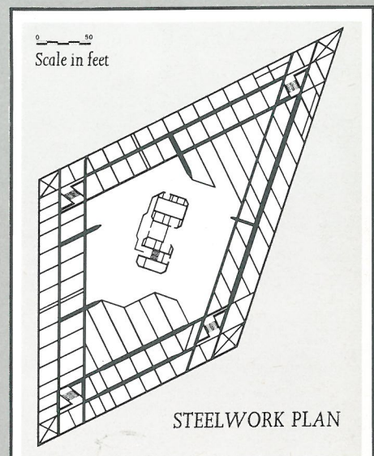
Erection of the steel frame took place from the suitably propped basement deck; the 305 tonne Manitowoc Ringer Crane lifting pieces weighing up to 61 tonnes each. The detailed erection sequence and the crane positions were all predetermined by using scale models of the site, steelwork and crane.

The period of erection for the 2,340 tonnes of structural steelwork was sixteen weeks.

In addition to the distinct advantages of steel as a structural material vis-à-vis concrete (with regard to self weight, detailing around holes, tolerances, etc.), there was the specific advantage that the steelwork could be fabricated coincidentally with the construction of the basement and towers thereby considerably shortening the length of the overall programme.

Careful planning was necessary to integrate the separate phases and to ensure a smooth transition from one to another.

The end result would seem to more than justify the initial confidence that was expressed in the decision to adopt steel for the principal structural component.



STEELWORK PLAN