

# **ANNEX 5-B**

## **Case study**

### **STEEL FRAMED APARTMENTS IN SOUTHAMPTON**

Admiral's Quay in Southampton is a harbour-front project consisting of eight apartment buildings, seven of which are in composite construction with light steel separating walls. Excellent acoustic performance was confirmed by on-site tests.

## STEEL FRAMED APARTMENTS IN SOUTHAMPTON



A new model for city living is where home, work and play are just a short distance apart. Admiral's Quay by developer Wilson Bowden exemplifies this notion by new additions to Southampton's waterfront to a consistent style, designed by architects Broadway Malyan. Composite construction was chosen for the structure in order that floor spans could accommodate communal facilities, car parking and retail outlets at ground floor, and all floors could be partitioned to suit a range of apartment layouts.

Eight buildings are planned for this prestige waterfront site at Ocean Village, the first completed buildings being a metro supermarket and two apartment buildings. This £80 million redevelopment project is well underway and is currently one of the largest city centre residential projects in the UK. Eventually, 400 apartments will be created, each with private balconies and terraces.

Seven of the eight buildings of 5 to 9 storeys height are constructed using steel frames, and comprise 500 tonnes of structural steel and over 50,000 m<sup>2</sup> total floor area. The ground

floor provides for retail outlets by using approximately double the storey height of the residential levels, which is typically 3.15 m. Typically, five apartments of 80 to 140 m<sup>2</sup> floor area are arranged in a cluster around a central steel core, containing a lift and access stairs. Excellent acoustic insulation of the composite floor was achieved, which was over 10 dB better than required by Part E of the Building Regulations.

The façade materials were chosen to emphasise the nautical 'feel', being a mixture of cedar wood, white insulated render and brickwork. Full height glazing provides for panoramic views. The cantilever steel balconies are attached directly to the supporting steel structure, which also included an isolating layer to minimise 'cold bridging'. This project emphasises the wide range of façade treatments that is possible using steel construction.

**Construction Benefits:**

- Freedom of internal partitioning by use of UC sections as composite beams
- Excellent acoustic performance
- Edge beams permit full height glazing
- Steel balconies attached to edge beams
- Retail outlets at ground floor
- Speed of construction

**Project Team:**

- Developer:** Wilson Bowden City Homes
- Architects:** Broadway Malyan
- Structural Engineer:** Robert West Consulting
- Steel Fabricator:** Robinson, Midland Steel Structures, Bone Steel, Carnaby Structures
- Decking Suppliers:** SMD, Ward, PMF



*Courtyard view showing the 7 storey apartments and their balconies*

**Construction Details:**

The steel frame of the building is designed using composite construction. Universal Column (UC) sections are chosen for all beams in order to minimise their depth in spans of 6 to 9 m. The composite slab used *holorib*-type decking and is generally 170 mm deep, to meet the current UK Building Regulations requirements for acoustic separation of the residential units. A battened floor and suspended ceiling provide the required acoustic insulation, which was confirmed by on-site tests (see table).

Separating walls use light steel frames and the external walls were masonry cavity walls, or insulated render onto brickwork, or cedar wood boarding. The cladding is supported by the structure at alternate floor levels.

The column grid is governed by the ground floor car-parking layouts, and as such, is not always on the building perimeter, resulting in 1.2m cantilever beams supporting the cladding.

Generally the centre bays have columns at 7.8 m centres in both directions, with the smaller edge bays having bays at 7.8 m x 3.9 m. The edge beams were also designed to be of minimum depth to provide full height glazing and walkthrough balconies and terraces.

The cantilever steel balconies are attached to 'stubs' or brackets which in-turn are directly connected to the edge beams, that are torsionally restrained by the composite slab. An isolating layer was introduced to minimise cold bridging of the extended steelwork.