



LIGHT STEEL FRAME BUILDING

SOARING

By John Barnard, SASFA director

There is a growing trend amongst the leading architects in South Africa to use LSF for curtain walls of multi-storey office buildings and shopping centres.



OPPOSITE TOP: Riverwalk Office Park, with LSF external walls and EIFS finish (Architect Boogertman + Partners).

OPPOSITE BELOW: LSF curtain wall at Cell C Headoffice.

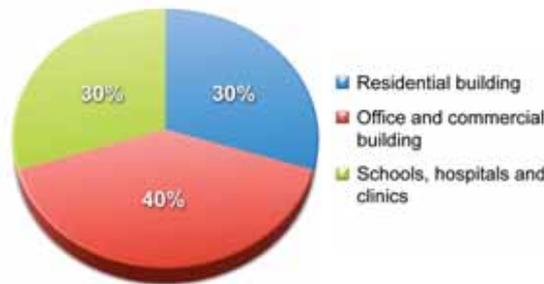
BOTTOM LEFT: One of the office buildings at Summit Place (Architect Boogertman + Partners).

BOTTOM RIGHT: Another of the Summit Place office blocks, with LSF curtain walls (Architect Boogertman + Partners).

The light steel frame industry and SASFA can start the new year on a positive note.

During the eight years that SASFA introduced LSF to the country, architects and developers were quick to identify the advantages of using LSF for other building types, and the application of LSF in South Africa has diversified to a number of non-residential applications.

During a survey recently carried out by SASFA, the industry indicated the following distribution of LSF during 2014:



The significant growth in the use of LSF in schools, hospitals and clinics stems from the resolution of the PICC (Presidential Infrastructure Coordinating Commission) that innovative building technologies (such as light steel frame building) will be used for the building of a growing percentage of all new schools and clinics, as well as student accommodation.

LSF curtain walling for multi-storey buildings

There is a growing trend amongst the leading architects in South Africa to use LSF for curtain walls of multi-storey office buildings and shopping centres. This entails replacing heavy masonry walling with light steel framing, which is fixed to the reinforced concrete floors.

The steel frames are clad with galvanized steel sheet, to which 60mm to 90mm thick expanded polystyrene (EPS) panels are



to higher levels



fixed. The external finish of the EPS consists of two layers of a special colour impregnated polymeric plaster. A reinforcing fibreglass mesh is embedded in the coating. This cladding system is referred to as EIFS (external insulating and finishing system). The inside of the light steel frames is clad with fire-resistant gypsum board. Additional insulation can be installed in the wall cavity, if required.

There are a number of significant advantages offered by LSF curtain walling for multi-storey buildings:

Low mass: LSF walling offers a 90% mass saving compared with heavy masonry cladding. The mass of the LSF walling comes to some **40kg per square metre** including the components of the wall, compared with **450kg per square metre** for plastered heavy masonry walls. This mass saving reduces the logistics and the labour needed for installation, speeds up the installation process, and results in savings in the supporting structure – floor slabs can be thinner as they need to carry less load. This means that the columns can be smaller, again saving concrete and

reducing the load on the foundations – smaller diameter piles will also be required.

Accuracy: Due to the narrow tolerances offered by LSF (as little as $\pm 2\text{mm}$) windows and door frames can be ordered in advance.

Speed of construction: Apart from the rapid installation of the frames and the EIFS – the client would **save up to 50%** on the time it would have taken to build heavy masonry walls. The use of LSF walls allows other trades concurrent access to the site, speeding up the overall building process.

Energy efficiency: The excellent thermal insulation offered by LSF walls with EIFS reduces the capacity of air-conditioning plant required. The CSIR has done tests to confirm the energy efficiency of LSE.

Design freedom: LSF curtain walls offer the designer 'gravity defying' solutions, through the low mass of the wall and the strength of the steel framework. As illustrated in the Riverwalk Office Park, window openings need not be vertical, and the facade need not be in a flat plane –

raised sections can be used for an interesting relief (in terms of giving the impression that the material has been raised above the background plane).

There are some notable buildings in South Africa with LSF curtain walls including the Cell C Head Office, Riverwalk Office Park (as mentioned above), the Summit Place buildings, the Villa Mall Shopping Centre, and the Zambezi Mall. Some of these buildings can be seen in this article.

