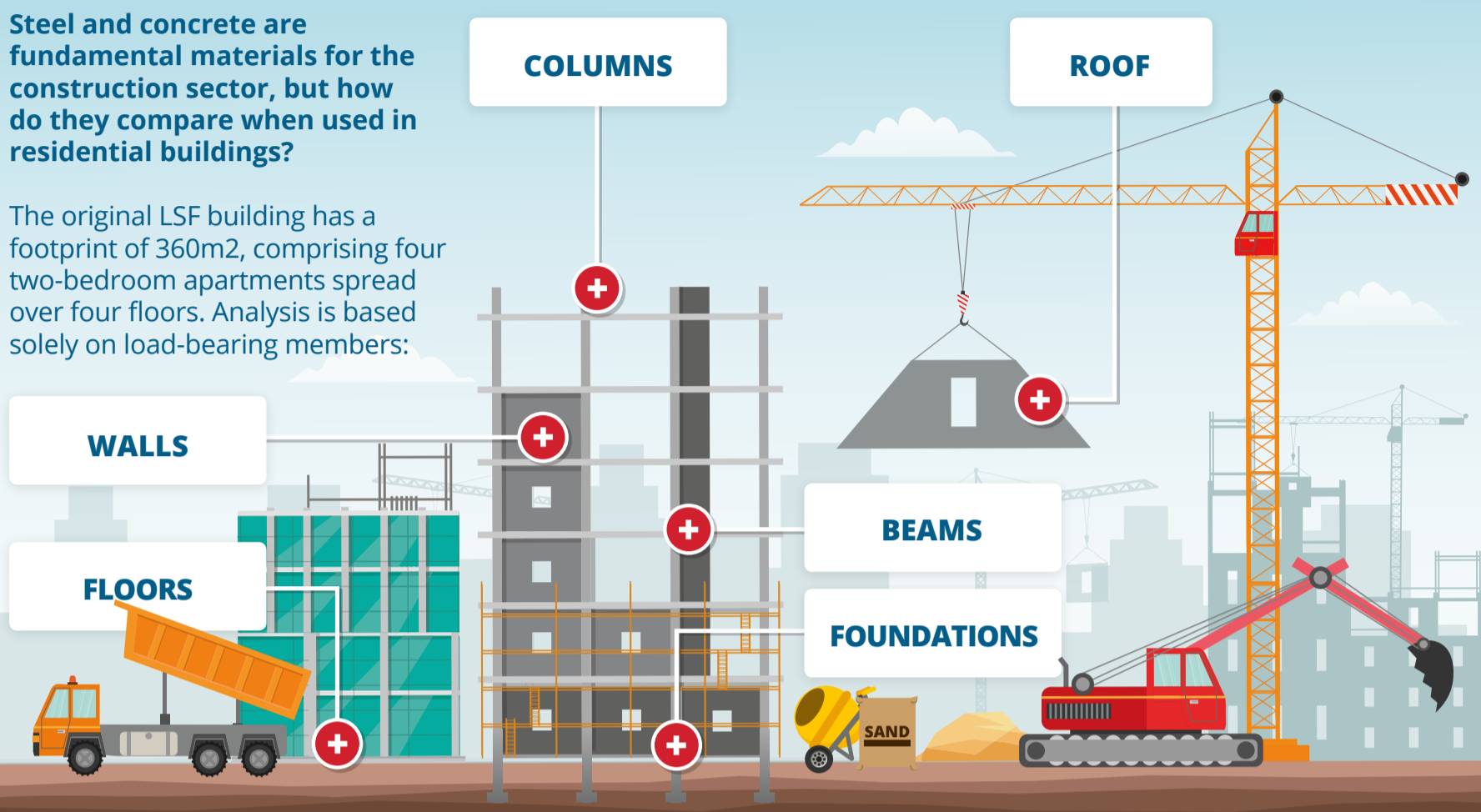


Benchmarking materials performance: A tale of two buildings

Comparison of materials performance in a light steel frame* (LSF) building and a reinforced concrete (RC) building.

Steel and concrete are fundamental materials for the construction sector, but how do they compare when used in residential buildings?

The original LSF building has a footprint of 360m², comprising four two-bedroom apartments spread over four floors. Analysis is based solely on load-bearing members:



Here's how the LSF building performed against the RC building:

Weight

LSF building is **-55%** lighter, needing **-700t** less materials. The LSF building has a much lower weight per unit area, meaning lower loads are transmitted to the foundations.



Speed

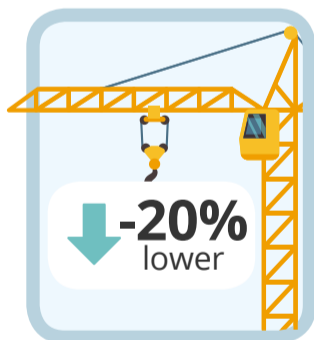
LSF building can be erected in **-23%** less time (**-90 days**) due to:

- Lighter foundations
- Prefabrication offsite
- No need for formworks or propping



Costs

LSF building crane costs were **-20% lower** due to faster speed of construction. As the LSF building is also lighter, it requires fewer materials and transport resources.



Sustainability

Life cycle emissions of the LSF building from extraction, manufacture & construction adjusted for end of life results in **-26 tonnes less CO₂** (**-10%**)



Less required material means that:

-60 fewer trucks are needed



As the LSF building is lighter it requires:

-60% less concrete



Fire & acoustic solutions:

The LSF building can achieve up to **180 minutes fire protection** using specialist gypsum boards. Structural steel can also achieve fire protection with sprayed plaster, intumescent paints, etc.

Combining LSF with **high performance acoustic insulation and gypsum board** in walls, ceilings and floors can meet demanding performance requirements.

* LSF: Cold roll-formed from galvanised steel strip < 3mm thickness