

# Volumetric construction

Yorkon Limited



Finished elevation of  
volumetric building

## Key facts

- The use of volumetric construction has the potential to reduce on site waste by 90%.
- The manufacturing and erection process produces less than 0.6% waste to landfill.

## Volumetric offsite methods

**Volumetric offsite construction methods can help to significantly reduce the amount of waste generated on site and sent to landfill by up to 90% compared to traditional construction. Yorkon Limited are an exemplar in their industry and have shown that the design, manufacturing and erection processes in volumetric construction are closely intertwined and, together, generated less than 0.6% of waste material sent to landfill.**

## Volumetric offsite methods: A complete solution

Volumetric offsite methods offer complete solutions to housing, hospitals, student accommodation, office buildings and schools. Amongst other advantages, volumetric offsite construction brings to the factory all critical activities linked to the structure, mechanical and electrical work as well as to the exterior and interior finishes, including special equipment. This approach ensures better quality control, but also limits the work to be carried on site to groundwork and foundations, connection to services, and minor finish work. As a result of this, volumetric offsite methods have the potential to help achieve a waste reduction of up to 90% on site compared to traditional construction. By bringing most trades within a controlled factory environment it has been proven that the generation of waste can be limited to less than 1.8% of the total weight of materials processed, and that appropriate recycling measures can limit the waste sent to landfill to less than 0.6%.

## From design to erection: Control on material and resources

Volumetric modular manufacturing is based on a lean design and procurement process that optimises the use of materials and ensures better management of resources.

## Yorkon: The factory and its supply chain

Constant review of methods and procedures gives the Yorkon management team the opportunity to identify the steps in the process that generate waste, and to involve the work force in devising new methods and procedures to reduce, reuse or recycle waste. Furthermore, through its buying force, Yorkon has successfully involved its supply chain in these waste saving and recycling activities.

### The design stage

Yorkon works closely with its clients to ensure that layout and design of modules will be optimised whilst suiting the clients' needs and rationalising the use of resources and materials, hence reducing waste. Furthermore, the use of state-of-the-art CAD-CAM software helps the design engineers to ensure that the standard products, materials and construction details are used. This approach has reduced the wastage of materials by nearly 50% since 2004.

### The manufacturing process

Floor construction has been optimised to include joists that are made from preformed steel plates bent and formed at the factory. These preformed steel plates are delivered in specially made reusable containers. Assembled together, these joists are then covered by floor panels delivered to the factory by the sub-contractor to the exact size of the floor. This eliminates handling of materials in the factory and eliminates waste due to off cuts.

Walls are factory assembled composite panels that are made to suit full length dimensions. Window and door openings are then cut off the panels, but all material from these off cuts are either recycled (steel) or reused for floor insulation. All the timber structural elements are also standard and made to specific dimensions by the timber

suppliers. Timber chips and sawdust are sent to recycling facilities. Windows and doors are delivered to the factory on specially designed and reusable steel stillages. All structural steel elements and steel based finishes are delivered cut to length and ready for installation on a just-in-time basis. A special steel stillage system is used for delivery.

Finally, Yorkon has developed a Kanban supply system for all sundries and small parts. This system is based on frequent visits from their suppliers and delivery of them directly to the work stations. This eliminates the need for packaging and inventory management. Overall, Yorkon generates waste equivalent to around 1.8% of the total material weight processed through the factory, of which 65% is recycled.

### Delivery on site

For transportation, modules are protected by reusable protective curtains, brought back to the factory after installation. Otherwise, the site activities are limited to fixing the modules to anchors already in place, and to make connections to adjacent modules and to services. These activities generate a negligible amount of waste.

For more details on the waste saving that volumetric offsite construction methods can offer, please consult the full length report on [www.wrap.org.uk/construction](http://www.wrap.org.uk/construction)

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