OFF-SITE CONSTRUCTION

Offsite construction describes any construction that takes place at a different location then where it will be used. Room size units are individually fabricated, and then stacked together to make multi story buildings. Sometimes the steel or concrete walls are load bearing and are part of the building's structural elements. Other times light gauge steel is used and the prefabricated rooms are combined with strong steel framing.

Improved Sustainability

Offsite construction will grow and become more socially sustainable, in the USA, as confidence is built through repeatability and reliability.The earlier in a project that offsite construction is specified, the larger the time and cost savings will be.

Offsite construction saves time in the construction process, because it shortens the "critical path". For a typical onsite construction critical path could be A: Design, Engineering, and obtaining approval; B: Site preparation and infrastructure; C: Construction; D: finish work. If B and C can be worked on simultaneously, the total time to complete the project can be reduced by 30-60%. The critical pat for a project using Off-Site construction would be A: Design, Engineering, and obtaining approval; B and C; D: Instillation of components.[1]

Offsite construction saves money by manufacturing and sourcing materials on a larger scale and therefore more efficiently. Offsite construction can provide higher quality control and are not as exposed to weather that could damage products. Mini apartments are increasing in social popularity. More and more people, especially in big cities are living alone. Environmental sustainability is measured by the life cycle of a building from cradle to grave, grave being when the structure is reused or recycled.[2]

Historical Background

Offsite construction was addressed by Task Group 74 of CIB. CIB comes from a French phrase meaning International Council for Building. CIB was started in 1953, and now has more than 5000 experts and 500 participating organizations that research and innovate in the areas of building and construction [3] . In 2008, CIB determined it was necessary to research how society, culture, economics and business practices around the world effect offsite construction, and how to make offsite construction have the greatest positive impact in different situations [4] . Many papers were written by experts throughout the world on offsite construction for everything from building houses to industrial applications to business models to concrete bridge beam production processes.

Variation

Modular buildings are constructed by stacking several room size prefabricated sections.
Modular construction shorter construction time which means sooner return on investment[5] .
On site construction can be sustainable socially and economically but it is less sustainable environmentally [6] . According to a study in the UK, offsite construction can reduce wasted materials by 90% and reduce the number of to the construction site by 90% [7] .
When building domestic buildings with a 18 week time scale can be reduced to 15 weeks by using offsite construction [8] .

Buildings that use Offsite Construction

Small apartments have been built using offsite construction in New York, San Francisco, Austin, and other major cities around the US. These prefabricated units are built and fitted with plumbing and

electrical hook ups off site. Though these are small living spaces, people in big cities like them and feel that they do not need a large apartment. Below is a picture of a 290 square foot prefabricated apartment in Berkeley[9].

Many apartment complexes have been built in the UK as well, two of which are seen below[10] .

Recent Research

Offsite construction is a growing industry, especially in the UK. In September of this year, it was projected that offsite construction would account for 7% of total construction output in the UK for 2013 (Curling, 2013)[11] .

Offsite production has the potential for meeting both the need for new low cost homes and the push for the low carbon agenda (Curling, 2013)[12] .

Offsite construction requires design engineers as well as 3D drawing and Computer Aided Design (CAD) specialists (Curling, 2013)[13] .

Helen Beck, research manager at UK commission for employment and skills, concludes, “Offsite construction requires skills that are different to those needed for traditional construction. In particular, offsite construction professionals need a greater understanding of the interaction between principles of design, construction, manufacturing and engineering. If the UK construction industry is to exploit the potential of offsite, multi-skilling, collaboration and greater flexibility within job roles is crucial.” (Curling, 2013

Source : http://letu-cefs.wikispaces.com/Off-Site+Construction