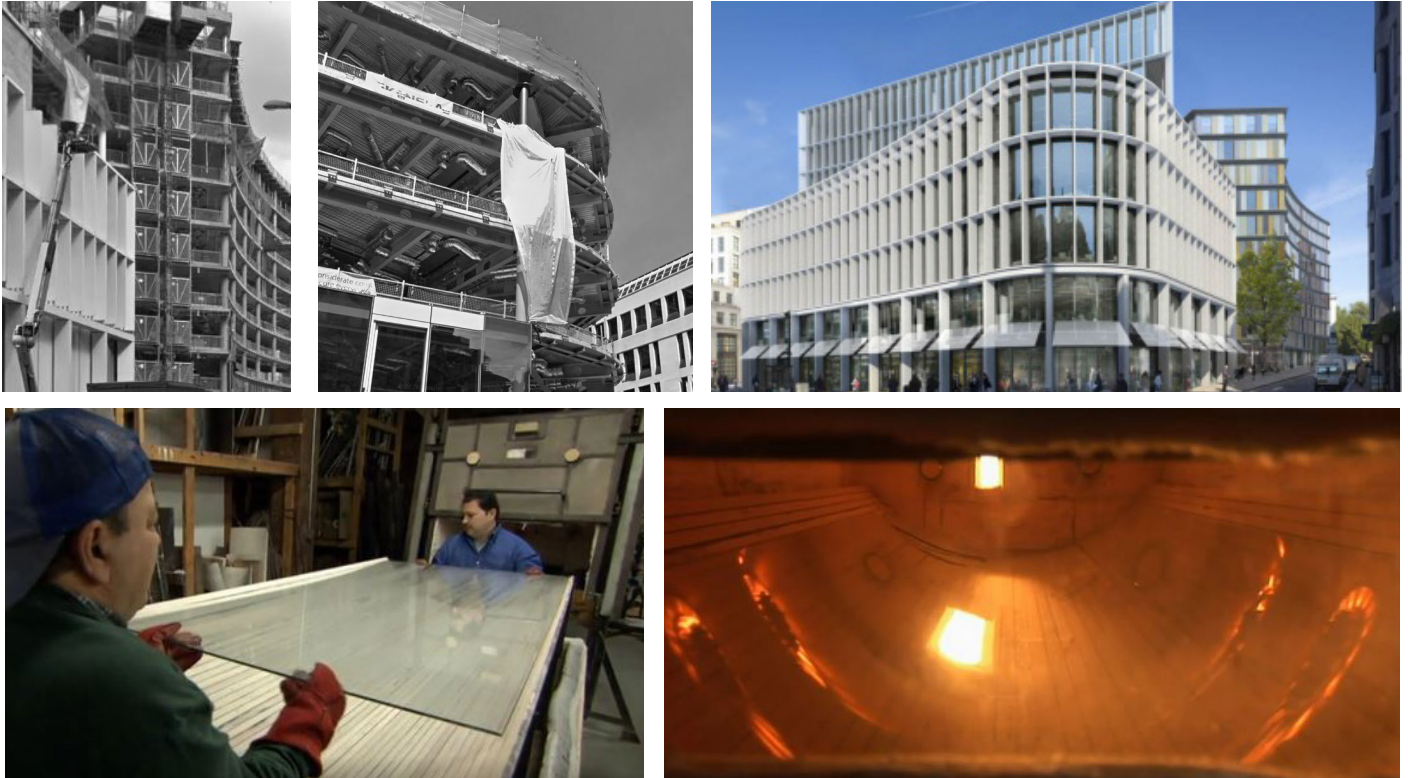


TS EXERCISE 1
LOLA CONTE

MATERIAL STUDIED: CURVED GLASS PANNELS

ARCHITECTS: FLETCHER PRIEST ARCHITECTS
DEVELOPERS: LAND SECURITIES
BOROUGH: CITY OF LONDON EC4
SIZE: 35,702sq m



Weight = 2500 kg/m³

Material

The material that I chose to focus on is glass, and in particular the curved glass panels that make up the main facade. The glass used in most building is a Soda lime silicate obtained by melting the mixture at high temperature. it is composed of sand, soda, calcium carbonate, fining agents and various metal oxides. In this particular case the glass used is float glass, (in some areas colored) that was then curved through a complex process.

Fabrication processes:

Customised curved glass comes at a cost. When it comes to creating window panel precision is necessary. The curve wanted is replicated using a mold. The glass is used as a stencil to fashion three brackets from gauge steel. The brackets are then used to shape a mold that precisely mirror the architecture's window. The steel mold is then pre heated for an hour while the glass is being cut. The glass cannot be put in at the same time as it would heat up much faster than the steel, and could potentially shatter when in contact with a cold steel surface. The next phase poses another problem, a single particle of dust on the glass could cause fatal flaws if it sits on the surface during the firing process. The glass is therefore polished to perfection (the glass is inspected with UV light in order to reveal the slightest dust particles). The glass then is painted with a mix of detergent clay, calcium for it not to stick to the mold. The glass can go in for three hours at 1300 degrees. The temperature is highly regulated in order to avoid any flaws or imperfections. More affordable alternatives have been developed, namely the cold bending process which is used to bend glass plates on site at room temperature. The process implies that toughened float glass laminates are gradually bent on a curved frame. Finally, the newly curved panel is mechanically fixed to the frame, which implies that the glass is continuously subjected to bending stresses during its lifetime.

Structural strength and weaknesses:

The characteristics of light-weight facade enveloping a building are different from the conventional steel or concrete structures. Glass cannot crack like concrete and it is much more brittle than steel. Glass is weak in tension and when it is stressed beyond its strength limit, unlike steel and aluminum, breakage occurs immediately without warning. (one has to be aware of excessive stress from wind pressure, thermal stress, direct contact with metal) Furthermore as glass is a brittle material that stress cannot be re-distributed and failure is assumed once crack occurs.