

# Swiss Re—The Gherkin—30 St. Mary Axe



Source: <<http://www.architecture.com/imageLibrary/jpeg330/5984.jpg>>

**Location:** London, England

**Latitude/Longitude:**  
N51.54°/W0.3°

**Annual Precipitation:**  
~52" per year

**Building Type:**  
Commercial High-Rise

**Statistics:**  
Rentable space 252,025 sq. ft.  
Estimated actual area  
~500,000 sq. ft.

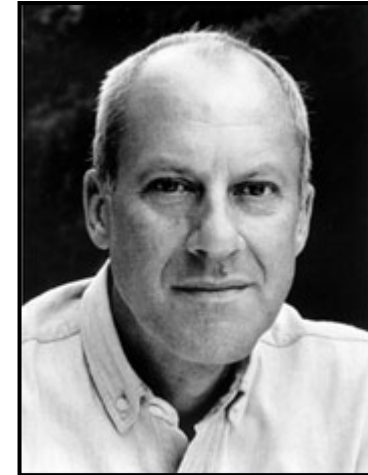
**Floors:** 40 floors

**Height:** 179.8 meters

**Completion Date:**  
September 2003

**Client:**  
Swiss Re Reinsurance Company

**Design Team:**  
Foster and Partners

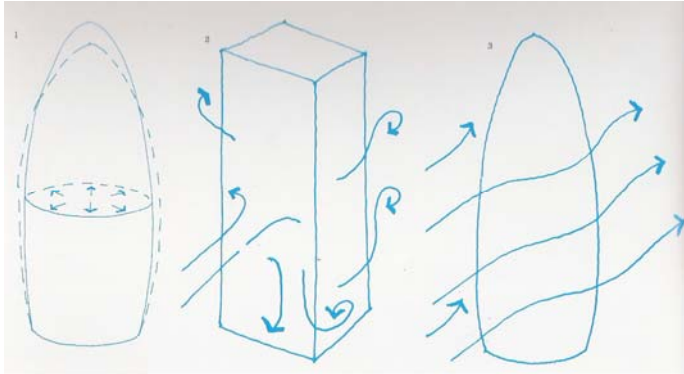


Source: <<http://www.hearstcorp.com/tower/images/foster.jpg>>

ARUP

Source: <<http://www.arup.com>>

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Source:  
*Skyscrapers:  
Structure and  
Design*

above: p30

right: p33



The Swiss Re Reinsurance Company contracted Foster and Partners to create a design for the site that was not only spectacular and engaging, but for the building to be sustainable, amplifying the attributes of the site instead of merely conforming to them. The client wished for the building to stand out in contrast from the hard-lined façades of decades past that neighbor the building. The philosophy of the design team was that innovation in building and form come from development of new technologies and techniques for building. The seemingly expressionist façade was actually developed through air flow testing (ARUP engineering). This design proved the best, maximizing air flow around the building. It also decreased the size of the footprint of the building, allowing for a very accessible public plaza at ground level.

The integration of very finely tuned construction methods and the new resources that humankind has developed fueled the design. The structure is made up of a “Diagrid,” comprised of steel pieces coming together at triangular nodes to support the outer weight of the structure. This design allows for uninterrupted office interiors with revolving triangular atriums that connect the spaces floor-to-floor and allow for ventilation. Because of the façade and double-wall structure of the building, an all-glass façade was chosen to maximize sun exposure.

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The “egg” shape of the building lends largely to the sustainable approach that the design team took to this project. Not only does it reduce the amount of volatile winds at pedestrian level, but with smoother air flows through the area, there is less heat loss over the surface of the building. This low-pressure system also allows the designers to have large light wells at heights that would be otherwise unfeasible. Because the building is designed for and relies on office equipment and occupants to heat the space, it was projected by the design team that the building could be naturally ventilated 40% of the year.

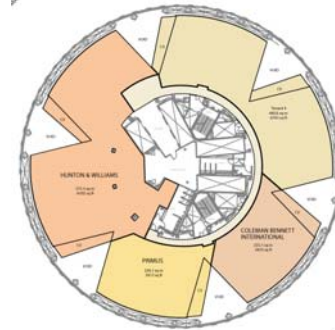
The steel nodes used in the construction of the frame of the building also had to be tested and simulated in order to make absolutely sure that the building would fit together and perform properly. This methodology is referred to as “Precambering.” The design team constructed mock-ups of the structural connections, and then using sophisticated computers, calculated the amount of deflection and compaction that would take place over 40 stories of construction.



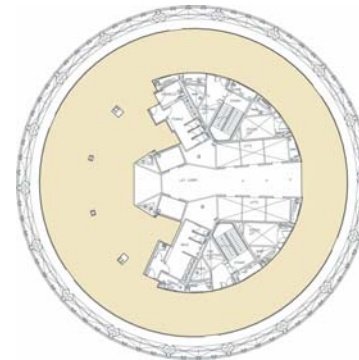
Source: <<http://www.30stmaryaxe.co.uk/construction.asp>>

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The building is composed of a double-wall system. The outer wall is a double-glazed glass wall composed of mullions and triangular-shaped window pieces. The inner wall is made of sliding glass doors (accessible only by maintenance). In between the two walls is a space and a row of horizontal shading devices. This design allows for a ventilation chimney to ventilate the whole building. Each floor is rotated 5 degrees from the floor above or below it, allowing up to 6 floors to be attached by the vertical light wells. The double wall contains venting flaps, built into the triangular façade, to allow hot air to travel up and out the building. There is a built-in heat exchange system built into the ceiling of each floor unit, with exchangers for cooling of spaces, running off a cold-water well for summer months.



Source: <<http://www.30stmaryaxe.co.uk/accomm.asp>>



Source: <<http://www.30stmaryaxe.co.uk/accomm.asp>>



Source: <<http://www.30stmaryaxe.co.uk/photo.asp?imgSec=1>>

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The environmental control systems for the building are all located above the lounge/restaurant at the top of the building. This spectrum of sensors allows the building to adjust how much hot air is being let out at any one time. Thus far the notion that the building might be naturally ventilated for 40% of the year has not been tested partly because, while remaining sustainable, every floor is built to renter needs and the heating and conditioning system can be overridden.

One of the aspects of this building that has apparently failed is the rather abstract floor and space plan that the building offers its renters. On the open market this space plan has proven to deter renters instead of intrigue them.



Source: <<http://www.30stmaryaxe.co.uk/photo.asp>>

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Source: <[http://www.spacesyntax.com/images/th\\_pics/photo\\_30stmarys218.jpg](http://www.spacesyntax.com/images/th_pics/photo_30stmarys218.jpg)>

## Awards

Stirling Prize, 2004

Special Steel Award, 2004

Best Central London Office Development, 2004—  
IAS/OAS

Emporis Skyscraper Award, 2003

Best British Innovation, 2003

Walpold award for British Excellence, 2003

- 360 steel nodes connect the “Diagrid.”
- Maximum load per diagonal column—1,500 tonnes
- Over 2,500 tonnes of steel were used in the construction of the building.
- Tallest lounge/restaurant in London providing a 360° view of the cityscape.
- 55 km of steel were used on this project.
- Over 76,400 square meters of office space are available for use.
- At any one time 378 people can be transported vertically at up to 6 meters per second.
- The core-to perimeter dimension varies from 6.4 meters to 13.1 meters.

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## Bibliography

Lepik, Andres. *Skyscrapers*. New York: Prestel, 2004.

Sewing, Werner. *Architecture: Sculpture*. London: Prestel, 2004.

Wells, Matthew. *Skyscrapers: Structure and Design*. New Haven: Yale University Press, 2005.

<<http://www.arup.com>>

<<http://www.fosterandpartners.com>>

<<http://www.30stmaryaxe.co.uk>>

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**Journey summary** [edit search options](#) [new journey](#) [return journey](#) [onward journey](#)

Departing: Thursday 06 April 2006 at 18:27.  
 From: W1W 5PN  
 To: Liverpool Street  
 Restrictions:

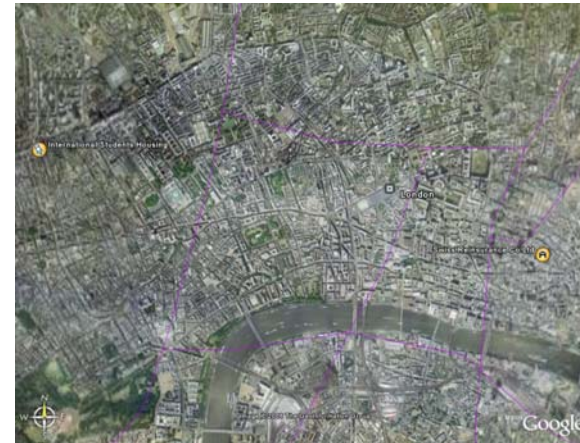
## Route 1

Time	Details	Maps	Information
18:24	<b>start</b> W1W 5PN Walk to Great Portland Street	<a href="#">start map</a> <a href="#">end map</a>	Transfer time: 4 mins
18:28	<b>Great Portland Street</b> Take the <b>Circle Line</b> towards King's Cross St.Pancras or <b>Metropolitan Line</b> towards Aldgate or <b>Hammersmith &amp; City Line</b> towards Liverpool Street	<a href="#">start map</a> <a href="#">end map</a> <a href="#">area map</a>	Av journey time: 12 mins
18:40	<b>end</b> Liverpool Street		

Maximum journey time: 00:16  
 Interchanges: 0

Source:

<[http://journeyplanner.tfl.gov.uk/user/XSLT\\_TRIP\\_REQUEST2?language=en&sessionID=JP02\\_2969186704&requestID=1&tripSelector1=1&itdLPxx\\_view=detail&tripSelector1=on&command=nop](http://journeyplanner.tfl.gov.uk/user/XSLT_TRIP_REQUEST2?language=en&sessionID=JP02_2969186704&requestID=1&tripSelector1=1&itdLPxx_view=detail&tripSelector1=on&command=nop)>





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Source: <<http://www.30stmaryaxe.co.uk/photo.asp?imgSec=3>>



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