Bicentenary of I.K. Brunel 1806-1859

200 Years of Women Bridge Builders

Dr Nina Baker
Department of Architecture
1811 Sarah Guppy

Granted patent no. 3405 for “A new mode of construction and erecting bridges and railroads without arches or sterlings, whereby the danger of their being washed away by floods is avoided.”

1806 Isambard Kingdom Brunel born, Portsmouth
Access to Education

1696 Education Act: Established universal primary education in Scotland


1831 Brunel designs his first bridge: Clifton Bridge, Bristol.

1839 Maidenhead Bridge opened.
Mrs Emily Roebling
Engineer in charge, Brooklyn Bridge

1865 John Roebling designed Brooklyn Bridge.  
1869 John Roebling died. His son, Washington Roebling, took over.  
1872 Washington Roebling got caisson sickness. Emily took over.  
1883 Brooklyn Bridge opened.
Women’s access to engineering education

1869 Watt Institution and School of Arts admits women

1876 University of London admits women

1892 Scottish Universities admit women

Women students as % of total undergraduate students attending engineering, applied chemistry, mining, metallurgy, architecture etc
Dorothy Donaldson Buchanan (Fleming) 1899-1985
Civil Engineer

1923 BSc Civil Engineering Edinburgh University
1923-6 Worked for Sir Ralph Freeman on the Sydney Harbour Bridge.
Then and now at Tacoma

1940, Tacoma Narrows Bridge opens and fails 4 months later

New Tacoma bridge to open 2007. 10% female workforce.
Mary Isolen Fergusson OBE
Born Plymouth 28 April 1914 died London 30 November 1997

1936, BSc Hons. in Civil Engineering, University of Edinburgh

1936, Indentured trainee: Blyth and Blyth, Edinburgh

First female senior partner in a UK civil engineering firm: 1948

1945
Women workers build Waterloo Bridge, London
Mary Isolen Fergusson OBE
Worked on civil engineering infrastructure projects including:
• Highland Bridges
• River Leven water purification scheme
• Markinch paper mills
First woman fellow Institution of Civil Engineering, 1957
Active in Scout Association, WES and Soroptimists
Retired 1979
OBE 1979
Honorary Doctorate of science, Heriot-Watt University, 1985, for her work in encouraging women to take up engineering careers
Women bridge builders in the Greater Khingan Mountains in northeast China, 1969

1964
Europe's first long-span suspension bridge, Firth of Forth road bridge, opens

1981
World's longest suspension span: Humber Bridge opens
Where are we now?

![Graph showing proportions of women in SET occupations and related statistics from 1993 to 2004.]

- Proportion women in SET occupies (%)
- Engineering Professionals women as % of total
- Building Professionals women as % of total
- Engineering professors women as % of total
- % girls successful at Higher maths
- % boys successful at Higher maths

2000
London’s Millennium Bridge

2004
Viaduc de Millau
Questions for you to take away…..

Are bridges designed for men or for women?

Is a bridge different if it is designed by a woman?

Does it matter if women do not become engineers?