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**QUEENSFERRY CROSSING BRIDGE DESIGNER JOINS
ENGINEERING HALL OF FAME**

Naeem Hussain, who led the illustrative concept and design of the Queensferry Crossing, is one of four engineers to join the Scottish Engineering Hall of Fame.

He is joined by David Elder, the father of marine engineering on the Clyde; William Burton, whose water and sanitary improvements are credited with saving Japan from cholera and Victoria Drummond, the debutante who turned her back on high society for a successful and meaningful 40-year career as a ship's chief engineer.

Their induction was announced at the annual Institution of Engineers and Shipbuilders in Scotland (IESIS) James Watt dinner, held in Glasgow last night. (Friday 5 October, 2018)

Gordon Masterton, Chairman of Judges for the Hall of Fame said: "We are delighted to welcome Naeem into this pantheon of Scottish Engineering achievement. The Queensferry Crossing is already an iconic addition to Scotland's engineering heritage, much admired across the world. Our three Forth Bridges are emblematic of three centuries of world-leading bridge design, and the new bridge sits comfortably, and proudly, alongside its neighbours. Naeem's concept survived a complex construction process and he deserves the credit for his engineering flair in creating a beautiful, functional structure."

Collectively, the 35 members now in the Hall of Fame tell a story of 450 years of world-beating engineering innovation that has led to massive improvements in the quality of life and economy in Scotland, the United Kingdom and world-wide.

Welcoming the announcement of the new inductees, Jim Young, Chair of the Institution of Civil Engineers (ICE) Scotland, said: "It is wonderful to see engineers getting the recognition they deserve. Queensferry Crossing is everything good design should be. It safeguards a vital connection in Scotland's transport network and greatly enhances the landscape."

The Scottish Engineering Hall of Fame was launched in 2011 by The Institution of Engineers and Shipbuilders in Scotland (IESIS),

ENDS.

For further information please contact:

Gordon Masterton, IESIS (Chairman of Judges for the Hall of Fame)
Tel: 07770 851747 Email: themastertons@btinternet.com

Sara Thiam, Institution of Civil Engineers (ICE) Scotland Regional Director
Tel: 0141 221 5276 Email: sara.thiam@ice.org.uk

The [Institution of Civil Engineers](#) (ICE) features [the Queensferry Crossing](#) as one of the top [200 influential people and projects](#), past and present, which show how civil engineering has shaped the world and transformed people's lives for the better. To mark ICE's 200th anniversary, the Institution is highlighting 200 inspirational and world-changing projects around the world throughout 2018. Nominated by ICE's members and selected by an expert panel, the projects illustrate the breadth and depth of civil engineering's impact on our daily lives. The Forth Replacement Crossing Project has also made the final of the international ICE People's Choice Awards.

Notes to editors and Further Information

Website: <http://www.engineeringhalloffame.org/index.html>

The James Watt Dinner is the annual dinner of IESIS, Scotland's multi-disciplinary engineering institution founded in 1857. Each year it features the announcements of the latest inductees to the Scottish Engineering Hall of Fame. The Hall of Fame tells the story of Scotland's engineering contribution to our civilisation through the achievements and lives of the inductees. There are now 35 inductees.

The new inductees

Naeem Hussain (b.1942)

Naeem Hussain (born 1942), civil and structural engineer, married to Moira Elizabeth Dunbar from West Lothian, is Arup's global bridge leader and designer of Queensferry Crossing Scotland.

Educated in both engineering and architecture, Naeem is a firm believer in a holistic approach to design which respects the client's budget, combines engineering and architecture in a visually pleasing manner, is sympathetic to the immediate environs and is easily inspectable and maintainable. This concern for holistic and appropriate design led him to chair the drafting of the 'Guidelines for Design Competition for Bridges' published in 2013 by the International Association for Bridge and Structural Engineering. With the growth of architecturally convoluted and unrealisable designs, it is expected and hoped that the guidelines will help clients and procurement agencies holding bridge design competitions to achieve a successful outcome that fits their aspirations and budget.

Following graduation in 1962, Naeem joined Associated British Consultants in E.Pakistan as a structural engineer and worked on a variety of building structures varying from industrial factories, hospitals to office buildings. In 1964 he transferred to their sister company, Kenchington Little & Partners in London, where he worked on buildings such as the complex comprising of Euston Tower, Camden Library and Shaw Theatre. He then studied architecture at the Architectural Association School of Architecture London, before joining Christiani & Nielsen Contractors in 1967 as a Section Engineer for construction of viaducts on the M5 Midland Links Motorway, which attracted him to bridge engineering. This led Naeem to join the Arup Bridge Group in 1969.

Naeem's contribution to bridge engineering grew as the nascent Arup bridge group expanded their contribution to bridges worldwide, from short span concrete bridges to very long span cable-stayed and suspension bridges. Naeem always endeavoured to design visually pleasing bridges, and an early example of this is the River Ouse Bridge in York with its doubly curved soffit, which was completed in 1973.

Between 1973 and 1985, Naeem set up bridge groups in Malaysia, Nigeria and Hong Kong and worked on highway bridges, the notable one amongst these being the Numan Bridge across the River Benue which provided much needed access to north-east Nigeria.

He designed the competition winning Hulme Arch Bridge in Manchester, which was completed in 1999 and is the first bridge in the world with a diagonal arch. It has been described as the “show-piece for the civil engineering profession” and was awarded the Millennium Product Status fully recognising its innovation, creativity and pioneering qualities within the bridge field.

Naeem was a member of the competition winning design team and project director in London for development of the concept and illustrative design of the Oresund Crossing between Denmark and Sweden which has a combined road and rail cable-stayed bridge of 490m span and was the longest of its kind when completed in 2000.

He was the Engineering Manager for the concept and detail design of civil engineering structures on the 106km long High Speed 1 Railway built between London and the Channel Tunnel, which commenced services in 2003. The structures comprise two major underground stations, cut and cover tunnels, and over 170 rail and road bridges, including the 152m main span Medway balanced cantilever bridge.

In 1998 he transferred to Hong Kong to design and project manage West Rail mass transit railway CC2 contract which comprises of 7km of rail viaducts and 3 overground stations.

Naeem led the concept and detail design for Deep Bay Link Viaducts and Shenzhen Western Corridor Bridge that link Hong Kong to Shenzhen across Deep Bay. The main navigation spans are bridged by single inclined tower cable stay bridges. The bridge was opened to traffic in 2004.

He was the leader for the detail design of the Hong Kong Stonecutters cable stayed bridge with extensive high-level approach viaducts. The bridge has a main span of 1018m and comprises of two nearly 300m tall mono towers, a split deck of widely separated twin longitudinal orthotropic boxes and two cable planes in a semi-fan arrangement. It was one of the first cable stay bridges in the world with a span in excess of 1000m and was completed in 2009.

Naeem was the concept designer and leader for the illustrative design of the 3-tower cable stayed Queensferry Crossing bridge with composite spans of 650m, which he has described as a ‘blade of light across the firth’. It uses stay cables crossed at mid-span to restrain the central tower, and this is the first use in the world of crossed cables at this scale. The design was developed to ensure that it was in scale and a good visual neighbour to the existing road and rail bridges in the UNESCO World Heritage Site. The bridge was opened by the Queen on 4th September 2017.

Naeem worked on the concept and tender design on both the Mainland and Hong Kong sides of the 43km long Hong Kong Zhuhai Macao Bridge (HKZMB) across the Pearl River Delta. His notable contribution was for the concept and illustrative design of the Jizhou navigation bridge with sail-like towers which has become the visual symbol of HKZMB. The bridge became operational in 2018

He is the leader for the concept and detail design of the 30km Brunei Temburong Link which comprises of 3km of land viaducts and bored tunnels, 14km of marine viaduct, 2 cable stayed navigation bridges and 12km of innovative viaducts across

the Temburong swamp forest. The cable stay bridges have unique Islamic architectural towers. The link will be opened in 2019.

In addition to the above, Naeem has worked on road and rail bridges, viaducts and railway stations with the varying projects located in Australia, New Zealand, China, Korea, Thailand, Indonesia, Vietnam, Myanmar, Maldives, India, Iran, Qatar, South Africa, Turkey, Canada and US.

David Elder (1785-1866)

The father of marine engineering on the Clyde. Notable designer and builder of industrial buildings and their power systems, including the premises of Robert Napier's firm. Designer and builder of a succession of engines and boilers for key vessels in the development of ocean-going steam navigation, between the mid-1830s and the early 1850s.

His engineering genius was behind the reputation of Robert Napier as 'The Father of Clyde Shipbuilding'.

Designer and builder of machine tools for plate and section-working (including the machinery used in constructing the SS Great Britain) and for the particular needs of high-class marine engine manufacture.

Elder was not a man to seek external recognition, and indeed it was Robert Napier who took the limelight for Elder's work. Tributes paid at the time of his death uniformly testify to his ability, and especially to his concern for the highest possible standards of firmness, efficiency and reliability in marine engines and boilers.

The fine engineers (including Charles Randolph, James Thomson of J and G Thomson, and his own son John Elder) whom he trained became the professional leaders of the Clyde shipbuilding and marine engineering industries for many years after his death, and obviously imbued his high standards of design and construction, his absolute concern for the best. Charles Randolph and John Elder developed the compound marine engine and founded the Fairfield Shipyard, while James and George Thomson founded the Clydebank Yard, which moved down-river, and gave its name to the town of Clydebank

The engines and boilers he designed and built were vital to the establishment of oceanic steam navigation in the period c1835-c1855.

William Kinninmond Burton (1856-1899)

Born in Edinburgh 11 May 1856, son of John Hill Burton (1809-1881), the Historiographer Royal for Scotland.

Educated at Edinburgh Collegiate School, and trained by Andrew Betts Brown of Brown Brothers, mechanical and hydraulic engineers, Rosebank Ironworks, Edinburgh and from 1878-79 was their chief draughtsman.

At age 32 Burton accepted the position of Professor of Sanitary Engineering at the Imperial University of Tokyo, where he came to be the Japanese Government's

consultant on sanitary conditions and water supply for most major cities including Tokyo and Japanese-occupied Formosa (now Taiwan). His texts based on these were widely published.

Burton came to Japan in 1887. At the time, Japan was suffering from epidemics of diseases such as cholera that were killing as many as 110,000 people a year. The problem was exacerbated by the lack of clean drinking water and the Japanese tradition of collecting night soil for use as fertiliser. In a hectic 12 years, Burton supervised the establishment of fresh water and sewage systems in most of the major cities across Japan.

Burton also designed Japan's first "skyscraper", the famous Ryounkaku, a 12-storey brick building that towered above Tokyo's low-rise wooden buildings. The hexagonal structure became a Tokyo landmark, visited by thousands of Japanese a day. It was pulled down after being severely damaged by the 1923 earthquake but is still remembered fondly and a plaque marks where it stood.

Concurrently he founded the Photographic Society of Japan and provided the illustrations for John Milne's seminal papers on earthquake engineering.

In Shimonoseki, in southwestern Japan, the sand filtering system Burton built more than 100 years ago produces water so pure that today it is bottled and sold with his picture on the label.

Other remains of his water supply works are in: Tokyo, Hakodate, Aomori, Numata, Nagasaki, Fuluoka, Osaka, Okayama, Kobe, Moji, Omuta, Kofu, Nagoya, Niigata, Hiroshima, Takamatsu and Tai Pei.

In Japan he is revered as the foreign engineer who saved the country from cholera in the 19th century and built the country's first skyscraper. Naohiro Taniguchi of the Japan Association of Drainage and Environment and other Japanese engineers pay annual tribute to Burton at his grave in Tokyo. In 2006 Japanese admirers unveiled a plaque near the house where Burton grew up in Edinburgh to remind Britons of Burton's achievements and commemorate the 150th anniversary of his birth.

When Burton came to Japan in 1887, he was one of a number of foreign engineers and teachers hired by the Japanese government to help modernise a country stuck in feudal times. Among these men, Burton is particularly respected for the devotion he brought to the job. "He was clearly a man of incredible energy. When he came to Japan we didn't even have the concept of disease prevention, we just thought one got sick and went to hospital. Burton taught us differently," said Mr. Taniguchi. "He planted the seed without which Japan could never have modernised so quickly."

The Japanese believe Burton's tireless efforts on behalf of their country contributed to his early death aged 43, in 1899, as he was preparing to return home with his Japanese wife and young daughter

Victoria Alexandrina Drummond (1894-1978)

Born at Megginch Castle, Perthshire, to a Scottish aristocratic family and christened Victoria after her God Mother Queen Victoria. She was educated privately at home

and in 1913 was taken to London and presented at court as a Debutante to King George V and Queen Mary.

With this background it will be appreciated that her choice of career was treated with amazement by her family.

She was the first woman to go to Sea as a Marine Engineer and first woman to become a Member of the Institute of Marine Engineers now the Institute of Marine Engineering, Science and Technology.

In 1916 she commenced a five year Engineering apprenticeship, two years at a Perth Garage and three years at the Engineering Department of the Caledon Shipbuilding Company in Dundee. She studied Engineering three evenings a week at the Dundee Technical College now Abertay University.

In 1922 as a fully qualified engineer she sailed as tenth engineer on a Blue Funnel Line ship on a voyage to Australia. Through the years she rose to Chief Engineer sailing worldwide. She also for a time stood by several ships in build and in today's terms could be called a Superintendent Engineer. Although she served with the Blue Funnel Line, British India, Cunard-White Star and Cunard most of her sea time was spent with foreign Shipping Lines due to discrimination from British Shipping Lines and the Board of Trade now the Marine and Coastguard Agency who steadfastly refused to certificate her. Undeterred she received her Chief Engineers certification abroad.

During WW11 her vessel was attacked by aircraft of the Luftwaffe. At the start of the attack she ordered everyone else out of the engine room and operated the machinery single handed and increased the ships speed by several knots thus allowing greater manoeuvrability of the ship to avoid the bombs. For this action she was made a Member of the British Empire (MBE) the citation reading 'For devotion to duty' with the investiture by King George VI. She was also awarded Lloyds war medal for bravery at sea.

She eventually retired in 1962 after forty years at sea.

Victoria Drummond died in 1978 aged 84 and is buried where she was born, Megginch Castle, Perthshire, Scotland.

She opened doors for other women to follow and is still cited by the Institute of Marine Engineering, Science and Technology together with various women's organisations as a role model to be followed.

The Victoria Drummond Award , set up by Nautilus (seafarers union) is presented to women whose achievements boost the profile of women at sea.

Victoria Drummond was shortlisted for the Wallace Monument "Hall of Heroines".

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