

## CURRICULUM VITAE

Alan G FREW

<b>Present Appointment</b>	Associate, Scott Wilson Scotland Ltd
<b>Date of Birth</b>	11 June 1961
<b>Nationality</b>	British
<b>Education</b>	Bsc, University of Glasgow, 1982 (First Class Honours)
<b>Professional Qualifications</b>	Chartered Engineer Member of the Institution of Civil Engineers Member of the Institution of Highways and Transportation Member of the Hong Kong Institution of Engineers
<b>Languages</b>	English : Mother tongue

### Synopsis

Alan Frew joined Scott Wilson in 1982 and is currently based in Glasgow following previous postings overseas. His career has included all aspects of highway planning, design, contract documentation and project management. He has also gained a broad experience of different contractual forms including Design-Build and DBFO/BOT and has undertaken several economic evaluations of schemes.

He has recently been responsible for the preparation of contract documentation and a major risk management and Value-for-Money assessment for the M6 DBFO Project. He is also project manager for the procurement by Design-Build of the A8 Eurocentral Interchange (as Client's Agent), Contracts 5, 7, 9, 10 and 11 of the Millennium Canal Link (as Client's Agent) and the A96 Blackburn & Kintore Bypass (as Designer). He is responsible for the Firm's contribution towards the A701 Transport Improvements DBFO scheme including preparation of the Transport Challenge Fund Bid, the Planning Application and the contract documentation.

He worked in Hong Kong for 4 years in the early 1990's on a wide range of aspects for the £1 billion Route 3 expressway scheme, including: the design and project management of a four-level grade-separated interchange; project management of a complex "flagship" Administration Building; and procurement of a 10 million m<sup>3</sup> advance earthworks contract. He was Highways Team Leader for the £600 million Build Operate and Transfer (BOT) Country Park Section highway scheme.

His early experience was gained in Scotland in the design and construction supervision of a variety of road and bridge schemes. These ranged in scale from the UK's largest design-and-build roadworks contract to a number of smaller, though equally complex urban projects. He spent 6 months working in Nepal as the Design Engineer on site on the reconstruction of the strategic Prithvi Highway.

### Publications

See list at end of Curriculum Vitae.

## Professional History

1998 to date

### Scotland : Associate, Scott Wilson

A701 Transport Improvements : Project Manager in Scott Wilson's role as Technical Adviser to Midlothian Council for the procurement by Design Build Finance and Operate (DBFO) of this 4km dual carriageway scheme. Tasks have included public consultation, preparation of planning application, land purchase, preparation of specimen design and preparation of contract documents (including payment mechanism).

Millennium Link, Contracts 5, 7, 9, 10 and 11 : Project Manager for the procurement by Design Build of a series of schemes to remove obstructions to navigation at 15 sites on the Forth & Clyde and Union Canals. Tasks included the production of Options Studies to identify the preferred scheme at each location, followed by the preparation of Exemplar Designs and Employer's Requirements.

Traffic Control Centres PFI: fulfilled the role of Facilitator for the Value-for-Money study for the Highways Agency's £100m vehicle information system for England and Wales. Responsible for the production of Public Sector Comparator.

1996 to 1998

### Scotland : Principal Engineer, Scott Wilson Kirkpatrick

A8 Eurocentral Interchange : Project Manager for the preparation of tender documentation and management of the tender process for the procurement by Design-Build of a grade-separated interchange providing access to the Eurocentral Development in Central Scotland. The interchange will connect initially with the existing A8 trunk road, but will also allow for the future construction of the M8 DBFO scheme, resulting in the need for a main overbridge some 120m long.

A96 Blackburn & Kintore Bypass : Project Manager for the design of a 10km dual carriageway bypass scheme on the main Aberdeen to Inverness trunk road. Scott Wilson are designer to Balfour Beatty in this, the latest of a series of successful Design-Build roadworks schemes.

A701 Dualling : Project Manager in Scott Wilson's commission to assist Midlothian Council in their bid for Transport Challenge Funding for the 4km dual carriageway scheme between Penicuik and the Edinburgh City Bypass. The bid proved successful with Midlothian Council being awarded £2.5 million thanks largely to being able to prove the scheme's PFI viability. Subsequently assisted in the production of the Outline PFI Business Case and in the study to identify the preferred alignment option.

## Professional History

1996 to 1998 (con't)

Dalkeith Regeneration PFI : Project Manager for the firm's involvement in this combined PFI and PPP project, on the lead up towards Outline Business Case production. Providing procurement advice and input into the transportation aspects.

Balfron High School PFI : Co-facilitator and organiser for Stirling Council's risk workshops to assist in progressing this PFI scheme towards tender.

M6 DBFO : Responsible for the preparation of a detailed Value-for-Money analysis for this Private Finance Initiative scheme, including consideration of construction costs, operation and maintenance (O&M) costs and lane occupation charges. The analysis centred around the development of a Public Sector Comparator (PSC), Being the cost to the Scottish Office of procuring the construction and O&M of the scheme by conventional methods, and the consideration of Tenders against this PSC. In developing the PSC, SWK arranged a number of workshops aimed at identifying the risks associated with the various activities. The resulting quantified risks were then subjected to Monte Carlo analyses on the HARM and @RISK suites to provide robust cost estimates with associated probability distributions.

1995 to 1996

**Scotland : Assistant Principal Engineer, Scott Wilson Kirkpatrick**

M6 DBFO : Responsible for the drafting of contract documentation and providing advice to the Scottish Office on this Design, Build, Finance and Operate project. SWK were retained to assist the Scottish Office in procuring the final sections of the upgrading of the main strategic route to England to motorway standard via a shadow toll regime.

Management of the Scottish Trunk Road Network : Project Manager for SWK's proposals to manage the maintenance of sections of Scotland's Trunk Road Network, both in joint venture with Balfour Beatty for the Forth Premium Unit and in joint venture with Parkman for two All-Purpose Units.

Scottish Exhibition and Conference Centre (SECC): Preparation of Employer's Requirements for a Design-Build contract for the re-arrangement of the internal road system and car park layouts to accommodate recent extensions to the SECC facilities.

Planning Supervisor: employed as a planning supervisor under the Construction (Design and Management) Regulations 1994 on a number of environmental enhancement schemes.

## Professional History

1994 to 1995

### **Hong Kong : Senior Engineer, Scott Wilson Kirkpatrick**

Route 3 Country Park Section : Highways Team Leader and involved in the overall project co-ordination and liaison for this major BOT project. SWK were responsible for the design of some 8 km of dual 3-lane carriageway, including a complex interchange, 12 bridge structures and several large embankments constructed across soft ground.

Route 3 North West Tsing Yi Interchange : Project Manager for the design of a complex interchange connecting the Lantau Fixed Crossing, Tsing Ma suspension bridge, the Ting Kau cable stayed bridge, the Airport Railway and Route 3. The interchange involved four levels of roads and railways and included a toll plaza for north-south traffic. The nature of project involved continual co-ordination with the many interfacing projects and required the writing of detailed contractual provisions to ensure the construction responsibilities were clearly established.

Lantau Fixed Crossing, Administration Building; Project Manager for the design and consultant co-ordination of this "flagship" administration building, to be built in a prominent location overlooking the Tsing Ma and Ting Kau Bridge. The 5900 square metre building houses the state-of-the-art control facilities for the Traffic Control and Surveillance System for the Lantau Fixed Crossing and Route 3. The design required close co-ordination among the architectural, building services, civil, structural and systems disciplines.

Route 3 Kwai Chung Viaduct : Project Manager for the design and consultant co-ordination for the West Kowloon Emergency Response Centre. This centre included a single-storey building housing staff and ancillary equipment for the Route 3 Traffic Control and Surveillance System.

Route 3 Advance Earthworks Contract : Project Manager for the design of an Observation Platform adjacent to the North West Tsing Yi Interchange. The Observation Platform included a 15m high circular reinforced fill structure affording views of the adjacent Tsing Ma and Ting Kau Bridges. The scheme included associated earthworks, drainage, landscaping and car park layouts and was awarded as a negotiated supplemental agreement to the existing Advance Earthworks Contract.

Western Harbour Crossing : Roadworks advice on the alignment of Sai Ying Pun Interchange as part of SWK's role as Independent Checking Engineer (ICE) on this BOT project.

## Professional History

1994 to 1995 (con't)

**Highway Proposals** : Responsible for marketing the firm's highways expertise within the Hong Kong Government, and private organisations. Tasks included the submission of Expressions of Interest and detailed Proposals and the establishment of joint ventures and sub-consultancies.

**Staff Training** : an active member of SWK's Training Group in addition to taking on the role of Deputy Engineering Supervisor under the HKIE training scheme, responsible for the training of some 12 local graduates.

1991 to 1994

### **Hong Kong : Engineer, Scott Wilson Kirkpatrick**

**Route 3** : Involved in a number of aspects in the development of Route 3, a key element in the Territory's future road infrastructure. Route 3 provides the main access from downtown Kowloon and Hong Kong Island to the new international airport at Chek Lap Kok and ultimately to China. Route 3 has been designated an Airport Core Programme Project and as such is essential to the development of the airport before 1997.

**Route 3 Ting Kau Earthworks** : Project Manager for the development of a Supplemental Agreement to the existing Advance Earthworks Contract to include the excavation of an additional 2.9 million m<sup>3</sup> of material as advance works for Ting Kau Bridge.

**Route 3, Country Park Sector** : Responsible initially for all highway and civil aspects for the preliminary design and costing of a 14 km section of the Route 3 expressway running from the island of Tsing Yi towards the Chinese border. The Country Park Sector included several grade-separated interchanges, a major cable-stayed bridge and a 3.5 km dual 3-lane tunnel. The final outcome of the study was a costing and programming report covering design, construction and operation and maintenance aspects, that was utilised in testing the attractiveness of the scheme for private sector financing.

Subsequently acted as Project Manager in the submission to Government of an Expression of Interest for the Country Park Sector as a Build-Operate-Transfer (BOT) scheme. In charge of co-ordination amongst the various members of the design team on civils, traffic, E&M and property development aspects. Also responsible for liaison and advice to the various contractors and developers involved in the consortium.

**Route 3, Kwai Chung Viaduct** : Advisor in the preparation of the contract documents for the largest contract in the Route 3 Project.

**Route 3, Traffic Control and Surveillance System** : Involved in the civils co-ordination, contract documentation and various technical aspects for this state-of-the-art traffic control system.

## Professional History

- 1991 - 1994 (con't)      **Route 3, Advance Earthworks Contract** : Responsible for preparation of contract documents for a major earthworks contract on the island of Tsing Yi. The contract included the excavation of 6 million m<sup>3</sup> of material with rock cuttings over 100 m high, and the construction of the largest reinforced earth structure in Asia. Tasks included the development of a novel form of pricing document including milestone payment controls and partial lump sum items.
- 1990 to 1991      **Scotland : Senior Chartered Engineer, Scott Wilson Kirkpatrick**
- M8 St James Interchange Design and Build Contract** : Highways Team Leader and involved in overall project co-ordination for this important motorway interchange contract in Central Scotland; the largest design and build roadworks contract in UK. Tasks developed from the initial, successful tender submission to Government to the final design and documentation.
- The M8 St James Interchange scheme was awarded Scotland's top construction industry award in 1994, the Saltire Society Award, for both design and construction.
- In charge of a team involved in the design, contract document preparation and site supervision of a number of road and bridgeworks projects.
- 1989 to 1990      **Nepal : Design Engineer, Scott Wilson Kirkpatrick**
- Malekhu-Mugling Road Rehabilitation Project, Nepal** : Responsible for the on-site detailed design of a 40 km stretch of the Prithvi Highway in Nepal - the main strategic link between the capital, Katmandu, and India. Tasks included the design of road geometry, drainage, earthworks and retaining walls - all of which were affected by the severe topography and climate. Additionally, in charge of the day-to-day management of the locally-staffed design office and surveying teams. The project was run on an unusual form of cost-based management contract whereby the international management contractor's risks were minimised whilst offering local works contracts to Nepalese contractors. This resulted in additional site supervision duties of the local works contractors.
- 1988 to 1989      **Scotland : Chartered Engineer, Scott Wilson Kirkpatrick**
- Forth and Clyde Canal, Restoration of Navigation** : Responsible for a team engaged principally in designing four road and bridgeworks contracts aimed at restoring navigation to the Forth and Clyde Canal in Glasgow. Each of these contracts included intricate traffic and services diversions in tight urban locations and involved feasibility studies, planning applications, preparation of contract drawings and documents and supervision-in-chief duties during construction.



## Professional History

1988 - 1989 (con't)

One of the schemes, The Glasgow Bridge near Kirkintilloch was awarded a certificate of merit by the Association for the Protection of Rural Scotland in 1992.

Traffic and planning studies and contract document production for various smaller schemes for clients from both the private and the public sector.

1986 to 1988

**Scotland : Graduate Engineer, Scott Wilson Kirkpatrick**

Engaged on a variety of roadworks contracts in Scotland ranging from supervision-in-chief duties on the 14km Garelochhead Bypass and Northern Access Road to supervision of the design of a road widening scheme near Edinburgh.

Responsible for the design of the sub-structures for three bridges on the Glen Fruin Road, a temporary access road for construction traffic for the Clyde Submarine Bases at Faslane and Coulport.

1985 to 1986

**Scotland : Engineer's Representative, Scott Wilson Kirkpatrick**

Peel Park Distributor Road, East Kilbride : Responsible for the supervision of construction of a 3-span concrete railway bridge and 400 m of new road and embankment. The scheme was the first in Scotland to use vertical band drains to accelerate consolidation settlement.

1982 to 1985

**Scotland : Graduate Engineer, Scott Wilson Kirkpatrick**

Sellafield Nuclear Fuel Reprocessing Plant : Discrepancy check of reinforced concrete works.

Glan Conwy Viaduct, Wales : Independent check of a 10-span composite steel/concrete viaduct.

Waterside Bridge, Grampian Region : Independent check of a 3-span composite steel/concrete bridge.

Garelochhead Bypass, Strathclyde Region : Conceptual design of three bridge structures.

### **Professional History**

1986 - 1988 (con't)

P1/P2 Interchange, Tuen Mun, Hong Kong : Design of prestressed and reinforced concrete sections for a complex, curved expressway interchange. The scheme included the design of some 40 varying spans, subjected to the extreme climatic and seismic loadings of Hong Kong. Involved in the scheme for 2 years from the initial conceptual design through to final issue of construction drawings and advice to the Hong Kong office on contractual matters.

1980 to 1981

**England : Assistant Engineer, Balfour Beatty Construction Ltd**

Sellafield Nuclear Fuel Reprocessing Plant : Vocational employment on the construction of a large reinforced concrete structure and in the Sub-contracts Co-ordination Department.

### **Publications**

“The Design of the Articulation System for a Large Expressway Interchange in Hong Kong” - ICE Miller Prize, 1986.

“Vertical Band Drains - A Case History” - ICE Russell Allin Prize, 1989

“Route 3, Hong Kong” - IHT Babbie Premium Paper scheme, 1996.