

CV

Sohail Forouzan-sepehr

BSc MSc MPhil CEng MIStructE

Chartered Bridge Engineer with strong experience and knowledge in bridge engineering design and management



Profile

Sohail is a chartered structural engineer with more than 20 years of engineering experience in the United Kingdom and Middle East including assessment, conceptual and detailed design with different codes (BS, DMRB, Eurocodes, CDM, ACI, AASHTO, AREA and Iranian National Codes), technical review and consultancy, design leadership, as well as mentoring/coaching engineers and lecturing at universities and workshops. He has also authored several engineering journal/conference papers and books, and cooperated in a number of academic researches and engineering software development.

Key Experience

- Experiences in assessment and strengthening of highway bridges;
- Experienced in conceptual and detailed design of highway structures and rail bridges;
- Highway and railway bridges design leadership;
- Technical review and appraisal of assessments, strengthening of substandard highway bridges as well as design of new highway structures;
- Review and appraisal of CDM compliance of highway structures schemes;
- Providing technical consultancy to national and local authorities;
- Mentoring and lecturing engineering courses;
- Computational mechanics of structures.

Qualifications and Trainings

- MPhil in Structural Engineering
- MSc in Structural Engineering (2nd Rank Award)
- BSc in Civil Engineering (1st Rank Award)
- Chartered Engineer (CEng)
- Member of the Institution of Structural Engineers (MIStructE)
- Construction Skills Certification Scheme (CSCS) Professionally Qualified Person
- IOSH Managing Safely in Construction
- APS Principal Designer Course
- Lean Foundation Course

EXPERIENCE WITH A-ONE+ AREA 4/CH2M (2016 – 2018)

Area 4 Structures Design Team Leader

Lead of Area 4 Structures Design Team including resource management, team building with incorporated interviews and technical exams, technical supervision (concepts, buildability, CDM) and design/assessment/option study schemes lead of Highways England Area 4 structures schemes, development of design management processes and strategies, undertaking CDM 2015 Principal Designer duties, etc.

- **M20 Cradlebridge Railway Bridge (Team Leader/Technical Reviewer):** Client: Highways England. Managed the in-house assessment and outsourced independent check of the structure including technical lead, as well as the concrete refurbishment of a single span of 10.3 m carrying M20 motorway over Canterbury-Ashford-Ramsgate railway. Also, prepared BD 79 review of provisionally substandard structure with proposed installation and removal interim mitigation measures, and managed concrete refurbishment studies and works.
- **A27 Stockbridge Footbridge Replacement (Team Leader):** Client: Highways England. Managed the in-house design and outsourced independent check including technical lead of a replacement 30.0 m main span of a steel truss footbridge over A27 trunk road. The existing bridge had a low headroom and been subject to high vehicle collision to its soffit.
- **M20 East Street Footbridge Replacement (Team Leader):** Client: Highways England. Managed the in-house and outsourced different design/check teams for demolition of the existing ramp, detailed design of the new two-span steel footbridge and its associated multi-span ramp, as well as technical lead on structure/soil-structure interaction, buildability and procurement, etc. The main span of the proposed structure is 43 m with a side span of 22 m and 85 m long ramp. The existing footbridge collapsed due to its low headroom and vehicle collision to its soffit.
- **Heavy Load Routes Structural Assessment (Team Leader/Technical Reviewer):** Client: Highways England. resourced and managed assessment and independent check teams, as well as technical lead of a number of highway structures assessment. Technical review of the structures in accordance with BD 101/11.

EXPERIENCE WITH ATKINS (2015 – 2016)

Senior Bridge Engineer

- **Renewable Energy Noise Barriers (Technical Reviewer):** Client: Highways England. Technical review of structural aspects of AIP's for design of photovoltaic noise barriers on key locations along the M40. The scheme comprised developing cost-effective environmental barriers to reduce traffic noise for communities adjacent to major roads, together with the aim of developing innovative approaches that can achieve low carbon energy production which could be used locally. The AIP's were originated by a group of structural, electrical and acoustic engineers.
- **Strengthening of Heathrow Airport Main Tunnel Q6 (Technical Checker):** Client: Heathrow Airport. Design check of further strengthening of a multi-cell tunnel structure under the airport runway and taxiways to sustain known current and future (by 2019) aircrafts loading. The roof slab of the structure had been strengthened before by adding a new layer of reinforced concrete to the original soffit. However, recent inspections and assessment indicated the longitudinal shear capacity of the interface not to be adequate and require further strengthening.
- **M25 DBFO Substandard Structures Management (Technical Reviewer):** Client: Connect Plus Structures. Technical review of 'Initial Structure Option Reports' (ISOR's). The aim was to determine whether each structure is provisionally substandard and requires further assessment in accordance with BD 101/11.
- **Gosford Street Public Realm Enhancement (Design Consultant):** Client: Coventry City Council and Coventry University. Provided structural consultancy, CDM, design and construction advice to Coventry City Council to comply with current standards as well as the landscape architects requirements. The scheme consisted of enhancing general landscape of the public areas within Coventry University by constructing new ponds, pedestrian ways, cycle shelter, etc.

- **Assessment of Ham Bridge (Assessment Team Leader):** Client: Thames Water. Assessment technical lead of a half-through steel bridge over Thames River. The bridge is the only means of access to Ham Island; however, the soffit of the bridge superstructure is in poor condition. Although the bridge was determined to be incapable of sustaining full assessment live loading, possible interim measures and departure from standards were also investigated in a view of maintaining the access for Thames Water vehicles till its strengthening. Also, proposed a viable strengthening option with minimum possible construction time which later on, was implemented in detailed design and construction.
- **M25 Junction 28 (Design Team Leader):** Client: Highways England. Preliminary design lead of several highway and railway structures including a number of viaducts carrying M25 and A12, a jacked subway under an existing railway, etc.
- **Wadi Bani Hinay New Bridge (Technical Reviewer):** Client: Sultanate of Oman Ministry of Regional Municipality and Water Resources. Technical review of elastomeric bearings specifications and quality testing for a new highways bridge in the Middle East in accordance with relevant American Codes.
- **Pitsea Footbridge (Design Team Leader):** Client: Veolia and Essex County Council. Design lead of reinforced concrete substructure and approached ramp of a piled footbridge over Network Rail tracks as well as technical review of soil-structure interaction, buildability and CDM review.
- **Structures and Tunnels Investment Portfolio Stage 2 (STIP 2) (Assessment Team Leader):** Client: Transport for London. Assessment lead of Lambeth Bridge over River Thames as well as senior inspector of Lambeth and Vauxhall Bridges.

EXPERIENCE WITH RAMBOLL (2014)

Senior Bridge Engineer

- **White City New Bridges (Design Technical Leader):** Client: St James Development, TAA: Transport for London. Design technical lead and CDM compliance review of a half-through steel girder highways bridge and a composite steel girder pedestrian platform over London Underground Central Line.
- **Structures and Tunnels Investment Portfolio Stage 2 (STIP 2) (Technical Reviewer):** Client: Transport for London. Provided gap analysis including review of available records to identify missing information and recommendations for potential items of work to ensure reliable operation of all structures along A40 Westway.
- **Mentoring (Delegate Engineer):** Acted as Delegated Engineer to assist a number of Graduate Members of the Institution of Civil Engineers (ICE) in achieving their chartership.

EXPERIENCE WITH JACOBS (2013 – 2014)

Senior Bridge Engineer

- **Rail Incursion Risk Reduction at Rayners Farm Bridge (Lead Designer):** Client: Essex County Council and Network Rail. Feasibility study, CDM compliance and detailed design of earth retaining structures to act as foundation for full height anchors and also retain the existing slopes. Rayners Farm Bridge is a single span structure located in Little Clacton, Essex over a dual track high-speed railway with brickwork parapets and no continuous approach and departure safety barriers to the end of the parapets. The scheme comprised installation of new safety barriers with full height anchors over ground beams which have to stabilise and retain the existing vertical slopes.
- **Reconstruction of Roding (Small) Bridge Footway (Lead Designer):** Client: Essex County Council. Detailed design of a new reinforced concrete slab integral bridge carrying the north footway of Roding Lane, Buckhurst

Hill, Essex. The existing footway was over an existing instable extension to the original brickwork arch bridge. The scheme comprises removal of the existing extension, stabilising the embankment and construction of a new bridge adjacent to the original arch bridge.

- **Technical Review of Third Parties Design AIP's for Acceptance On Behalf of Essex County Council (Technical Reviewer):** Review of various design AIP's by third parties including Design of A138 New Chelmer Viaduct, Design of New Chelmer Flood Relief Culverts, Retention of Caissons in Northern Approach Road – Phase 3 (NAR3), and Army and Navy Subway Northern Access Ramp on behalf of Essex County Council for compliance with CDM, current standards and Essex County Council requirements as well as approval of technical aspects of proposed schemes.
- **Halstead Depot Salt Barn (Technical Reviewer, Consultant, Senior Designer):** Technical review and design verification of the structure on behalf of Essex County Council as well as proposal and detailed design of an alternative option which would result in a significant saving in the County Council budget with higher level of safety. The scheme comprised design and construction of a new piled barn on the top of a made ground embankment and close to the crest of an existing slope to store 700 tonnes of de-icing salt with an Essex Highways depot.
- **Assessment of Essex County Bridges (Project Manager, Technical Reviewer):** Client: Essex County Council. Project management and technical review of assessment AIP's of various Essex County bridges. The assessments would be carried out by India Office and the AIP's had be reviewed and submitted within a certain timescale.
- **Technical Excellence Support:** Mentoring staffs for conceptual design and detailed design in accordance with Eurocodes, publishing technical blog posts on 'Understanding An Engineering Project' and administrating various technical forums including Bridge Engineering, Eurocodes for Structures, Mathcad, LUSAS, etc on the professional network of the company, and developing several design software packages. Also, designed technical tests in bridge engineering for senior engineers recruitment interviews.

EXPERIENCE WITH RINGWAY JACOBS (2012 – 2013)

Senior Bridge Engineer

- **Strengthening of Hercules Bridge (Senior Designer):** Client: Essex County Council. Feasibility study and detailed design of a new reinforced concrete arch bridge to the intrados of an existing masonry arch bridge. The existing bridge was indicated to be inadequate to sustain full assessment live loading and the proposed strengthening would enhance its structural capacity to the full ALL. The scheme comprised fixing new reinforcement to the intrados of the existing arch with dowels and building a new structural layer by spray concrete operation. The new reinforced concrete arch would sustain the overall loads and the existing bridge would act as a permanent formwork.
- **Reconstruction of Fish and Eels Bridge (Senior Designer, Design Technical Leader):** Client: Essex County Council. Provided feasibility study in compliance with British Waterway standards and technical lead of detailed design of a new bridge in Hoddesdon, Essex over River Lee Navigation.
- **Tortoise House Retaining Wall (Technical Checker):** Client: Essex County Council. Detailed design verification of a piled retaining wall which would protect a residential building against any possible vehicle incursion from the adjacent highway.

- **Mentoring (Mentor):** Mentoring Anglia Ruskin University second year students of civil engineering. The aim was to introduce the working environment to the students and assist them in planning for their professional career. Also, presented the importance of mentoring at the university on behalf of the company.

EXPERIENCE WITH MOUCHEL (2008 – 2012)

Bridge Engineer

- **Assessment of Essex County Box-Culverts and London City Bridges (Assessor):** Clients: Essex County Council / City of London. Re-assessed various highways bridges and culverts using yield line analysis and other rigorous methods to enhance the assessment rates of the structure. The re-assessments insured several provisionally substandard bridges to have adequate structural capacity without any requirements for further strengthening and thus, resulted in significant saving in the County Council budget.
- **Strengthening of Maldon Road and Ladywell Bridges (Designer):** Client: Essex County Council. Feasibility study, detailed design, site liaison/support, and scheme finalisation for strengthening of piers of two number of three-span bridges against possible vehicle collision; as well as strengthening of deck transverse link beams, etc against accidental vehicle loading over the bridge.
- **Strengthening of Smiths Green Bridge (Designer):** Client: Essex County Council. Detailed design, site liaison/support and scheme finalisation of a new structure supporting the existing weak bridge. The existing bridge was a masonry arch structure with 3-tonne weight restriction. The proposed strengthening enhanced its structural capacity to the full ALL. The scheme comprised fixing new reinforcement to the intrados of the existing arch with dowels and building a new structural layer by spray concrete operation. The new reinforced concrete arch sustains the overall loads and the original bridge acts as a permanent formwork.
- **Roscommon Way Extension New Structures (Designer):** Client: Essex County Council. Option study, feasibility study and detailed design of new reinforced concrete voided slab integral bridges and plant protection structures in Canvey Island. The alluvium subgrade of the site necessitated specific considerations in regard with the soil-structure interaction. Therefore, also carried out technical review of the approaches for implementing geotechnical considerations in design.
- **Refurbishment of Pitsea Flyover (Designer):** Client: Essex County Council. Detailed design for refurbishment of various reinforced concrete piers and retaining walls.
- **New Sutton Ford Bridge (Designer):** Client: Essex County Council. Detailed design of a new bridge. The superstructure consists of precast prestressed concrete beams with insitu reinforced concrete slab and is integral with reinforced concrete bearing piles.
- **Safety, Health, Environment and Quality (Environmental Coordinator, SHEQ Champion):** Acted as Environmental Coordinator and SHEQ Champion to ensure full compliance of the work environment with relevant regulations and to improve the culture of SHEQ within the office.

EXPERIENCE WITH HEXA CONSULTING ENGINEERS (2003 – 2018)

Design Team Leader (2007 – 2008)

- **Design Team Leader:** Technical lead and management of a team of five structural engineers and three draftsmen involving preliminary / detailed design of several infrastructure schemes mainly for Iran's Ministry of Roads and Transportation.

- **IT Department Leader:** New IT network design supervision
- **Bridge Engineering Workshops (Lecturer):** Lectured short courses for Iran's Ministry of Roads and Transportation staff on bridge engineering including *Design and Construction of Segmental Prestressed Concrete Bridges Using Balanced Cantilever Method*, *Design and Construction of Rigid Frame Bridges: An Overview to Mond 3rd Bridge*, *Construction of High Bridges by Launching Method*.

Bridge Design Engineer (2003 – 2008)

- **Mianeh – Bostanabad – Tabriz Double Track Railway Bridges (Designer, Design Supervisor, Project Manager):** Client: Ministry of Roads and Transportation. Detailed design and design supervision of eight number 40m multi-span steel box-girder bridges over valleys of 30-50m deep.
- **Kermanshah – Bisotoun Eastern Bypass Bridge (Designer, Project Manager):** Client: Ministry of Roads and Transportation. Detailed design of a 30m span voided slab reinforced concrete highway bridge.
- **Bridges of Second Runway of Chalus – Noshahr Bypass (Designer, Project Manager):** Client: Ministry of Roads and Transportation. Preliminary design of three number 2x30m spans highway bridges
- **Chalus Grand Bridge (Designer, Project Manager):** Client: Ministry of Roads and Transportation. Detailed design of a highway bridge superstructure comprising 8x40m precast prestressed concrete beams.
- **Esfahan – Azna Single Track Railway Bridges (Designer):** Client: Ministry of Roads and Transportation. Preliminary design including hydraulic studies of three number 25m multi-span bridges.
- **Chabahar – Fahraj Single Track Railway Bridges (Designer):** Client: Ministry of Roads and Transportation. Preliminary design including hydraulic studies of seven bridges comprising 25m multi-span precast prestressed concrete beams.
- **Dezful 5th Highway Bridges (Designer):** Client: Municipality of Dezful. Detailed design of a 28.35+9x45.30+28.35m bridge superstructure comprising precast prestressed concrete segments installed in place using balanced cantilever method.
- **Mond 3rd Highway Bridges (Designer):** Client: Roads and Transportation Organisation of Bushehr. Detailed design of a 28x25.0m multi-span reinforced concrete bridge.
- **Jolfa Highway Bridge (Designer):** Client: Boundary Terminals Organisation of Iran. Detailed design of a reinforced concrete multi-span 250.62m long bridge over Aras River connecting Nakhichevan Autonomous Republic and Iran.

EXPERIENCE WITH UNIVERSITY OF TEHRAN (2002 – 2004)

Contract Lecturer (2003 – 2004)

- Lectured engineering courses for BA students, Department of Industrial Design, Faculty of Fine Arts.

Teacher Assistant (2002 – 2004)

- Lectured problem solving in *Dynamic of Structures* for MSc students, Department of Civil Engineering, Faculty of Engineering.

EXPERIENCE WITH PARS PADIR CONSULTING ENGINEERS (1998)

Student Engineer

- Designed and verified steel structure residential buildings.

EXPERIENCE WITH AMIR KABIR UNIVERSITY OF TECHNOLOGY (1996 – 1998)

Teacher Assistant

- Lectured problem solving in *Statics* for BSc students, Faculty of Civil and Environmental Engineering.

PUBLICATIONS AND PAPERS

Dissertation

- S Forouzan-sepehr (2001); “A Contact Based Method for 3D Delamination Analysis of Composites Subjected to Impact Loading”, Master Thesis, School of Civil Engineering, University of Tehran, Iran.

Research Reports

- S Forouzan-sepehr, S Mohammadi (2001); “3D Analysis of Initiation and Propagation of Delamination in Composites Under Impact Loading”, Grant No 614/2/627, Vice Chancellor for Research, University of Tehran
- S Forouzan-sepehr, S Mohammadi (2004); “Meshless Methods for the Analysis of Engineering problems”, Grant No 614/2/988, Vice Chancellor for Research, University of Tehran

Papers

- S Forouzan-sepehr, S Mohammadi (2010); “A Fast Mesh-Free Galerkin Method for the Analysis of Steady-State Heat Transfer”, Journal of Aerospace Science and Technology, Sharif University of Technology, Tehran, Iran.
- S Forouzan-sepehr, S Mohammadi (2005); “Dynamic Analysis of Delamination in Composite Shells”, Journal of Faculty of Engineering, University of Tehran (Special Issue on Civil Engineering), Vol 39, No 3, pp 389-401.
- S Mohammadi, S Forouzan-sepehr (2003); “3D Adaptive Multi Fracture Analysis of Composites”, in: MP Cartmell (editor); Proceedings of the 5th International Conference on Modern Practice in Stress and Vibration Analysis, Vols 440-441, pp 145-152, Glasgow, Scotland.
- S Mohammadi, S Forouzan-sepehr (2003); “3D Analysis of Initiation and Propagation of Interlaminar Cracks in Composite Shells Subjected to Impact Loading”, in: Proceedings of the 4th Iranian Aerospace Society Conference, Vol 1: Aerospace Structures, pp 372-381, Tehran, Iran.
- S Mohammadi, S Forouzan-sepehr, A Asadollahi (2002); “Contact Based Delamination and Fracture Analysis of Composites”, Thin-Walled Structures, Vol 40, No 7-8, pp 595-609.
- S Forouzan-sepehr, S Mohammadi (2001); “A Contact Based Method for 3D Delamination Analysis of Composites Subjected to Impact Loading”, in: S Valliappan, N Khalili (editors), Proceedings of APCOM '01: First Asian-Pacific Congress on Computational Mechanics, pp 691-696, Sydney, NSW, Australia.

Books

- S Forouzan-sepehr (2005); “Intellectual Skill-Learning Problems”, Mobtakeran, Tehran, Iran.
- S Forouzan-sepehr, A Safaeian (2000); “Problems of Maths for Middle School Students”, Mobtakeran, Tehran, Iran.
- S Forouzan-sepehr (1996); “Tests of Maths for Middle School Students”, Mobtakeran, Tehran, Iran.

Developed Software Packages

- Participated in developing *ELFEN* for 3D delamination analysis of composites using finite/discrete element methods and Fortran 77.
- Programmed *EFAP 2006*, an academic purpose software for analysis of heat transfer problems and error estimation using element-free methods and Visual Basic.NET 2005 (refer to <http://efap.sfsepehr.com/>).

- Developed several design software packages with different standards using Mathcad and Excel