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**G E Findlay BSc., LLB., C Eng., MICE., MIMechE, C.WEM.,
MCIWEM., MIWISA.**

Curriculum Vitae.

Summary.

I am a Chartered Engineer Civil and Mechanical Engineer with over 40 years' experience within the Water Industry with consulting engineers, water companies and manufacturers.

For 22 of those years I was employed by Severn Trent Water Ltd where I was responsible to Directors for the implementation of a large proportion of Severn Trent's Multi - Million Pound Capital Works Programme.

This included acting as the project manager on many schemes covering the whole range of Water Industry Schemes including acting as Engineer to the Contract.

I was also responsible for the development of the award-winning Severn Trent RBC and Reed Bed Process including the Cranfield Initiative to resolve defects in mechanical integrity.

I am the author of several papers on engineering topics mainly Rotating Biological Contactors (RBCs) and other technical publications but I also have experience in a range of small sewage treatment works.

From June 2000 to February 2007 I was a senior manager with an international manufacturer of small sewage treatment plants and other sewage treatment equipment responsible for the following sewage treatment frameworks:

1. Severn Trent RBC Remediation Programme – value £2M.
2. Northumbrian Water New RBC Framework – value £1M.
3. Various other individual contracts for water related mechanical plant with UK Water Companies.

In all these contracts I acted as contract manager / director.

I have acted as an independent consulting engineer in the UAE, Jordan, and Mauritius etc.

In February 2008, I was appointed an Engineering Reviewer for Chartered Engineer status for the UK Chartered Institute of Water and Environmental Management (CIWEM) and for the Institution of Mechanical Engineers (I Mech E).

I have expert witness experience in both civil and criminal litigation, technical audit experience and have been employed water companies, solicitors, fabricators, and private bodies including a County Council on Health and Safety work, I have given Expert Evidence in the Construction and Technology Division of the High Court in London and appeared in the Crown Court and lesser tribunals.

Education.

- 1959 Ardrossan Academy, Ayrshire Scotland.

1959 -1962 Kettering Grammar School, Northamptonshire.

Academic Qualifications.

General Certificate of Education: - Ordinary Level: -
French, English Language, Physics, Chemistry, Religious Knowledge.

General Certificate of Education: - Advanced Levels: -
Physics, Chemistry, Applied Mathematics, Pure Mathematics.

General Certificate of Education_Scholarship Level_
Pure Mathematics.

1962- 1965 Victoria University of Manchester.
Graduated B. Sc Second Class in Engineering.

1979 -1983 DE Montfort University Leicester.
Graduated following evening study in Law (LL B Hons. Second class division 2.)

1979 Institution of Civil Engineers.
The Institution Contract Law and Administration Course.
1980 Reading University Postal Course on Arbitration.

Professional Qualifications.

Chartered Civil, Mechanical and Water Engineer (C Eng.)
Corporate Member, Institution of Civil Engineers (MICE.)
Corporate Member, Institution of Mechanical Engineers. (M I Mech E.)
Member, the Chartered Institute of Water and Environmental Management (MCIWEM.)
Chartered Water and Environmental Manager (C.WEM.)
Member, Water Institute of Southern Africa (MWISA.)

Employment.

1965-1966 Babbie Shaw and Morton, Glasgow.

- Assistant Resident Engineer.

Employed on water related schemes.

1966-1970 Ward Ashcroft and Parkman, Liverpool

- Assistant Engineer,

I was primarily responsible for designing the percolating filter sewage treatment works and associated sewerage for the town of Rhayader in Wales.

1970-1975 John Taylor and Sons, Westminster.

- Team Leader / Senior Engineer.

Initially employed on Water supply schemes, I wrote my first paper on a pipeline scheme and was awarded the Rex Winter Premium of The Water Engineers and Scientists (now CIWEM.)

I was promoted to Senior Engineer and transferred to take charge of the Plymouth office, responsible as Project Manager for the design and contract administration of several sea outfalls and first time percolating filter and sewerage schemes in the West Country. During this time, I acted as an Expert Witness on 2 separate schemes.

1975-1978 Southern Water Authority.

-Team Leader / Project Manager

I was responsible for managing two design teams employed on sewage treatment design and construction in West Kent.

1978 – 1984 Severn Trent Water Ltd.

- Senior Engineer.

I was responsible for the planning of sewage treatment schemes in Leicestershire. This entailed planning schemes to maximise the use of spare WwTW capacity created before water rationalisation in 1974. This required knowledge of economic principles to assess the most technically and economically viable scheme.

I was also responsible for the resolution of coal mining disputes, including action against the National Coal Board under the Mining Subsidence Act 1957.

1984 – 1988, Severn Trent Water Ltd
- Principal Auditor (Post Project Appraisal)

Seconded to Headquarters and appointed principal auditor to undertake a technical and contract audit of Carsington Dam contract prior to the collapse and from 1985 to post appraisal (technically audit) the design and contract audit of schemes undertaken by Severn Trent Engineering and their consulting engineers.

Post appraisal reports were forwarded directly to the Directors of Severn Trent Water Authority and a summary sent to the then Department of the Environment. This was fundamental to the funding of new work in Severn Trent immediately after privatisation of the water industry.

I also advised on the resolution of claims and assisted in the litigation following the collapse of Carsington Dam.

1988 – 1990 Severn Trent Water Ltd
- Principal Engineer

As a principal engineer initially based at Headquarters I was responsible for upgrading many sewage treatments works through consulting engineers and “in-house” to a very tight programme dictated by legal requirements associated with privatisation of The UK water industry.

1990 – 2000 Severn Trent Water Ltd
- Senior Principal Engineer

I was responsible for the project management of three design teams (two civil and one mechanical) implementing a large proportion of the company’s Multi – Million GBP Capital works programme.

Severn Trent’s capital works program is substantial and covered the whole range of water industry schemes including water supply, sewage, and wastewater treatment.

Although responsible for a large proportion of the Company’s Multi Million GBP capital works programme, I was in addition responsible for developing the Company’s Rotating Biological Contactors (RBC) and Reed Bed Process and installing plants throughout the whole of the Company’s Region totalling 8.500 sq. miles.

I was also responsible for resolving the problems traditionally associated with RBCs and for the initiative with Cranfield University to improve mechanical integrity. This entailed taking legal action against errant RBC suppliers. Suppliers were made to upgrade their plant or fund the total cost of replacement with specified plant.

The Severn Trent RBC and Reed Bed process

The Severn Trent RBC and Reed Bed process was a new flow sheet unique within the water industry and proved to be highly innovative. It resulted in new techniques and design principles resulting in Severn Trent Water Ltd receiving several major Awards. The Severn Trent RBC flow sheet was copied by many other companies becoming the *de facto* industry standard.

For the first time, all flow (including storm sewage) was treated to a high quality (less than 1.0 ammonia) and mechanical plant was warranted defect free for a minimum of 20 years.

The RBC and Reed Bed Flow sheet attracted a great deal of international interest resulting in short term lecturing commissions at overseas universities and papers to overseas conferences.

On leaving Severn Trent in 2000 I was granted a visiting chair by Cranfield University. There was no specific task or salary associated with this (although Cranfield reserved that option) and I viewed it as merely honorary recognising the friendship and team working with Cranfield University School of Engineering over the previous ten years. I maintained an association with the University acting as an Industrial Advisor until 2019. I have conducted post graduate examinations on RBC related work. Like most Visiting Chairs this has now expired.

I also exercised the role of Engineer - to - the Contract on "in-house" designed schemes.

I was from time to time employed assisting Severn Trent International on overseas schemes.

2000 – 2006 Copa Ltd. - RBC Manager.

Copa Ltd was an international supplier of sewage treatment equipment primarily Rotating Biological Contactors (RBCs) and Submerged Aerated Schemes (SAFs).

I was invited to join Copa Ltd as their RBC Manager responsible for all aspects of the Company's RBC business both at home and abroad. My role was a "hands on" role and included acting as project manager with responsibility for the research, design, tender submission, manufacture, installation and contract negotiation and all new development and related aspects concerning the "Copa RBC."

COPA RBC

Copa Ltd sold to all the UK water companies including Scottish Water and in Northern Ireland. The RBC plant was warranted defect free for a minimum of 20 years. We were extremely well regarded by all our clients. offering a free civil design service based on STWL policy.

The Copa RBC was originally designed for STWL by Cranfield but further developed by me to give a range of defect lives up to 30 years. None, to my knowledge, have failed either in compliance or structurally.

Copa Ltd no longer exist, having been acquired by Ovivo who now trade as Jacopa Ltd. I have no association with Jacopa or any other manufacturer

2006 – Present Sewage and RBC Solutions Ltd - Director & Owner

I am a Self-Employed Independent Consulting Engineer employed on water related matters at home and abroad.

Some of the projects include:

1. Acting as a sewage expert in the Review of the Master Plan for Abu Dhabi Island Drainage for Berlinwasser. (Berlin Germany)
2. Post appraising and reporting on new works on Abu Dhabi Mainland for Berlinwasser.
3. Reporting on the condition of pumping stations in Al Ain for Berlinwasser.
4. Preparation of a feasibility study and transition documents for the Dead Sea Waste Water Treatment works for an effluent re-use scheme for Sachsen Wasser. (Leipzig, Germany.)
5. RBC training for EIMCO Water Technologies Group UK sales staff.
6. Assisting in the preparation of proposals for a major water distribution and wastewater treatment and associated works in Libya.
7. Investigating the mechanical and civil engineering integrity, of a major wastewater treatment works in Mauritius.
8. RBC training for EIMCO Water Technologies Group technical staff.
9. Advising Adroit Group on the Yorkshire Water Services Framework.
10. Acting as an Expert Witness on a major pollution Incident involving defective design.
- 11 Assisting a sub-contractor recover his costs which were being wrongly withheld by the main contractor and involved mediation as an option.
- 12 Employed as sewage treatment and RBC expert on the largest RBC scheme in Ireland.
- 13 Employed as a consultant to EIMCO Water Technologies Ltd on RBCs in Scotland. This includes the process, civil and mechanical design.
- 14 Consultant to OVIVO on the Severn Trent RBC Framework.
- 15 Advising a developer / environmental consultant on sewage treatment issues.

- 16 Advising Severn Trent Water Ltd and United Utilities on RBC issues through OVIVO Water.
- 17 Acting as an Expert Witness for many schemes for Major UK Water Companies, Solicitors, and Contractors and Suppliers. Crown Court Experience. Including giving Expert Witness Evidence in the Construction and Technology Division of the High Court in London.
- 18 Advising on the Review of the New suite of Conditions of Contract for civil engineering works.

Publications

I am the author of several papers presented at International and domestic conferences and to professional institutions on various engineering matters but primarily sewage treatment.

A small number of the papers can be downloaded on request from www.rbcsewage.co.uk.

The more important papers are listed below:

Paper No	Title	Publishing Body / Event
1.	Summerton J D and Findlay G E (1972.) "The design of a Trunk Main with particular reference to the long-term effects of ground settlement." <i>J Inst Wat E Vol 26, issue 7 Oct 1972 pp 359 – 367.</i>	Institution of Water Engineers and Scientists - Liverpool UK.
2.	Black D W and Findlay G E (1990.) "Coping with COPA 11: Actions to Improve Effluent Quality." <i>Water and Environment Journal Vol 5 Issue 4 August 1991 pp 425 - 438</i>	Chartered Institution of Water and Environmental Management- West Midlands Branch Birmingham.
3.	Findlay G E (1993.) "The selection and design of rotating biological contactors and reed beds for small sewage treatment plants." <i>Proc., Instn Civ Engrs, Wat., Marit., & Energy 193 101 Dec 237-246</i>	ICE Water Board Paper No 10249.
4.	Findlay G E (1998.) "The Severn Trent RBC and Reed Bed Process."	Water Institute of Southern Africa- Biennial Conference Cape town April 1998.
5.	Mba D, Bannister R H and Findlay G.E (1999.) "Mechanical Redesign	Water Research Journal.

	of the Rotating Biological Contactor” <i>Wat Res V33 No 18 pp 3679 - 3688 (1999).</i>	
6.	Mba D, Bannister R H., and G E Findlay (1999.) “Condition monitoring of low – speed rotating machinery using stress waves – Part 1.” <i>Proc Instn Mech Engrs Vol 213 Part E.</i>	Intuition of Mechanical Engineers – London.
7.	Mba D, Bannister R H, and G E Findlay (1999) “Condition monitoring of low – speed rotating machinery using stress waves – Part 2.” <i>Proc Instn Mech Engrs Vol 213 Part E.</i>	Intuition of Mechanical Engineers – London.
8.	Findlay, G.E and Elliott, I (2002.) “Design principles to achieve a robust sewage treatment process using rotating biological contactors and reed beds.” <i>Int. J. Water, Vol. 2, Nos. 2/3,</i>	The Future of the Mediterranean Rural Environment: Prospects for sustainable Land Use and Management”, 8 – 11 May 2000 Menemen, Turkey.
9.	Findlay, G E (2002.) “The Production of High-Quality RBCs for the UK Water Industry.”	Aquaenviro Wastewater Conference – Edinburgh. 15 -17 April 2002.
10.	Mba D, Bannister R H and Findlay G E (2002.) “Manufacturing High Quality Rotating Biological Contactor’s for the UK Water industry.”	Water Institute of Southern Africa- Biennial Conference Durban 19 – 23 May 2002.
11.	Findlay G E and Scale D J (2003.) “Framework Contracts: One supplier’s view.”	Institution of Civil Engineers Risk and Reward Conference –London November 2003.
12..	Findlay G E (2003.) “RBCs: A cost effective solution for small communities.”	Water and Wastewater Europe- Nice, France 4-6 March 2003.
13.	Findlay G E, 2003.) “Resolving the reliability issues of Rotating Biological Contractors.”	WEFTEC Conference Los Angeles USA 2003.

14.	Findlay G E (2004.) "Technical and Financial benefits of Refurbishing RBCs."	Water and Wastewater Europe Conference – Barcelona Spain 25 – 27 May 2004.
15.	Findlay G E (2005.) "Advantages of, and improvements to, Framework Contracts for the supply of Mechanical Plant in the United Kingdom Water Industry."	Water and Waste Water Europe Conference – Milan, Italy.
16.	FINDLAY G E (2005) "The Evaluation of Mechanical Plant Tenders with Particular Reference to Rotating Biological Contactors."	Water and Waste Water Europe Conference - Milan, Italy.

Awards.

I was awarded The Rex Winter Premium of the then Institution of Water Engineers (now CIWEM) for the Paper entitled *"The design of a Trunk Main with particular reference to the long-term effects of ground settlement"*

This award is for overcoming formidable engineering difficulties. See paper 1 above.

The Severn Trent RBC and Reed Bed Process was a new flow sheet for the water industry and attracted a great deal of interest including that from H R H The Princess Royal who visited the RBC at Avening in Gloucestershire in June 1993.

Award details are as follows:

AWARDING ORGANISATION.	AWARD.	STATUS.	YEAR.
Engineering Council.	The Environment Award for Engineers.	Highly Commended.	1993.
Royal Academy of Engineering.	The Hydro Award for Water Quality Improvement.	Highly Commended.	1994.
The Commerce Business Magazine.	Special Award for Innovation in the Environment.	WINNER.	1995.
Institution of Mechanical Engineers.	Mechanical Excellence Award for Customer Care.	Finalist.	2003.

G E Findlay

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