

Richard Smith

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SUMMARY:

I started in the Sheffield alloy steel industry, progressing via study then research, into an industrial / construction / technology / manufacturing career. Euler-Bernoulli beam calculations and Finite Element Analysis modelling are newer abilities I apply in welding and design. Cornwall involves me in mineral processing and geology.

AI (Artificial Intelligence) usage is a recent success, applying experience to evolve stepwise questions which draw-out answers from the AI.

WORK EXPERIENCE:

24/03/2025 to date

Volunteering.

Home renovations.

Projects mining and mineral-processing.

14/10/2024 to 21/03/2025

Metalcraft Cornwall Ltd.

Unit 40, Kernick Ind. Est., Penryn, Cornwall, TR10 9EP

Welder

Metals fabrications for minerals processing and marine. My niche was repeat components presenting challenges. My MIG/GMAW welding machine had a very narrow good range - listed 42 starting conditions applying 3 shroud lengths for good welds, with an air-cooled torch. Made jigs for welding and fabrication. Consistency revealed finer systematic error in press-brake, which adjusted-out benefitted all pressings in the shop. Office admitted received phone call "Who is making these? They fit!".

08/12/2023 to 18/12/2023

Truro College

College Rd, Truro TR1 3XX

Lecturer / teacher in welding to welding apprentices

08/10/2022 to 07/12/23

House renovation

Peak District, Derbyshire and home, Cornwall

Two properties renovations

03/10/2022 to 07/10/2022

Penzance Dry Dock (Linked Solutions Ltd)

Wharf Road, Penzance, Cornwall, United Kingdom, TR18 4BW
Welder
Barge residential live-aboard – including weld hull plates overhead
(PE/4G) SMAW 7018

22/03/2022 to 02/10/2022
Home acquisition
Devon, Cornwall
Urgent acquisition of house/home given economic situation

06/12/2021 to 21/03/2022
Manor Marine UK Ltd
Manor Buildings, Portland Port, Castletown, Portland, Dorset, DT5
1PB
Welder
MIG/GMAW (IS04063 Num.131) aluminium welding marine Al-Mg 5000-
series grade.
Building 26m catamaran wind farm support vessels with 22knot service
speed – very slender hulls slicing the water at twice the "Froude
'last efficient speed'"

08/11/2021 to 19/11/2021
Coastal Workboats Ltd
Units 1, 2 & 3, Gabriel's Wharf, Water Lane, Exeter, Devon, EX2 8BG
Welder-fabricator
Constructing steel "multicat" work boats. MIG/MAG/GMAW (IS04063
Num.135) welding.

11/10/2021 to 29/10/2021
Fugro GeoServices Ltd
Bickland Industrial Park, Falmouth TR11 4TA
Welder
MIG/MAG/GMAW (IS04063 Num.135) and 7018 SMAW welder of high-
specification drilling-rig components.

11/08/2021 to 15/09/2021
Underhill Engineering Ltd
Waycon House, Western Wood Way, Langage Business Park, Plymouth,
Devon, PL7 5BG
Welder
Welding is MIG/GMAW steel and MIG/GMAW aluminium – great Company;
made sense and got Al welds from me accepted as the solution on a
major contract

12/07/2021 to 30/07/2021
C Toms and Son
East Street, Polruan-by-Fowey, Cornwall, PL23 1PB
Welder
Building and repairing trawlers (commercial fishing vessels). GMAW/
MIG (5356 wire) of Aluminium (5083 plate) for above-waterline and
superstructure. Steel FCAW (E71T-1 (gas-shielded rutile FCAW)) of
trawler structure.

18/06/2021 to 24/06/2021

SMS (Southampton Marine Services) Ltd

Unit B, Motorway Distribution Centre, Bristol, Somerset, BS11 9YT

Welder

Maintenance, repairs and modifications to a sand dredger ship moored at Avonmouth Dock. SMAW (7018) and FCAW (E71T-1)

19/04/2021 to 06/05/2021

Fugro GeoServices Ltd

Bickland Industrial Park, Falmouth TR11 4TA

Welder

MIG/MAG/GMAW (IS04063 Num.135) welder of high-specification drilling-rig components (high stresses in cyclic fatiguing loading).

05/10/2020 to 26/02/2021

Blackhill Engineering Services Ltd

Blackhill Quarry, Woodbury, Exeter, Devon, EX5 1JL

Welder

"Coded" MIG/MAG/GMAW (IS04063 Num.135) welder of higher-specification structural steel fabrications.

18/05/2020 to 24/07/2020

Vinci

East Park, Rennes Drive, Exeter, EX4 4ST

Construction labourer

Work for lead contractor on Halls-of-Residence complex. Lightweight steel structural method.

15/04/2020 to 15/05/2020

Mace Construction

The Depot, Summerland Gate, Exeter EX1 2JX

Construction labourer

"Covid19" cleaner - disinfect all contact surfaces frequently.

08/10/2018 to 10/03/2020

TMS (Teignmouth Maritime Services)

22b Dawlish Business Park, Dawlish, Devon, EX7 0NH

Welder

Welding of steel structures for marine construction projects.

Weld on marine site - SMAW "7018" (CaCO₃-based) "positional" welds (PA, PB, PC, PF, PD); oxy-propane cut steel tubes and sections - mainly steel tubular pile to concrete jetty deck transition details. Steel grades - mainly S355; some S275.

Summary of marine / maritime skills applied:

- * "deckhanding" on construction-barges and boats - handling the lines (ropes) for mooring and when connecting tugboats to barges, lift/lower barge spud-legs
- * experience of boats and their types - tugboats, crewboats, workboats, "multicats", construction barges, cargo barges - how they work and how they are used
- * gained Royal Yachting Association Levels 1&2 dinghy sailing and joined a sailing club - to "read" prevailing maritime conditions
- * understand the shipping forecast and computed weather-maps
- * tides and basics of navigation

13/08/2018 to 21/09/2018

Clifford Friend Steel Fabrication

Unit 11 & 12, Little Liverton Business Park, Liverton, Devon, TQ12 6JB

Coded welder

Steel fabrication and MIG/GMAW welding

09/04/2018 to 03/08/2018

Centristic Ltd

Cavalier Road, Heathfield Industrial Estate, Devon, TQ12 6TQ

Coded welder

MIG/GMAW welding components for quarrying equipment. A lot for Hemerdon Hill – tungsten ore. In 2025 now in West Cornwall – "opens a lot of doors" in mineral processing community where they recognise parts I made which they installed.

14/12/2017 to 30/03/2018

Linden Homes

Wellington Grove, Epsom Road, Guildford, Surrey, GU1 2QY

Gatekeeper and traffic marshal

Control access to construction site; marshal lorry traffic in and on site.

(studied Euler–Bernoulli beam equations while personning gatehouse continuously)

25/09/2017 to 06/12/2017

MCS Construction

Crabtree Rd, Thorpe Industrial Estate, Egham TW20 8RJ

Labourer

General construction site assistant and labourer.

05/06/2017 to 16/06/2017

A M Fabrications

Unit 1 Franklin Industrial Estate, Patterson Street, Blaydon, Tyne & Wear, NE21 5TL

Welder

On Brighton Pier truss under-deck support structure. Welder – SMAW "6013" Rutile; steel-fabricator; steel-erector.

24/04/2017 to 12/05/2017

Semmco

9 Kestrel Way, Goldsworth Park Trading Estate, Woking, Surrey, GU21 3BA

Welder

MIG/GMAW welding of airport ground-support aviation accessories.

05/12/2016 to 06/02/2017

Pennyhill Park Hotel

London Rd, Bagshot, Surrey, GU19 5EU

Kitchen assistant

Cleaning kitchens and working pot-wash lines in this highly-rated hotel.

05/11/2016 to 25/11/2016
Liberty Express Limited
Foxhols Farm, Lyne Ln, Chertsey KT16 0AN
Packer
Labelling and packing books for air-freight.

30/08/2016 to 13/09/2016
Hy-Ten Ltd
Gresham Road, Staines, Surrey, TW18 2BJ
Welder-fabricator
MIG/GMAW welding structural steel.

26/04/2016 to 13/05/2016
NLS Design Fabrication & Metalwork
Shed 14, Pinewood Studios, Pinewood Road, Iver Health, Bucks, SL0
0NH
welder-fabricator
Making film-sets for the movie industry. Steel fabricating and
welding.

09/03/2016 to 01/04/2016
Thames Wire Productions Ltd
Unit 1, Omega Way, Egham, Surrey, TW20 8RD
welder-fabricator
Fabricating and welding steel film-sets for the movie industry.

15/02/2016 to 26/02/2016
Mitie Water
Frimley Green
Administrator
For documentation recording legal / statutory compliance on water
quality, file records in the database. Contact clients and schedule
the periodic planned-maintenance visits by Company technicians.

04/08/2015 to 07/08/2015
K-Sark Fabrications Ltd
80A Reading Road, Finchampstead, Berks, RG40 4RA
Welder-fabricator
MIG / GMAW weld structural steels for building construction.

27/07/2015 to 31/07/2015
Thames Wire Productions Ltd
Unit 1, Omega Way, Egham, Surrey, TW20 8RD
Welder-fabricator
Fabricating and welding steel film-sets for the movie industry.

17/02/2015 to 15/06/2015
Hyundai Engineering & Construction Co.Ltd.
Tuzla office - Rauf Orbay Cd. 57/A, 34944 Tuzla/Istanbul, Turkey
Welding Engineer
The bridge, the third crossing the Bosphorus, has:
* US\$2.7billion cost
* 1.4km span between two 300m-tall concrete towers, one on Asia and
one on Europe

- * notable huge 59.4m deck-width
- * provides 8 road traffic lanes and 2 railway lines across the one top-of-deck level
- * hybrid cable-stayed with central suspension deck support form
- * steel deck has streamlined cross-section comprising Orthotropic stiffened panels for external and internal walls
- * steel structure for the deck plus tower cross-braces, cable termination boxes and tower-tops
- * Hyundai, my employer, as lead contractor delivering the bridge to the Client

There was complete breakdown of project management across all parties, with procedures detached from events in the manufacturing subcontractors consuming resources without output. Hyundai identified my high scientific knowledge coupled to practical welding experience, in recruiting me to navigate the way forward. To be successful, I would have to influence all parties. Accorded the unique title of Welding Metallurgist, reporting to the Hyundai's Chief of manufacturing, astutely anticipating "push-back". My Doctoral-level scientific insight presented many "low-hanging fruit" to start upon. My crucial perception was to categorise the parties to the project into two groups: those who needed the bridge to be completed (Client, lead contractor, manufacturing subcontractors); and those with no dependence on the success of the project, who were making all the problems (counterintuitively, the engineering-oversight and Non-Destructive Testing consultancies contracted by the Client). Combining these perceptions delivered first little improvements, initiating allegiance and deflating previous acrimony between the "need completion" parties. Navigating to success came with broadening cooperation, in overcoming the two biggest "show-stopper" problems which had cost US\$100's-of-millions so far. Both impasses used faults and shortcomings in the governing Standards to create problematic contentions aligning where neither Nature nor the Standards offered demonstration of spuriousness, making them intractable. Amongst extremely experienced contemporaries, this was the area of my almost solo contribution, in seeing the mechanisms, and in scientific research experience so that unless breaking a proven physical law of the universe bars the path, finding answers can be a challenge but not impossible. Requisite test programmes on fatigue-resistance and on ultrasonic inspection of welded steel structures which I formulated clearly would have illuminated the topics with real information, eliminating the defensibility of the previously entrenched power-bases, which were abandoned, freeing the project to proceed. This rewarding assignment utilised the full depth of my scientific and technical abilities, as well as my skills of teamworking, so regarding the following list I promise every item possesses detail to support an extensive seminar.

That detail is largely provided in this article on my own website
http://www.weldsmith.co.uk/career/writing/3bb_2015/1703_3BBp_RDS_memoir.html

Applicable terms : steel structural design - code EN1090; structural steel - Grades S275, S355, S460, S460N, S460NL, S460M, S460ML, Normalised, TMCP, low-temperature-tough; welding - FCAW, E80T-1, Execution Class, EXC, heat input, SAW, automation, ISO5817 flaw quality levels, WPS, weld procedure qualification, production test;

fatigue-resistant welded steelwork design – cyclic stress, stress-raisers, stress concentration, stress-raising flaws, fatigue tests, sample test, full-sized assembly test; Ultrasonic NDT – pulse-echo, transmitted beam, DAC, sensitivity, 3mmSDH, ISO17640 techniques, ISO11666 acceptance levels, calibration blocks, probability-of-detection; Radiographic NDT – X-ray, Gamma-ray, IQI sensitivity, computed radiography, through-thickness flaw detection, 4-way joint intersection.

07/01/2013 to 23/01/2014

Intecsea

Lansbury Estate, 102 Lower Guildford Rd, Knaphill, Woking, UK, GU21 2EP

Metallurgist, Welding Engineer

Duties:

- * In the office – provide welding input to specifications for oilfield equipment and pipelines.
- * As a welding specialist, travel at short notice as "The Client's Representative" to manufacturing subcontractor sites getting stalled component manufacture restarted whilst maintaining quality standards.
- * "political", in identifying subcontractors attempting to omit exacting specification requirements they were being remunerated to fulfil, warn those procurement teams to be vigilant, and get inspections of in-manufacture state.

List of skills deployed : welding; metallurgy; non-destructive testing (Ultrasonic Testing, Radiography / Radiographic Testing); destructive testing of samples; technical and scientific understanding.

03/01/2012 to 12/10/2012

Amec

207–211 Old Street, London, EC1V 9NR

Metallurgist, Welding Engineer

This new oil-rig in 140m of water West of Shetlands was having its "topsides", with its well-fluid processing equipment, designed and its construction overseen here.

In the small "metallurgical" team, I served all the individual equipment ("package") teams on the project. By reviewing weld procedures submitted by the subcontractors for suitability, and in provided advice to the "package" teams about good welding solutions to look for in proposals by the subcontractors. The "reviewing" activity was essentially a sieve through which any contractor clearly knowing what they are doing passed-through, believed-in but detail query passed-through on always-satisfactory clarification, with the tiny proportion "stopped" including fraud, nonsense which could not possibly be how the work was really being done, etc.

01/03/2010 to 26/03/2010

Mike Costigan Ltd

The Old Garage, West Street, South Petherton TA13 5DJ

Steel-erector

Steel erector on public works in Bristol, UK.

09/03/2009 to 26/01/2010

Cronite Castings Ltd

Blacknell Lane, Crewkerne, Somerset, TA18 7YA

Foundry Technician

Casting high-temperature-resistant Ni-alloys and stainless steels. Technician to entire foundry (sand, lost-wax, spin-casting) including H&S legislative compliance (HSA74, MHSWR, COSHH, PUWER, PSSR, etc).

Weld repair of product castings and process plant.

28/02/2008 to 05/12/2008

Allister Welding

Horndon Industrial Park, West Horndon, Brentwood, Essex, CM13 3XL

Welder/fabricator, site fitter, driver

MIG welder and steel fabricator in workshop. Steel-erector on London sites. Driving 3~1/2tonne flatbeds ("Transit"/"Merc.") with steels and equipment between yard and sites.

12/11/2007 to 25/01/2008

TMP Group Ltd

Platts Eyot, Hampton, TW12 2HF

Foreman Welder/fabricator

Constructing steel boats - foreman of small team building superstructure on floating hulls, using fast high-penetration SMAW "6010" welding rods.

Design work, including 5m truss-bridge gangway.

21/05/2007 to 09/11/2007

Capital Steel Fabrications

21-23 Parkhouse Street, London, SE5 7TQ

Steel fabricator, steel erector

MIG welder and steel fabricator in workshops. Steel erector at central London sites.

05/03/2007 to 18/05/2007

Welding Engineers Ltd

Gt Amwell, Ware, Herts., SG12 9TA

Site welder

Travelled in van with equipment and stock to sites to weld repair or weld anew security fitting.

18/12/2006 to 02/03/2007

ASM (London) Ltd

20 Upper Berkeley Street, London, W1H 7PF

Labourer

Building labourer and plumber's mate for this property developer.

19/12/2005 to 21/07/2006

Newham College of Further Education

Stratford Campus, Welfare Road, London, E15 4HT

Lecturer: Maths, Science and Railway Signalling

Taught (by my time allocation) the mathematics (60%), science (10%) and railway signalling (30%) components of vocational courses, getting good pass rates.

22/09/2003 to 16/04/2004

Anthony Burrows, Patent and Trademark Agent
Business Centre West, Avenue One, Business Park, Letchworth Garden
City, Hertfordshire, SG6 2HB
Clerical and data assistant
Prepare letters, patent specifications, etc, from notes and
dictations.

30/07/2002 to 31/01/2003

The Circle Squared
146 High Street, Cottenham, Cambridge
Web-developer
Maintaining and extending web-based database applications.

14/05/2001 to 10/05/2002

Castings Research Group
Case Western Reserve University, 10900 Euclid Avenue, Cleveland,
Ohio 44106, USA
Computational modeller, CAD draughtsperson
Computational modeller ("Magma" castings simulator -
www.magasoft.de) and CAD (AutoCAD) draughtsperson of casting
processes - mainly squeeze-casting aluminium to fully-sound heat-
treatable "aircraft-grade" castings. In foundry, worked casting
aluminium, magnesium, stainless steel & cast-iron.

15/05/2000 to 19/05/2000

LB Bentley Valves
Kingfisher Business Park, London Road, Stroud, UK, GL5 2BY
Expediter
Valves for subsea oil wellhead control-lines. Found capable company
with clear plan, so paired with testers to work evenings in the
pressure test cells on valves built during the day, shortening the
build-and-test programme.

12/04/1984 to 22/08/1986

British Steel Stocksbridge Works
Stocksbridge, S.Yorks
Metallurgical Technician
Electric arc furnace steelworks making high-specification low and
medium alloyed steels. Technical trainee in all sections of modern
steelmaking plant, then heat-treatment technician to Routine Testing
Dept.
Applicable terms : melting shop; ladle furnace; ladle metallurgy;
vacuum degas; continuous caster; rolling mill; billet; inspection;
tests - tensile, yield stress, Charpy impact, notch impact
toughness, hardness, micro-hardness, Jominy hardenability,
metallography, grain size, inclusion count, clean steel, magnetic
particle; heat treatment : quench, temper, normalise, anneal,
solution-treat.

08/11/1982 to 11/04/1984

Hadfields Ltd
Vulcan Rd, Tinsley, Sheffield, S.Yorks

Metallurgical management trainee

Electric arc furnace steelworks making regular grades of carbon and low-alloy steels. Management Trainee, doing continuous improvement efforts in productivity and through-put. Cover role as shift quality controller to bar-mill.

Applicable terms : melting shop; rolling mill; billet; inspection; tests - tensile, Charpy impact, hardness, metallography

EDUCATIONAL and VOCATIONAL TRAINING:

2026 January -- used AI ("DeepSeek" - an Artificial Intelligence considered good on technical subjects), on metallurgy and welding topics, as a familiarisation exercise. It responds well to querying previous responses citing a fundamental scientific basis expressing - surprise; or wish for more detail on part of the previous response.

Current AI is clearly a very useful tool during technical endeavour.

2024 -- "cover-to-cover"ed the 510pages of Wills' "Mineral Processing Technology, An Introduction to the Practical Aspects of Ore Treatment and Mineral Recovery", 8th Edition, September 1 2015, Barry A. Wills & James Finch - which is "the bible" of minerals processing - a global collaborative work

2024 -- learning "embedded devices" (independent mini-computers controlling processes) Working with the "Arduino" device; rated for capability handling analog (proportional physical signal - typically a voltage) inputs.

2018 [2yrs validity] -- CPCS slinger-signaller (A40) Cert. for crane & lifting operations

2017 [3yrs validity] -- ISO9606-1 welder Coding MIG/MAG/GMAW (135) tube-to-plate

fillet steel PB-position multilayer (ISO 9606-1, P/mech 135, T-P, FW, FM1, S, t5.49-t8, D88.9, PB, ml)

2017 [5yrs validity] -- CSCS Card -- grants working access to UK construction sites given proven competence - type "Professionally Qualified Person"

2016 -- Finite Element Analysis modelling for stresses and strains within a structure of known design and imposed loadings. Self-taught until able to model components and structures known to me in the real world, producing results matching reality and enlightening on reason for some behaviours.

2016 (1 day) Attended "Bridges 2016" at the Institution of Civil Engineers, London, UK

2016 (1 week) "Painting Inspector - ICorr Level 1" course and gained qualification. I identified that in engineering welds getting correct high-performing welds into service was not enough; I also needed to optimise designs to enable long-term coatings performance giving decades of good service for steel structures.

2015 (2 days) Attended "Materials Testing" Expo seeing latest NDE techniques

2014 – became Chartered Engineer (C.Eng.) – through Welding Institute
2014 (1 week) "ISO9001 lead auditor" qualification ("IRCA QMS")
2012 (six days) learned TIG welding of steel pipe – root, fill and cap, 1G-rolled and 5G
2012 (3 weeks) Ultrasonic Testing of Welds training to PCN / CSWIP Level 2 syllabus

2011 Cranfield University, Bedfordshire, UK – Welding Engineering MSc.

Project – fatigue-resistant welds for ships and steel structures. I performed a programme of testing on welds I prepared. Some were more specialised, such as laser-MIG hybrid welds. However, the interesting and commercially useful findings were for wire-feed (MIG / GMAW, FCAW) welds for large-scale applications. I found fatigue endurance exceeding 5 times the predicted cycles to failure – many standard deviations higher than the traditional mean and clearly a new performance.

2010 (2 weeks) Radiographic Testing of Welds training to PCN / CSWIP Level 2

2010 (four days) TWI, UK – all-Basic ("7016/7018") SMA positional welding of steel pipe

2009 (1 week) IOSH course "Managing Safely" – passed

2006 to 2016 – Committee member of London branch of Welding Institute

2006 – 2009 Newham College, Stratford, London – welding course in evenings

2000 – 2006 Colleges in Cambridge and London – welding evening courses to CG3267

1999 Brunel University, Uxbridge, West London, UK – Doctorate (PhD), researching

why TMCP plate steels from Germany and Japan perform so well. The issue I researched was hydrogen distribution and its movement and destination in time. Initially defined regarding welds, in seeking to explain the very high weldability of these steels, I also explained why TMCP steels are very resistant to sour-oil hydrogen-induced cracking. No "standard" laboratory techniques could be applied regarding solute hydrogen in steels, and my research programme applied novel investigative techniques I devised.

1991 University of Sheffield, UK – Master's Degree – "Advanced metallurgy"

1990 Sheffield Polytechnic (Sheffield Hallam University) – BSc "Metallurgy"

1986 Stocksbridge College, S.Yorks, UK – BTEC – steelworks day-release studies

MEMBERSHIPS:

2004 to date – Professional Member of the Welding Institute (MWeldI), with Chartered Engineer (CEng) status

HOBBY ACTIVITIES:

Mining and minerals – I volunteer at

– Condurrow mine – preserved tin mine with two upper levels above unpumped water-table

– King Edward Mine – museum preserving and demonstrating the surface workings including mineral separation of cassiterite / tin

I serve as Treasurer to Carn Brea Mining Society