



# **Profile of the IFATE Engineering, design and development pathway occupations in Cheshire and Warrington - May 2023**

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BRENNAN WILSON LTD

South Cheshire Chamber as the lead employer representative body developing the Local Skills Improvement Plan (LSIP) have commissioned this work from Brennan Wilson Ltd. The work takes the qualification pathways that have been developed by the Institute for Apprenticeships and Technical Education, mapping different occupations against them and contextualises them for the Cheshire and Warrington economy.

## Contents

<b>Introduction</b> .....	2
<b>Occupational mapping</b> .....	2
<b>Occupational demand</b> .....	4
<b>Wages</b> .....	5
<b>Age and gender</b> .....	6
<b>Automation Risk</b> .....	7
<b>Industry sectors</b> .....	8
<b>Job postings</b> .....	9
<b>Specialised skills</b> .....	12
<b>Common skills</b> .....	13
<b>Software skills</b> .....	14
<b>Spatial demand</b> .....	14

## Introduction

The Engineering, design and development pathway is one of three pathways that sit within the Engineering and manufacturing technical education route. There are 15 routes that span the range of technical education in England which have been developed by the Institute for Apprenticeships and Technical Education ([IFATE](#)). This profile<sup>1</sup> draws on work commissioned by IFATE from the Institute of Employment Research (IER) at Warwick University. This IER project maps the 15 routes, and their linked occupational maps, to the Standard Occupational Classification (SOC) at the 4-digit level.

Further work has been undertaken to disaggregate the IER SOC mapping to the IFATE pathways that sit below each route, to provide a 4-digit SOC mapping for each pathway. The group of SOC codes generated for each pathway has been used, in this instance, to generate the profile of the Engineering, design and development pathway below. Data is from the Lightcast Analyst tool.

Profiles for other occupations can be found [here](#).

## Occupational mapping

The table below sets out the (4-digit SOC) occupations that are supported in some way by the Engineering, design and development pathway and the volume of employment in Cheshire and Warrington that is associated with each of these occupations.

Some occupational areas are supported by more than one standard (eg Design and Development Engineers is a single SOC area supported by five standards); some occupational areas in the table below will encompass jobs for which there are currently no standards or will be no standards (eg various types of mechanical or civil engineers), and some of the roles within the occupational areas identified will fall out of scope of the Pathway (eg a large number of roles classified as being SOC 2113 – Physical Scientists or being 2136 - Programmers and software development professionals will not sit within the Engineering, design and development pathway).

This means that the 2023 employment numbers given in the jobs column below is the maximum possible ceiling of jobs in Cheshire and Warrington that will relate to currently developed IFATE standards in the Engineering, design and development pathway.

On this basis, there are a maximum of c15k jobs in Cheshire and Warrington to which standards in the Engineering, design and development pathway relate. The occupations with more than 1,000 employed in 2023 in Cheshire and Warrington are:

- Chemical and related process operatives
- Civil engineers
- Design and development engineers
- Engineering professionals n.e.c.
- Engineering technicians
- Programmers and software development professionals

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<sup>1</sup> Commissioned through Cheshire and Warrington LEP to support the LSIP process.

**Jobs in Cheshire and Warrington in 2023 supported by standards in the IFATE Engineering, Design and Development Pathway**

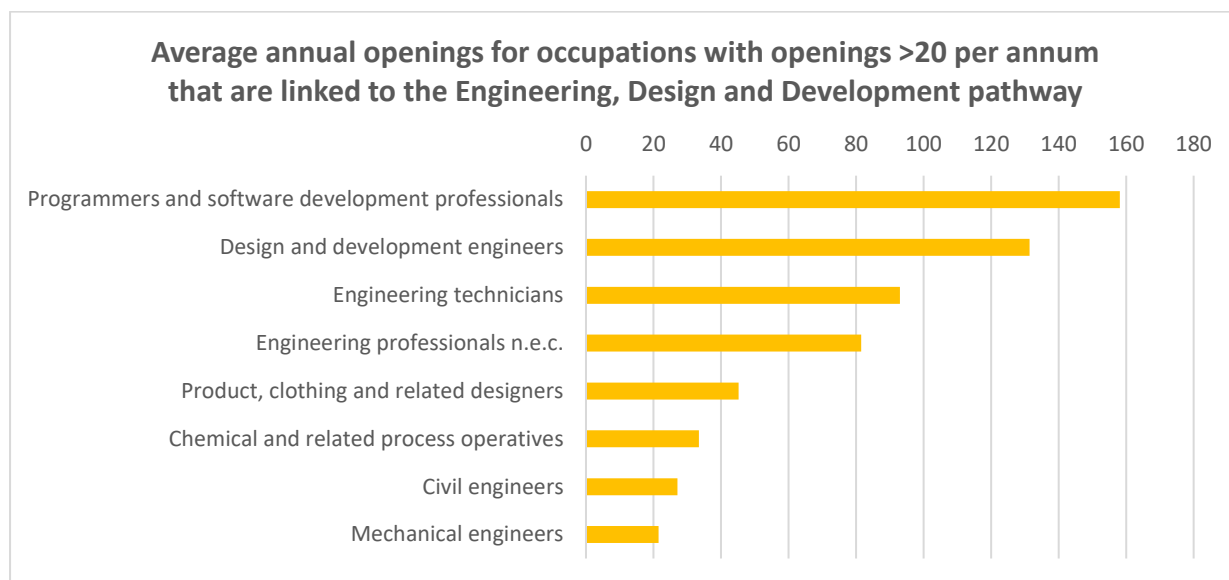
SOC	SOC2010 description	Jobs	Standard name(s)
5236	Boat and ship builders and repairers	55	Boatbuilder
5442	Furniture makers and other craft woodworkers	239	Furniture Manufacturer
			Advanced Furniture CNC Technician
5412	Upholsterers	198	Advanced Upholsterer
2113	Physical scientists	322	Ordnance munitions and explosives (OME) professional (integrated degree)
8121	Paper and wood machine operatives	417	Wood product manufacturing operative
8114	Chemical and related process operatives	1179	Technical dyer and colourist
2121	Civil engineers	1134	Geotechnical engineer integrated degree apprenticeship standard
2126	Design and development engineers	1111	Product design and development engineer (degree)
			Power and Propulsion Gas Turbine Engineer
			Electro-mechanical engineer
			Tool process design engineer
			Systems Engineer
3122	Draughtspersons	593	Engineering design and draughtsperson
2123	Electrical engineers	687	Electronic Systems Principal Engineer
2129	Engineering professionals n.e.c.	1708	Post graduate engineer
			Materials Science Technologist (Degree)
3113	Engineering technicians	1247	Railway Engineering Design Technician
			Engineering Manufacturing Technician
			Space Engineering Technician
2122	Mechanical engineers	902	Aerospace engineer (degree)
3422	Product, clothing and related designers	728	Fitted Furniture Design Technician
			New Furniture Product Developer
2136	Programmers and software development professionals	4915	Aerospace software development engineer (degree)

**Source: Brennan Wilson Ltd analysis of IER and Lightcast data**

## Occupational demand

In total, there are slightly more than 650 annual openings in these occupations each year, with the highest levels of demand each year being for Programmers and software development professionals. Other occupational areas with annual openings in excess of 80 are:

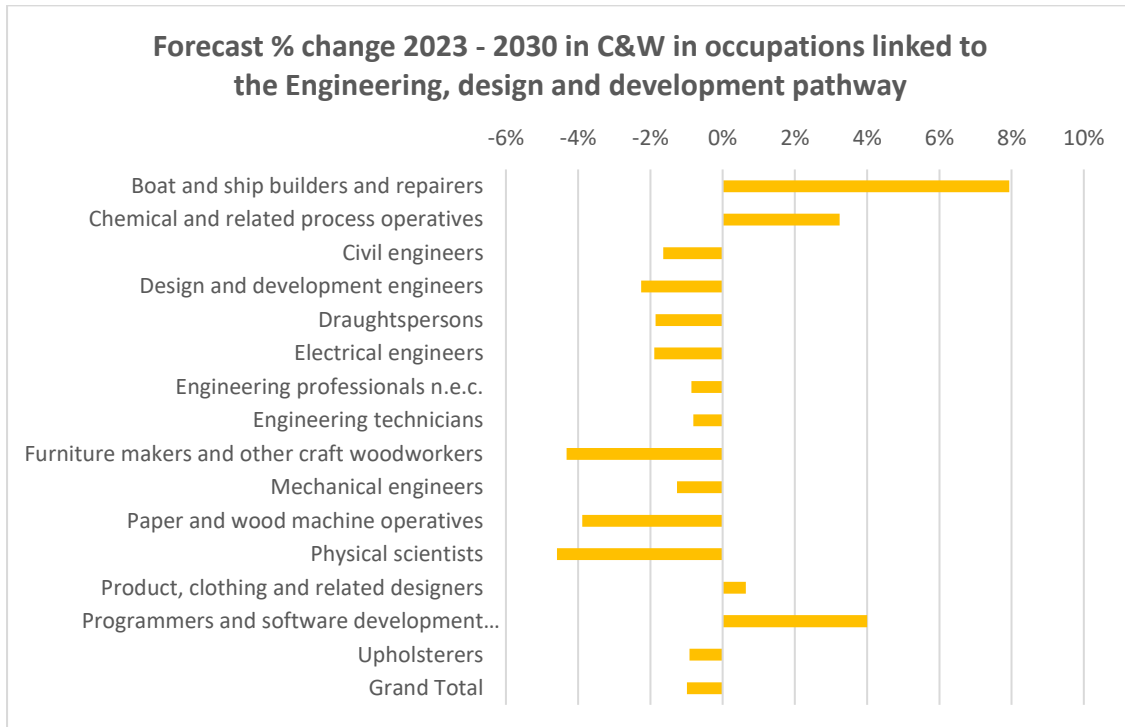
- Design and development engineers
- Engineering technicians
- Engineering professionals n.e.c.



Analysis of Location Quotients (LQs) for occupations linked to the Engineering, design and development pathway indicate that employment volumes in Cheshire and Warrington in these occupations reflect what might be expected from national employment levels. The exception to this is the Chemical and related process operatives SOC which has an LQ of 2.34. This significantly higher density of jobs in this SOC reflects C&W's industrial structure.

<b>LQ of Engineering, Design and Development pathway occupations (&gt;500 2021 jobs in C&amp;W)</b>		
	2021 Jobs	2021 LQ
Programmers and software development professionals	4756	0.95
Engineering professionals n.e.c.	1718	1.04
Engineering technicians	1255	1.03
Civil engineers	1148	1.04
Chemical and related process operatives	1147	2.34
Design and development engineers	1130	1.04
Grand Total	1045	1.02
Mechanical engineers	914	0.92
Product, clothing and related designers	724	0.85
Electrical engineers	698	1.14
Draughtspersons	602	1.09
<b>Source: Brennan Wilson Ltd analysis of IER and Lightcast data</b>		

Employment in Cheshire and Warrington in occupations linked to the Engineering design and development pathway is forecast to remain relatively stable with all such occupations with any significant volume of employment being +/- 5% in 2030 compared to 2023 levels.



**Source: Lightcast Analyst**

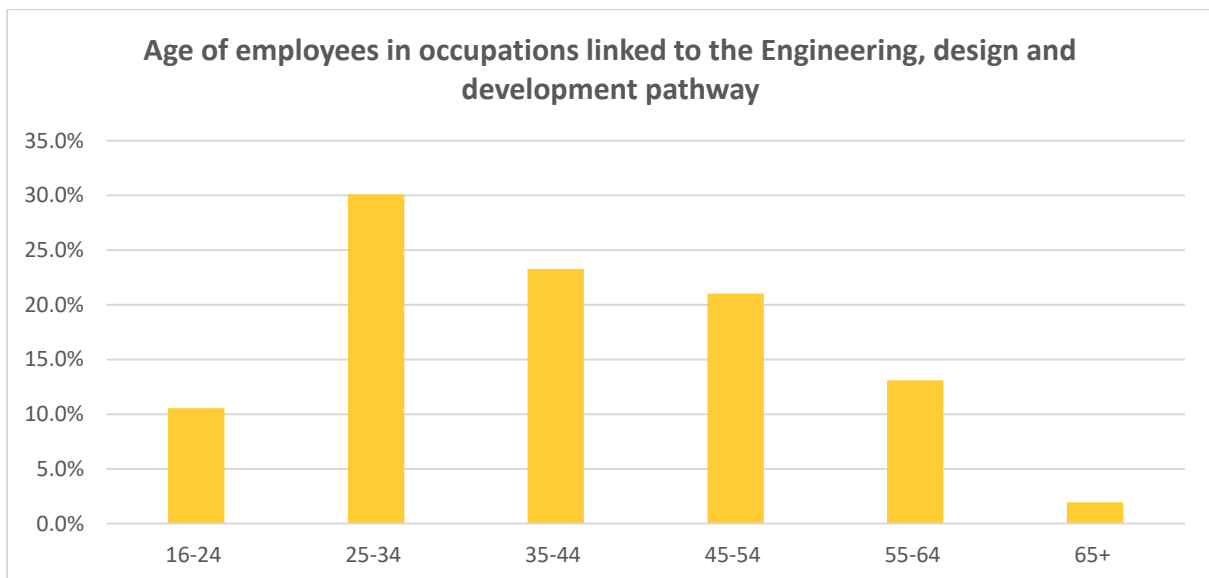
## Wages

The median wage in Cheshire and Warrington of all occupations linked to the Engineering, design and development pathway is £33.9k, which is over £8k higher than the median wage for all occupations in Cheshire and Warrington, which is £25.8k. Every occupational area linked to the pathway that employs significant volumes (ie >1k) in Cheshire and Warrington pays median wages well in excess of that paid for all occupations in Cheshire and Warrington.

<b>Median wages of occupations linked to the Engineering, design and development pathway.</b>	
	Median Wages
Electrical engineers	£51,388
Programmers and software development professionals	£42,865
Engineering professionals n.e.c.	£42,832
Mechanical engineers	£42,203
Design and development engineers	£40,756
Civil engineers	£34,138
Engineering technicians	£33,694
Chemical and related process operatives	£29,890
Boat and ship builders and repairers	£28,124
Product, clothing and related designers	£27,752
Draughtspersons	£26,400
Physical scientists	£25,677
Paper and wood machine operatives	£23,281
Upholsterers	£21,563
Furniture makers and other craft woodworkers	£21,453
<b>Source: Lightcast Analyst</b>	

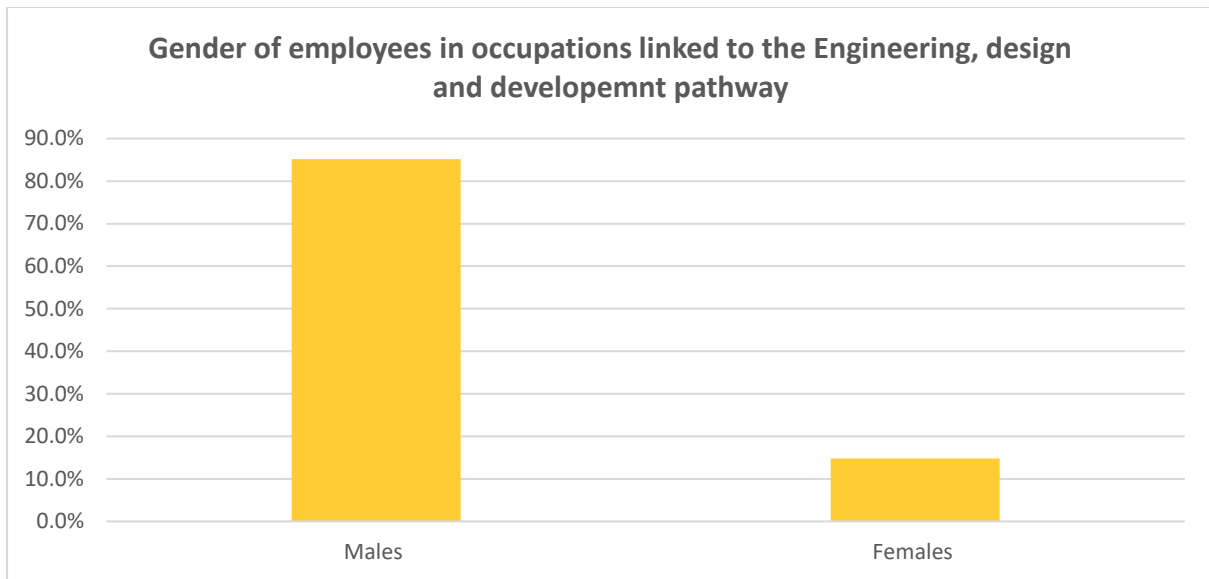
## Age and gender

Nationally, over 40% of those employed in occupations linked to the Engineering, design and development pathway are aged 34 or below, just over 15% are aged 55 or above.



**Source: Brennan Wilson Ltd analysis of IER and Lightcast data**

Employment is significantly skewed to males. Nationally, over 85% of all employment in occupations linked to the Engineering, design and development pathway is of males.



**Source: Brennan Wilson Ltd analysis of IER and Lightcast data**

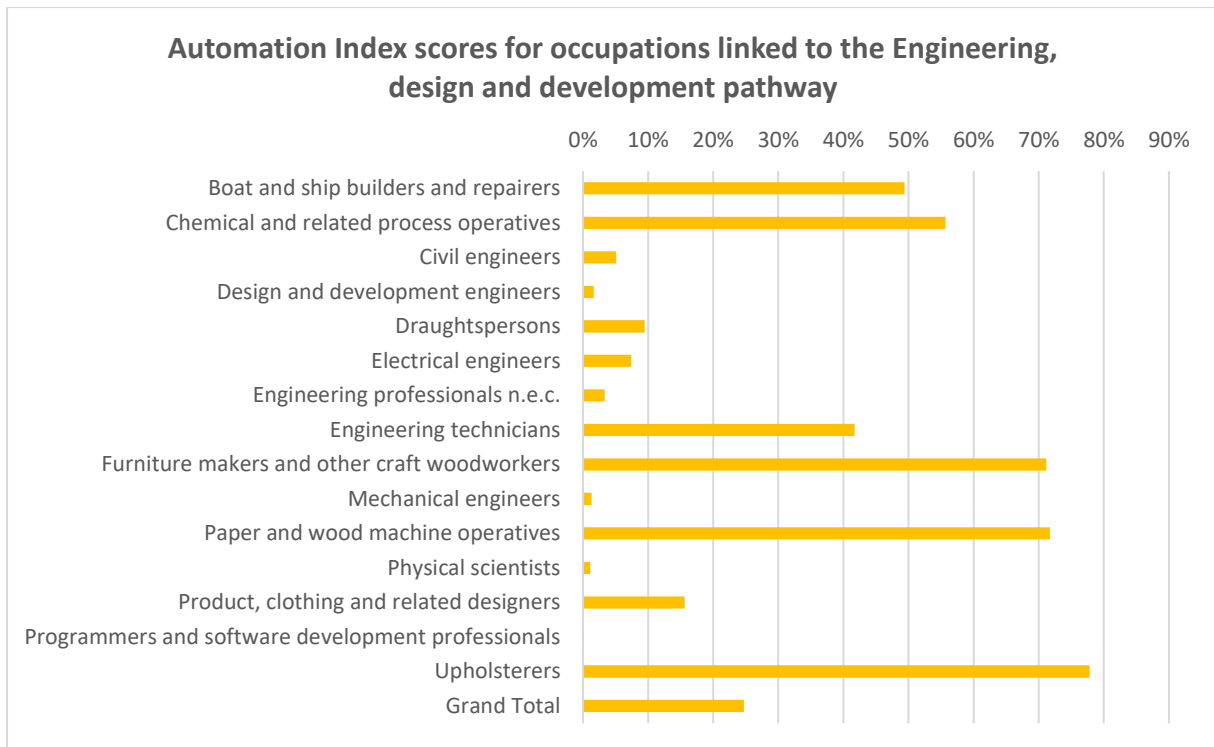
## Automation Risk

The Lightcast UK Automation Index uses data from different sources to assess the proportion of working time spent in each occupation performing tasks which are at “high risk” of disruption through automation and other technological change anticipated over the next 20 to 30 years. Estimates of how much time is spent performing those tasks are constructed using the frequencies for different Work Activities in the US ONET database, and mapped across to UK SOC. The relationship between different 38 task categories and Frey and Osborne’s estimates of the “probability of computerisation” is used to classify each task category as high, middle, or low risk, depending on the significance and direction of that relationship.

The index is directly applicable as the amount of working time which could be disrupted by technological change; it ranges between 0% (no working time spent performing tasks at high risk) to 100% (all working time spent performing tasks at high risk).

The Automation Index scores for occupations linked to the Engineering, design and development pathway sit overall at 25%. The areas of highest risk are: Furniture makers and other craft workers; Paper and wood machine operatives; and upholsters.





**Source: Brennan Wilson Ltd analysis of IER and Lightcast data**

## Industry sectors

Over two thirds (71%) of jobs in the occupations linked to the Engineering, design and development pathway are in three industrial sectors:

- Manufacturing
- Professional, Scientific and Technical Activities
- Information and Communication

More than 1 in 10 of the jobs in the following sectors are in the occupations linked to the Engineering, design and development pathway:

- Manufacturing
- Information and Communication
- Water Supply; Sewerage, Waste Management and Remediation Activities
- Electricity, Gas, Steam and Air Conditioning Supply

**Cheshire and Warrington employment of occupations linked to the Engineering, design and development pathway, by industrial sector**

Industry Sector	Linked occupations in Industry (2023)	% of linked Occupations in Industry (2021)	% of Total Jobs in Industry (2021)
Manufacturing	4447	29%	11%
Professional, Scientific and Technical Activities	3184	22%	5%
Information and Communication	3222	20%	16%
Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	1108	7%	1%
Construction	1026	7%	5%
Water Supply; Sewerage, Waste Management and Remediation Activities	483	3%	12%
Financial and Insurance Activities	443	3%	2%
Administrative and Support Service Activities	312	2%	1%
Electricity, Gas, Steam and Air Conditioning Supply	266	2%	13%
Human Health and Social Work Activities	236	1%	0%

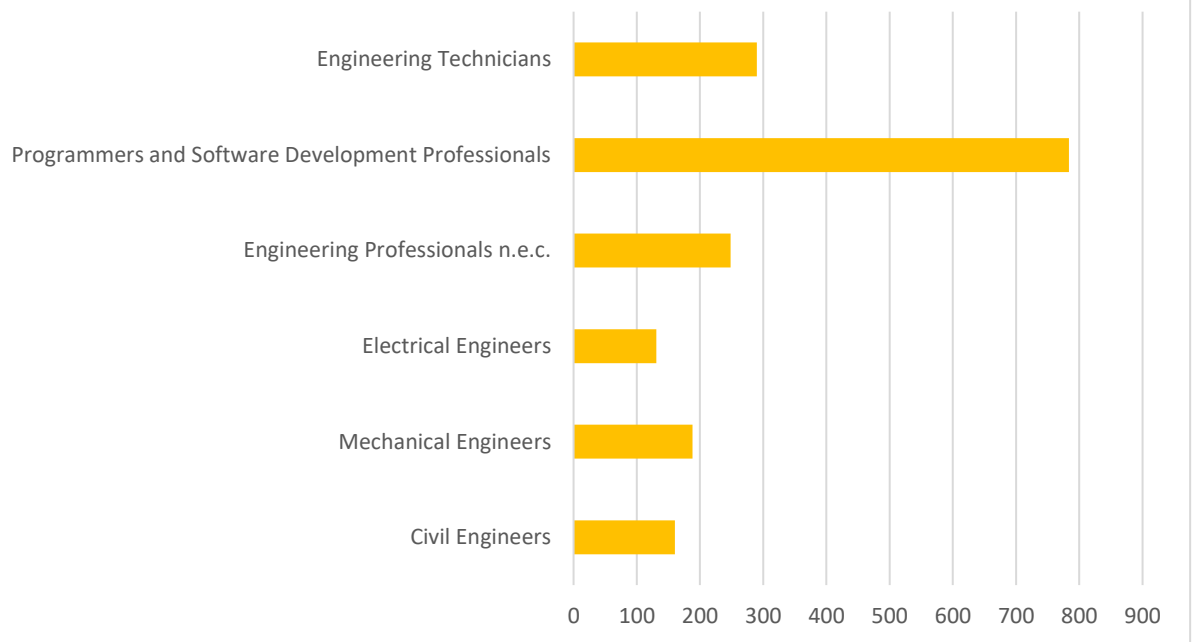
*Source: Lightcast Analyst*

## Job postings

There were six occupations linked to the Engineering, design and development pathway that averaged more than 100 unique job postings per month in Cheshire and Warrington in the five years to March 2023. These were

- Civil engineers;
- Mechanical engineers;
- Electrical engineers;
- Engineering professionals n.e.c.;
- Programmers and software development professionals; and
- Engineering technicians.

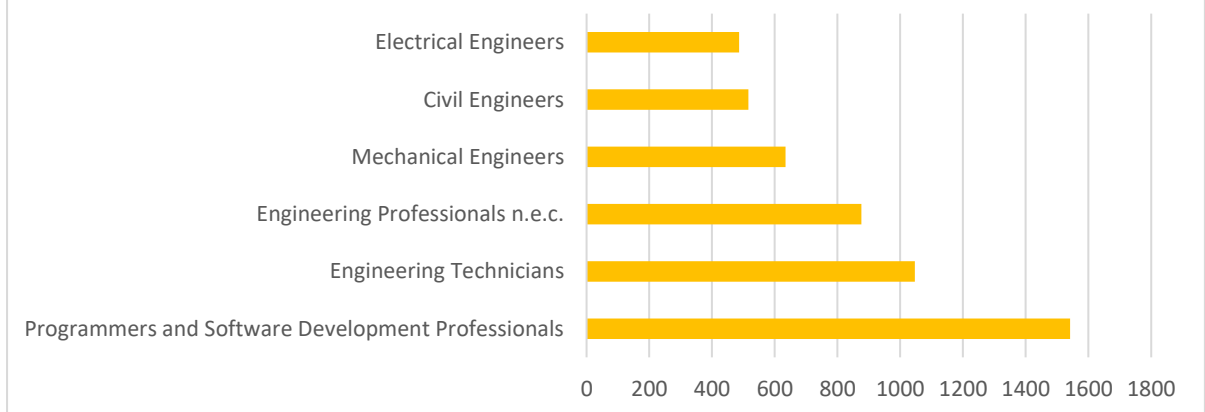
**Occupations linked to the Engineering, design and development pathway that exceeded 100 job postings per month on average in C&W (Mar 2018 - Mar 2023)**



**Source: Brennan Wilson Ltd analysis of IER and Lightcast data**

The number of employers in Cheshire and Warrington competing to appoint to these key occupations over this time ranged from 486 for Electrical engineers to 1541 for Programmers and software development professionals.

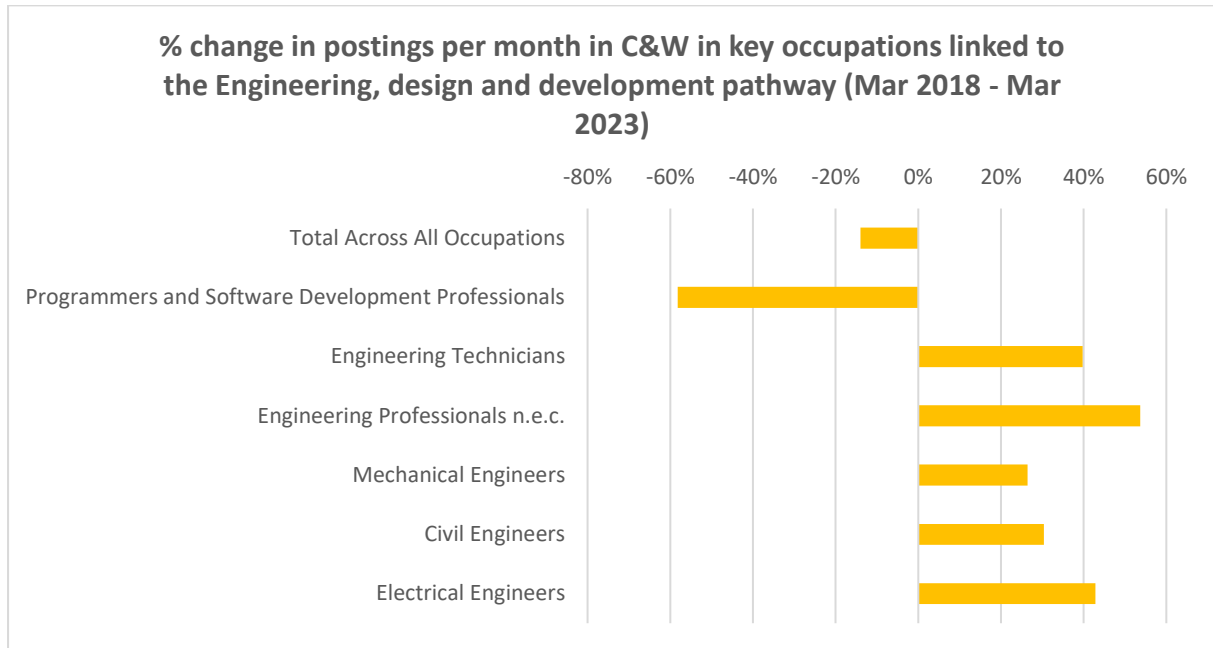
**Number of employers in C&W competing to appoint occupations linked to the Engineering, design and development pathway (Mar 2018 - Mar 2023)**



**Source: Brennan Wilson Ltd analysis of IER and Lightcast data**

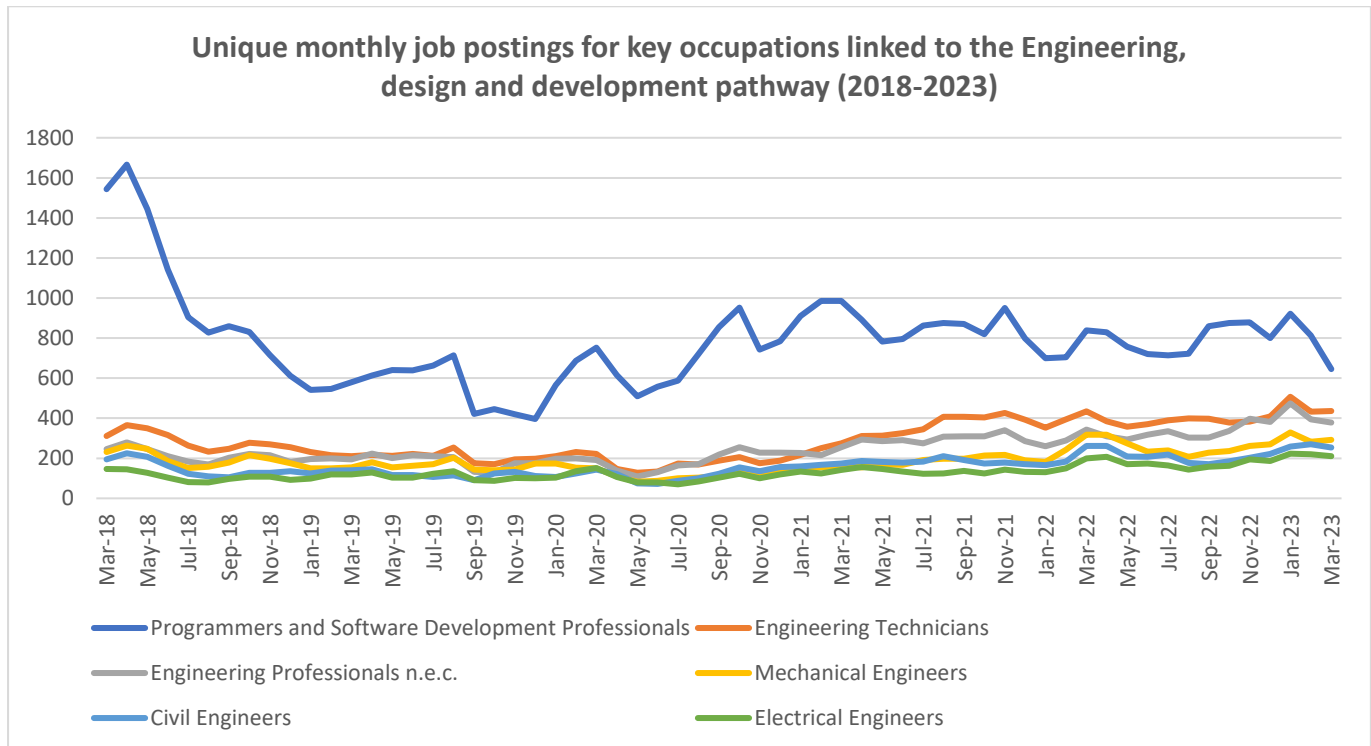
Overall there was a decrease of 10% in the postings for occupations linked to the Engineering, design and development pathway over 5 years, although this was driven by a 58% decrease of postings for

Programmers and software development professionals. Every other occupation for which there was a high level of demand in Cheshire and Warrington (ie >100 postings per month) saw a growth in demand in excess of 20% over this time.



Source: Brennan Wilson Ltd analysis of IER and Lightcast data

This sharp decline in demand for Programmers and software developers but steady incremental growth of demand for other key occupations linked to the Engineering, design and development pathway can be seen in the trend chart below.



Source: Brennan Wilson Ltd analysis of IER and Lightcast data

## Specialised skills

The table below shows the top specialised skills sought by employers in job postings for occupations linked to the Engineering, design and development pathway. The three most sought after specialised skills were:-

- C# (Programming Language)
- SQL (Programming Language)
- Agile Methodology

There was a significantly higher demand in Cheshire and Warrington than nationally for the following specialised skills:

- Mechanical Engineering
- AutoCAD
- .NET Framework
- Engineering Design Process

<b>Top Specialised Skills sought in job postings in C&amp;W for key occupations linked to the Engineering, design and development pathway</b>			
	C&W Postings	National Average	LQ
C# (Programming Language)	5458	4707	1.16
SQL (Programming Language)	5081	4306	1.18
Agile Methodology	5040	5737	0.88
JavaScript (Programming Language)	4856	5135	0.95
Mechanical Engineering	4157	2947	1.41
AutoCAD	3043	2138	1.42
Java (Programming Language)	2964	4513	0.66
Software Development	2924	3580	0.82
.NET Framework	2910	2142	1.36
Application Programming Interface (API)	2849	2941	0.97
Automation	2842	2988	0.95
Microsoft Azure	2816	3201	0.88
Amazon Web Services	2754	3837	0.72
Electrical Engineering	2749	2306	1.19
Cascading Style Sheets (CSS)	2601	2372	1.10
Software Engineering	2597	4377	0.59
Engineering Design Process	2465	1346	1.83
Machinery	2404	2107	1.14
Angular (Web Framework)	2254	2001	1.13
HyperText Markup Language (HTML)	2250	1949	1.15
<b>Source: Brennan Wilson Ltd analysis of IER and Lightcast data</b>			

## Common skills

The table below shows the top common skills sought by employers in job postings for occupations linked to the Engineering, design and development pathway. The three most sought after common skills were:-

- Communications
- Management
- Problem Solving

There was a higher demand in Cheshire and Warrington than nationally for the following common skills:

- Mathematics
- Microsoft Office
- Influencing Skills
- Organizational Skills

<b>Top Common Skills sought in job postings in C&amp;W for key occupations linked to the Engineering, design and development pathway</b>			
	C&W Postings	National Average	LQ
Communications	11101	10419	1.07
Management	6911	6239	1.11
Problem Solving	4179	4030	1.04
Planning	3620	3345	1.08
Customer Service	2996	2858	1.05
Leadership	2932	2638	1.11
Self-Motivation	2883	2445	1.18
Operations	2821	2748	1.03
Innovation	2819	2639	1.07
Mentorship	2122	2046	1.04
Detail Oriented	2017	2246	0.90
Sales	1906	2263	0.84
Mathematics	1814	1608	1.13
Microsoft Office	1587	1103	1.44
Interpersonal Communications	1537	1320	1.16
Enthusiasm	1373	1332	1.03
Influencing Skills	1241	1145	1.08
Organizational Skills	1230	1077	1.14
Writing	1229	1333	0.92
Troubleshooting (Problem Solving)	1228	1594	0.77
<b>Source: Brennan Wilson Ltd analysis of IER and Lightcast data</b>			

## Software skills

The table below shows the top software skills sought by employers in job postings for occupations linked to the Engineering, design and development pathway. The three most sought after software skills were:-

- C# (Programming Language)
- SQL (Programming Language)
- JavaScript (Programming Language)

There was a higher demand in Cheshire and Warrington than nationally for the following software skills:

- AutoCad
- .NET Framework Mathematics
- Microsoft Office

<b>Top Specialised Skills sought in job postings in C&amp;W for key occupations linked to the Engineering, design and development pathway</b>			
Top Software Skills	Unique Postings	National Average	LQ
C# (Programming Language)	5458	4707	1.16
SQL (Programming Language)	5081	4306	1.18
JavaScript (Programming Language)	4856	5135	0.95
AutoCAD	3043	2138	1.42
Java (Programming Language)	2964	4513	0.66
.NET Framework	2910	2142	1.36
Application Programming Interface (API)	2849	2941	0.97
Microsoft Azure	2816	3201	0.88
Amazon Web Services	2754	3837	0.72
Cascading Style Sheets (CSS)	2601	2372	1.10
Angular (Web Framework)	2254	2001	1.13
HyperText Markup Language (HTML)	2250	1949	1.15
Git (Version Control System)	2194	2153	1.02
React.js	1794	2468	0.73
Python (Programming Language)	1618	3644	0.44
Microsoft Office	1587	1103	1.44
Docker (Software)	1400	2157	0.65
RESTful API	1337	1551	0.86
Linux	1315	2242	0.59
Microsoft SQL Servers	1241	803	1.55
<b>Source: Brennan Wilson Ltd analysis of IER and Lightcast data</b>			

## Spatial demand

The table below sets out the volume of job postings in Cheshire and Warrington between March 2018 and March 2023, by place, for occupations linked to the Engineering, design and development

pathway Warrington, Chester, and Crewe all saw in excess of 5,000 unique postings for these types of occupation.

<b>Places with the highest volume of job postings for occupations linked to the Engineering, design and development pathway 2018-2023</b>			
	Total Postings	Unique Postings	Median Posting Duration
Warrington	47025	17625	31 days
Chester, Cheshire West and Chester	20924	8854	31 days
Crewe, Cheshire East	13119	5394	29 days
Knutsford, Cheshire East	9671	3761	30 days
Macclesfield, Cheshire East	4927	2045	31 days
Ellesmere Port, Cheshire West and Chester	3763	1620	33 days
Wilmslow, Cheshire East	3600	1500	31 days
Northwich, Cheshire West and Chester	2704	1110	30 days
Nantwich, Cheshire East	1696	725	29 days
Winsford, Cheshire West and Chester	1795	638	32 days
Congleton, Cheshire East	1425	596	34 days
Alderley Edge, Cheshire East	796	366	24 days
Middlewich, Cheshire East	700	246	31 days
Sandbach, Cheshire East	523	227	30 days
Frodsham, Cheshire West and Chester	279	143	32 days
Lymm, Warrington	326	120	31 days
Poynton, Cheshire East	176	84	29 days
Tarporley, Cheshire West and Chester	97	57	31 days
Neston, Cheshire West and Chester	119	56	33 days
Great Sankey, Warrington	66	32	21 days
Malpas, Cheshire West and Chester	39	30	32 days
Disley, Cheshire East	56	18	30 days
Latchford, Warrington	3	3	29 days
<b>Source: Brennan Wilson Ltd analysis of IER and Lightcast data</b>			