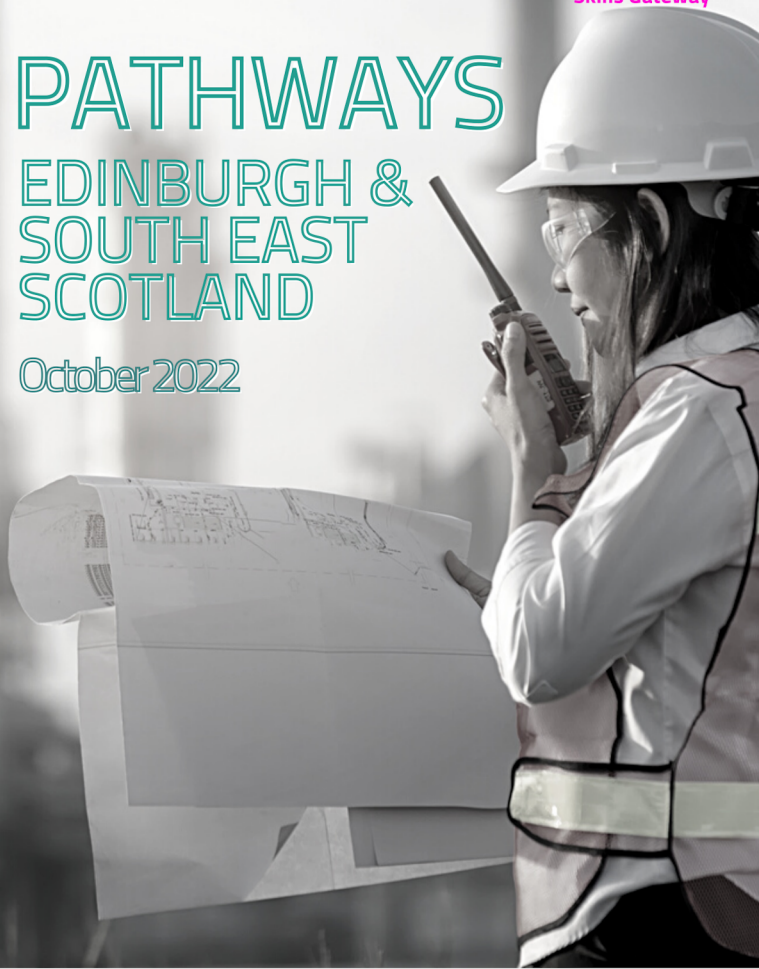


PATHWAYS

EDINBURGH &
SOUTH EAST
SCOTLAND

October 2022



Foreword

I set up EqualEngineers in 2017 to empower organisations to engineering inclusive cultures to attract, develop and retain talent.

This was partly born out of my frustration as a member of the LGBTQ+ community seeing a lack of focus on inclusivity centred on hidden identities, and so a desire to focus holistically on all strands of society which are underrepresented in engineering. All our activities guide us towards achieving equitable representation.

I was absolutely delighted when I was approached to lead this work on behalf of HCI Skills Gateway. Especially so because I am, in fact, a local boy! I grew up in Midlothian and went to Beeslack Community High School in Midlothian. It was here that I discovered my passion for science and maths and made the decision to apply for university places in engineering. I took myself down to London to study at Imperial College and this has set me up ever since.

Edinburgh has grown so much in that timeframe, the city and wider region has expanded and regeneration and investment is obvious. We also pride ourselves in Scotland in being an open and welcoming country, and there are opportunities abundant for people to get involved with.

I really hope the Pathways Programme can help catalyse getting more talent onto an education or employment pathway which helps participants achieve positive outcomes. EqualEngineers is all about bringing people together from different circles, connection, breaking down preconceptions, challenging biases, getting groups talking to one another, raising aspirations and empowering people to believe that they can do it, and they can be it!

We have so many challenges facing us ahead from the achieving net zero to address the climate crisis, we need to empower people from all backgrounds to consider opportunities in engineering and, more broadly, STEM.

Please get in touch if you would like to take part, or would like more information on the programme.

Dr Mark McBride-Wright CEng MChemE
mark@equalengineers.com



Executive Summary

Edinburgh & South East Scotland needs 4,000 more engineering and construction professionals by 2026 [1]; a huge opportunity across the region to address not just built environment skills gaps, but to also take action on pre-existing inequalities evident in the industry's workforce. **Engineering students from diverse backgrounds – historically excluded from senior roles in construction and infrastructure – face additional challenges to secure graduate employment.**

EqualEngineers, led by Dr Mark McBride-Wright CEng, MChemE, designed the Pathways Programme to ensure greater employability outcomes for engineering students experiencing disadvantage or discrimination. Dr McBride-Wright is a recognised diversity and inclusion leader, who speaks about psychological safety in inclusive teams. As founder and Managing Director of EqualEngineers, his company offers a wide array of diversity and inclusion consultancy, training services, and creative events. In recognition for his efforts, he was awarded the prestigious Rooke Award from Princes Anne on behalf of the Royal Academy of Engineering for his work in promoting engineering to the public.

Launching the Pathways Programme as a national pilot in October 2021, 5 employers have so far partnered with EqualEngineers: First Bus, Rolls-Royce, Network Rail, McLaren Racing, and SSE. Over 200 engineering students – from over 620 applications – are paired with engineering mentors from these organisations. All partners remain active in the programme, with Airbus joining from October 2022.

The Housing, Construction & Infrastructure (HCI) Skills Gateway is a £6 million investment as part of the Edinburgh &

South-East Scotland City Region Deal as part of the Integrated Regional Employability & Skills programme. HCI aims to develop innovative pathways and programmes to support inclusive construction careers. HCI Skills Gateway is funded by the UK Government and Scottish Government and is based at Edinburgh Napier University where it is led by Dr Kenneth Leitch and Kirsty Connell-Skinner.

HCI approached EqualEngineers to explore if the Pathways Programme could offer a framework to support further and higher education students from diverse backgrounds within the City Deal Region, adapting and tailoring the pilot model to a regional context.

The ambition is to boost numbers of individuals from historically excluded communities into housing, construction, and infrastructure careers within the City Region, through developing confidence, raising aspirations, improving skills, and supporting transition from engineering education to engineering employment.

This recognises that for many college and university engineering students, gaining a place on the course is only the first step in a challenging journey.

Executive Summary

Historically excluded groups – including women, people from black and minority ethnic backgrounds, people with disabilities, LGBTQIA+ people, and people from low socio-economic backgrounds – also face structural barriers to achieving an engineering and construction career [2].

In response, EqualEngineers proposed a two-phase approach to HCI's challenge:

1. An initial round of interviews with stakeholders representing in-scope universities, colleges, local authorities, employers, and third-sector support organisations, to gauge need and interest for the proposed scheme; and
2. Enhancement of the EqualEngineers Pathways Programme model for the Edinburgh & South-East Scotland City Region Deal area, involving a wide range of employers and over 100 opportunity-seekers from further and higher education to join EqualEngineers' employability training and a 6-month mentoring programme.

The purpose of this report is to present the findings from the first project phase of interviews, and to propose the activities for next phase of this project in moving to a regional pilot.

At BE-ST Fest 2022 EqualEngineers and HCI Skills Gateway published this report to present the initial stakeholder findings and share the plans to deliver EqualEngineers Pathways: Edinburgh & SE Scotland.



Mapping an Inclusive & Diverse Pathway

While employment opportunities for new entrants to engineering and construction careers in Edinburgh & South East Scotland look set to continue to grow, **concerted action is required to reduce and not deepen pre-existing inequalities for people from historically-excluded groups in accessing these careers** across the region.

There is a growing area of employment opportunities in construction and engineering, aligning with Scotland's Net Zero by 2045 carbon reduction aspiration. Skilled individuals for these emerging roles are required throughout the supply chain, developed via new and emerging provision pathways including those piloted by HCI Skills Gateway [3]. The City Region Deal guarantees everyone should benefit fairly from the change towards a green economy, supporting those who have been disproportionately affected by the Covid-19 pandemic (particularly young people) to secure sustainable employment [3].

16.5% of engineers in the UK are women, and the UK engineering workforce is 88.6% white [4]. 21% of UK engineering professionals come from low socio-economic backgrounds, compared to 29% of the entire UK workforce. An increasing desire on the part of employers for soft and interpersonal skills, as well as leadership and management abilities [5] benefits those from higher socio-economic backgrounds, where abilities like 'polish', 'confidence', and 'gravitas', act as proxies for expertise and map to social class [6].

In terms of other diversity characteristics, a 2015 House of Commons report found that UK engineering is losing a potential £11.2 billion due to LGBTQIA+ (lesbian, gay, bisexual, transgender, queer or questioning, intersex, asexual, and more) engineers remaining in the closet due to a 30% reduction in productivity [7]. Royal Academy of Engineering research estimates people with disabilities comprise only 5% of the UK engineering workforce, compared to 17% of the UK population [8].

Even after taking account of different education routes, **white men from higher socio-economic backgrounds are 8 times more likely to have a management or senior role in construction and engineering by the age of 39** [6]. As such, industry-leading firms tend to focus diversity activities on gender and ethnicity, and seldom utilise an intersectional analysis [2].

In 2021, 46,000 people were employed in construction, architecture and engineering in Edinburgh & South East Scotland [1]. By 2024, it is estimated an expansion of a further 4,400 roles will be required to meet construction demand in the region, with 1,100 new roles and 3,300 replacement roles [1]. By 2026 around 91,000 engineers – 19.5% of the 2016 UK engineering workforce – will be retired [9].

In May 2022 there were 5,423 modern apprenticeship achievements in Scotland in Construction & Related and Engineering & Energy Related occupational groupings [10].



Mapping an Inclusive & Diverse Pathway

In 2019/20, there were 15,865 entrants to Engineering undergraduate courses at Scottish universities (of whom 82% were male) [11]. However, pre-Covid, only 38% of UK engineering graduates entered a relevant professional role within 6 months [9], increasing to 68% three years after graduation [12]. This gap between graduation and professional employment may also indicate the increasing desire on the part of employers for graduates to demonstrate the above-mentioned 'soft' skills.

In 2015, 71% of white engineering graduates were in full-time work 6 months after graduation compared to 51% of Black, Asian, and minority ethnic graduates [12]. Deliberate effort on the part of the engineering and construction industry is necessary to harness the widest possible range of talent, to nurture the innovation that the sector needs, especially in the face of the climate crisis.

Evidence indicates that tangential initiatives to advance engineering diversity has negligible impact, including unconscious bias training and affinity groups [6]. Meanwhile, multiple longitudinal studies of science, technology, engineering, and mathematics (STEM) students from under-represented backgrounds demonstrate an impact on positive academic and career outcomes for mentees [13].

The Pathways Programme, by engaging senior leadership, embeds inclusion and diversity efforts in leadership responsibilities and within organisations' people strategies, especially around graduate and early career recruitment.

People do not experience their diversity characteristics in isolation; by adopting an intersectional approach and recognising cumulative disadvantage, **the Pathways Programme voices people's lived experiences and will enable engineering leaders across the region to adopt diverse recruitment and retention strategies that are complementary and mutually reinforcing**, rather than in competition.

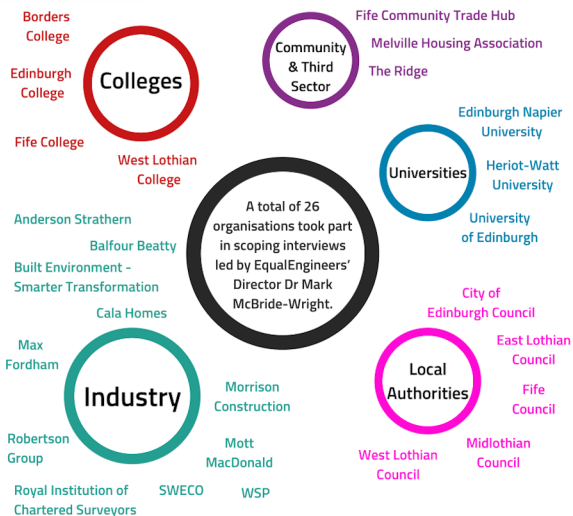
HCI Skills Gateway supports early-stage interventions to address employment and skills gaps in sustainable construction and engineering across South East Scotland to help achieve Net Zero, without perpetuating existing structural barriers to a diverse workforce.

EqualEngineers Pathways: Edinburgh & SE Scotland Programme offers industry a tailored strategic and intersectional approach to inclusion, highly likely to have a net positive effect on both employment outcomes and economic growth across the Edinburgh & South East Scotland City Regional Deal area.



Kirsty Connell-Skinner
HCI Programme Manager

The Interviews



Through structured questions and free-flowing discussion, interviews revealed the needs and perspectives of each stakeholder.

- What are the destinations for your graduates?
- What metrics do you monitor and measure to report impact?
- Do you cover equality, diversity, and inclusion as part of your training? If so, how?
- What could be some attractive components to a mentoring programme which could help build a community?
- Are there any structural / societal barriers with regards to representation of minoritised groups such as women, LGBTQIA+, ethnic minority, class, disability (hidden/invisible)?
- What support would be useful to change the demographic composition?
- Are there any particular nuances which could be unique to Edinburgh and South East Scotland City Region?

Colleges

Borders College: Jimmy Louth,
Curriculum & Learning Manager - STEM

Edinburgh College: Ron Eldridge,
Head of School of Construction

Fife College: Denis Savage,
Academic Head for Built Environment

West Lothian College: Diane Mitchell,
Director of Workforce Development

Community & Third Sector

Fife Community Trade Hub:

Kenny McAlister, Director

Melville Housing Association:

John McMorrow, CEO

The Ridge: Kate Darrah, Director

Industry

Anderson Strathern: Karyn Watt,
Head of Infrastructure

Balfour Beatty: Angela Pllu,
Environment & Sustainability Manager

Built Environment – Smarter Transformation:

Lynsey Brydson, Head of Digital Programmes
Kirsty Duncan, Associate Impact Manager - Digital
Danielle Miller, Associate Events Manager

Cala Homes: Megan Carreno,
Organisational Development Advisor
Tereasa McKay, Early Talent Manager

Max Fordham: Ingrid Berkeley,
Principal Sustainability Consultant
Jo John, Equality and Diversity Group

Morrison Construction: Conor Gray,
Communities & Social Impact Manager
Jim Johnstone, Head of Communities & Social Impact

Mott MacDonald: Karen Keast,
Business Development Manager
Miriam Sharkey, HR Manager UK & Ireland –
Buildings & Cities

Industry (continued)

Robertson Group: Graeme Hannah,
Head of Sustainability

Royal Institution of Chartered Surveyors:
Euan Ryan, Scottish Public Affairs Lead

SWECO: Rebecca McLean,
Head of Sustainability

WSP: Kyra Ferguson-Wardle, Principal Engineer
Blair Norman Mitchell, Head of Water

Local Authority

City of Edinburgh Council: Philip Ritchie,
Contracts & Programme Manager
Elin Williamson,

Head of Business Growth & Inclusion

East Lothian Council: Leanne Banks, Team
Lead - Employment Development

East Lothian Council: Garret Brady,
Employment Development Officer

Fife Council: Gordon Mole,
Head of Business & Employability

Midlothian Council: Annette Lang,
Group Service Manager (Community
Planning Partnership, Communities, Lifelong
Learning and Employability), IRES Board
Representative

West Lothian Council: Jim Henderson,
Business Development Manager & IRES
Board Representative

Universities

Edinburgh Napier University: Dr Kenny Leitch,
Head of Built Environment

Heriot-Watt University:
Professor Graeme Bowles, Director of Studies
for Construction Project Management and
Quantity Surveying

University of Edinburgh: Professor Sean Smith,
Chair of Future Construction

EqualEngineers Pathways: Edinburgh & SE Scotland Programme

The Pathways Programme for Edinburgh & South-East Scotland will be supported financially from HCI Skills Gateway, utilising funds from the UK and Scottish Governments. Structured as a pilot regional programme, it will follow a similar structure to Cohort 3 of the EqualEngineers National Pathways Programme.

Overview

Participants will first complete a Pre-Programme Orientation course online, following by an in-person on-boarding session to discuss the programme in detail as well as establish expectations from both students and mentors. Participants will also access the Guide Workbook at this stage.

Knowledge obtained from both the Guide Workbook and online Employability Modules provide the tools to steer discussion in meetings between the mentee (student) and their mentor. Both the mentee and mentor must commit to meeting at least five times during the duration of the Pathways Programme. Participants can meet more often if both parties agree to do so based on requirements and availability.



EqualEngineers Pathways: Edinburgh & SE Scotland Programme

Student Mentees

The initial project proposition proposed recruiting 100 higher education undergraduate students on engineering courses and related subjects from the University of Edinburgh, Heriot-Watt University, and Edinburgh Napier University. This assumed that most further education students would be under 18 and require additional safeguarding to participate in a mentoring programme, beyond the scope of pilot delivery.

This assumption was challenged based on information shared by the region's College representatives regarding the age range of students in construction sector courses. Interviews with Local Authority colleagues also indicated well-developed expertise in running safe mentoring sessions with young people.

Coupled with advice from Industry participants, this Pathways Programme will now offer 15 places for each academic institution within the Edinburgh & South East Scotland City Region Deal. This equates to 60 FE College students and 45 HE undergraduate students, with 105 mentee participants in total.

Industry Mentors

Prior iterations of the Pathways Programme have run with 20 employees from 5 different companies – a total of 100 mentors – for each cohort. However, some Industry representatives interviewed expressed a strong interest to be involved as mentors, but without the capacity to supply 20 employees.

The EqualEngineers Pathways: Edinburgh & SE Scotland programme will therefore allow smaller employee groups to participate, counterbalancing any deficit through a greater number than the previous 5 companies. All companies listed under **The Interviews**, above, will be the main sources for mentors for this Pathways Programme.

Recruitment

University and College student recruitment will proceed as follows:

- The Pathways Programme will be advertised and shared via university representatives to undergraduate students on relevant engineering courses. Interested students will apply online, with the 45 participants shortlisted by EqualEngineers and HCI from the total number of applications made.
- College representatives will be requested to nominate 15 participants per FE institution, focusing on candidates with the potential to most benefit from this programme. The online application process will also be open to all FE students within the sector and across the Edinburgh & South East Scotland region.

A longlist of applicants will also be held in case any of the original 105 mentees are unable to participate in the programme following the Pre-Programme Orientation.

Completion of at least 80 participants in the full programme is anticipated.

Mentors will be advised by the participating companies. It will be at the individual companies' discretion whether mentors sign up via volunteering or nomination, although HCI and EqualEngineers will request senior leadership participation wherever practicable to embed outcomes at the highest levels.



Timeline



The Pathways Programme has various activity types:

- A monthly steering committee meeting with representatives from each employer, university, and college.
- 3 community meetings, providing an opportunity for both mentors and mentees to come together virtually to learn from guest speakers. Invitations from parties interested in sharing insights from their organisations, or their experience of the programme itself, are very welcome.
- 3 mentor-only sessions, as voluntary sessions for mentors to speak with each other in smaller groups and share learning as a collective to maintain and improve a successful relationship with mentees.
- The programme will culminate in an in-person conference in early April 2023.

As part of the Edinburgh & South East Scotland Pathways Programme, EqualEngineers is investing £6,000 to create a new mentoring platform to support project delivery. Every mentor and mentee are invited to create profiles to enable activity logs and monitoring. This pilots a robust reporting mechanism for EqualEngineers to track project progress, including overall number of contact hours.

Future Evolution

Beyond HCI Skills Gateway's initial support to April 2023, EqualEngineers envisions that mentees will continue to be informally supported by their respective mentors throughout their education journey, perhaps through in-field experience, an expanded network, and increased confidence and resilience: all making Pathways Programme mentees priority candidates for employment applications. HCI Skills Gateway will continue to track student participants until the end of the Integrated Regional Employability & Skills programme in 2026.

The successful delivery of EqualEngineers Pathways: Edinburgh & SE Scotland Programme will help harness additional future industry buy-in and sponsorship for future iterations with a wider historically excluded demographic, including candidates with no qualification, homeless, or those with criminal records. Further scoping research, interviews, and mapping of companies in Edinburgh & South-East Scotland will be continued by EqualEngineers.

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Find out more about



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and get involved as a student mentee,
industry mentor, or as a supporter

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