RACIAL INEQUALITIES IN ENGINEERING EMPLOYMENT IN AOTEAROA NEW ZEALAND

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WORKING TO END RACIAL OPPRESSION

THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

Title: Racial Inequalities in Engineering Employment in Aotearoa New Zealand

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GLOSSARY

This glossary provides definitions of technical, industry-specific, or uncommon terms used in this report to reduce ambiguity for readers and users.

Anglophone: Individuals, communities, or countries where English is the primary language spoken. It can describe people who speak English as a first language or regions where English dominates in communication, education, and governance. Examples of Anglophone countries include the United States, United Kingdom, Canada, Australia, and New Zealand. The term is often used in discussions about linguistic identity, colonial history, and global English influence.

Colourblind racism: Colourblind racism is the belief that ignoring race and treating everyone equally will end racism. While it promotes fairness on the surface, it overlooks systemic inequalities and ongoing racial disparities. It minimises racism, shifts blame to marginalised groups and justifies racial hierarchies as natural or the result of individual choices. By denying the need to address racial injustices, colourblind racism reinforces the status quo.

Cultural tax: The term is used to describe the emotional, psychological, and financial toll that Māori engineers and other Māori professionals such as academics experience when navigating monocultural workplaces. This burden arises from the need to constantly explain, educate, defend and represent their cultural knowledge to people who are unfamiliar with or even resistant to diversity.

Equality: Equality is about treating everyone the same, providing everyone with the same resources or opportunities. It assumes that everyone starts from the same place and needs the same help. However, this approach can overlook the fact that people have different starting points, challenges, and barriers.

Equity: Equity focuses on fairness by recognising that each person has different circumstances and allocates the resources and opportunities needed to reach an equal outcome. Equity addresses systemic inequalities and aims to level the playing field by providing tailored support and resources based on individual needs.

Glass ceiling: This term refers to invisible but persistent barrier that prevents certain social groups (i.e., women, Māori, Pacific, racialised immigrants) from advancing to higher positions of power, autonomy and leadership within the organisation despite having the required qualifications and achievements. This metaphor highlights the systemic

discrimination and structural limitations that exist within organisations, industries, or society at large, keeping these groups from reaching top-level roles such as executives or board members.

Global South: Countries that are considered less economically and industrially advanced. The Global South broadly comprises of Africa, Latin America and the Caribbean, Asia (excluding wealthy countries such as Israel, Japan, Singapore, South Korea and Taiwan), and Oceania (excluding Australia and New Zealand).

Global North: Economically and industrially advanced countries and broadly comprising Northern America and Europe, Israel, Japan, Singapore, South Korea, Taiwan, Australia, and New Zealand.

Meritocracy: Meritocracy is an ideology that proposes individuals should be rewarded based on their talent and abilities, rather than factors such as social class, gender, race, or privilege. In theory, it promotes fairness by suggesting that everyone has an equal opportunity to succeed based on merit. However, the concept is frequently critiqued for overlooking systemic inequalities that shape people's opportunities to develop and display merit. Structural barriers, such as unequal access to quality education, limited social networks, and biases in hiring or promotions, disproportionately impact marginalised groups, making true meritocracy difficult to achieve in practice. As a result, meritocracy can often undermine efforts to implement equity-based initiatives, as it fails to address the broader context of systemic discrimination and inequality that prevents a level playing field for all.

Racialised burden: This term refers to the additional, often invisible, challenges and responsibilities placed by the systems and administrations on an individual due to their racial, ethnic, or national origins or indignity. This burden stems from systemic racism, discrimination, and cultural stereotypes that can manifest in various areas of life, including education, employment, and social interactions.

Racial inequality: Racial inequality refers to the unequal distribution of and access to resources, opportunities, and power of different racial groups. This inequality stems from historical and ongoing legacies of colonisation, slavery, segregation, globalisation, displacement and discriminatory laws, which have created systemic barriers for marginalised racial groups.

EXECUTIVE SUMMARY

This report presents findings from research on racism and inequality in engineering employment in New Zealand. Conducted as part of the Working to End Racial Oppression (WERO) research programme (see: https://wero.ac.nz/), this study examines how racial discrimination operates in recruitment and career progression within the engineering sector. The research was carried out with the support of Engineering New Zealand | Te Ao Rangahau and the Association of Consulting and Engineering New Zealand.

This research involves two phases of in-depth interviews. The first phase entails interviews with industry key informants such as human resources staff, managers, or people from diversity and culture teams for different engineering firms that ranged from very small to large in size. In the second phase, currently employed engineers from different ethnic groups were undertaken, including Māori, Pacific, Pākehā, Asian and Middle Eastern, Latin American and African (MELAA). The findings from these two sets of interviews are presented respectively in Section 3 and 4.

The research also included an analysis of the workforce composition and wage gaps in Engineering based on analysis of Census and New Zealand Income Survey data. This analysis, which is presented in Section 1, revealed the disproportionately low number of female engineers, and of Māori and Pacific people employed as engineers. Analysis of average median hourly wages revealed notable differences, with Māori and Pacific engineers having median wages that are around 80% of the overall median.

There has been a significant emphasis on Diversity, Equity and Inclusion (DEI) in recruitment and human resource management in Engineering in recent years. This emphasis reflects industry efforts to address known ethnic and gender imbalances in the workforce. Industry informants, however, highlighted several challenges, tensions, and contradictions they faced in integrating and practicing DEI in recruitment. Employers often struggle to balance competing frameworks such as equity, meritocracy, and people-focused approaches, making recruitment decisions complex. Despite initiatives like blind CV screening, targeted graduate programmes and preferential shortlisting of Māori and Pacific applicants, the industry remains heavily merit-driven. Additionally, DEI efforts are largely gender-focused, lacking an intersectional approach that considers overlapping social inequities.

The interviews with engineers revealed that individuals from different ethnic groups face distinct barriers and challenges in securing employment and advancing their careers. For Māori and Pacific engineers, the pathway into engineering is severely limited, with only a small number entering the profession each year. Those currently employed often experience what has been described as a 'cultural tax'—being expected to take on cultural responsibilities in addition to their technical roles, without monetary compensation or clear career advancement opportunities. Racialised immigrant engineers, on the contrary, reported devaluation and deskilling of their qualifications and experience based on their ethnic and national origins. Despite extensive work experience in their home countries, they were often required to restart their careers in graduate or entry-level positions. Several participants shared experiences of unfair promotions, where White, European, and Anglophone employees were favoured for leadership roles. When discussing their own career trajectories, most non-Pākehā and non-European participants expressed scepticism about ever being promoted to senior positions with decision-making authority.

The accounts of discriminations and racial inequalities shared by engineers have profound implications for their employment, career progression, well-being, and society at large. Navigating a predominantly monocultural work environment—marked by challenges like cultural taxation, glass ceilings, and the 'white boys' club'—places additional burdens on racialised groups. The pressure to constantly prove their worth further exacerbates these issues, leading to serious retention problems. If not addressed, the sector risks losing engineers from diverse ethnic backgrounds, exacerbating gender and ethnic pay gaps, worsening representation and diversity issues, and reinforcing systemic racial inequities.

Addressing monoculturalism and the 'white boys' club' culture and fostering a genuinely inclusive profession will require systemic changes within engineering firms and in accepted norms in the profession and industry. Without a shift in workplace culture, efforts to recruit more engineers from underrepresented backgrounds will remain ineffective, as many will continue to leave due to unwelcoming environments. To create lasting change, DEI initiatives must go beyond recruitment and actively reshape the structures, policies, and day-to-day practices that define the industry. This requires the mindful integration of diverse cultural values and practices into every layer of organisational functions, including recruitment, career advancement frameworks, and job descriptions.

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INTRODUCTION

1.1 Background and Purpose of the Report

The purpose of this report is to present the findings from research exploring racism and inequality in engineering employment in New Zealand. This research has been conducted as part of the Working to End Racial Oppression (WERO) research programme (for further information see: https://wero.ac.nz/. The overall aim of WERO is to examine institutional and interpersonal racism in areas of employment, housing, institutions and communities. To examine how racial discrimination is operational in recruitment and career progression in employment, we undertook a case study in the engineering sector with the support of Engineering New Zealand | Te Ao Rangahau and the Association of Consultants and Engineers.

This report is structured into five key sections. The first section offers an introduction, outlining the background and rationale for choosing the engineering sector as a case study, along with a brief discussion on systemic racism and racial inequalities in workforce composition and wage disparities within engineering. The second section details the study design, including the processes for data collection and analysis. Sections three and four present the findings, with section three focusing on themes derived from interviews with industry key informants and section four highlighting insights from employed engineers. Finally, section five discusses the implications of racial discrimination and presents a set of recommendations from both the research participants and the researchers.

1.2 Why Engineering?

This project was initially conceptualised to understand how systemic racism and inequalities operate in the employment domain in Aotearoa New Zealand. Institutional racism is apparent across all employment sectors in New Zealand – evidenced by persistent ethnic wage gaps (Maré 2022) and as detailed in qualitative research in a range of sectors and amongst Māori, Pacific peoples and ethnic communities (Tan et al., 2024). After several months of stakeholder engagements and meetings across different sectors, the engineering sector was selected as the project's case study. Engineering New Zealand (Te Ao Rangahau) and the Association of Consulting and Engineering New Zealand (ACENZ) were keen to partner in the project. Engineering was selected as a case study for this project for several reasons.

In Aotearoa, the engineering profession carries a complex and contested history, shaped not only by the enduring legacies of epistemic coloniality but also by its direct complicity in the infrastructural and ideological expansion of settler colonisation. Engineering was instrumental in facilitating land appropriation, resource extraction, and the development of infrastructure that entrenched Pākehā dominance over Māori land and lifeways. The sector continues to be haunted by its colonial past well into the twentieth century—a legacy starkly illustrated by the 1979 "Haka Party Incident" (Wolfe 2024). As depicted in a recent documentary (Wolfe 2024), engineering students at the University of Auckland—predominantly Pākehā—routinely performed a parody of the haka, a traditional Māori posture dance, during graduation celebrations. Despite numerous complaints, this practice continued for over two decades. In 1979, a group of Māori and Pacific activists—later known as He Taua—confronted the students. Aligned with the broader Ngā Tamatoa movement advocating for Māori rights, anti-racism, land rights, and tino rangatiratanga (sovereignty), He Taua's actions marked a critical moment of resistance. While He Taua members were charged with multiple offences, the engineering students—whose actions had long involved racist performances and public disorder—faced no disciplinary consequences. In interviews featured in Wolfe's documentary, some of the former student leaders continued to question whether their actions were problematic, underscoring the enduring normalisation of colonial and racist attitudes within the engineering profession.

The sector remains dominated by white males, with identified underrepresentation of Māori and Pacific peoples and various social groups, including women (Mpofu, 2019). As engineers are responsible for building the infrastructure of society, it is critical that the workforce in this sector reflects the demographic diversity of the community. In addition to representation, design bias is possible within the engineering sector given the way in which the products of engineering work shape everyone's lives. It is thus additionally important that engineering is inclusive of diverse social groups, including women, Māori, Pacific peoples, and other minoritised ethnic groups.

One example of racial and ethnic design bias in software/computer engineering is evident in facial recognition technology. These systems are often designed and trained using datasets predominantly composed of lighter-skinned, white individuals. Consequently, facial recognition algorithms tend to perform significantly better on people with lighter skin tones and often struggle with accurately identifying individuals with darker skin tones, particularly Black and Brown people. For instance, studies have shown that facial recognition systems have higher error rates when identifying people of African, South Asian, or East Asian descent (Grothe et al., 2019; Karkkainen & Joo, 2021). This bias can lead to serious consequences, such as misidentification in law

enforcement contexts, where individuals from minority groups may be disproportionately and unjustly targeted. This example underscores the importance of ensuring that the datasets used to train AI and other engineering systems are diverse and representative of the global population to avoid perpetuating racial and ethnic biases (Benjamin, 2023).

Another example lies in the incorporation of Indigenous knowledge into the construction of major infrastructure projects. Engineering as a profession has a long-standing historical connection to colonisation, as engineers were responsible for designing and building the roads, railways, and other infrastructure that enabled colonisation of New Zealand and other settler colonies. Physical infrastructure in countries like New Zealand has often been built solely from the perspective of Western science and has thus marginalised Mātauranga Māori and the perspectives of Māori hapū and iwi in development (Parsons and Fisher 2022). When Māori are significantly involved in infrastructure development, however, this critical knowledge on the development of infrastructure can lead to enhanced outcomes that also recognise the authority and interests of mana whenua in shaping their own futures (Philp 2021). While active engagement with hapū and iwi in relation to infrastructure development can lead to enhanced outcomes, embracing Mātauranga Māori in engineering knowledge requires shifts in the composition of who engineers are and who makes decisions about engineering projects.

1.3 Systemic Racism and Our Approach

This project focuses on the operation of systemic racism in recruitment and employment. Systemic racism refers to the societal and institutional arrangements that reinforce the differential distribution of resources according to ethnic groups and barriers to meaningful participation in social, economic and political life. In this respect, racism is not only apparent in overt racial abuse and explicit discrimination but rather manifests in taken-for-granted arrangements that reproduce societal inequities. Racism is deeply embedded in and throughout systems, laws, written or unwritten policies, entrenched practices, and established beliefs and attitudes that produce and perpetuate widespread unfair treatment of people of colour (Humpage, 2001; Braveman, Arkin, Proctor, Kauh, & Holm, 2022).

In the context of Aotearoa, systemic racism is rooted in the colonial racialisation of differently positioned communities, including tāngata whenua (Māori), tāngata Moana (Pacific peoples), and migrants of colour. Racism is evident in the inequitable outcomes for Māori across the system of health, education, housing, employment and justice. Māori, Pacific and Asian peoples experience discrimination in employment settings, both in gaining employment as well as in the workplace (Statistics New Zealand, 2012; Harris et al., 2018). Racism is also apparent in evidence that migrants are more likely to experience racial discrimination in the workplace than non-migrants (people born in New Zealand) (Reid, Yadav, Dixon, & Hurren, 2022). Through this case-study we delved into exploring how systemic racism is operational and manifest in engineering employment in recruitment, retention and career progression. As noted earlier, systemic racism operates in all employment settings in New Zealand – the aim is to explore the specific operation and effects in engineering rather than singling out this industry as a particular case.

1.4 Racial Inequities in Workforce Composition and Wages

In addition to the qualitative research undertaken for this project, we also present here a quantitative analysis by WERO researchers on racial inequities in workforce composition and wages. Table 1 shows 2018 census counts of the number of engineers, broken down by gender and ethnicity. The counts include census records for which occupation is imputed – to compensate for under-coverage and missing responses. Of the 40,068 engineers identified in the census data, 91% (36,558) are men. By ethnicity, 76% (30,327) are European, and 16% identify as Asian. A low proportion of engineers identify as Māori (7%), Pacific (3%), MELAA (2%) or Other (2%) ethnicities.

Table 1: Engineers: Composition of employment by gender and ethnicity (Census 2018)

	All	European	Māori	Pacific	Asian	MELAA	Other
Number							
All	40,068	30,327	2,940	1,329	6,384	888	669
Male	36,558	28,167	2,754	1,236	5,277	747	633
Female	3,510	2,160	189	93	1,104	138	36
Percent							
All	100%	76%	7%	3%	16%	2%	2%
Male	91%	70%	7%	3%	13%	2%	2%
Female	9%	5%	0%	0%	3%	0%	0%

Source: 2018 Census (including records with imputed occupation)

Table 2 presents analogous counts estimated from the 2016-2023 Income Surveys. The estimate show patterns that are fairly consistent with the census data. The overall number of engineers is remarkably consistent – at around 40,100. The estimated proportion of engineers who are women is slightly higher (11%), as is the proportion who identify as Asian (19%). The number of female engineers who identify as Māori, Pacific, or 'Other' ethnicities is suppressed due to low numbers, so separate counts by gender are not shown.

Table 2: Engineers: composition of employment by gender and ethnicity (IS 2016-2023)

	All	European	Māori	Pacific	Asian	MELAA	Other
Number							
All	40,188	29,963	2,175	888	7,750	1,050	588
Male	35,963	27,613			6,163	813	
Female	4,225	2,350			1,575	238	
Percent							
All	100%	75%	5%	2%	19%	3%	1%
Male	89%	69%			15%	2%	
Female	11%	6%			4%	1%	

Source: NZ Income Survey 2016 – 2023 (average annual count)

Table 3 presents the Median hourly wage of engineers by gender and ethnicity. The data for this table came from the New Zealand Income Survey between 2016 – 2023. The median female engineer earns 6% below the overall median. Māori and Pacific engineers have median wages that are around 80% of the overall median. The MELAA and Other ethnic groups have such high estimated median wages as the underlying number of observations is relatively small and is either missing or suppressed in some years. Therefore, it should be interpreted with caution. Median wage rates for female engineers who identify as Māori, Pacific, or 'Other' ethnicities are suppressed due to low numbers.

Engineers are identified based on their self-reported occupation. Occupations are coded based on the Australian and New Zealand Standard Classification of Occupations (ANZSCO) 2006 classification. The ANZSCO system is designed to classify occupations based on skill level and specialisation. In this analysis, Engineers are all employed workers whose occupation is coded as "Engineering Professionals" (ANZSCO 3-digit code 233).

The ethnicity of engineers is based on self-reported ethnic identification, using a 'total response' definition. This means that anyone reporting more than one ethnicity will be included in more than one ethnic group. Counts by ethnicity will thus sum to more than total counts. A broad classification of ethnicity is used (European, Māori, Pacific, Asian, Middle Eastern/Latin American/ African – MELAA, and Other). Missing ethnicity data is imputed.

Table 3: Engineers: median real hourly wage by period and ethnicity (IS 2016-2023)

	All	European	Māori	Pacific	Asian	MELAA	Other
Median real Wage							
All	$44.73	$45.33	$35.52	$37.23	$43.64	$52.23	$46.51
2016-19	$45.63	$45.76	$32.95	$37.23	$43.67	$50.33	$52.62
2020-23	$44.40	$44.73	$37.11	$35.00	$43.64	$57.06	$39.04
Relative to overall median within period							
ALL	100%	101%	79%	83%	98%	117%	104%
2016-19	100%	100%	72%	82%	96%	110%	115%
2020-23	100%	101%	84%	79%	98%	129%	88%

Source: NZ Income Survey 2016 – 2023 (pooled median)

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STUDY DESIGN

2. Study Design

This project involves two phases of in-depth interviews with industry key informants and currently employed engineers from different ethnic backgrounds. In the 1st phase, we interviewed 13 key informants who have leadership or decision-making roles in relation to engineering recruitment and employment. These key informants included human resources staff, managers, or people from diversity and cultural teams for different engineering firms that ranged from very small to large in size. We also interviewed recruitment agents and the senior leadership of Engineering New Zealand and the Association of Consulting and Engineering New Zealand. In each interview, we asked a range of questions about the recruitment process within the industry and the factors that influence recruitment decisions. Interviews also canvassed key informants' perspectives on the current challenges in recruiting, and retaining employees from different ethnic groups, the diversity and inclusion initiatives within their organisation and perspectives on the wider industry.

In the 2nd phase, we interviewed 20 currently employed engineers from different ethnic backgrounds. These groups include, Pākehā and European, Māori, Pacific, Asian, and Middle Eastern, Latin American, and African (MELAA). The employed engineers were asked a range of questions about their personal background and upbringing, experiences of job seeking, progression and career pathways. They were also asked how they were recruited, their working conditions, whether they were valued and supported in their roles, as well as their career aspirations and how confident they felt about those.

Interview data were analysed using the thematic analysis method. Themes in this study represent common, recurring patterns across the dataset clustered around a central organising concept. The codes, on the contrary, are more specific, capturing a single idea associated with a segment of data and consisting of concise labels that identify what is of interest within the data (Clarke & Braun, 2017). Codes are the building-blocks that combine to create themes, which then form the basis of the different sections and sub-sections in this report. To maintain the confidentiality of participants in this report we avoid providing any identifying information, including ethnicity, occupation, firm size or type, or participation in associations that could reveal an individual's identity.

It is noteworthy that the research and analysis undertaken for this report is throughout guided by the Takarangi framework (https://wero.ac.nz/research/takarangi-wero-values-and-roadmap/). Takarangi is a framework that was workshopped and developed by the WERO researchers which involves a set of values and ethical principles to that can guide our work at every stage of the WERO researchers. These principles are designed to support collective reflexivity—encouraging us, as researchers, to critically reflect on our own positionalities within racialised social orders, and to approach the work of writing about the experiences of Māori as tangata whenua, and of other racialised groups, with care, humility, and cultural integrity. In particular, these values guided us to ensuring that Māori experiences are not understood within the cultural and socio-political contexts, shaped by both historical and ongoing colonial, structural, and institutional forces.

3

CHALLENGES

3. Challenges and Opportunities of DEI Initiatives: Key Informants' Perspectives

This section presents the key themes and issues that emerged from interviews with key informants. The key informants described both challenges and opportunities in implementing Diversity, Equity, and Inclusion (DEI) initiatives within the sector. Notably, discussions around racial inequalities and the underrepresentation of certain ethnic groups were predominantly framed by key informants in terms of diversity, equity, and inclusion (DEI). In contrast, employed engineers described their personal experiences and challenges related to employment and career progression using more explicit terminology, such as racism and racial discrimination. While DEI clearly has provided important attention to the makeup of organisational workforces and highlighted issues of equity and inclusion, international research has also noted that DEI initiatives can also serve to obscure racism and the continuation of racialised inequities (Ahmed 2012).

3.1 Diversity, Equity and Inclusion in Recruitment

The responses of the key informants reveal several challenges, tensions, and contradictions in integrating and practising DEI in recruitment. Balancing different frameworks, such as equity, merit, and people-focused approaches, often complicates the recruitment decision-making process, requiring recruiters to navigate competing priorities and considerations.

3.1.1 Equity vs. Merit

In the context of the aforementioned imbalances in the ethnic composition of engineers, some engineering firms take a more targeted approach to recruitment as they try to ensure diversity and representation of underrepresented groups, such as women, Māori, and Pacific peoples. These firms often employ preferential shortlisting and targeted graduate recruitment programs to apply an equity lens to the hiring process. Some participants described to us that preferential shortlisting is used to provide Māori and Pacific applicants with face-time with the recruitment panel. However, interviews with different engineering firms and recruitment agencies revealed that there are no standardised processes or policies regarding the practice of equity in recruitment. Personal discretion is frequently used to make judgments and hiring decisions. The firms that are actively taking an equity approach to recruitment are often faced with a perceived challenge of balancing it with the Equal Employment Opportunity (EEO) approach.

> "I guess what we're trying to do with the EEO and then also having Māori and Pacifica come through and try and give them a bit of a push is we're trying to make sure that they're also getting an equal employment opportunity. So what we're finding is Māori and Pacifica are actually falling behind because somewhere along the lines of social statistics, Māori and Pacifica are less likely to apply for a role because they just from the get-go say, 'I'm not going to get in.' They've got all these hurdles in front of them that they've put there. So we're trying to push them into the mix.
>
> Once they're in there and we've gone through a process of interviewing and met the candidates, then I guess Māori and Pacifica ethnicity is no longer a factor to hiring. It comes down to technical skills, but what we're trying to do is just make sure that they are also coming along for the ride and not cutting themselves off."

Another notable phenomenon in industry recruitment practices is the overemphasis on meritocracy. In theory, meritocracy implies that the applicant with the best CV should be selected. However, this approach is grounded in an equality framework rather than equity, meaning it often overlooks systemic inequalities and underrepresentation, thereby perpetuating these issues. Several key informants noted that the industry and organisations express a desire for a more diverse group of engineers. There also remains a deep-rooted belief in meritocracy, however, and the notion that for graduate applicants the individual's academic credentials, specifically their GPA, speaks for itself. These participants acknowledged that the challenge of shifting away from viewing GPA as the sole marker of a great potential employee or engineer is yet to be overcome by the industry.

One of the many ways the industry tends to advance the practice of equity in recruitment is through blind

screening processes. Industry recruiters in particular expressed a strong belief that a blind screening process helps removing unconscious bias. However, some key informants expressed scepticism about the overall effectiveness of blind screening. Additionally, from responses we received in interviews, it is not evident to what extent an application or CV can be fully anonymised to remove all identifying and personal information, especially when considering experiences, style of communication, and specific accomplishments that may still reveal a candidate's background, gender, or ethnicity.

> "So then when I started looking about at those, I was like, okay, are we going from an equality viewpoint? A blind CV is great, but from equity viewpoint, it sucks because if I'm not afforded the same opportunities as somebody else, then how can I have a blind CV that would look good enough to be picked up? And so what I do now is I go through the CVs and when I see a CV that I think, okay, well it's not linear but it is an interesting one, I throw it in the mix anyways, knowing that usually a team leader wouldn't pick that up, but I wouldn't put my reason in of why we should consider the candidate or sometimes I wouldn't go ahead and screen them, so that I can go ahead and recommend. Again, the reality is that there are almost no applications from the Māori and Pacifica group of people."

While blind screening may reduce some forms of bias, there is concern that it cannot fully eliminate unconscious biases because these can resurface during later stages of the hiring process, such as interviews or reference checks. Moreover, the blind screening practice is grounded in the equality framework, and while it helps advancing the principles of EEO, it does not uphold the tenets of equity for historically marginalised and underrepresented groups in the recruitment process. Therefore, blind screening can overlook the importance of considering diversity goals and ensuring equitable opportunities for candidates from underrepresented groups, which might require more purposive and transparent recruitment practices.

3.1.2 People vs. Skills

When implementing an equity-based approach in recruitment, firms and recruiters often face the challenge of whether to prioritise the individual or the skill set. This raises the question of whether the recruitment process should emphasise an individual's personal qualities and technical expertise, or strike a balance between personality traits, soft skills, and technical abilities. According to key informants, the focus on either the person or technical skills largely depends on the role being filled and the size of the organisation. Some recruiters noted that larger firms often have highly technical roles where specific skills are the primary criteria. However, for client-facing roles in larger organisations, there is a stronger emphasis on non-technical soft skills and how candidates present themselves during interviews. Additionally, some organisations utilise internal matrices and competency frameworks in their recruitment processes. These frameworks are often applied to assess applicants during interviews, focusing on key areas such as leadership, technical skills, and client management. These core elements guide the evaluation, helping firms to systematically measure a candidate's suitability for the role.

> "They want people to sit at a desk, they want them to do their calculations, be able to converse with the clients, and that's it. They don't want to get to know them as people, whereas I draw out all the interesting quirks about individuals and what they like to do, what their hobbies are, what their interests are, and I'm putting forward people. Yes, they're engineers, but I'm also putting them forward as an individual, with a family or hobbies or interests as well. To me, it's like you're not just employing an engineer, you're employing a person who has differences in ways of doing things and thinking. To me, that's what will make the industry colourful and more open-minded and pro-diversity essentially."

Another related notion to this people vs skills framework is 'cultural fit'. According to the key informants, cultural fit refers to an applicant's fitness to the organisation's work culture and values. Some recruiters described traits such as the ability to be 'action-oriented', having a learning attitude, ability to be a team player, communication style and skill, and relationship management are some desirable attributes that make an applicant a cultural fit or right fit for the organisation. They also pointed out that the notion of cultural fit can be contingent on company values and the existing team of employees.

> "To be honest, that's totally subjective to the company and what they consider the fit is. Sometimes, I'll be honest, we don't know. We'll just go, 'How was the interview? The candidate might be keen,' and then our feedback will be, 'We just don't feel they were a fit.' And we do try and say, 'Well, can you define what that means?' And I guess often it's just their impression of the individual and how they feel they'd fit in, whether it's the company culture or whether it's a personality thing, I don't know."

There is a risk that a focus on cultural fit, which seemingly refers to soft skills and personality traits, can also contribute to limiting the recruitment of people who come from non-majority ethnic groups. These patterns can also reflect and reinforce monoculturalism within organisations, as reported by some key informants and by a number of employed engineers who participated in this research.

> "Then, we just talked about as well that the interviewing process is quite a western worldview of how we assess competence. You're asking someone to come in and brag to you for an hour about what they're great at and culturally that doesn't necessarily sit as well with everybody. So, we talked about some people who we've taken on board, who have been amazing for [organisation name], but haven't necessarily shone in that particular structure as well, so we've tried to be quite deliberate around that messaging."

The interviews with key informants also highlighted that recruitment practices are predominantly monocultural in the engineering industry. Some recognised this and noted that the 'one-size-fits-all' approach in recruitment inhibits the attraction of a diverse workforce. The use of monocultural prototypes in roles, job descriptions, and interview processes may not appeal to different groups, perpetuating inequity and underrepresentation. In other words, the lack of a culturally tailored approach to advertising, interviewing, and recruiting individuals from diverse backgrounds contributes to the issue. For instance, one key informant pointed out how the standard interview process in the industry is Eurocentric and does not accommodate other cultural practices.

3.1.4 A Gender-Focused Diversity Agenda

Interviews drew attention to the development of DEI in the engineering industry in New Zealand, which has been initially framed around addressing gender imbalances and has been subsequently revised to start addressing ethnicity. This is a common pattern of development in DEI internationally (Ahmed 2012) and has been observed in healthcare contexts in New Zealand (Lee et al. 2020) and raises questions about how a view towards gender can shape and potentially limit responses to ethnic diversity. The responses from key informants in interviews indicate that the conceptualization of the Diversity Agenda and its current implementation is primarily centred around gender, with ethnicity being addressed secondarily within the same framework. This history is evidenced by the lack of comprehensive ethnicity data and the absence of ethnic pay gap analysis within engineering firms, reflecting a broader apprehension and cautious approach to addressing ethnic equity and equality.

Some key informants noted that efforts to address the collection and analysis of ethnic pay gap data run the risk of "opening a can of worms" leading organisations to prefer incremental changes rather than adopting an aggressive stance on ethnic diversity issues. Additionally, key informants pointed out the practical predicament in collecting ethnicity data from employees: (1) a reluctance among employees to self-identify their ethnicity, (2) fear of stigma and prejudice, (3) the complexity involved in systematically collecting and analysing ethnicity data, and (4) difficulties surrounding the classification of ethnicity. These barriers contribute to the slow progress in addressing ethnic pay gaps and broader ethnic equity issues in the industry.

> "I think a lot of organisations start with gender. It's a really great place to start and people say, 'Where do you start?' gender, you're focusing on a target group who are nearly 50% of the population, and if we thing about the intersectionality, if you're focusing on half of the population who are women, you are then going, 'Okay,' so women are more than one thing, so that's where you also then benefit other groups and communities through that focus. We started with gender because it's quite obvious and it's an industry where it's very male dominated, so when you're looking at where do you start, if one of your challenges is that there's an

> underrepresentation of women in the industry, so I think we've got 18 to 20% going through university, and then in the industry a really low percentage of women in technical roles, and in some of those leadership roles it becomes so quite obvious that there's something not right and that needs to be fixed."

A Hierarchical prioritisation seems to have emerged, where various forms of social justice and diversity issues are ranked, resulting in uneven attention to different social groups. It is frequently noted by the key informants that focusing on gender addresses half of the population and so therefore was a good basis for addressing ethnicity. However, there is a risk that gender-focused policies often default to prioritising the experiences of White women, leading to a narrow approach that can be exclusionary. This focus on gender, without accounting for ethnicity, endangers marginalising large groups of racialised individuals, as it may not address the systemic patterns of social and economic inequities that persist due to racism. In other words, this gender-first framework does not consider how race and ethnicity intersect with gender, thereby overlooking the compounded effects of discrimination experienced by women of colour and other racialised groups. As a result, policies that prioritise gender but remain blind to ethnic diversity continue to perpetuate inequalities rather than disrupt them.

Additionally, the initial industry practices, such as grouping Māori and Pacific communities together in data collection reflect a limited recognition of the unique challenges and needs of different ethnic and other social groups. While recent efforts to disaggregate data and recognise Māori within the framework of Te Tiriti o Waitangi are steps forward, the overall strategy remains insufficient. This approach is especially problematic when considering the needs of immigrant professionals, such as engineers, whose challenges and barriers to success are often neglected in broader diversity efforts.

3.1.5 Implementation of DEI and Industry Disconnects

While there is clear leadership on DEI from industry organisations, the interviews with key informants highlighted issues related to implementing DEI programmes and practices within organisations. Some participants suggested that there are pockets of resistance and reluctance in actively practising or participating in initiatives such as the incorporation of Māori worldviews, perhaps particularly from the engineers of the older generation.

> "Again, it is general and it's not representative of anyone who's in a certain age demographic, but I do feel that younger engineers, they've come through the system where it's been actively promoted and actively valued. And it's normalised for them and that's just how they think and other engineers who perhaps weren't bought through the similar system, they don't have the same view and some possibly never will. But the more education and training that there is, then the more people I think will come on board."

Another challenge highlighted by key informants is the disconnect within the industry when it comes to DEI initiatives. It was noted by some participants that these initiatives are often not well-coordinated between various industry stakeholders, such as universities, employers, recruitment agencies, and organisations like Engineering New Zealand (ENZ) or the Diversity Agenda. On several occasions, these groups seemed to suggest that it was other entities or organisations that ought to be initiating partnerships or fostering better communication on DEI efforts.

> "Going to Women in Engineering and firms like that business, they don't waste their time on that stuff. They're fucking ruthless. So, they fix problems by throwing cash at it, which actually exacerbates the problem in the market. And then you go to the Diversity Agenda, and you report your statistics and guess who's not in the diversity agenda? The universities. How are we going to fix this? All we're reporting is who we've stolen from each other, but if that firm's got more females or more Māori this year, it's cos they came from that firm ... fundamental disconnect from industry and the pipeline."

Despite a unanimous consensus among key informants that more school-level interventions are needed to address the training, recruitment and retention of Māori and Pacific engineers, there was a recurring tendency to expect the "other party" to take responsibility for driving these efforts. At other times, as the quote above suggests, there was a view that firms were simply competing with each other

for existing engineers rather than collaborating on more transformational initiatives. These observations suggest a need for a more coordinated approach to achieving DEI goals across the industry.

3.2 Recruitment of Māori Engineers and the Māori Business Case

The legislative changes in procurement requirements and partnership expectations (e.g., engagement with local government, Iwi business and organisation, and cliental needs) have led to a growing emphasis on the recruitment of Māori engineers. Interviews with key informants also highlighted how some firms have seen the integration of Te ao Māori have a critical element for the engineering industry. Many organisations have taken an interest in developing cultural competency and meaningful engagement with Māori is emerging as a business strategy. This includes embedding tikanga elements at different levels of the organisation and fostering cultural competency within their teams. However, there is a notable tension between the cultural expectations placed on Māori engineers and their desire to excel in technical skills (see section 4.5 for further detail).

> "We really have tried, but what did happen and I think looking back, I feel like the [...] that we have, he was also part of the Te Ao Māori Group. It is possible that maybe he was carrying this cultural load of being the carer of the whole knowledge, which was probably quite unfair. He was just out of uni, he was in a grad role and he was still getting the science stuff going. And I think what we wanted to have is him feeling like he's educating us and us feeling like we're working together as engineers and things, but it is possible that perhaps it was too much pressure for him. He didn't mention it in the exit interview as one of the reasons for leaving, but I do feel like that cultural load probably was maybe too much."

The recruitment of Māori engineers in the industry is shaped by a competitive approach to diversity. In the competitive model of Māori recruitment, larger firms often dominate both Māori-specific and general recruitment efforts, positioning ethnic diversity in a way that prioritizes market competitiveness but does not necessarily shift the overall compositional imbalances amongst engineers. This model reinforces competition over collaboration in the effort to attract a limited pool of Māori graduates and professionals, leading to disparities in how firms engage with te ao Māori. Larger firms, with greater resources and established Te ao Māori frameworks, are better positioned to attract and support Māori engineers. In contrast, small and medium firms struggle to compete in this space, lacking the same level of resources and cultural integration, and may not be able to retain Māori staff recruited by larger firms or seeking alternative careers. This creates a tension between legislative and industry-led changes that encourage diversity and the realities of a competitive business market, where firms must balance meeting cultural expectations with maintaining technical and financial performance.

3.3 School to Industry Pathways for Māori and Pacific Engineers

Key informants widely acknowledged that the pathway for Māori and Pacific engineers into the industry is broken and in need of significant reform, with a focus on school-level interventions to develop a strong pipeline. Some suggested that engineering needs to be made more visible and attractive as a viable career option for Māori and Pacific students. Equally important is having Māori and Pacific leaders serve as role models to inspire these students. Ensuring that students understand what engineering roles entail and encouraging them to pursue STEM (science, technology, engineering, and mathematics) subjects at the high school level were seen as critical steps in building a strong pipeline of Māori and Pacific graduates.

> "We probably have a lot of challenges around having senior role models as well. We have that more so now than what we used to, but we try to, I think, have spotlights around senior Māori, senior Pasifika within our business and making sure that they get profiles so that people coming in can see that they have a space. Again, our employee affinity networks as well, like having opportunities for people to connect in once they join [organisation].
>
> I mean we just have the issue because we have so few Māori Pasifika within our business, if you lose one person within your pipeline, it has such an outsized impact overall who you have in your business."

However, several key informants noted that current DEI strategies within the industry tend to focus on temporary or short-term solutions, rather than addressing the deeper, long-term structural issues. This approach often leads to initiatives that fail to create meaningful, sustainable change. As a result, the potential to build a more inclusive and diverse engineering workforce appears to require more coordinated and transformative strategies.

3.4 The Complexity and Differential Treatment of Overseas Recruitment

The recruitment of overseas, immigrant engineers is often a complex and challenging process for the industry due to several factors, including immigration and visa requirements, frequent changes in immigration policies, and the qualification assessment and accreditation process. A notable aspect of this recruitment is the preference for hiring individuals from predominantly White, Anglosphere countries like the United Kingdom (UK). Some key informants justified this preference by citing administrative ease, such as simpler qualification assessments, and New Zealand-specific expertise, like knowledge of seismic design codes. Additionally, some informants highlighted the structural similarities and perceived transferability of skills from countries like the UK, making these regions attractive for recruitment in the New Zealand engineering industry. However, underlying biases also surfaced from such responses. While it may be administratively convenient to recruit from the UK due to comparable organisational structures, the fact remains that the UK and many other Anglophone countries do not necessarily specialise in seismic design. Furthermore, the emphasis on the transferability of skills from these countries may imply an underlying belief that skills from non-Anglophone countries are less transferable in the New Zealand context, perpetuating biased perceptions of engineers from these regions.

> "One of the initiatives we've spoken about at [our organisation] and that we haven't done yet, so this is just high level thinking, is we've looked at that not everyone has the same pathway to getting a job. So, for example, if someone comes from the UK, their pathway to getting a job at [our organisation] is very different to someone who's come from India. The education background, the biases that come with it, generally a UK university is a lot easier to get their NZQA approved where an Indian university will take a lot longer, which means that the managers may go, 'Oh, it's going to take six months before we hear from person X in India's qualification meets New Zealand requirements, yet I've got a UK candidate. I'm just going to go with them. It's a lot easier.' So we now recognise that it's not the same for both candidates and so how can we change that? We haven't really done anything yet, but those conversations are happening about what we can do in the future."

Some key informants acknowledged the presence of prejudice and bias regarding the place of origin of immigrant engineers, as well as the perceived quality of their skills, experiences, and qualifications. It was also noted that a common justification for not recruiting an immigrant engineer is their lack of local experience. These issues of prejudice, bias, and differential treatment based on an engineer's place of origin are further explored in section 4.3, where the accounts of affected engineers provide deeper insight into these challenges.

4

RACIAL INEQUALITIES

4. Racial Inequalities and Discrimination: Employed Engineers' Perspectives

This section presents the key themes that emerged from interviews with engineers of diverse ethnic backgrounds and national origins who are currently employed in the industry. During interviews for this research, these engineers described their varied career trajectories and experiences related to recruitment and career advancement within the engineering sector. They reflected on their professional journeys, pathways, and encounters with various forms of discrimination, including racism, and sexism, as well as the relative privileges that shaped their experiences.

4.1 Entry into Engineering

To situate the experiences of discrimination and relative privilege in engineering careers, the interviews began by exploring participants' motivations for becoming engineers. Each participant shared a unique story shaped by their individual circumstances, including their ethnic and gender identities, birthplace, family background, and schooling experiences, among other factors. While our focus is on examining discrimination and privilege in the process of becoming a successful engineer, it is important to acknowledge that our sample inherently reflects the dependent variable. All participants in these interviews are employed as engineers, indicating career success to varying degrees, despite the different challenges they may have faced. For New Zealand-born participants, exposure to engineering in school or through industry promotion can be significant for drawing people into this career. Many of the engineers mentioned that their decision to pursue a career in engineering was inspired by their exposure to initiatives like the Wonder Project or Women in Engineering programs during their school years.

4.2 Stereotypes in Recruitment and Employment

The key informants in this research highlighted a recognition that there were issues in the gender and ethnic composition of the engineering workforce in New Zealand. Their accounts also spoke to different ways in which different organisations sought to address this through mechanisms such as targeted recruitment (more common in larger firms) or efforts to reduce perceived bias through blind screening. As noted above, many key informants also recognised the limitations of these approaches in addressing overall imbalances. The question remained for many of how they might move beyond systemic bias in recruitment and career progression. The accounts of employed engineers who were interviewed for this research, highlight that despite recognition of issues of bias in the industry, there remain stereotypes and norms that operate in both recruitment and employment that continue to shape who gets hired and how they progress in their careers.

> "I mean this is my personal perspective. I don't know about the recruiter perspective. Once they see that these people are from Asia, I think they already look down on us, that maybe they are not really capable to sell things or do the presentation in front of the customers, which in the 21st century is totally absolutely ridiculous. I don't know how they perceive this, but I think many, many developed countries, they are really moving away from all this kind of perspective. Not only here, it's also applicable in many western countries. They have this notion that the people coming from this side or maybe because of the colour or race or background, I think they don't have enough knowledge, capability or working experience to work in this role. They will not even talk to you."

The above-mentioned quote from the participants shed light on how they experienced the existence of stereotypes and prejudice in the recruitment process in engineering. Indeed, the employed engineers highlighted several stereotypes related to their social groups and identities that have impacted their experiences in the engineering industry. These include perceptions that "racialised migrants struggle to adapt to New Zealand culture," that "racialised migrants are willing to work longer hours and are indifferent to work-life balance," that "Māori and Pacific engineers are less capable," and that "women's voices are not taken seriously as authoritative." The engineers' accounts reveal that these stereotypes significantly shaped their experiences of recruitment, rejection, employment, and career advancement within the industry.

"In the past, I've always been told, 'You've misinterpreted the situation,' or 'That doesn't happen in the industry,' or 'That doesn't happen in New Zealand. Are you sure?' I think in an ideal world, that's what I would like to work on in 10 years' time. I don't know if I'd be in the industry as such, but still part of it in some way."

Besides stereotypes, participants also observed that racism often manifests in recruitment and employment through microaggressions, passive aggression, victim-blaming, and gaslighting. They emphasised that racism operates in ways that are often invisible, subtle, and difficult to identify, making it challenging to confront. However, participants frequently experience it through unfair treatment, such as being underemployed, overlooked for promotions despite their qualifications, and lacking support and resources for career progression.

4.3 Racialisation of Skills and Qualifications

The role of stereotypes in recruitment was evident in the accounts of immigrant engineers, all of whom hailed from non-Anglophone backgrounds. These immigrant engineers described facing the devaluation and deskilling of their qualifications and skills based on their ethnic and national origins – in other words, their value as engineers was racialised in a negative sense. For instance, immigrant engineers from the Global South frequently find that their qualifications are not valued or recognised to the same extent as immigrant engineers from the Global North and especially Anglophone countries. Participants described having extended job experience in their home countries but in many cases were expected to start again in their careers by being appointed in graduate or entry-level positions.

A common rationale for undermining the previous work experience of applicants or employees from non-Anglophone countries is their lack of local (New Zealand) experience. Notably, even engineers from countries with seismic design codes and structural engineering expertise reported that their employment experience was devalued in New Zealand compared to co-workers from the United Kingdom. Overall, participants highlighted that qualifications and work experience from Anglo-White countries are consistently regarded as more credible.

"[…] in general, coming from a developing country, people sort of look at you – I don't know… They don't trust you the same, so they think you perhaps less professional than somebody that graduated from London or something like that. […] so they definitely think that if you come from a country that is a developing country, that is not a European country, is not from England or English colonial or something like that. Not all the English colonies but Australia, New Zealand South Africa I think is within that sort of VIP group. If you don't come from one of those ones, you are less professional. Professional experience is not as relevant I think. When I came here, I had two Masters. I had work experience, I was already a senior engineer before I came here and I had to start pretty much from zero as a graduate engineer here and I have to – I mean, sometimes I have to explain to people how to do stuff. In the seismic topic for example, it's very relevant for New Zealand environment, [removed for anonymity] is also part of the ring of fire, so for me, that was like second nature. I have done three or four courses of seismic design before I came here and then I saw that – if somebody comes from the UK, -I think that they are really good people and professional too but they don't know anything about seismic design cos basically it doesn't shake there. However, somebody coming from there has a lot more credibility than somebody coming from […], even if we have better experience in design in seismic, just because of the countries, so that's what I experience."

Accounts such as the above quote provide some insight into the valuation of engineers' prior experience that is at least partly based on where they come from rather than their capacity to perform their roles effectively. In particular, the interviews with immigrant engineers revealed the operation of 'colour-blind racism' (Bonilla-Silva, 2021). Discrimination

occurs through purportedly non-racial recruitment approaches such as valuing of qualifications or work experience from Anglophone countries because it is claimed to be higher quality or similar to New Zealand but that then has implications in terms of racialised inequities in the workplace. Described as a meritocracy in recruitment, the effect of colour-blind racism can normalise and justify racial discrimination.

Immigrant engineers also face additional administrative burdens given that they have to navigate the complexities of professional accreditation and the processes of gaining immigration status. While all immigrant engineers (apart from those from Australia) have to navigate these issues to some degree, their experiences vary and like recruitment are more burdensome for immigrants from non-Anglophone and Global South countries whose qualifications are not necessarily recognised to the same degree. Because of the way immigration policy operates in relation to skill level and salary remuneration classifications, recruitment into more junior engineering positions is also likely to mean gaining immigrant status (whether work or residence visas) has additional challenges for Global South engineers. Immigrant engineers from the Global South, particularly those who did not arrive in New Zealand with a direct pathway to residency, noted that securing employment was significantly more challenging without a residency visa. They faced frequent rejections, often because of their lack of residency status, and in some cases, their qualifications were deemed "overqualified," further hindering their job prospects.

Cumulatively, the operation of stereotypes in recruitment and the particular experience of immigration and accreditation position immigrant engineers from the Global South in a contradictory position. On the one hand, they are expected to prove themselves worthy as engineers to a greater degree than immigrant engineers from the Global North and yet even having done that they are nonetheless seen as less skilled and, as we outline in the following section, experience a glass ceiling in career progression alongside other racialised minority engineers.

4.4 Glass Ceiling

Existing research demonstrates that ethnic discrimination is particularly pronounced in the recruitment and selection of leadership positions (Cook & Glass, 2014; Adamovic & Leibbrandt, 2023). The findings of this study align with previous research (Ofe-Grant, 2018), as non-Pākehā and non-European participants reported facing significant barriers to career development. Many noted that their career progression heavily depends on how invested their managers are in supporting them, with a lack of managerial support often impeding their advancement. Several participants also highlighted instances of unfair promotions favouring employees with White, European, and Anglophone backgrounds. When asked about their own career trajectories, most of the non-Pakeha and non-European participants expressed doubt that they would ever be promoted to senior leadership roles with decision-making authority.

> "Like I said, he had his selected few Caucasians that were his favourites, and you could tell there were probably three Caucasians in our team and the rest of us were people of colour. You saw that he invested more of the information and time into those three people. It was, I guess, a bad joke, but my ongoing joke as well, he's going to need managers for the future. That was the ongoing joke in our team because all of the current managers, which were three managers were all Caucasian. I was like, well, we're going to need three managers for the future and those are his replacements. While it was a joke, everyone agreed to that joke, 'You mean even the Caucasian boys,' as far as understanding that they knew that they had that privilege and advantage over us. It was there; it was well known."

This quote was indicative of the perspective of a significant proportion of non-Pākehā and non-European participants who expressed scepticism about the likelihood of ever being promoted to senior leadership positions, especially those with substantial decision-making authority. As this participant's account also suggests, however, this pattern is normalised in organisations and recognised by those affected by it to the extent that it is considered "a bad joke". These insights raise important questions for the aspirations expressed by key informants about shifting the composition of the engineering workforce, including in terms of its seniority, and how cultural norms and social networks in workplaces can perpetuate existing ethnic and gender hierarchies. They also link to observations earlier in this report that revealed substantial wage gaps that are at least partly attributable to differences in the seniority of engineers from different ethnic groups (see Section 1.4). For participants in this research, there was a

common sense of doubt about their career prospects that highlights entrenched power imbalances and the persistent underrepresentation of minority groups in leadership roles.

4.5 Cultural Tax

This research also suggested that the pathway for Māori and Pacific engineers is broken, a point that was recognised also by key informants. The number of Māori and Pacific engineers in the industry is disproportionately small compared to the Māori and Pacific population in New Zealand, which is then compounded for female engineers who are Māori and Pacific (see Section 1.4). It is evident from our interviews with key informants that there is a stated desire to address this issue and to find mechanisms to train and recruit more Māori and Pacific engineers. As noted earlier, part of this imperative comes from the Māori business case (see Section 3.2) wherein procurement and consultation requirements as well as genuine partnership aspirations demand greater expertise in Te ao Māori and connections to hapū and iwi.

In this context, the drive to recruit more Māori engineers, as noted in interviews, led to the phenomenon commonly known as the 'cultural double shift' or 'cultural tax', a phenomenon that has been identified in higher education in New Zealand. Haar and Martin (2022) highlight how Māori academics and scientists are expected to fulfil cultural roles in addition to their professional duties. In the engineering sector, this is described as a 'cultural tax.' The increasing legislative requirements around cultural engagement, particularly with Māori stakeholders and iwi, necessitate cultural competency and Māori knowledge. Consequently, Māori engineers are frequently expected to assume cultural responsibilities, such as teaching and practicing tikanga.

> "I mean I mentioned that at my last company and now this company, I helped the company through implementation of tikanga, teaching karakia and teaching te reo and things like that. Definitely, I guess I probably contribute more than others who don't have to do that. I mean I always say to others, 'You don't have to do it.' For me, I choose to do it because I don't want to work in a place where … it's a burden, but also it's a choice. I choose to do it because I don't want to work in a place that's ignorant or uneducated or whatever. It's my way of contributing with what I know to a place where I want to work, but definitely it's something that I experience and through my work in [a social network] - common, very common. In the classic way, let's do a karakia and look at the person and say, 'Well, you do it.' "

This expectation has several implications. The most immediate is the added burden and extra responsibilities. Māori engineers generally described themselves and others as willingly taking on these roles, seeing it as their way of reshaping the workspace and resisting monocultural environments. They express a hope that, over time, such responsibilities will become normalised, and no one will have to bear this extra burden. However, for some, it creates career distractions. One participant shared that their organisation created a strategic Māori leadership role to build in-house cultural competency. While they voluntarily sought to take on the role because they saw its importance, they also viewed this move as a sideways shift into a non-technical role, leaving them uncertain about future career progression.

On the contrary, some participants mentioned that employers often expect those with Māori whakapapa to take on cultural responsibilities, without considering that individuals may not feel confident doing so. Due to different levels of connection to Māori heritage and organisations, often influenced by factors such as where they grew up and their connections to whānau and hapū, these individuals may not feel equipped to fulfil these roles. The cultural tax described here is one of the recognised consequences of DEI initiatives that do not lead to more transformative shifts. While there is valorisation of different cultures within workplaces to a degree, this valuing can also have the effect of creating hierarchies of competency that position Māori knowledge holders, or even Māori who are less confident in tikanga and their social connections, differentially from other engineers. The evidence in higher education is instructive in this case, where the 'cultural double shift' has effects on the workloads, wellbeing and career progression of Māori academics (Haar & Martin 2022). While we only have limited insight into these issues in engineering from this research the similarity in patterns observed here suggests this is a significant challenge to face as the engineering industry seeks to address the composition and skillsets of its workforce.

4.6 White Boys Club

Aligning with the above accounts of stereotypes facing immigrant engineers, glass ceilings and cultural tax, there was a pervading sense amongst participants that engineering was largely monocultural and characterised by particular gender and cultural norms. Pointedly, some participants described engineering as a 'white boys club' dominated by both Pākehā/European norms and expressions of dominant masculinity. Key informants also noted the composition of the engineering workforce as being skewed to white men but because their commentaries came at a distance from day-to-day work experiences they did not comment on the character of the workplace. In contrast, employed engineers interviewed for this research suggested that engineering workplaces were primarily designed for white men and can as a result be hostile and confronting for various groups, including women, women of colour, people of colour, and individuals from cultural backgrounds where humility and respect are valued as virtues.

For some of the participants in this research, the monocultural character of engineering was experienced in forms of overt and covert racism and overlapping instances of sexism and bullying. These incidents included name-calling, the use of inflammatory and derogatory language, mocking individuals for their language skills, and instances where non-White female engineers were subjected to verbal abuse and being yelled at. More generally, participants described engineering as having a 'bro-culture' that involves particular kinds of in-work and out-of-work socialising, which can subsequently influence their career progression opportunities.

> "[…] it's a combination of not being able to join, not being able to and not wanting to join the boys club basically. Like, they used to go to see the cricket for example. I don't understand cricket. I don't enjoy cricket, so I can't share with them outside their work because it's not part of my culture and I don't understand. I don't enjoy it, plus I am a mum. I don't have the time, so I have to do my work, leave quickly, pick up my daughter, things like that. I wouldn't say it's one aspect. It's just a combination of many circumstances. It definitely holds you down to progress in certain environments which is better designed for men and if you go to the cricket together, to the rugby together, to the pub together. I don't drink. It's all those little things. This is not related to work. It's related to yeah, to the boys club, that you may don't fit or choose not to join because basically, you don't enjoy it. It's not about doing your job properly. You shouldn't define your possibilities the way they do using social interaction with you. – do you know what I mean?"

The comments in this quote and the more general experiences reported in the interviews highlight the importance of considering the effects of monocultural workplaces. As noted earlier in this report, recruitment of engineers sometimes occurs through the assessment of 'cultural fit', a social framing that is likely to be completely or at least partly about the way in which applicants are seen to fit into existing work cultures (see Section 3.1.2). Similarly, we have noted that employed engineers in this research experience glass ceilings and see career progression as being tied to close social networks that reinforce existing imbalances in organisational leadership (see Section 4.4). Lastly, we have noted how there is a cultural tax for Māori engineers, that at least in part reflects the additional labour of working outside of the cultural norms of engineering, even when that labour is viewed as important. Cumulatively, these links highlight how the issues that interviewees identified can be interlinked, even when their own experiences as engineers necessarily vary depending on their personal circumstances, the organisations they work in and their ethnic and gender positions.

5

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Implications of Racial Discrimination

The experiences and accounts of racial discrimination shared by the employed engineers reveal several detrimental implications for their employment, career progression, overall well-being, and society as a whole. Navigating a predominantly monocultural work environment, often marked by challenges like the cultural tax, glass ceilings, and the 'white boys' club,' imposes additional burdens on racialised groups. These racialised burdens (Ray et al., 2023) are often invisible to others but can be exhausting and emotionally draining for Indigenous and non-white employees, who must navigate and endure them just to secure and maintain employment, let alone to progress in their careers. This toll is compounded by the fact that they are frequently required to push themselves and prove their worth on a daily basis.

This persistent strain can lead to serious retention issues. When asked about their future aspirations, several participants mentioned considering leaving the sector, switching to a different industry, or even retraining in fields entirely unrelated to engineering. The common reason given was the emotional exhaustion of constantly having to prove themselves. If these issues are not addressed to retain engineers from diverse ethnic backgrounds, it will further exacerbate gender and ethnic pay gaps and deepen the issues surrounding representation and diversity. This, in turn, will reproduce and perpetuate racial inequities across the sector.

5.2 Recommendations from Participants

This section outlines a list of suggestions and recommendations provided by key informants and currently employed engineers to address the issues of underrepresentation, diversity, inclusion, and racism within the engineering industry. These suggestions include practical steps and strategies aimed at fostering a more diverse, equitable and inclusive environment, improving recruitment practices, and addressing the structural barriers that contribute to the exclusion of Māori, Pacific and other minoritised ethnic groups.

5.2.1 Suggestions by the Key Informants

The following is a list of suggestions offered by the key informants to improve diversity, inclusion and racial equality in recruitment and employment in the industry:

- **Coordinated DEI Efforts Across Industries:** There is a need for more coordinated efforts both within and across industries to advance DEI initiatives. This involves fostering collaboration between different stakeholder and industry bodies including Engineering New Zealand, Diversity Agenda, Universities, Engineering Firms and Recruitment Agencies for sharing best practices, data, and strategies to address systemic inequities.

- **School-Level Interventions:** Increased efforts to attract underrepresented groups—particularly Māori, Pacific peoples, and women—into engineering should begin at the school level. This could involve more targeted programs and initiatives that make engineering pathways visible and accessible to these groups early on, encouraging their participation in the field.

- **Recognising Diverse Cultural Skills:** Organisations should acknowledge and value culturally diverse soft skills in the workplace. Recognising these skills can offer new perspectives and approaches to problem-solving and collaboration, making space for engineers from different cultural backgrounds to leverage their strengths within the industry.

- **Strengthening Connections with Recruitment Agencies**: Engineering New Zealand and the Association of Consulting and Engineering New Zealand (ACENZ) should establish stronger relationships with recruitment agencies, which often serve as the public face of hiring processes. By engaging with these agencies, they can gain insights into recruitment trends, challenges in diversity, equity, and inclusion (DEI), and opportunities to promote inclusive hiring practices.

5.2.2 Suggestions by the Employed Engineers

Below is a list of suggestions offered by the employed engineers to improve diversity, inclusion and racial equality in recruitment and employment in the industry:

- **Greater School-Level Interventions:** Introduce and expand programs that highlight engineering pathways to Māori and Pacific students, making these careers more visible and attractive at an earlier age.
- **Inclusion of Māori Immersion Schools:** Ensure that initiatives like the Wonder Project are accessible to fully Māori immersion schools.
- **Science as a Core Subject:** Reinstate science as a compulsory subject for NCEA Level 1 to build foundational knowledge and interest in engineering among a diverse student base.
- **Review Membership Processes for Immigrant Engineers:** Industry bodies, such as Engineering New Zealand, should review their membership assessment processes to better account for overseas experience, ensuring immigrant engineers, especially those from racialised groups, are not overlooked.
- **Increase Board Representation:** Improve the representation of racialised immigrant engineers in industry leadership and governance, such as board positions, to promote diversity at decision-making levels.
- **Bridging or Crash Courses for Immigrant Engineers:** Develop targeted bridging programs to help immigrant engineers adapt to local cultural expectations, work practices, and technical standards, ensuring smoother transitions into the local industry.
- **Transparent and Accountable Recruitment:** Ensure transparency in recruitment processes, offering candidates the opportunity to seek feedback, which promotes accountability.

5.3 Conclusion and the Project Recommendations

While various diversity, equity, and inclusion (DEI) initiatives are being implemented across the engineering industry to improve the recruitment and retention of Māori, Pacific peoples, women, and other underrepresented groups, our research highlights persistent challenges in translating these efforts into meaningful action and change. This study found that Māori, Pacific peoples, and racialised immigrant engineers face distinct barriers in securing employment and advancing their careers. However, current DEI efforts remain largely gender-focused, with plans to later extend these initiatives to other marginalised groups, including ethnic minorities, immigrants, and neurodiverse individuals. To address the structural imbalances and inequities in the Engineering workforce, future DEI strategies will need to be more tailored and intersectional in their approaches, addressing the specific challenges faced by different groups rather than applying a one-size-fits-all model.

Engineering in Aotearoa has a complicated colonial legacy, with the profession historically playing a key role in enabling colonisation and environmental destruction. For Māori, this has at times created antipathy with the profession. Māori engineers in our study emphasised that to rebuild trust and attract more Māori into engineering, the profession must reconnect with ancestral knowledge of science and innovation—such as Māori navigation and environmental stewardship—and incorporate cultural elements that align with Māori values. There are also clearly wider societal inequities in social, economic and educational opportunity that shape the prospects for Māori students to pursue pathways in the Engineering profession. Addressing these structural issues requires industry, government, educational institutions and employer involvement in transforming the profession to reflect its place in 21st Century Aotearoa.

Our research suggests that there is a particular need to address the 'cultural tax' experienced by Māori engineers. While the effects of this tax are sometimes acknowledged, more tangible measures are less apparent. Tangible measures to address cultural tax could include monetary recognition, recognition and inclusion of cultural responsibilities into the job descriptions, clear career advancement pathways, and opportunities for engineers to progress in both technical and culturally focused roles. Monetary recognition acknowledges the time, and expertise individuals contribute beyond their regular responsibilities. Clear career advancement pathways can ensure that those contributing to cultural and diversity efforts are not overlooked in their professional growth. These pathways could include formal recognition of such work in performance

reviews and promotion criteria. Cultural competency, mentorship, and leadership in diverse teams can be considered essential skills and thus given weight in career progression.

Our research also points towards specific forms of systemic racism faced by Asian and MELAA engineers, especially those who are from immigrant backgrounds. While engineers are often deemed highly skilled in immigration selection processes and have opportunities to gain work visas and access residence pathways, they experience uneven career progress in engineering firms in New Zealand. Discrimination occurs in particular when the skills and experiences of immigrant engineers from non-White and non-Anglophone backgrounds are considered. Our research suggests that there is scope for firms to scrutinise their assumptions about merit-based selection, to pay greater attention to the past experiences of engineers and to question assumptions about the importance of 'cultural fit', which often reinforces existing workplace composition and norms.

More broadly, to dismantle the entrenched monocultural workplace such as a "White boys' club will need the industry to move beyond conventional DEI approaches and embrace transformative change. Bringing care and cultural elements into the profession can help decentre white male dominance and make engineering a more viable career path for people of colour, particularly women of colour. It will need an intentional integration of other cultural values and element into every step and layer of the day-to-day organisational practices including recruitment, the use of recruitment and careers advancement framework, job description and so forth. Further the engineering profession can benefit from learning from and sharing best practices with other fields that have progressed more rapidly in achieving gender and ethnic equity.

Addressing racial discrimination and fostering a genuinely inclusive profession will require systemic changes within engineering firms and in the character of the engineering profession. Without a shift in workplace culture, efforts to recruit more engineers from underrepresented backgrounds will likely remain unsuccessful, as many will continue to leave the profession due to unwelcoming environments. To create sustainable change, DEI efforts must go beyond recruitment and actively reshape the structures, policies, and day-to-day practices that define the industry.

6

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APPENDICES

APPENDICES

INTERVIEW GUIDELINES - KEY INFORMANTS

- ### Background information

  Could you please tell us a little bit about your current role? Tell us about the size, structure, and make-up of the staff (i.e., ethnicity, gender, age, etc.) hierarchy of the organisation a little bit.

  What are the three biggest challenges facing your organisation right now?

- ### General recruitment/hiring process

  From your experience, can you tell us about the hiring process of engineers in the industry? How is the role advertised?

  When advertising or seeking to fill a particular role, what are the desirable criteria for an applicant? What are the factors that shape these 'desirable' factors from a recruitment perspective?

  If hiring/recruitment is done by a third party (i.e., recruitment firms, etc.), how is the recruitment brief communicated to them? What are the process of resume screening, interviews etc., with the candidates? How are hiring decisions made?

- ### Recruitment of domestic graduates

  Tell us a little about recruiting domestic university graduates.

  Our consultation with industry bodies revealed that there are pipeline issues (i.e., not enough Māori, and Pacific engineering graduates) to recruit in the industry. What is your view on that? How should this issue be addressed? Do you have any initiatives coordinated with universities to address this issue?

- ### Recruitment of immigrant engineers

  Tell us a little bit about the recruitment process for immigrant engineers (i.e., the mode of recruitment, people/organisations/agencies involved in the recruitment, etc.). How does immigrant engineers' recruitment differ from domestic recruitment?

  Aside from the skill shortage, what are the factors that influence the decision to overseas recruitment?

- ### Diversity and inclusion initiatives

  Tell us about diversity and inclusion initiatives within your organisation and industry.What objectives do you want to achieve through these initiatives? Does your organisation hire targeted diversity? If so, please tell us about the process.

  What are the key challenges in attracting and retaining engineers from Māori, Pacific, and other ethnic backgrounds?

  Māori, Pacific, and other ethnic minorities are underrepresented in leadership roles, but they are often over-represented at the bottom of the organisational hierarchy. What is the root cause of ethnic disparities in the industry? What are the barriers for them to move up to a senior management or leadership role?

- ## Solution

  If you could propose one thing to improve engineering employment, what would it be? What could employers and industry bodies do to address employment disparities (i.e., under-representation of racialised people in leadership roles, the concentration of the same groups at the bottom of the organisational hierarchy, etc.)? What could the government do?

INTERVIEW GUIDELINES - EMPLOYED ENGINEERS

- ## Background information

  Can you tell us a little bit about your upbringing? What were your parents' occupations? Where did you go to school? What were your aspirations as a young person? Were they similar to your peers? Did you feel it was possible to achieve what you wanted to as a young person? Do you feel you experienced racism or other types of discrimination when you were young? Or, were you given privileges as a young person? How did this impact you?

- ## Becoming an Engineer

  When did you decide to become an engineer? What drew you to engineering? Did your parents, teachers, or others influence your plans? Did anyone discourage you from being an engineer? Why? If you were to describe a typical engineer before you started studying what would you have said?

- ## Engineering Education

  Tell us about the university/institute where you studied engineering - size, student body, staff, culture, etc. Do you feel like you fitted in at university studying engineering? Were there many other students who were [ethnic background]? Did you experience any racism or other types of discrimination at university? Or, do you feel you were privileged when you were studying? How did this impact you?

- ## Seeking employment

  Can you tell us about how you went about looking for work when you were completing your engineering degree? Internships? Graduate recruitment schemes? Job fairs? Etc. What was the ethnicity of the people running these recruitment opportunities? Did you feel that you were privileged or discriminated against when you were going through recruitment processes? Do you think other Engineering graduates are? How did this impact you?

- ## Migration module [only for participants who migrated to New Zealand as an adult]

  When did you first come to New Zealand? Do you have any previous experience of migration? What did you hope to achieve through migration? Why did you come to New Zealand specifically? What did you expect migration to NZ would be like? Did anyone assist in your migration? Did you have to pay them? How much and where did you get this money from? If debt, have you paid it off? How long did/will it take?

  Tell us about getting accreditation for your prior study and being permitted to work as an Engineer in NZ. Was your prior study recognised? Did you have to make any special applications?

- ## First engineering job

  Tell us about your first job as an Engineer [in New Zealand]. Employer size, industry focus, the makeup of the staff (ethnicity, gender, age, etc). How did you feel about having this job? Do you feel like you fitted in? Were there many other Engineers who were [ethnic background]? Did you experience any racism or other types of discrimination in this job? Or do you feel you were privileged in this job? How did this impact you?

- ## Subsequent engineering job [if applicable]

  Tell us about your one other job you have had as an Engineer. Employer size, industry focus, makeup of the staff (ethnicity, gender, age, etc). How did you feel about having this job? Do you feel like you fitted in? Were there many other Engineers who were [ethnic background]? Did you experience any racism or other types of discrimination in this job? Or, do you feel you were privileged in this job? How did this impact you?

- ## Current engineering job [if applicable]

  Tell us about your current job you as an Engineer. Employer size, industry focus, makeup of the staff (ethnicity, gender, age, etc). How did you feel about having this job? Do you feel like you fitted in? Were there many other Engineers who were [ethnic background]? Did you experience any racism or other types of discrimination in this job? Or, do you feel you were privileged in this job? How did this impact you?

- ## Career progression

  What role are you in now? Tell us about your career progression so far. Have you faced any barriers to progression? Do you think your career progression has been impacted by racism or other types of discrimination? Or, do you feel your career progression has been accelerated for any reason? How did this impact you and how you feel about your career?

- ## Future aspirations

  Tell us about your future employment aspirations? What do you need to achieve these? Do you think you will face any barriers? Do these barriers relate to racism or other types of discrimination? How will you negotiate these issues? Where do you see yourself in ten years' time?

- ## Racism and discrimination in Engineering

  Engineers in New Zealand then to be men, Pākehā or to a more limited degree Asian, why do you think this is? Do you think racism and other types of discrimination are an issue within the engineering sector? Can you tell us about how these issues emerge? Is anyone doing anything to address racism and discrimination in Engineering?

- ## Solutions

  If you could propose one thing to improve employment in the Engineering industry, what would it be? What could employers do? What could industry bodies do? What could engineers do? What could the government do?

Working to End Racial Oppression (WERO) Research Programme
https://wero.ac.nz/