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FROM THE CHAIR . . .

THE BENEFITS of a diverse workforce are well known. Businesses that embrace diversity are often shown to have that competitive edge. Providing opportunities for everyone is good for corporate citizenship and a company's reputation as a good employer.

Employees who feel valued and included in a team make a higher effort at work. There is much to learn from other cultures, experiences and working styles. Having another viewpoint can enhance decision-making and result in an engaged, high-performance business culture.

So, it's very encouraging to see another initiative underway to improve the diversity of the engineering workforce.

The Diversity Agenda is an initiative to increase the number of women in engineering and architecture. Engineering New Zealand, the New Zealand Institute of Architects and ACENZ have set a goal of 20 percent more women in engineering and architecture roles by 2021.

They plan to achieve this by helping businesses to diagnose their situation, offering mentoring and by establishing an online resource hub. I commend these organisations on this initiative.

Sir Neville Jordan
Chair, Engineering e2e Steering Group



Institute of Fire Engineers staff Leonce Jones, Trent Fearnley and Jason Hill watch on as Sir Neville Jordan co-signs their redefined MoU with Engineering e2e

IFE re-signs MoU

Engineering e2e re-signed its Memorandum of Understanding (MoU) with the Institute of Fire Engineers (IFE) this month, and we took the opportunity to reflect on achievements over the past 12 months.

The team from IFE are passionate advocates for their sector and together we have seen a New Zealand Diploma in Engineering (NZDE) in Fire Engineering registered on the New Zealand Qualifications Framework (NZQF) and a successful application for a feasibility study

of micro-credentials for fire engineering.

This year, the IFE celebrates its centenary. The organisation began in the UK in 1918 and now has branches around the world providing services to over 10,000 members.

Industry pushes for early start to degree apprenticeship pilot

The engineering industry has endorsed the pilot degree apprenticeship programme – in which apprentices are employed in the industry full time while studying – with some employers so enthusiastic they are pushing for an earlier start.

The Bachelor of Engineering Technology degree in Infrastructure

Asset Management is co-designed by employers, polytechnics and

institutes of technology. The pilot degree is being implemented by WelTec and Otago Polytechnic in partnership with IPWEA (Institute of Public Works Engineering Australasia) and will be launched in mid-2019.

James Mackay (WelTec) and Richard Nyhof (Otago Polytechnic) say there has been very strong buy-in from industry. "During our recent curriculum meeting with employers," says James, "they were pushing to start the pilot six months earlier. We're working through the implications of that."

Meanwhile, although the pilot programme has not been formally advertised, industry word of mouth has resulted in a high level of interest. James and Richard have been approached by people already in

the workforce who want to enrol in the programme, while some employers have employed young people in anticipation of having them complete the degree.

Progress on the degree continues to go well; the new standard has been workshopped and converted from a taught degree to an apprentice degree. It will be submitted to the New Zealand Qualifications Authority for approval this week.

Over the next few months, Richard and James will give a few talks to industry about the Infrastructure Asset Management standard and industry. "Demand from industry is very high," says James, "partly because it's a new kind of engineering degree and also because of the focus on asset management as there is a shortage of asset managers."

You've had your say on engineering qualifications definitions

In 2017, we published plain English definitions of NZDE, NZDEP, BEngTech and BE (Hons) qualifications. The definitions were developed as part of work to raise engineering employers' awareness of engineering qualifications.

There was a great deal of debate about how best to describe the qualifications in language a layperson would easily understand. We received a lot of feedback and as a result the Steering Group agreed a set of definitions that they felt was good enough to 'road test' by going live on the website.

Over the past two months we have reviewed the definitions. Feedback received during this period has been considered by the authors and changes agreed.

A draft of the revised version is available in PDF format. The Steering Group will review the feedback and approve changes to the online definitions before the end of the year.

ENGINEERING E2E – EDUCATION TO EMPLOYMENT

A quick guide to engineering qualifications



There are four main kinds of engineering diplomas and degrees available in New Zealand. Here are broad definitions of the kind of work you would expect a person with these qualifications to do.

NEW ZEALAND DIPLOMA IN ENGINEERING (NZDE)



“I'M A HANDS-ON ENGINEER. I build the things others have designed – and sometimes suggest design improvements by applying my knowledge of what works on the ground. The NZDE is an internationally recognised qualification and to earn one, I studied full-time for two years – though you can also do it part-time while working.”

New Zealand Diploma in Engineering (NZDE) graduates work in a wide variety of jobs at a technical level applying engineering practices and designs. They are the engineers you will usually find building things (or managing the building process) and using current technology to solve the practical problems that arise when implementing a design. They often use their practical knowledge to suggest design improvements. Other roles that are often filled by NZDE engineers include drafting and creative technical drawing, computer aided design (CAD) drafting and management of construction sites. Very experienced NZDE graduates can also be found in more specialised and senior roles such as designing improvements to machinery used in manufacturing or developing high-tech electronics equipment.

The NZDE is a Level 6 diploma qualification that is internationally recognised and takes two years full-time study through an Institute of Technology or Polytechnic (ITP), though it can also be studied part-time while working.

NEW ZEALAND DIPLOMA IN ENGINEERING PRACTICE (NZDEP)



“I'M A SENIOR PRACTICAL ENGINEER. It takes a minimum of four years of study and work experience to become an NZDEP engineer, but most of us have advanced technical skills built up over years of work, study and work-based assessment. You'll find us in every field of engineering, using our knowledge to implement engineering designs – and solve the practical issues that always crop up along the way. NZDEP is an internationally recognised qualification.”

NZDEP-qualified engineers are senior technical practitioners. It takes a minimum of four years of study and work experience to become an NZDEP (starting with an NZ Diploma in Engineering), but most have advanced technical skills built up over many more years of working, study and work-based assessment. NZDEP graduates use their practical knowledge to implement designs. They are also very skilled at identifying and solving practical problems that arise in the implementation process and making design improvements. Experienced NZDEP engineers often specialise and may design machinery, structures or processes using current technology. Practice areas are varied and include maintenance and management of buildings or machinery, engineering design and manufacturing, installation of machinery, technical sales and customer service, draughting services, and a wide range of construction jobs.

The NZDEP is equivalent to the old New Zealand Certificate in Engineering and is a Level 6 diploma qualification.

BACHELOR OF ENGINEERING TECHNOLOGY (BEngTech)



“WE'RE THE ENGINEERING 'ALL-ROUNDERS', because we combine strong practical skills with specialist engineering knowledge. This combination means we can be found in almost every part of engineering practice, from design to detailed build. We work at the level of broadly defined engineering

problems in the widest range of engineering jobs of any type of engineer. Our ability to bridge the practical and the theoretical also makes us great project managers. The BEngTech is an internationally recognised qualification and to become one I studied full-time for three years at an Institute of Technology or Polytechnic.”

Bachelor of Engineering Technology (BEngTech) graduates are often considered the 'all-rounders' of the engineering world because the degree combines strong practical skills with specialist engineering knowledge. The qualification's emphasis on bridging the practical and the theoretical means BEngTech graduates are found in the widest range of engineering jobs of any type of engineer – everything from site engineering and project management to specialised design of equipment, buildings and processes. They also work in a wide range of industries from construction, mechanical design and manufacturing to high tech electronics and telecommunications. Some very experienced BEngTech engineers run their own consultancies, but most can be found working in teams that include New Zealand Diploma in Engineering (NZDE) and Bachelor of Engineering (BE [Hons]) graduates. The BEngTech is an internationally recognised Level 7 degree so you will find graduates employed around the world. It requires three years full-time study through an Institute of Technology and Polytechnic (ITP) or technical university, though it can also be studied part-time.

BACHELOR OF ENGINEERING WITH HONOURS (BE [Hons])



“I'M A SPECIALIST ENGINEER. I do the complex calculations, design and problem-solving in engineering projects. Like other engineers we work in a particular area – such as civil, mechanical, electrical or IT engineering – and we tend to stay in the specialty we trained in, becoming more expert over time. Generally the buck stops with us, so you will often find an experienced BE (Hons) graduate heading an engineering team and taking overall responsibility for the quality of the design and implementation. It takes four years full-time study to become a BE (Hons) in New Zealand and the qualification is internationally recognised.”

BE (Hons) graduates are specialist engineers who do the complex calculations, design and problem solving in their area of expertise. The main categories of specialisation include: Civil Engineering, including Roading & Transportation, Structural, Water & Waste Strands; Mechanical Engineering, including Product Design, Manufacturing & Production, and Mechatronics Strands; Electrical and/or Electronic Engineering; Network & Communications or Computer & Mobile Systems Engineering; Software Engineering; and Chemical and Process Engineering, including food manufacture and the oil and gas industry.

Specialisation begins at university and generally continues throughout a BE (Hons) graduate's career – building experience and expertise in a very specific area of practice. They are able to work from first principles and may use new or emerging technology.

Because they are technical experts, BE (Hons) graduates often have 'sign-off' on a project, taking overall responsibility for the quality of engineering design and implementation. Some become sole practitioners or consultants, but many BE (Hons) graduates work in teams with other engineers whose qualifications have a more of an implementation focus – such as NZDE, NZDEP or BEngTech engineers.

The BE (Hons) is a Level 8 degree and takes four years' full-time study at university. The qualification is recognised internationally, so you will find New Zealand BE (Hons) engineering graduates employed around the world.

October 2018 (First published July 2017)