



Solve it.



Develop it.



Foster it.



Connect it.



Inspire it.



Dream it.

FY2022



Acknowledge it.

MIHI Mauri ora ki a Ranginui. Mauri ora ki a Papatūānuku. Tēnei rā, ka rere ake te reo whakamihi, ki ngā iwi me ngā tāngata katoa. Tēnā koutou, tēnā tātou katoa, tēnā tātou i ō tātou mate tuatini, tēnā tātou i ngā piki me ngā heke. Heoi anō, kia mau, kia manawanui!

May blessings be upon our Sky Father. May blessings be upon our Earth Mother. As we extend our greetings, to all peoples. Greetings to you, one and all, including those who have passed on, and those left behind to continue the work. May we all be strong and resolute!

WHAKATAUKI Ko te pae tawhiti, whāia kia tata; ko te pae tata, whakamaua kia tina!

Pursue the distant horizon until it is nearer; pursue the near horizon and grasp it tight! The potential for tomorrow, depends on what we do today.

18 Delivering solutions. Solve it.

44 Developing & maintaining.

Develop it. Foster it.

58 Connecting & inspiring.

Connect it. Inspire it.

70 Future proofing. Dream it.



88 Financials. Count it.

**Rukuhia te
wāhi ngaro,
hei maunga
tātai whetū.**

**Explore the
unknown,
pursue
excellence.**

Deliver it.

Our people

Nā tō rourou, nā taku rourou ka ora ai te iwi.
With your food basket and my food basket, the people will thrive.



MEMBERSHIP

Manager Customer Service, Rebecca Symonds, has been working hard to develop a strategy to improve our membership engagement, working closely with Manager Accounts, Ronita Kishore, to automate and streamline our membership renewals process.

COMMUNICATIONS

Our GM Comms 4.0, Kim Nugent, continues to drive industry uptake of digital platforms to spread the voice of our industry further. A key focus has been increasing public relations for key industry projects particularly in Industry 4.0, sustainability and mātauranga Maori.

INNOVATION

Innovation & Transformation Architect, Greg Buckley, has been working behind the scenes to launch HERA's App MetalMind publicly, whilst managing key Pūtātara media clients, Innovation Centre works and an IT network restructure. He has also been part of a submission for a potential ACC Injury prevention fund on Industry 4.0 in health and safety.

STRUCTURAL SYSTEMS

GM Structural Systems, Kaveh Andisheh, has seen his team capability grow to now include Structural Fire Engineer, Fanqin Meng, and our new Senior Structural Engineer, Reza Kordani (to replace Andrew Pennington). Our Finite Element Analyst, Nandor Mago, rounding the team out with expertise in simulation works.

SUSTAINABILITY

A key focus for our CEO, Troy Coyle, has been sustainability. This year, HERA has developed our Carbon Emissions Offsetting Program for steel products and led research in steel recycling, the value of Construction 4.0, and guidance in calculating carbon footprints.

WELDING CENTRE

Our GM Welding Centre Michail Karpenko, has delivered a highly successful year which has placed HERA in good standing. He has been working with his team's Senior Welding Engineers, Alan McClintock & Volkan Yakut, Welding Engineer, Robert Ryan and Hafez Taheri, to deliver crucial industry training auditing services and research.

INDUSTRY 4.0

Welding Centre Research Engineer, Holger Heinzl, has been a key person to lead our Fab 4.0 Lab - home to state-of-the-art technology solutions and training facilities to ensure industry are connected to the latest technology advances. This is part of our industry 4.0 focuses, as well as our Construction 4.0 research program.

MĀTAURANGA MĀORI

GM Comms 4.0, Kim Nugent, is also the Project Lead of our mātauranga Māori project to help industry look at their work through a cultural lens. This also crosses over to our Construction 4.0 project, and some value focused research to attract and retain more Māori engineers, along with ongoing commitments to our Whanake Scholarship.

Review it.

TŌ MĀTOU MATAKITENGA, WHAKATAKANGA, RAUTAKI | OUR VISION, MISSION, STRATEGY.

Auahatanga pūmaitai. He whakapūmau i te ahumahi mō āpōpō, mā te mahi auaha, ināianei tonu. E whakatipu ana i tētahi hunga māhunga maitai e autai nei ki te mahi auaha. Ko te arotahi ā tō mātau rōpū, he whai kia anga whakamua ai te ahumahi maitai o Aotearoa, ā, kia noho rite rawa ai mō anamata hoki. Ko ā mātou mahi – he whakataki whakatikanga, he whakatipu me te pupuru kaimahi whai-pukenga, tae atu ki te tūhonohono, whakahihiko i a rātou, ā, kia āta tautokongia ai o rātou hiranga hangarau me te whakawhitinga mātauranga, ā, kia whiwhi ai i ngā pukenga tika mō ā rātou mahi, ā, he kaha tūhono hoki i te hapori, he noho kotahi hoki.

Innovation in metals. We're securing tomorrow's industry by innovating today. We are doing this by building a passionate tribe of metal heads who innovate successfully. Our team is focused on making sure our NZ metals industry is looking ahead and is prepared for the future. We are delivering solutions, developing and maintaining a skilled work force and connecting & inspiring, so our members are supported in technical excellence and knowledge transfer, have the right skills for their needs, and are a community engaged and united.

FY2022 was a strong year for heavy engineering, with building and construction remaining very strong despite skills shortages and disruptions from Covid-19.

For HERA, the FY22 saw an increased focus on applications of Industry 4.0 to construction and fabrication, sustainability and structural design support.

Looking at the big picture

HERA's FY2021 pivot to digital delivery of its services, enabled us to respond well to continued lockdowns due to Covid-19 in FY2022. Throughout the year, there was high demand for HERA training and certification, both of which we were able to deliver digitally when required.

HERA continued its investment in Industry 4.0 capability, through further fit-out of the fab4.0lab and seeding of some key research projects, as well as progressing development of the HERA Innovation Centre in collaboration with the HERA Foundation. HERA also commissioned a key investigation of productivity benefits associated with the construction sector's adoption of Industry 4.0. This study demonstrates significant financial benefits for Aotearoa of doing so.

We also invested in the development of structural fire engineering capability, through the appointment of Fanquin Meng. This is an area that we will continue to invest in and develop.

Our Sustainability Fund projects, including commencement of development of Australasia's first material passport, along with the development of the zero carbon steel program (to be launched in FY2023), positioned us as an innovative sustainability thought leader for our industry. Our reports on steel recycling, demonstrated that steel is a leader in Aotearoa's circular economy and that there are significant carbon equivalent emissions reductions arising from steel recycling. The recycling rates of steel in building and construction waste were also shown to be high, estimated at 85%.

In FY2022, we also focused on reinvigorating our delivery of design guide support for our industry - something our members had asked us to focus on more.

Financial performance

We took a conservative approach to our FY2022 budget development due to uncertainty relating to Covid-19 impacts. However, our income was much higher than expected due to a strong levy and strong participation in our training and auditing services.

We were also able to resolve an outstanding issue with the levy, requiring changes to the Heavy Engineering Research Levy Act, 1978, that had arisen from a change to the customs code identifiers for previously levied items. An MOU between Customs, HERA and MBIE was signed to ensure that the risk of this occurring again is minimised.

David Anderson | Chair

Technical Director, John Jones Steel

LETTER FROM CHAIR AND CEO

We did have some issues with levy reporting accuracy from Customs, which caused us to take a prudent approach to expenditure until the source of the reporting errors were identified. Due to the unexpectedly strong income to tightly managed expenditure ratio, we were able to support some key initiatives towards the back-end of the year. These included purchasing of more research equipment for the Fab4.0Lab, providing some support to NZSSDA initiatives, automating some of our administration processes, fast-tracking some software development, initiating a Mātauranga Māori capability program with Tūtira Mai, seeding some international collaborative research and providing a PhD Scholarship to University of Auckland to develop teaching tools to demonstrate flexural torsional buckling of steel beams.

We focused on further developing strategic relationships, for example with BRANZ. We also had a number of our staff join influential boards and advisory groups. For example, the working group for the Advanced Manufacturing Industry Transformation Plan, MBIE's Building Advisory Panel and the Vice Chancellor Advisory Group at AUT.

Looking forward, the outlook is very strong. We anticipate at least another strong year for the building and construction sector. We also have several grant applications for research funding in play, with hope that at least some of these will be successful and will be able to commence in FY2023. We also have a strong program of research, training and publication in the year ahead, with focuses on structural fire engineering, seismic, Industry 4.0, Mātauranga Māori interfaces, sustainability and software development.

Our people

The key staff additions for HERA in FY2021 were the appointments of Ronita Kishore as Finance Manager, Fanqin Meng as Structural Fire Research Engineer and Reza Kordani as Structural Engineer.

Ronita has a senior accounting background in Fiji and is currently studying for her CPA qualifications. Fanqin has seven years of research experience assessing the performance of structural components and sub-assemblages in fire, gained in both China and New Zealand. Reza, has a research background in simplified design guidelines for rocking structures.

CEO Outlook

In the coming 12 months, HERA will have the following key focuses:

- **Sustainability.** We have plans to develop Australasia's first material passport for steel, a number of presentations to architects on our zero carbon steel program, use of our recycling report data to inform Module D considerations in carbon calculators, investigation of expanding steel design lifetimes, and a range of industry and stakeholder training, aimed 6 star greenstar accreditation for the HERA Innovation Centre;
- **Industry 4.0.** Further expansion of our Fab4.0Lab facilities, expansion of our research capabilities in Construction 4.0, Health and Safety 4.0 and Monitoring 4.0;
- **Positioning HERA.** We plan to further focus on positioning HERA as a key contributor to thought leadership and media commentary in both the manufacturing and building/construction sectors, thus highlighting the significant role steel plays in these;
- **Mātauranga Māori capability development for our industry.** We are doing this because it is the right thing to do. It will also have benefits to our industry from increased industry attractiveness and will prepare our industry for the coming increased focus on this in Government procurement. This will include a range of training and research activities;
- **Improving member engagement.** This will include increased support for students, improved member communications and greater relevance of HERA activities; and
- **Structural Fire.** This is an area where we started to build capability in FY22. We will review the impacts of this and respond accordingly.

Thank you to the tribe of engaged metalheads that continued to support us through FY2022.


DAVE ANDERSON
CHAIR, HERA


DR TROY COYLE
CEO, HERA



Troy Coyle | CEO
HERA

Govern it.

Our Executive Board

The governance of HERA is made possible by a unique blend of industry leaders who ensure we always act in the best interest of the heavy engineering and steel industry of Aotearoa.



Dave Anderson
HERA Chair
Technical Director,
John Jones Steel.



Craig Stevenson
HERA Deputy Chair
Technical Director - Built Environment,
Aurecon.



Ben Jensen
HERA Chair of Financial Audit & Risk Committee
Financial & Project Manager,
Jensen Steel Fabricators Ltd.



Noel Davies
HERA Foundation Chair
Joint Managing Director,
Hydraulink Fluid Connectors.



Darren O'Riley
General Manager,
SCNZ.



David Moore
Managing Director,
Grayson Engineering Ltd.



Dieter Adams
Executive Director,
The Manufacturers' Network.



Jane Warren
Director & Joint Owner,
Dixon Manufacturing Ltd.



Jayden Mellsop
Contract Manager & Director,
Eastbridge Ltd.



Matthew Black
Head of Innovation and Product Development,
NZ Steel



Matthew Kidson
Managing Director,
Kernohan Engineering.



Raed El Sarraf
Technical Principal - Materials & Corrosion,
WSP New Zealand.



Yvonne Chan
Director of External Engagement,
Auckland University of Technology.

Celebrate it.

A year of success.

HERA is so proud of the work that our team has delivered this year to assist our industry.

Our HERA report shows that the adoption of Construction 4.0 could boost NZ's GDP by as much as:

\$8bn

We responded to

850+

requests for free technical advice.

Special project launched to help industry embrace mātauranga Māori in the workplace.

Our decarbonisation presentation was attended by:

453


architects.

14 

technical research publications delivered to our industry.

700+

professionals upskilled through our courses, webinars and training offerings.

42 

active composite software users were recorded since its public release.

61

members informed our Structural Systems roadmap via our member survey.


 **4**

design guides were developed and delivered to the industry.

Sustainability took the front seat, with key steel recycling & carbon footprint initiatives delivered. 

61

audits to AS/NZS ISO 3834 and/or SFC carried out as contract services to HERA Certifications.



Development of online corrosivity map completed & tested.

Solve it.

Delivering solutions.

Our members and industry are supported in technical excellence and knowledge transfer.

I orea te tuatara ka patu ki waho.

A problem is solved by continuing to find solutions.

We need to embrace creative thinking, adaptability and perseverance, because in order to explore the unknown, re-invent and re-imagine - we need all of these things.



HERA seismic research

Testing of structural active links at the University of Auckland

Test it.

Seismic research

Over 90% of New Zealand buildings are not more than 3 storeys high and around 9% of the remaining ones are not more than 10 storeys high. For these buildings, the earthquake loads can be more than 10 times the wind loads, even though a severe earthquake, statistically, has a less than 10% chance of occurring during the design life of the building.

Since 2016, the focus of our seismic research has been on these structures. In particular, the welded connections used on them, and how we can make them more cost-effective, as well as developing welded connections for the various forms of seismic resisting systems that exist.

This is ongoing research which so far has led to important developments such as reinforced partial penetration butt welds which have allowed the delivery of the same performance as a complete penetration butt weld at 40% of the cost. We are also testing weld details for new forms of construction, such as Bolted Replaceable EBF Active Links; quantifying the extent of conservatism in fillet weld and incomplete penetration butt weld design procedures in the Steel Structures Standard.

This year's key research outcome was the publication of HERA Report No R8-043:202: "The use of effective full penetration of T-butt welds in welded moment connections," and our Research Engineer, Hafez Taheri's PhD thesis.

Another objective of this research has been to define properties of steel required to perform safely under repeated seismic load based on the fracture mechanics to supplement design standards NZS 3404 and AS/NZS 5100.6. The recommendations developed includes easy to use steel selection tables covering AS/NZS, EN, JIS and some of the ASTM and API 5L steel grades.

The methodology used to develop the tables was based on the fracture mechanics procedure of Eurocode 3. The procedure was modified to allow for seismic actions following the IIW procedure.

“Our seismic research has led to the development of a new weld technique that delivers the same performance, but at 40% of the cost.”

Michail Karpenko
GM Welding Centre

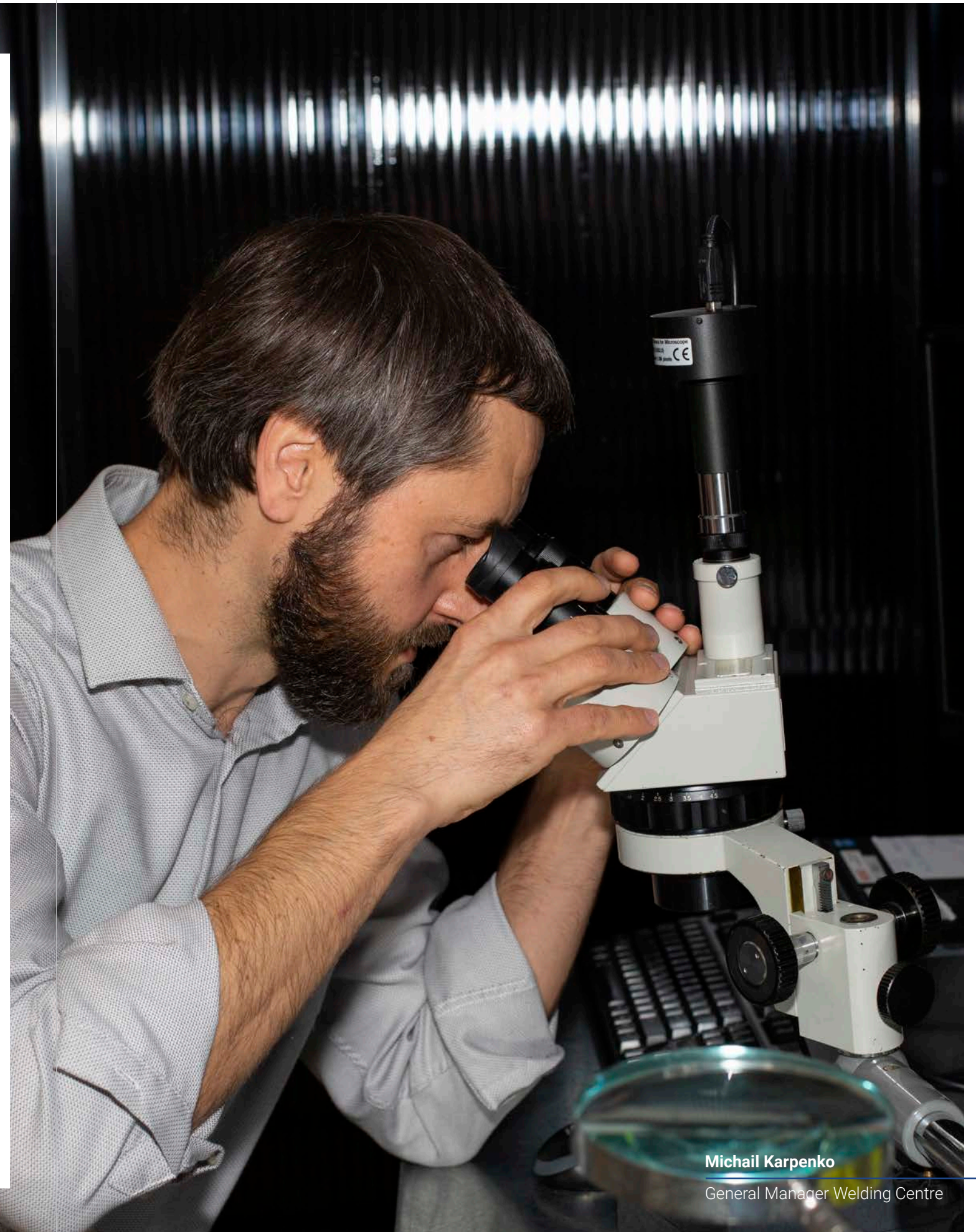
Considerations have been given to the detectability limits of the crack at a weld detail, cyclic loadings, strain hardening and rates and other parameters that can be adjusted to suit the application considered.

This work has been conducted in cooperation with Prof. A Hobbacher in Germany, and industry partners and its recommendations were published in the paper: "Provisions for avoiding brittle fracture in steels used in Australasia including effects of seismic action, Springer 2022."

Performance of coastal weathering steels in New Zealand coastal environment

Weathering steel has been used since the 1930s in railway coal wagons, bridges, buildings, facades and many architectural features such as sculptures and landscaping. It has been used extensively in North America, Europe and Japan for over 55 years; and over the last 10 years in New Zealand.

The aim of this project is to evaluate the performance of coastal weathering steels in the New Zealand coastal environment by conducting exposure tests and to update recommendations in HERA Report R4-97. So far, the test coupons have been prepared by our member Welding Engineers Ltd, and the long-term exposure tests are being performed in cooperation with BRANZ.



Michail Karpenko
General Manager Welding Centre

**Kaveh Andisheh**

General Manager Structural Systems

RESEARCH AND DEVELOPMENT

Structural fire research

In our industry there is a growing interest in understanding the reliability of structural fire design.

That is why we have a number of research focuses that are working to improve building resilience and safety for structures subjected to severe fires. These include:

1. Our Slab Panel Method (SPM) works, which are aimed at updating the existing SPM method to design metal composite flooring systems in severe fires to deliver an advanced technical solution that decreases uncertainty and increases design accuracy.
2. Our work to develop an advanced analytical procedure to design steel car park buildings under severe fires. This follows the publication of our HERA report R4-152 which was focused on the validation of structural fire design for steel framed car parks. The first draft is now prepared and is pending external review comments.
3. The development of an advanced structural fire performance-based design procedure for steel structures which includes a detailed HERA guide on performance-based fire design of multi-storey steel and composite (steel/concrete) structures.

Research for industry advancement

We continue to support the seismic research program led by our welding team. This includes implementing the Japanese "effective notch strain concept" to allow the fatigue strength assessment of load carrying cruciform joints (like the beam flange to column flange welded connections in moment resisting frames) in low and high cycle fatigue region, and the testing of the large and small-scale specimens and advanced numerical modelling.

We are also collaborating with BRANZ on their wall cavity research. This will address a critical issue related to steel durability.

“ We are focused on developing new technical solutions in structural engineering to address industry gaps and extend our inhouse capabilities to better support our members. ”

Kaveh Andisheh
GM Structural Systems

Kia whakatōmuri te haere whakamua.

At HERA we are firmly focused on future proofing our industry. But, we also recognise the mātauranga (knowledge) that our past is a big part of our story, and influences the role we play for a better tomorrow.

I walk
backwards
into the
future with
my eyes
fixed on
my past.

The past, present and future are intertwined. The past is central to, and shapes our present and future.

Decarbonise it.

Our Hōtaka Whakakore Puhanga Waro (mo te Hua Rino) - Carbon Emissions Offsetting Program (for steel products) is nearly here!

This program development has been in response to our role in reducing Aotearoa New Zealand's carbon emissions.

We acknowledge the steel industry's emissions is a big challenge. This is because carbon is primarily used in the steel making process as a reductant (rather than a fuel). Unfortunately, there is currently no commercially viable alternatives that exist for coal as the reductant in steel making.

Until such an alternative is developed, it is important for the steel industry to utilise carbon offsetting as a mechanism to reduce net emissions.





“ Our carbon offsetting program, combined with steel recycling, completes a circular economy for steel.

”

Troy Coyle
CEO

Reuse it.

Circular economy and a low carbon future

Our social licence to operate is fundamental to the long-term sustainability of the NZ steel industry.

Steel is the backbone of Aotearoa's cities, and local manufacturing and fabrication are important to our economy, infrastructure and society.

Transition to renewable energies such as geothermal, solar, hydro, wind and wave energy generation will require extensive use of steel. From the car you drive and the bridges you drive over, to the roof over your home, and much more - steel is essential to New Zealand's way of life and its thriving economy.

As a vital part of New Zealand's future, steel therefore has an important role to play in our zero-carbon future. Particularly given that the actions to reduce, reuse, reconfigure, recycle and retrofit are all benefits of steel.

Zero carbon steel - how the program works...

Emissions for most steel products used in New Zealand will be calculated using our online calculator. Emissions are then offset via Ekos within the calculator itself. The offsets are focused on the planting and protection of native forests which in turn provides additional biodiversity and human capital benefits.

The core offsetting calculations in the program are based on life cycle assessment and environmental product declarations to ensure credibility of the data, and the program rules were developed by independent sustainability advisors at thinkstep-anz. The carbon credits arise from establishing new forests and protecting existing forests indefinitely from logging. These conservation activities create measured, reported and verified carbon benefits.

Steel recycling and the circular economy

'Infinitely recyclable' is the underpinning sustainability message of steel.

Our HERA Report R5-89 Steel Recycling Report released this financial year shows an impressive 85% of steel scrap in New Zealand is recycled, and that recycling steel scrap produced in Aotearoa New Zealand provides significant environmental benefits – despite the need for transport to overseas recycling facilities.

At 85% recovery, the savings in global warming potential per tonne of steel scrap generated in the sector is 1,249 kg CO₂-equivalent. If 100% recovery could be achieved, there are potential savings of 1,473 kg CO₂-equivalent.

A steel circularity passport

Structural steel materials have the potential to be re-used across multiple construction projects over time, as in certain circumstances (given the availability of required data), a quick initial review can be conducted to identify the suitability of reuse before demolition.

Our research will aim to identify roadblocks and barriers to the re-use of structural steel, and will first investigate the role of a data platform in facilitating steel re-use. Following this, a material passport decision-making framework will be developed to facilitate future end-of-life recovery, reuse, repurposing and recycling.

This project will develop the first Australasian material passport in the construction industry. So far, the second draft of a literature review, a common language document, and a steel circularity passport is being prepared.

Reimagine it.

SUSTAINABLE STEEL

Improving the durability of steel

We aim to develop and host a digital corrosivity zone map tool to enable users to search by address and determine a recommended corrosion classification to NZS TS 3404. This tool will provide a more accurate location classification than can be obtained currently, and also will cut down the time to do so. Understanding such data will help ensure steel structures are as durable as possible across its lifetime. At this stage, our amended version of the online map has been released for beta testing.

Exploring the feasibility of non-destructive tests to identify mechanical properties of structural steel elements

One of the key problems with facilitating steel re-use is understanding the mechanical properties of the steel in question. To date, this data set has been acquired through intrusive means which are often costly, and not particularly safe to execute.

This research project investigates the feasibility of non-intrusive, cost-effective approaches to estimate mechanical properties of structural steel to facilitate re-use. The first draft of this project is in progress.

Making steel a low-carbon material choice

We are working with our member company WSP to peer review their literature review which is aimed at getting a holistic view on existing best practice, barriers, issues, and opportunities for making steel a low carbon material choice.

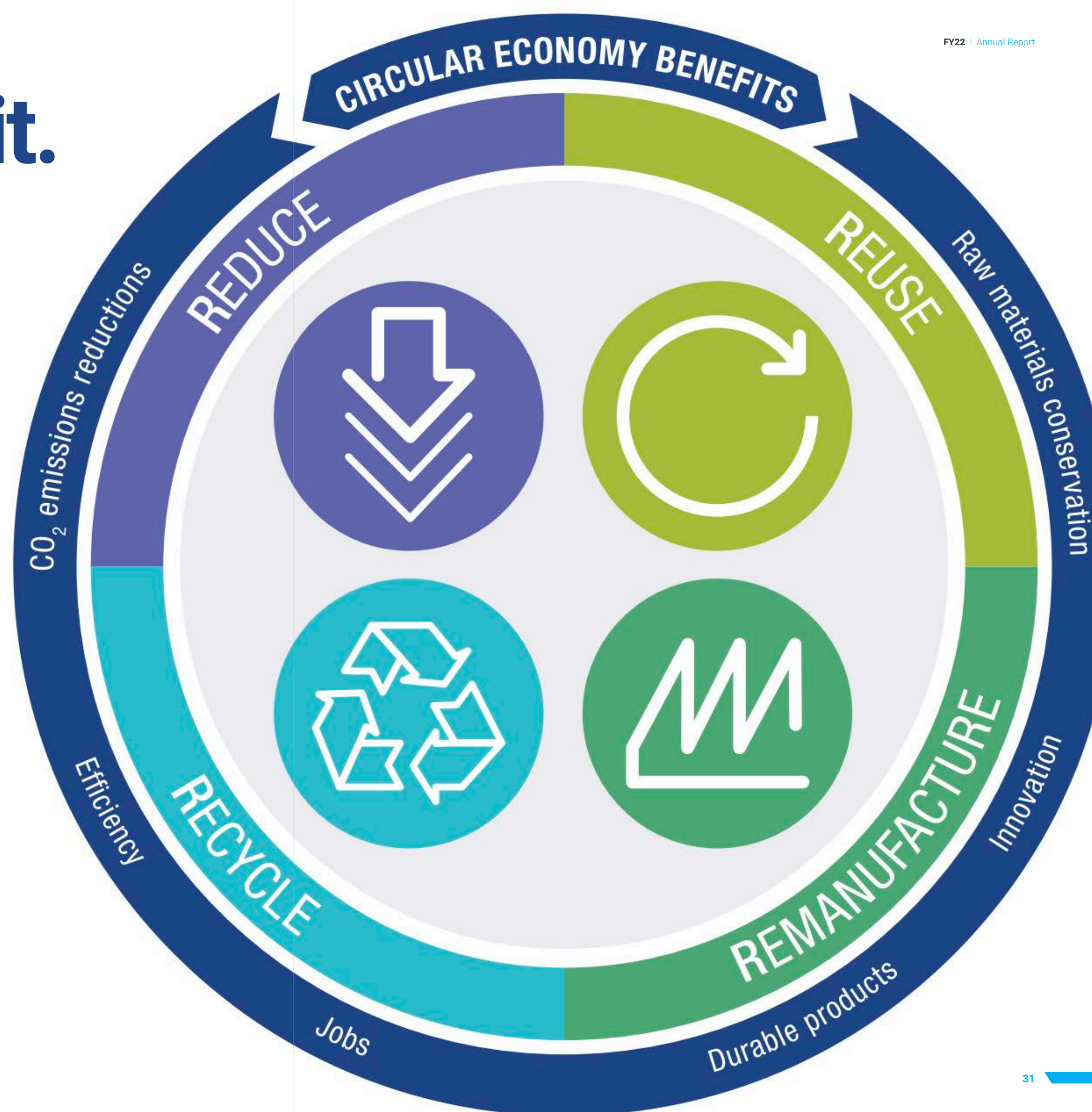
It is hoped this report will be able to create a roadmap or guideline to unlock the sustainability benefits of steel. This project will also provide recommendations for future research in steel sustainability areas.

Green star rating for our Innovation Centre

We are working to get our Innovation Centre build green star rated as part of our commitment to drive leadership in sustainable steel construction. Our durability data collection and wall cavity research are ways in which we can improve our green star rating score, along with product selection and carbon offsetting program.

United Nations Sustainable Development Goals (UN SDGs)

A wero that we have recently taken up, is to view our work through the lens of the UN SDGs. The output of this review was a report authored by IIW Fellow, Chris Smallbone, and our CEO, Troy Coyle, which assessed the initiatives HERA has undertaken to achieve sustainable heavy engineering and our contributions to make positive change globally.





Financial and physical capital



Major economic contribution:

- GDP of \$3.5 billion
- Estimated \$800 million tax contribution
- Exports worth \$650 million
- Contribution growing



Steel is building our nation

- Key input into building, construction and civil engineering
- Public views steel as safe, good value and reliable
- The industry is innovative
- During the past 12 months, the structural steel sector turned approximately 100,000 tonnes of structural steel into buildings and bridges
- Structural Steel Industry has a current capacity of 120,000 tonnes per annum, up by 20 percent over the past 20 years.



The industry is committed to safeguarding and improving wellbeing through:

- Adherence to the Charter of the Sustainable Steel Council
- Development and implementation of the Aotearoa Steel Industry Transformation Plan



Human capital



Employment

- Number of FTE jobs has been increasing over the past 20 years
- 24,056 directly employed
- For every person directly employed in the steel industry, almost a further three are employed in industries upstream and downstream of steel
- Jobs are now more dispersed around the country



Social capital



Trust and confidence in steel

- The public believes the industry can be trusted
- The industry invests significantly in standards development
- HERA Certifications offers third party verification programs



Promoting trust and connectedness to the community

- More than half of HERA's members fund or sponsor community activities and events
- A key focus of the Aotearoa Steel Transformation Agenda and Plan is reducing inequalities
- Another key focus of the Agenda and Plan is ethics and legal compliance



Health and safety

- Employee health and safety identified as a critical issue in the Charter of the Sustainable Steel Council
- Two-thirds of HERA members have apprentices or trainees



Natural capital



Reducing waste

- Steel is infinitely recyclable
- 85% of scrap steel in New Zealand is collected for recycling
- New Zealand Steel recycles 98 percent of the stormwater it collects and the water it uses in its processes



Reducing and offsetting emissions

- The Aotearoa Steel Industry Transformation Plan commits New Zealand Steel to reducing GHG emissions by one percent each year to 2030
- HERA has developed a robust carbon offsetting programme for the steel industry in New Zealand
- The Aotearoa Steel Industry Transformation Plan has circular economy and carbon reduction/offsetting commitments

Source: BERL (2021) The Steel Industry's Impact on Living Standards in New Zealand.

Align to it.

A commitment to the Living Standards Framework

We continue to look at our projects through the lens of the Living Standards Framework (LSF), this year updating our LSF assessment report. The results showed that our industry continues to reflect we are a strong contributor to the NZ economy and living standards of New Zealanders.

This is important for our industry to understand, as procurement will now frequently ask for broader social outcomes and steel's contribution to intergenerational wellbeing.



Advise it.

Technical excellence

Our technical expertise ensures our research and development delivers value.

We're a highly regarded professional organisation that engages with key organisations affecting our industry.

Our staff are currently on the following boards:

- Sustainable Steel Council (Chairing);
- Construction Industry Council;
- Pro Vice Chancellor's Advisory Board (AUT);
- Hanga Aro Rau, Workforce Development Council for Manufacturing, Engineering and Logistics (Co-Chairing)
- MBIE's Building Advisor Panel;
- National Association for Steel Framed Housing (NASH);
- Metals NZ;
- Steel Construction New Zealand;
- HERA Cert;
- Steering Group for Advanced Manufacturing Industry Transformation Plan;
- MBIE's Building Advisory Panel;
- AUT Engineering Industry Advisory Group; and
- Standards committees including: WD-002, WD-003, ME-001, MT014, ISO/TC167, BD-023, BD-032, BD-006, BD-090, ME-029, MT-001, AS/NZS 1170.2: 2021 was published, and AS/NZS 1554 has also been revised with our contribution.

We continue to work on active standards projects for AS/NZS 2327, NZS 3404, and AS/NZS 5100.6.

Technical advice

We support the toughest projects through technical support and services.

In FY22 our team provided technical support to a wide range of needs from the interpretation or application of standards, to technical enquiries requiring indepth technical knowledge and judgement, technology assistance and implementation, design guide queries and more.

Last year we delivered value in:

- weldability issues;
- brittle fracture;
- design of welded joints;
- quality management;
- welding procedures and qualifications;
- compliance;
- welding of reinforcing steel;
- finite element analysis;
- simulations;
- corrosion maps and durability;
- corroded structures;
- composite structures;
- seismic design;
- structural fire engineering; and more.

We also developed and delivered assistance services for SME HERA member companies to help them to establish quality systems in compliance with AS/NZS 5131 CC2.

“ We are trusted for our technical excellence and respected as an impartial partner supporting industry. ”

HERA Certifications is an impartial partner supporting industry.

As the International Institute of Welding (IIW) Authorised Nominated Body for Companies Certification (ANBCC) for New Zealand to IIW MCS ISO 3834, we're able to provide New Zealand fabricators with a world class certification system.

Certify it.

“ HERA Cert is an independent certification service ensuring certified New Zealand fabricators manufacture structural steelworks to international best practice and are held accountable to that standard.

”



**HERA
CERT**

D&H Steel Construction

IIW auditors touring the workshop

All activities of HERA Certifications Ltd are controlled by an independent Governing Board, including representation from our nations fabrication industry and other interested parties.

Certification services are delivered by experienced HERA auditors and technical experts contracted to HERA Certifications Ltd.

The Scheme is fully aligned with the fabrication requirements of the standard AS/NZS 5131:2016 Structural steelwork—Fabrication and erection. It is a vital standard for the structural steel industry that has been cited on the Building Code.

AS/NZS ISO 3834 is a key part of the Steel Fabricator Certification Scheme (SFC), reflecting the significance of the quality of welded connections for the safety and reliability of structures subject to high seismic demand. This part of the Scheme is accredited by the International Institute of Welding (IIW).

Over seven years of operation, we're pleased to share we've successfully been able to certify companies

that have the appropriate personnel and quality management systems in place. In the reporting year, the HERA team performed a total of 61 audits on behalf of HERA Certifications Ltd.

Four new companies have been certified by HERA experts to the requirements of SFC CC3 and 2 to SFC CC2. One company has been certified to AS/NZS ISO 3438.2. One fabricator achieved Certified Fabricator Endorsement to SFC Construction Category 3. More than ten companies are working toward achieving certification.

The SFC Scheme now includes 53 companies certified to CC3 Certified Fabricator, six companies to CC2 and three to Certified Fabricator Endorsement with SFC CC3 representing more than 90% of steel fabricated in New Zealand.

Michail Karpenko
Manager

Michail Karpenko

Digitise it.

If there is one thing that we have learnt post-pandemic, it is that understanding and embracing digital platforms and technologies is a necessary step for future proofing our businesses.

This is further bolstered by our assessment of the economic contribution that increased adoption of Industry 4.0 technologies would have to the New Zealand economy. This report showing that GDP over a five year period could be as much as \$8 billion and wages are likely to increase by almost \$3.5 billion over this period.

It is why in delivering solutions to our industry, a large part of that focus has been in the development of software tools and platforms that improve productivity, accessibility and reachability for our industry.

Software development

Driven to make steel the material of choice for designers, we are committed to collaborating with national and international software developers to simplify the design process for steel and metal composite structures.

This includes:

- underlying research and development of an online corrosivity map which has undergone beta testing and will launch early FY23;
- updating the slab panel method software to allow designers of steel framed buildings to value optimise the fire and structural engineering to reduce expenditure on applied fire proofing to parts of the structure that aren't required;
- release of our beam and slab software according to AS/NZS 2327:2017-Amd 1:2020 with new functionality that includes fire design of composite beams and serviceability limit state checks.

Finite element analysis

We continue to use general purpose Abaqus software for realistic simulations to help solve complex structural engineering problems for our industry.

Digital communications

Last year we successfully launched our members only app MetalMind with collaboration, technical support and value at its heart. Testing to a select number of users has now been complete and has been rolled out widely to membership with 227 users now on the platform.

We hope to grow the value of this platform by exploring how we can give members exclusive access to our technical advice.

Our digital media room Pūtātara has gone from leaps and bounds and allowed us business continuity when it came to communicating through the delivery of our Stirring the Pot podcast and digital communication services to our industry.

Digital delivery

A major focus has been the transition of our training to digital platforms. This pivot has allowed us to offer our technical training to more people, and more frequently throughout the year with online courses and webinars.

“Going digital has allowed us to modernise our processes, accelerate efficient workflows and increase profitability.”

Publish it.

A part of HERA's role is to facilitate connection, collaboration and knowledge sharing for our NZ metals industry.

Our library resources are valued by our members and industry. It is why, we continue to deliver reports, design guides and publications to keep industry up to date with the latest standards, research and technical guidance to design and develop safe, resilient and cost effective structures.

Structural Systems design guides

R4-131:2022, "Design of Composite Steel Floor Systems for Severe Fires (slab panel method (SPM) design guide)" - a new design guide delivering an advanced technical solution for cost-effective construction with increased sustainability and safety of buildings in severe fires.

HERA Guidance and corrections to clauses in AS/NZS 2327:2017 Amd1: 2020 - which provides a commentary guide to use the most recent version of Composite structures standard- Composite steel-concrete construction in buildings (AS/NZS 2327). The report was submitted to standard Australia and was used to develop scoping document for AS/NZS 2327.

R4-156: "Seismic design of moment resisting steel frames" is the result of significant edits to the Moment Resisting Frames (MRF) section of HERA Report R4-76, to account for changes to NZS3404 and NZS1170.5, as well as take into account lessons learnt in the Christchurch earthquake series and a number of other research papers. This guide follows the capacity design procedures from NZS3404:1997 including amendments 1 and 2. The design guide also includes a capacity design based worked example of a multistorey steel framed building and the determination of the seismic and gravity design actions of the 4-storey building following an equivalent static approach.

R4-157: 2022: "Design recommendations for API 5L columns derived from capacity factors calibration" summarises and discusses the research work published by past studies in international journals for calibration of capacity factors and evaluates the sensitivity of capacity factors for SWTs with different permitted manufacturing tolerances. This provides a simplified design guideline, so engineers and professionals can use the procedure in practice.

- Weathering Steel Bridges – An Australasian Experience, Abstract submitted to Austroad 2022.
- Steeling ourselves for a sustainable future, Abstract submitted to IPWEA Conference.

Welding Centre

HERA Report R8-43:2021 The use of effective full penetration of T-butt welds in welded moment connections.

Adolf F. Hobbacher and Michail Karpenko: Provisions for avoiding brittle fracture in steels used in Australasia including effects of seismic action, Welding in the World, Springer 2022.

HERA Technical Guide No 04:2021: Commentary on the stud welding standard AS 1554.2:2021.

Industry focus

R5-89 – Steel Recycling Report (VK Soo, C Chandrakumar, E Townsend) November 2021.

R5-90 – State of art of industry 4.0 literature review (H Ngo) September 2021.

R5-91 – The potential business and economic benefits of Construction 4.0 in NZ – a literature review (M Cox) July 2021.

R5-92 – Modelling the potential economic impacts of Construction 4.0 in NZ (K Hurren, N Robson, M Cox) September 2021.

R5-93 – HERA's role in progressing the UN SDG's (C Smallbone, T Coyle) December 2021.



WHAKATAUKI | PROVERB

**Whaiwhia
te kete
mātauranga.**

**Fill the
basket of
knowledge.**

Education and knowledge sharing is important. It ensures people fill their basket with knowledge which is something that is important to HERA - because we know, this means we are filling the collective basket of our industry at the same time.

Create it.

Building a skilled and strong workforce.

Everything we do is to ensure we're a New Zealand that supports our metals based industry.

We want our members to be employers of choice, and to be optimising cost effectiveness through productivity and efficiency.

That is why, a core focus for us is providing training and support so they follow global best practice, are evaluating and adopting new technologies for commercial success, and are recognised for their outstanding commitment to quality.



HERA seismic research

Seismic tests at the University of Auckland

Structural training and support

Our structural team has stepped up in the training space this past year, developing digital training materials to support greater understanding in moment resisting steel frame design, design of composite beams and slabs, and weathering steel for bridges and building applications.

Out of the webinars developed and presented by our Structural team, 277 professionals across Aotearoa and Australia attended. The webinars were:

- Optimised Sliding Hinge joint - Design and detailing a low-damage seismic solution for steel moment resisting framed buildings;
- Weathering Steel for Bridge Engineering applications;
- Design of composite beams and slabs using HERA composite software webinar;
- Slab Panel Method live stream; and
- Seismic design of moment resisting steel frames (MRSF).

Welding focused training and support

Job knowledge training for welders

For more than 20 years, we've supported welding-

education programmes by providing a range of welder training modules. This year was the first time we pivoted our delivery methods to an online offering for our Job Knowledge Training to AS/NZS ISO 9606.1.

This 20 part modular e-training scheme for the joining of materials is fully aligned with the job knowledge requirements of AS/NZS ISO 9606.1 and our qualifications framework, and provides certification once the online training is completed, and the online test is passed.

Qualification and examination

Our popular Welding Supervisor and International Welding Inspector courses are offered biannually in Auckland and Christchurch, offering an opportunity for motivated people in the industry to seek ongoing professional development and to increase their value. In FY2021-22, we helped 40 professionals achieve their AS 2214 Welding Supervisor qualification and four achieve their IIW Welding Inspector qualification.

What every engineer should know about welding!

To ensure that the welded steel component or structural steelwork is fit-for-purpose, engineers need to be familiar with key aspects of quality management in welding fabrication including: welding procedures, weldability of materials, applicable standards, weld inspection and quality

as well as the roles and responsibilities of parties involved (design, fabrication, inspection). In response, we developed a nine part webinar series to help, with 49 professionals attending various modules.

Advanced weld design webinars

To disseminate the latest research results achieved in our Seismic Research Program, we developed and offered a webinar for engineers on Specification of the Effective Full Penetration Butt Weld (EFPBW) detailed in HERA Report-R8. There were approximately 300 attendees online, with a further 83 viewing the follow-up webinar on implementation of the EFPBW.

Welding Innovations Network (WIN)

We have joined CWB Canada, SAIW South Africa and IWI India as part of an international cooperation to offer online expert training. The first WIN e-course 'Principles and methods for the design of welded structures' was delivered by Professor Pingsha Dong, University of Michigan, USA in four modules of which 40 professionals from Australasia attended online.

Structural steel inspection for welders

Following requests from industry, a new e-training course 'Inspection for Welders – Structural Steel Welding to AS/NZS 1554' was developed with eight 'on demand' online training modules. We were

pleased to have 52 professionals attend.

Welding qualifications under Level 4

We've provided expertise to Competenz to develop and update new welding qualifications for the New Zealand Certificate in Welding Level 3 and 4. This qualification provides the engineering and manufacturing industries with trained individuals who have attained the knowledge, understanding, and practical skills required to safely and effectively carry out basic welding tasks.

The qualification has been designed for individuals who are interested in a career in welding, or for those already working in the industry.

Site erector presentations

We have developed expertise in the assessment of site erectors to the requirements of AS/NZS 5131 and SFC, giving a series of presentations on the SFC Site Erector Certification programme around the erection of structural steelwork which consists of the assembly of steel components into a frame on site, which involves lifting and placing components into position, then connecting them together.

SFC CC2 beginners workshop

The Steel Fabricator Certification Scheme is rapidly growing. To help the new SME members to get started, we delivered a SFC CC2 beginners workshop on behalf of SCNZ, where we had more than 30 industry representatives attend the event.



Volkan Yakut | Senior Welding Engineer

Delivering technical training at HERA House

Teach it.

WHAKATAUKI | PROVERB

**Poipoia te
kakano,
kia puawai.**

**Nuture
the seed
and it will
blossom.**

At HERA we know that a bright future is contingent on how well we foster and support our future engineers.

Lead it.

We have expertise where it matters!

FY22 has been a rewarding and successful year for HERA - and this is because of our people!

We have continued to embrace a flexible work policy which has allowed our team to work from both the office and home. We have also revised our digital behavior to act more sustainable and smarter.

Our team continues to grow, particularly to support our efforts to increase our technical expertise and offerings.

We created a new position in structural fire research engineering, welcoming Fanqin Meng to the team on a fixed-term basis, as well as welcoming Structural Engineer, Reza Kordani. Reza is the replacement to Andrew Pennington, and is an expert in software development, so it is expected he'll enhance our team capability in design tool development.

We have also invested in skills development, increasing our offerings in finite element analysis in life cycle analysis, as well as placing our Welding Centre Research Engineer, Holger Heinzl, through training to become a certified Industry 4.0 assessor.

Our Innovation and Transformation Architect, Greg Buckley also put himself through study - achieving a Postgraduate Certificate in Connected Environments, which we're sure will significantly help inform our Innovation Centre works moving forward.

Sadly, we said goodbye to HERA mainstay - Senior Welding Engineer, Alan McClintock, who retired at the end of this financial year. His expertise in consulting for welding processes, weldability and quality management - including codes and standards for structural, transport, marine and pressure applications will be a big hole to fill!

“ We share our ideas and knowledge and value the contributions of others. We are seekers of diverse perspectives. ”

Our values
Collaboration & respect

Commitments to health and safety

The way in which businesses operate have significantly changed as we navigated the way we live and work with Covid-19 in our communities. We have remained as agile as we can, developing risk assessments and health and safety plans to keep people in HERA House safe, whilst also respecting an individual's choice to be vaccinated or not. This has resulted in a digitised register to track visitors onsite on a daily basis, and the adoption of Covid-19 scanning protocols.

We have also welcomed policy change to include Covid-19 related sick leave in order to accommodate Ministry of Health guidelines to self isolate.

Events, conferences and presentations

Key presentations:

- Decarbonising New Zealand, Brightstar conference;
- Zero Carbon Steel, LCA New Zealand conference;
- Tech Week TV: The Value of University and Industry Partnerships Panel;
- Innovative Young Minds IRANZ Panel (women in STEMM).



Alan McClintock
Senior Welding Engineer



Rebecca Symonds

Manager Customer Experience

Foster it.

“Our student membership continues to grow, and we are working hard to create opportunities for them.”

Rebecca Symonds
Manager Customer Experience

Where we can, we try to create connections with our future engineers.

Last year, we supported a number of initiatives run by students, for students and about students.

Whanake Scholarships

We continue our commitment to support Māori students to achieve their dreams of becoming engineers. This scholarship is targeted at Māori students in their first year of a four-year Bachelor of Engineering degree.

We believe having genuine interactions with young Māori and their unique view on the world is very important for the future of our industry. This is an area that we want to actively extend our industry's capacity, by creating a more diverse and attractive industry that Kiwi's work with – and for.

This year we supported Sarah Lewis, Lily Sanson, and John Cole in collaboration with the Māori Education Trust.

MECHA for wellness

We were pleased to sponsor this year's University of Auckland's MECHA wellness event which was designed to give support to its engineering students and drop the stigma around looking after mental health in the lead up to exams.

This event was created by students noticing the lack of aid specifically for mechanical and mechatronics engineering students. We were proud to support this event given that mental health is something that all businesses are needing to think more deeply about

when it comes to the health and safety of their teams.

Raising student profiles in industry

A new initiative we have started, is to step up the connection points our student membership have with our members. We are now releasing regular student profiles in hopes to foster potential touch points for work experience, mentorship opportunities and similar.

Final year project sponsorship

We were proud to sponsor the latest University of Auckland final year project this past year.

This year awarding the prize to students Emily Horning and Unmesh Vanka who worked under the supervision of Jan Polzer to successfully develop a smart, mechatronic system to optimise the production of pipes.

This was in collaboration with Auckland-based company Spiraweld Stainless Ltd who produce spirally welded stainless steel pipes. The goal of the project was to better align the weld torch with the weld seam, and cut down on fabrication time for them.

The system the students developed used a vision system to detect the location of the weld seam in relation to the weld torch, and use an electric motor to make automatic adjustments to the position of the weld torch as required.

We were also happy to support Auckland University of Technology's Engineering, Computer and Mathematical Sciences Awards – awarding our HERA Woman in Engineering Award to Justine Schwieters.

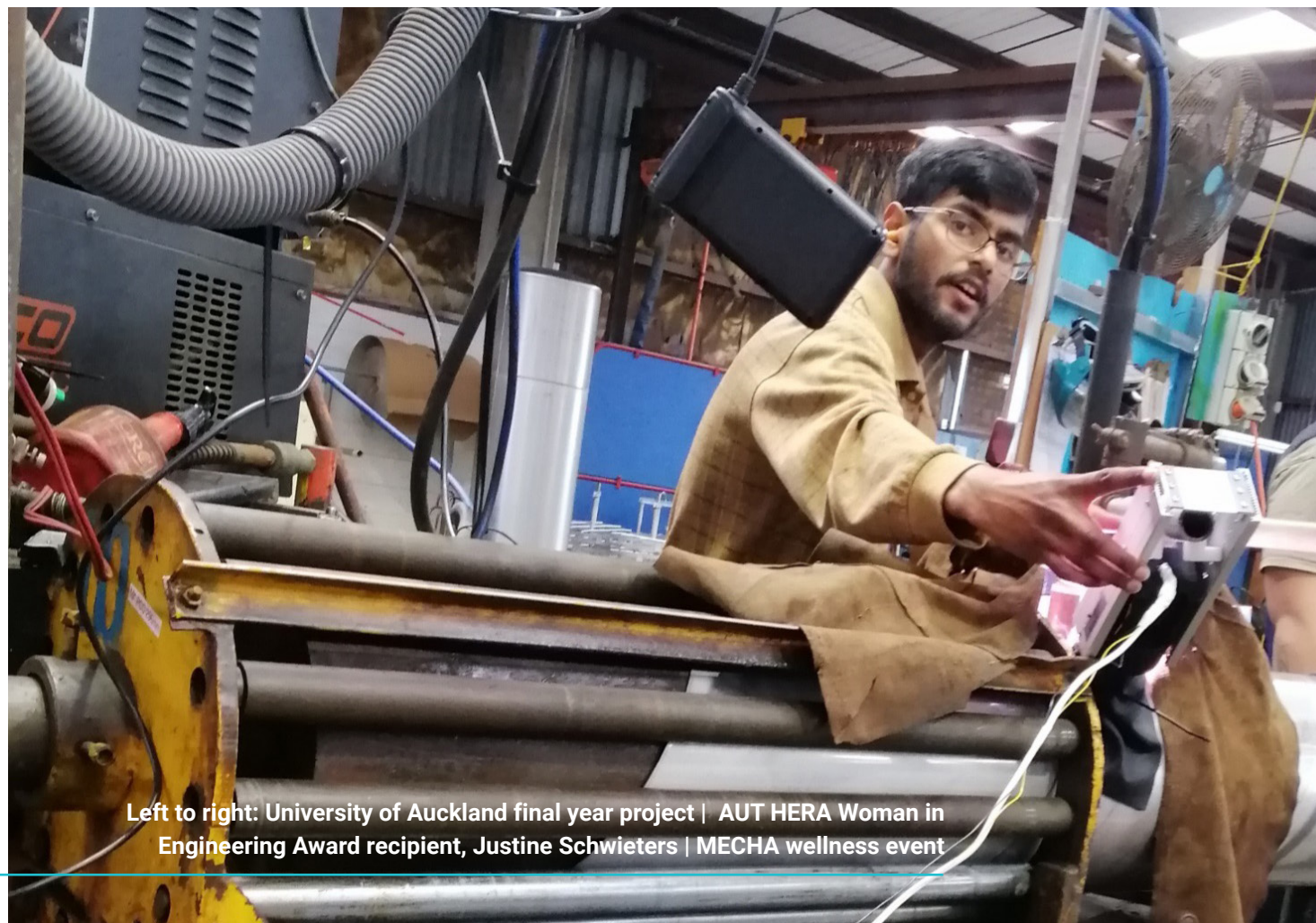
Join it.

Our student members

Across Aotearoa, we have welcomed 123 students to our membership:

- 8% represented by students from ARA, Dalian, Fiji National, Massey University, Unitec, University of Waikato, Wellington Institute of Technology, and Weltec;
- 35% from the Auckland University of Technology;
- 4% from the Open Polytech;
- 26% from the University of Waikato; and
- 27% from the University of Canterbury.

We hope in the coming year we can increase student connections across Aotearoa, and also create a programme of activities that provide greater value to this membership offering.



Left to right: University of Auckland final year project | AUT HERA Woman in Engineering Award recipient, Justine Schwieters | MECHA wellness event



WHAKATAUKI | PROVERB

**Waiho i te
toipoto,
kaua i te
toiroa.**

At HERA we know that the key to building a tribe of metal heads is making sure that we are all connected, informed and aligned for the betterment of all.

**Let us
keep close
together,
not wide
apart.**

It is important to keep connected, maintain healthy relationships and a flowing dialogue so we move forward together.



Connect it.

We are building a tribe of passionate metal heads.

We want our members, stakeholders and our wider industry to create a community actively engaged and collaborating.

One way we have been working to achieve this, is through our digital media room - Pūtātara, by helping businesses to pivot their operations by leveraging digital communications as the key tool.

Pūtātara is the conch shell Māori used to signal a message was coming. Similarly HERA's Pūtātara, is home to all the digital content and communication tools your business needs to tell the world about what you do. Its main aim is to provide the support and resources you might expect from a digital agency but with the added benefit of industry insight and messaging.

Greg Buckley | Innovation and Transformation Architect

Creating digital content in our Pūtātara media room



Kim Nugent

General Manager Comms 4.0

Share it.

“

HERA plays a crucial role as a thought leader - we have to intrigue, challenge and inspire our industry.

”

Across our business we have focused on offering guidance, insight and advocacy in key areas of importance.

This has influenced the content that we share across our communications.

Advocating materials equality

One key area that we have been challenging in our communications is to ensure that Government policy does not lead to the preference of one building material over another in the race to reduce carbon emissions.

We have been asserting in our advocacy that evidence needs to form the basis of decision making and that the whole life cycle performance including end of life scenarios must be used to evaluate sustainability.

There are numerous areas where steel is a sustainable choice, particularly when it comes to comparative issues such as treated timber and its end of life scenarios, arsenic impacts and leaching in landfill.

We have also called for an approach where evidence needs to form the basis of decision making. We support choosing the right material for the right design, versus policy that might place one material as superior over another.

This has lead us to share articles that highlight research conducted around the world which demonstrates that alternate materials such as concrete and steel can often offer more affordable and safer options to laminated timber or treated timber - particularly in multi-storey buildings.

- *Research and evidence gaps on fire performance challenged*

- *Study shows cast-in-place reinforced concrete more affordable than cross laminated timber in a US-based 10-storey building;*
- *Fire and burn out resistance of timber columns.*

Sustainable steel

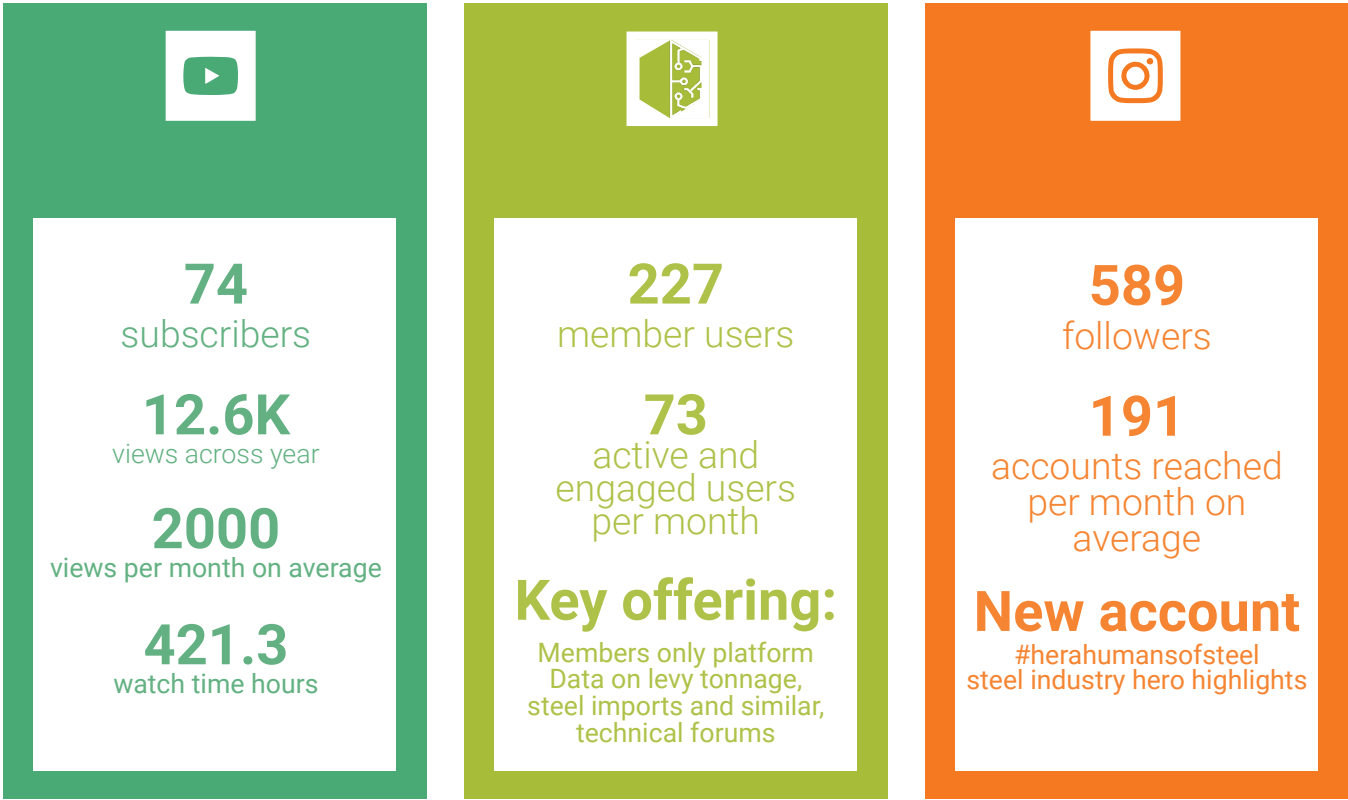
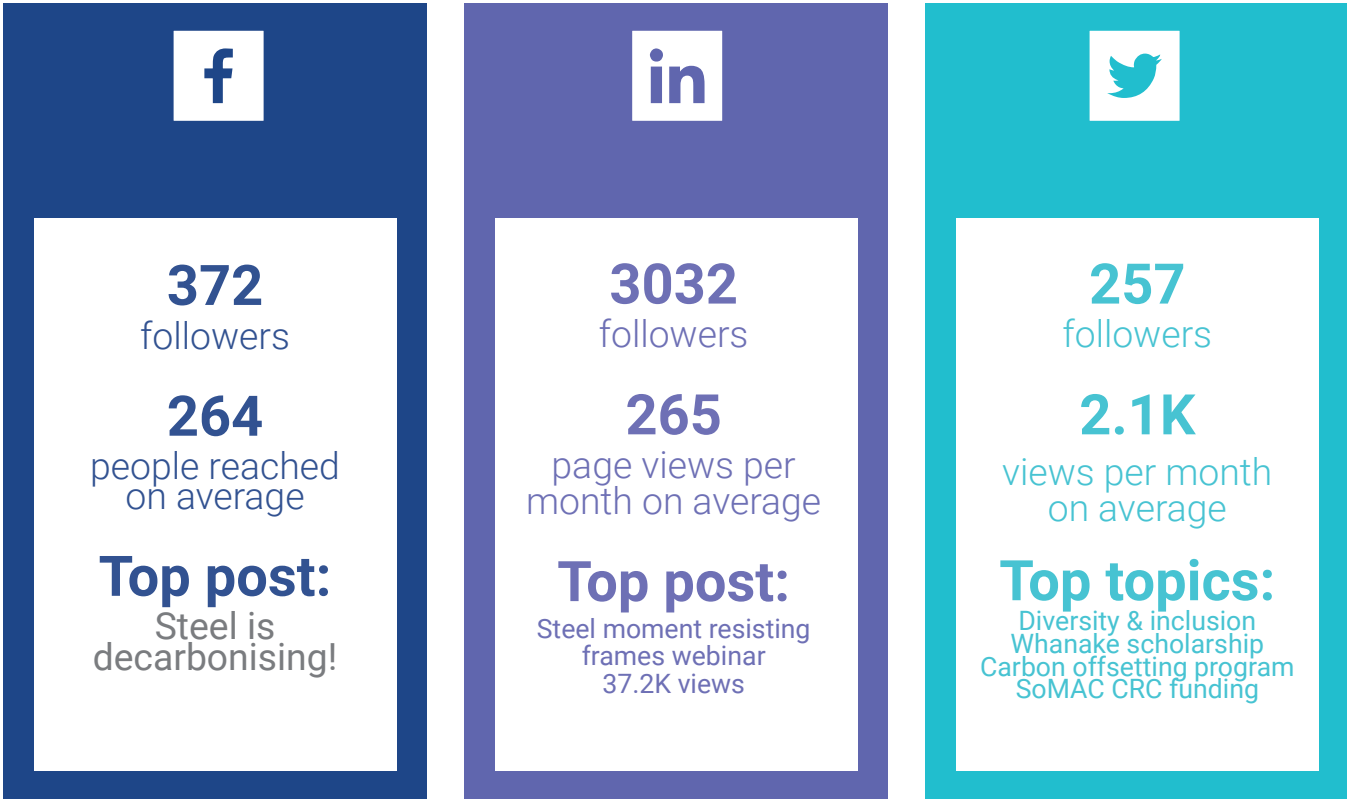
One way we have worked to support materials equality, has been to better communicate the sustainability credentials of steel as we work to combat a lot of incorrect assumptions about the carbon performance of steel.

Key content releases have been around the release of our research into steel recycling, and subsequent updates to this report later in the year, as well as the update to our Living Standards Framework report, and release of our United Nations Sustainable Development Goals review.

We were also proud to share a *break through next step into alternate reductant research* being conducted out of Victoria University - which will provide a homegrown solution to steel decarbonisation being delivered in collaboration with our industry.

To assist engineers and specifiers to understand steel from a sustainability standpoint, we've also developed a *'frequently asked questions' resource* as a quick reference to improve understanding of sustainable steel in construction.

We are also introducing the concept of *'materials passports'* to help society reimagine how valuable materials are tracked and recycled, which in turn offers a healthy sustainability solution for structural engineers.



Key updates to HERA operations

One thing we work to achieve, is to be transparent around the work we do for our members and industry.

This is why this past financial year we shared some key changes to the HERL Act. This was the result of working with the MBIE innovation policy team and Customs for quite some time, and was pertaining to levy rates and levied items which had been dropped from levy due to changes to the statistical reporting codes to some of the tariff items covered in the HERL Act.

As a result HERA had missed out on levy collections for these items (mainly RHS categories), and the industry as a whole has missed out on investment exceeding \$300K into heavy engineering support.

The legislative changes fix this administrative issue so that the levy can again be collected on these items and invested, through HERA, into industry support.

This year, we also announced a new membership offering for our smaller sized members!

This new tier is within our Platinum (Ordinary) category and comes in direct response to feedback received from sole practitioners and smaller firms who

have struggled to join this paying membership due to financial restraints.

The payment tier recognises businesses that have staff numbers of 1 to 3 people working within heavy engineering, at an apportioned fee, which makes it easier to afford.

We hope this will provide an entry level for such companies to gain the great benefits of HERA membership moving forward.

Another initiative we have also started is to share the submissions that we put forward across the year that are relevant to our mahi or the industry we represent.

The first one we have done this for, was a submission for MBIE's Te Ara Paerangi Future Pathways Green Paper, which looks to transform the current RSI system.

New Zealand's research system was designed nearly 30 years ago, and some parts of the system are not working as well as they should be. Te Ara Paerangi Future Pathways is a multi-year program focused on addressing that, by looking at what the future of New Zealand's research system looks like.

Diversity and inclusion

We continue to challenge our industry to embrace diversity and inclusion within the workplace.

There are many reasons why we feel this is an important space to advocate in, but some key ones are that diversity in thinking is the pillar to innovation within our industry. Diversity is also an answer to how we can address the skills gap and labour shortages that many of our members are experiencing.

It is fair to say that there is a perception that the New Zealand metals industry is male dominated and if you believe the stereotypes 'old and white'. The truth is, that there is some truths to this - particularly in the leadership of organisations, but it also fair to say that we are starting to see change. The latest insights from the Diversity Agenda Accord survey showing that the number of women working in firms is up 2% to 41.4% within Accord signatory businesses.

Despite these changes, there is still room for improvement, so we always ensure to highlight the wahine in our industry on

Follow it.

International Women's Day and Women In Engineering Day #INWED21 - and every other day!

We are also very passionate about challenging thinking around mātauranga Māori and Te Tiriti o Waitangi. We believe that to be true Te Tiriti partners our governance models need to change, and our people, members and industry need to understand their role in making sure this happens.

To achieve this, we need workplaces that are inclusive of Māori and embrace the knowledge they bring to the workforce.

We are also working strongly in the space of age diversity, having started our student membership category two years ago to start fostering this relationship. If we want future engineers to work in our industry - they need to know that their values align with ours, and that their viewpoints are heard.

All in all, we have much work to do in this space - so keeping the spotlight on this conversation is crucial to keep change occurring.

WHAKATAUKI | PROVERB

**He aha te
kai a te
rangatira?
He kōrero,
he kōrero, he
kōrero!**

**What is the
food of the
leader?
It is talking,
it is talking,
it is talking!**

To be thought leaders for our industry, we must communicate.

Inspire it.



Ep.43 | Troy Coyle
Six reasons why steel is the future!



Ep.44 | Anna Radford
Amplify your voice with key messages



Ep.47 | Rob Campbell
The threat of change for human kind



Ep.48 | Nicky Smith
Engineering a change of culture



Ep.49 | Renata Hakiwai & Troy Coyle
Te Tiriti at play in governance, Part 1



Ep.52 | Motu Bridge project team
A history remembered - Motu Bridge Pou



Ep.53 | Mahonri Owens
Challenging the status quo, Part 1



Ep.54 | Paora Tapihana
Challenging the status quo, Part 1



Ep.58 | Scott Morrison & Laura Coffey
Spreading the #sustainablesteel word



Ep.59 | Jordan Akhurst
Inclusion, transformation, collaboration.



Ep.60 & 61 | Joe Te Rito
Move your mentality from the 1940's

Practical conversations that challenge, inspire and inform our industry - www.hera.org.nz/podcast/



Ep.45 | Nathan Larkin
Bringing robotic automation to industry



Ep.46 | Ceinwen McNeil & Matt Bishop
The new age of engineering



Ep.50 | Phil Hokianga & Graham Burke
Te Tiriti at play in governance, Part 2




Ep.51 | Ben Jensen & Jayden Mellsop
Through the eyes of our future leaders



Ep.55 | Hilary West-Reeve & Eldon Reeve
Remove the 'fill' from landfill!



Ep.56 | Mark Cox
The economic case for Construction 4.0



2.4K
downloads

22
episodes
released

Top posts

Diversity & inclusion
Mātauranga Māori
Te Tiriti in governance
Industry 4.0



Ep.57 | Sam McNaughton & Phil Alexander Crawford
Cultural transformation for industry



Ep.62 | Tane van der Boon
Take a stand against safety complacency



Ep.63 | Amy Barrett & Margaret Devlin
Ticking the diversity box?



Ep.64 | Chris Smallbone
SDG's - a blueprint to a sustainable future?

Announce it.



A key strategy for HERA this year has been to position ourselves more in the national conversation, and our industry as a thought leader.

65K
people reached

for content focused on: our seismic construction lessons post Christchurch earthquakes and the impacts of our research in this space for more resilient structures, and the release of our new software tools in composite design.

1.7M
people reached

for content focused on: our Fab4.0Lab showcasing cutting edge research and technologies, report showing adoption of Construction 4.0 could boost GDP by \$8b, steel industry leading the charge into the digital era, and Industry 4.0 technology proposed to ACC for health and safety initiative.

137K
people reached

for content focused on: our announced sustainability research fund and projects backed, the future of steel in New Zealand and the seven steps to becoming a global low-carbon exemplar, steel as the hero of the circular economy with 85% of steel in construction being recycled, and supporting the United Nations Sustainable Development Goals.

824K
people reached

for content focused on: calling for science to lead the way in choosing materials in a project versus policy mandate, questioning a potential Wood First policy by challenging whether wood is as sustainable as they say, by exploring fire performance, multi-storey construction and end of life scenario research.

135K
people reached

for content focused on: profiling the leaders of our industry and the work they do, including our own CEO, Troy Coyle, as well as D&H Steel Construction Managing Director, Wayne Carson, and Steel & Tube Chief Digital Officer, Mike Hendry.

36K
people reached

for content focused on: raising the mana of Mātauranga Māori as science, our aspirations to increase the number of Māori engineers in our industry, the intersection of mātauranga Māori and Construction 4.0, honouring Te Tiriti o Waitangi in governance, advocacy for #breakingthe bias in industry career paths.

R&D focuses

Industry 4.0

Sustainability

Materials equality

Industry spotlight

Diversity & inclusion



Dream it.

The work we do, is aimed at future proofing our industry.

To do this job well, we need to be the industry futurist who looks ahead to determine future trends, disruptions and innovations - so we can prepare our industry for them.

It is this future thinking that always determines the projects we focus on, and the future investment we make in research.

Holger Heinzl | Welding Centre Research Engineer

Delivering training in our Fab4.0Lab



“ Our HERA report shows that the adoption of Construction 4.0 could boost New Zealand’s GDP by as much as \$8 billion. ”

Troy Coyle
CEO

Revolutionise it.

Industry 4.0 is driving unprecedented transformation globally.

New technologies promise to save time, boost productivity, reduce waste, expand business models, and be more responsive to fast-changing environments and consumer demands.

It is why, a strong focus on Industry 4.0 is part of the mahi (work) we are doing to future proof our industry.

Our Industry 4.0 roadmap & Welding 4.0 research

The world is currently experiencing the Fourth Industrial Revolution.

On a manufacturing level, this means that information about a product or production machine is captured, digitised and shared. In turn, this information can be processed and analysed by computers to support and optimise decision-making, execute tasks, self-diagnose and more.

The premise is that companies that have integrated these technologies in their business and fabrication models will be more productive, faster innovating and ultimately more profitable.

To assess the current state of Industry 4.0 readiness of our members, we’ve conducted several R&D projects, assessments and related activities and products. These include automation audits, Fabrication 4.0 audits, our Welding 4.0 research program and six Industry 4.0 cluster group events to transfer technology. We have also developed a case study project demonstrating the advantages of offline programming of welding robots.

We have also done some renovations and technology upgrades in our Fab4.0Lab - acquiring a cobot, laser scanners, virtual and mixed reality technology, 4.0 data loggers, 3-D printers and similar.

The economic benefits of Construction 4.0

We have identified a need for greater uptake of Industry 4.0 technologies to improve productivity in the construction industry.

The logical starting point to bring our industry on this journey and capture the imagination of the construction sector more generally was to quantify the value of doing so.

It is why we commissioned BERL to determine the

economic contribution that increased adoption of Industry 4.0 technologies would have to the New Zealand economy.

The key findings were:

- GDP will be boosted and over a five year period could be as much as \$8 billion and, even our most pessimistic forecasting revealed a \$4 billion increase, compared to the base scenario.
- Wages are likely to increase of almost \$3.5 billion over the five year period.
- The benefits will be felt most by those in the middle-income bracket and is marked by higher incomes and consumption. This reflects the particular mix of people employed in the construction sector
- Government spending can evolve. With more money, the government can invest in large-scale infrastructure and wellbeing projects.
- The construction industry would benefit; so too would other industries along the supply chain, from logging to the users of commercial buildings.

This year our Structural team have also submitted a

proposal on Construction 4.0 for Endeavour funding, in which its research sub-programs will include circular design and Monitoring 4.0. We are currently waiting for confirmation on if we were successful or not.

Industry 4.0 in health and safety

HERA currently has 250 member organisations with around 25,000 workers in total, which equates to an approximate ACC cost per annum of nearly \$22m.

That is why, this year we have worked with industry partners to submit an expression of interest to ACC’s Injury Prevention Fund, specifically relating to innovation to reduce harm and injury in the workplace associated with psychosocial and mental health risks.

We have since submitted a full proposal explaining how these risk factors could be reduced in sectors relating to our organisation through the use of Industry 4.0 technology to ultimately improve employees lives.

If successful, this will be a three-year programme of work focused on the deployment of wearable technology to track biological and physiological markers among employees who work in fields where heavy machinery is operated.

WHAKATAUKI | PROVERB

**Kei ōu
ringaringa
te ao.**

**The
world
is yours.**

To be thought leaders for our industry, we must communicate.

Honour it.

Mātauranga Māori is a living resource.

It is a body of knowledge that has been accumulated over time and continues to develop and grow in response to our changing world.

Unlocking the potential of this knowledge base in research and innovation is undoubtedly beneficial, but more crucially, recognises Māori as important partners in shaping the future of Aotearoa.

The unique relationship between Māori and the environment can not be underestimated, and can help make the welfare of our environment part of everyone's personal journey.

This is because Māori have a deep connection to the physical world around them through their whakapapa, or genealogical origins, evolution and history. This relationship to the natural world comes with deep responsibility and connection not only for the 'now' but the '500 years from now'. This is a concept that HERA embraces wholeheartedly in our own vision to secure tomorrow's industry by innovating today.

Bringing mātauranga Māori into the every day.

Our team continues our journey to deepen our understanding of mātauranga Māori and build a genuine relationship with Māori which honours our commitments to Te Tiriti o Waitangi. Our team is now undertaking learnings in not only Te Reo Māori, but also Te Tiriti, tikanga and Māori connections to engineering. Where we can, we sprinkle Māori into our every day communications such as email signatures, our website and of course our annual report!

A key focus of our communications has been to raise the mana of mātauranga Māori as a science and advocate for Te Tiriti o Waitangi governance models and increased diversity through more Māori in engineering.

The intersection between Mātauranga Māori and Construction 4.0

We believe Construction 4.0 could benefit from the interface with Mātauranga Māori. This is because the unique epistemology of Mātauranga Māori holds value that is not widely represented in many of the physical, applied and practical sciences within New Zealand.

“The unique epistemology of Mātauranga Māori holds value that is not widely represented in many of the physical, applied and practical sciences in Aotearoa.”



In this sense, it offers a valuable management tool for design, construction, monitoring, policy, and planning perspectives. Achieving inter-connection and data driven decisions that also take into account mātauranga Māori provides an opportunity to start out with a more inclusive approach and with broader thinking than we would typically apply to a new endeavour.

We are partnering with the Pūhoro Charitable Trust and AUT to deliver this project in developing new ways of doing research. There is certainly a lot of Māori knowledge that is being missed in the typical research process and it is a failure of the prevailing research paradigm that indigenous knowledge is typically under-utilised or unacknowledged.

Ngā Ara Mahi - career paths proposal

This year, we had submitted a proposal through to the Equity, Diversity and Inclusion Capability Fund overseen by MBIE and were notified as being successful.

However, we could not accept the funding as the MBIE contract did not adequately reflect obligations to Te Tiriti o Waitangi.

This project was considered important, because Māori will represent approximately 30% of the workforce

by 2030, but currently represent less than 2% of the scientific workforce.

This project seeks to improve this metric by increasing rangatahi (youth) engagement in STEMM careers by mapping core values in a te ao Māori context to potential STEMM careers.

The hope is, from this research we will be able to develop a values-based career matching App for rangatahi, to assist rangatahi to relate to STEMM ara mahi (pathways) that suit their personal world views, and imagine STEMM career options in a way that they can connect with.

We are now working to deliver this project in collaboration with the Pūhoro Charitable Trust, and are now seeking alternative funding mechanisms that will better protect the associated mātauranga Māori.

Pūhoro have existing links with more than 1500 rangatahi who are actively pursuing STEMM pathways which make them a perfect lead in this mahi (work).

On this funding pathway, we have already learnt so much. One of which, is that we need to investigate a way in which mātauranga Māori intellectual property is well protected, and the kaitiaki of any learnings from it are properly attributed to Māori partners.

There is much decolonisation required in current business practices to ensure such areas are addressed.

A mātauranga Māori framework for industry

Many of our members want to embrace the cultural learnings of Māori into their workplace - but simply don't know how to make that happen.

What has become clear, is that there needs to be a bridge created between Te Ao Māori and Te Ao Pakeha, which enables both parties to come together in true partnership. In essence - we need to create a middle ground where both parties can communicate meaningfully, where each cultures viewpoints are heard and understood, so projects, people, and community can move forward together.

This has resulted in the creation of a project which looks to develop a Mātauranga Māori accreditation framework for the heavy engineering industry. Our vision is this would lead to a series of practical learning modules that businesses are able to take, in order to achieve accreditation and signal themselves as a business aligned with Māori and being true Te Tiriti o Waitangi partners.

This project is in its early stages, having partnered with Tūtira Mai to progress forward in FY23.

Photo: Sara Orme

Whakairo at Te Oro

Segment it.

Our members

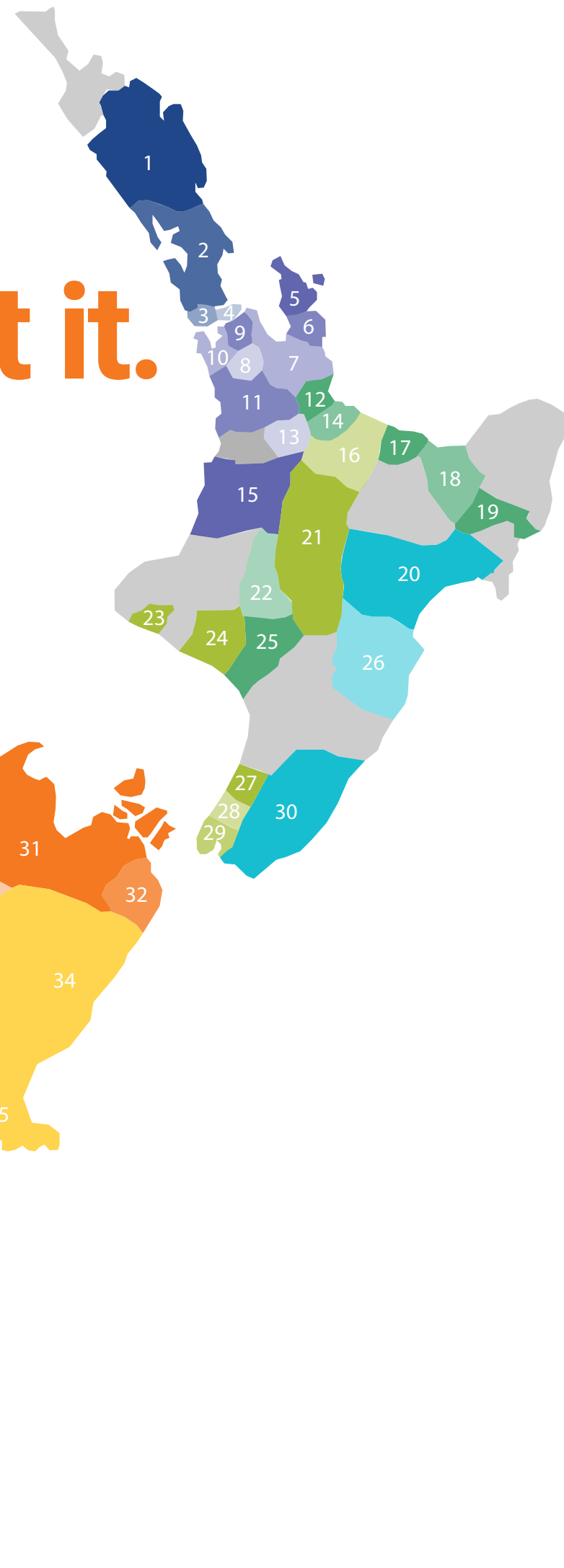
Our tribe of metalheads currently sit at 664 member companies.

This year welcoming 39 new member companies and 123 new student members to our fold.

An aspiration we hold, is that moving forward we find a way to meaningfully forge relationships across our membership, but also to help our members to develop meaningful relationships with their own local iwi.

We know a true partnership starts with connections, so our first focus has been to understand where our members are located across Aotearoa so we can identify who their local iwi might be.

Part of our mātauranga Māori project will be to facilitate programs and events that bring them together in the future.



1. Ngā Puhi - 10 members

Platinum members - CCL 2015 Ltd (Cook Costello), RS Eng Ltd, West Coast Steelworx.

Gold members - Arcwell Engineering Ltd, BDX Group, CALD Enterprises Limited, Culham Engineering Ltd, Ruakaka Engineering, Shipco 360, Truweld Engineering.

2. Ngāti Whātua - 46 members

Platinum members - Black Steel, Chester Consultants Ltd, Chris W Howell & Associates Ltd, Day Consultants Ltd, Engineering Design Consultants (EDC), Flo-Dry Engineering Ltd, MEC Engineering Consultant, MSC Consulting Group, MSME Ltd, Pont Consultants Ltd, Stephen R Mitchell Consultants, Aksa Ltd, Alfa Group, Hawthorn Geddes Engineers & Architects, Lough Associates, Markplan Consulting Ltd, Monocrane 2010 Ltd, North Harbour Engineering Ltd, OBD Consultants Ltd, Obelisk Industrial Ltd, Pelagic Asset Integrity, Peninsula Engineering Ltd, Peter Walker Consultants Ltd, Piletech NZ Ltd, Prendos NZ Ltd, R.J.Nelligan & Associates Ltd, Sable Engineering Ltd, Stroude Ltd, Dixon Manufacturing Ltd, ITSS Engineering Ltd, Mahurangi Sheetmetals Ltd.

Gold members - Active Engineering Ltd, Advanced Plasma Technology, Aimecs Ltd, Airworks (NZ) Ltd, All Steel Services Ltd, Baily Engineering Ltd, Donovan Group NZ Ltd, Fabrication Solutions Ltd, General Engineering Northshore, Malabou Manufacturing Ltd, NorthShore Towbars 2006 Ltd, Pro Custom Concepts, Pyramid Engineering, Service Engineers Ltd, Southern Cross Engineering Co Ltd.

3. Ngāti Mahuta - 41 members

Platinum members - Ace Engineer, ACH Consultants, BB & Sons Ltd, BCD Group Ltd, BE Hall Ltd, Bloxam Burnett & Olliver Ltd, Brown & Thomson Engineers, Certified Welding Ltd, D & H Steel Construction Ltd, DBCon Ltd, Design Management Consultants Ltd, Enviroservices (2002) Ltd, Fergusson Welding (2016) Ltd, Fraser Thomas Ltd, GDC Consultants Ltd, Genweld New Zealand Ltd, Gilbert Sheetmetal & Engineering, Integrated Maintenance Group Ltd, J & R Slecht Ltd, Konnect Fastening Systems Ltd, McNaughton Consulting Engineers, Metal Test Ltd, MH Design Ltd, Optimech International Ltd, Speedfloor NZ Ltd, Stainless Engineering Co Ltd, Steel & Tube Holdings Ltd, Steel Master Co Ltd, Structurereflect Ltd, Sullivan Hall Ltd, Transport Technology Ltd, Verstoep

& Taylor Ltd, Vulcan Steel, Warren Engineering Ltd, Weld IT Ltd, Wells Architects Planners Ltd, WestArc Engineering Ltd.

Gold members - Alloy Yachts International, Ateck Steel Construction, Enterprize Steel, Global Welding Supplies, Jay Cee Welding Ltd, Michael Harris N Z Ltd, Nelson Stud Welding.

4. Ngāti Whātua ki Tāmaki - 109 members

Platinum members - AECOM, Auckland Council, Aurecon NZ Ltd, Babbage Consultants Ltd, BDC Engineering, Beca Carter Hollings & Ferner Ltd, Brian Jones Engineering Ltd, Calibre Consulting Ltd, Canterbury Steel Structures Ltd, Compusoft Engineering, DBM Vircon, DHC Consulting Ltd, Dulux Protective Coatings, Engco Consulting Engineers Ltd, Enovate Limited, Envivo Ltd, EQStruc Ltd, Equipment Engineering Ltd, Genesis Engineering Ltd, Greer Consulting Engineers, Helix Flight Manufacturer Machines Ltd, HFC-Harris Foster Consulting Ltd, Hilti NZ Ltd, HLK Jacob Ltd, Proconsult Ltd, Holmes Consulting Ltd, Hyland Consultants Ltd, Ideas in Design Ltd (IIDL), Innovus Limited, Inspection & Testing Services NZ Ltd, iWeld Limited, Jacobs NZ Ltd, Jensen McArley & Associates Ltd, JP Engineering Services Ltd, Lautrec Technology Group Ltd, Les Boulton & Associates Ltd, LM Structural Ltd, Macdonald Barnett Ltd, Materials & Testing Laboratories, Matrix Applied Computing Ltd, Micus Consultants Ltd, Mecury Energy (formerly Mighty River Power), Mitchell Vranjes Consulting Engineers, Modern Maintenance Products NZ Ltd, MTL Ltd, Pacific Engineering Projects Ltd, Pengelly Engineers Ltd, Peter Swan Ltd, Q Designz Ltd, QS Building Ltd, R Anderson Ltd, SGS NZ Ltd, SkyCabs International Ltd, Southern Institute of Technology, Stantec New Zealand Ltd, Stiffe Hooker Ltd, Structure Design, Tectonix Structural Engineers, The Market Intelligence.co.nz, Thorburn Consultants (NZ) Ltd, Thorne Dwyer Structures (TD Structures), Tino Structures Limited, Tonkin & Taylor, Two Degrees Mobile Ltd, Unitec Applied Technology, Unitec, School of Construction, University of Auckland, School of Engineering. Welding Engineers (NZ) Ltd, Weld Test NZ Ltd.

Gold members - ABB Switchgear Division, Advanced Boiler Services, Allwin Steel Enterprises Ltd, Babcock NZ Ltd, Blake Steel Ltd, Cook Brothers Construction, Courtney Engineering Ltd,

OUR MEMBERSHIP

Demack Engineering 2008, Eastern Institute of Technology, Engineering Contractors Ltd, Fletcher Steel - Dimond, Flux Welding & Fabrication Ltd, GLG NZ Manufacturing Ltd, GM Engineering Services Ltd, Gray Construction, Howick Engineering Ltd, Hydraulink Fluid Connectors Ltd, Hytools NZ Ltd, Jetweld Engineering, Linear Design, Machine Part Welding Ltd, Metal Spray Supplies NZ, Milmeq Limited, Mobridge, MSC Consulting Group, Noble Engineering Services, Outside Broadcasting, Phoenix Metal Recyclers + Metalman, Pilcher Engineering Ltd, Select Engineering Ltd, Shape NZ Sheetmetals (1983) Ltd, Specialist Energy Engineering Solutions, Stainless Steel & Aluminium Welding Academy Ltd, Steelpipe New Zealand Ltd, Tasman Engineering Co, The School of Welding, Traction Lab Ltd, Twig Industries, Weldlok (NZ) Ltd.

5. Ngāti Whanaunga - 2 members

Platinum members - Coulter Engineering Services Ltd, Newton Weld Equip Ltd.

6. Ngāti Maru - 2 members

Gold members - Bitumen Equipment Ltd, Piako Transport Engineering.

7. Ngāti Tamaterā - 27 members

Platinum members - Access Specialties (2017) Ltd, Acrow Ltd, Airey Consultants Ltd, Alrite Steel & Services NZ, BOC Gases New Zealand Ltd, Cable Price (NZ) Ltd, CSP Coating Systems, Fortis Weld Inspection Ltd, Grayson Engineering Ltd, H J Asmuss Ltd, Hi-Spec Stainless Ltd, JLG Industries (New Zealand), McConnell Dowell Constructors Ltd, MHM Automation, NZ Welding School, Pakuranga Engineering Ltd, Quality Inspection Services Ltd, Rockweld Limited T/A, Auckland Welding School, Steelcraft Engineering Ltd, Tidal Power NZ Ltd, Truesteel Ltd, Watson Engineering (Thames) Ltd, Welding Inspection & Compliance Services Ltd, Welding Inspection Service, X-Ray Laboratories Ltd.

Gold members - Campbell Tube Products Ltd, Contract Connections Ltd.

8. Ngāti Paoa - 8 members

Platinum members - Belcher Industries Ltd, KnowHowe Engineering Ltd, Mainarc Engineering Ltd.

Gold members - APV NZ Ltd, D R Howells Engineering Co Ltd, Iain Codling Stainless Steel, Stud Welding New Zealand Ltd, Ullrich Aluminium Co Ltd.

9. Ngāti Tai - 66 members

Platinum members - Advanced Training Academy, Amor Building Consultants, Aotea Machinery Ltd, Atlantic Engineering Co Ltd, Blueprint Consulting Ltd, Buller George Turkington Ltd (BGT Structures), BWS Ltd, C L C Consulting Group Ltd, Chambers Consultants Ltd, Cylinder Testing / TankTest NZ Ltd, DC Weld Ltd, D&D Engineering Works, Department of Corrections, Design Production Ltd, Engineering Graphics Ltd, Fairfit Metal Productions, Fletcher Construction - Engineering, Forbes Consultants, GVK Design & Engineering Consultancy, Hill Design Engineering Ltd, Hirepool Ltd, HSM Engineering Ltd, Indepth Technology Ltd, Industrial Valve Engineering, Insteel Ltd, Legacy Steel Ltd, Macweld Ltd, Manukau Institute of Technology, MaxiTRANS Industries (NZ) Pty Ltd, Otahuhu Welding Ltd, Pacific Steel, Philips Diesel Ltd, Pipe & Tube Welding Eng Ltd, RC Macdonald, RSL Steel Enterprises (NZ) Ltd, SNC Steel Ltd, South Pacific Industrial Ltd, Steel Co Ltd, Steltech Structural, Takanini Engineering Ltd, Tanker Engineering Specialists Ltd, Tectonus Limited, Titan Marine Engineering, Turnco Engineering Ltd, WeldTrade Engineering Ltd.

Gold members - Atco Controls, Best Bars Ltd, CAS Enterprises Ltd, CFM Engineering Ltd, Christian Church Community Trust, Consolidated Engineering Company, Drury Construction Ltd, Electropar Limited, HEB Construction Ltd, ISSA Engineering Ltd, Maskell Productions, Millers Mechanical (NZ) Ltd, Otahuhu Engineering Ltd, Roadmaster Trailers Ltd, SAFE Engineering, Skookum

Technology Ltd, South Auckland Engineering Ltd, Specweld Ltd, Well & Boe Ltd Engineering, Wilson Precast Construction, Zeanova.

10. Ngāti Te Ata - 26 members

Platinum members - Akzo Nobel Coatings Ltd, CADPRO Systems Ltd, F&S Design Group Ltd, Ford Steel Engineering Ltd, Hornell Industries Ltd, Mountains ARARAT Ltd, Mulcahy Engineering, New Zealand Steel Ltd, R&S Steel Engineering Ltd, Triangle Steel Construction.

Gold members - Apex Greenhouses, Baker Cranes Ltd, Fairfax Industries Ltd, Fruehauf Trailers, Global Engineering Ltd, Ipsco Ltd, J & D McLennan Ltd, Laser Welding Ltd, Rigweld Engineering Services Ltd, South Pacific Industrial Limited, Specialised Container Services, Tidd Ross Todd Ltd, TP Engineering Ltd, Transfleet Equipment Ltd, Verissimo Engineering, Villa Maria Estate.

11. Ngāti Mahuta - 19 members

Platinum members - BCD Group Ltd, BE Hall Ltd, Bloxam Burnett & Olliver Ltd, DBCon Ltd, Design Management Consultants Ltd, McDowall Structures, Modern Construction, Onsite Engineering, Stiles & Hooker Ltd, Waikato Engineering Design Ltd, Waikato Steel Fabricators.

Gold members - J P Marshall & Co Ltd, Longveld Engineering Ltd, Modern Transport Engineers Ltd, NDA Engineering Group, NZMP Kauri, ROTIG, Stafford Engineering.

12. Ngāti Ranginui - 2 members

Platinum members - Cullen Engineering Co Ltd, Genweld NZ Ltd, Welding Technology Ltd.

13. Ngāti Huia - 8 members

Platinum members - Genesis Energy.

Gold members - BBC Technologies, Bedford Engineering Ltd, Stewart & Cavalier Ltd, Superior Fabrication Ltd, Technical Welding Services Ltd, Tru-test DTS Limited, Waratah NZ Ltd.

14. Ngāi Te Rangi - 28 member

Platinum members - Altex Coatings Ltd, Bay of Plenty Electricity, Bill Cassidy & Associates, Blue Steel Ltd, Cameron Crabtree Partnership, Chemical Management Solutions Ltd, Jensen Steel Fabricators Ltd, McLeod Cranes Ltd, Morgan Steel, Port Of Tauranga Ltd, Redco NZ Ltd, Robert Page Engineering Ltd, Robin King Engineers, Steelworks NZ Ltd, Stratum Consultants Ltd, TiDA Ltd, Trustpower Limited.

Gold members - BOP Gear Cutters Ltd, Domett Trailers Ltd, Gamman Industrial Componentry Ltd, Hayes International, JCD Engineering Ltd, Mouat Engineering Ltd, Pacific Timber Engineering Ltd, Rex Barnes Engineering, Rocktec Ltd, Stainless DownUnder, Transport & Engineering Repairs Ltd.

15. Ngāti Maniapoto - 1 member

Platinum members - RW + V Roberts Consultancy.

16. Te Arawa - 13 members

Platinum members - BSK Consulting Engineers Ltd, Dobbie Engineers Ltd, Index Engineering Ltd, Kraft Engineering Ltd, Sigma Consultants Limited, Structured Solutions Ltd, Techlogic NZ.

Gold members - Chemical Industry Engineering Ltd, Lakeland Steel Products Ltd, Patchell Industries Ltd, Ranfab NZ Pty Ltd, Rotorua Steel Structures 2018, Taslo Engineering.

17. Ngāti Awa - 6 members

Platinum members - Kawerau Engineering Ltd.

Gold members - EHL Group, Page Macrae Engineering Ltd, Trident 2000 Ltd, Wilson Bros Engineering Ltd, WM Ross Engineering Ltd.

OUR MEMBERSHIP

18. Whakatohea - 3 members

Platinum members - BW Engineering, Manktelow Consulting Engineers Ltd, WFM Ltd.

19. Ngāti Ruapani - 8 members

Platinum members - BHC Consulting Ltd, Eastland Engineering 2004 Ltd, Gisborne Engineering Ltd, LDE Limited, McCannics Waikanae Holdings, Universal Engineering Ltd.

Gold members - Gisborne Development Incorporated.

20. Ngāti Kahungunu ki Wairoa - 14 members

Platinum members - Create Ltd, Garry Newton Ltd, Geoff Kell Consulting Ltd, Hellacious Enterprises Ltd, Omega Engineering Consultants Ltd, Weldwell New Zealand.

Gold members - DSK Engineering, Eastbridge Ltd, Eastern Boiler Service, Honnor Welldrillers Ltd, LHT Design, Napier Engineering & Contracting Ltd, Port of Napier, Red Steel.

21. Ngāti Tūwharetoa - 8 members

Platinum members - KGW Consulting Engineers, Thermanrock Engineering Ltd, Wilkinson Transport Engineers.

Gold members - Cambridge Steel Fabricators & Engineers, Cambridge Welding Service (1953) Ltd, Canco Engineering Ltd, MB Century Limited (Century Drilling & Energy Services Ltd NZ), Superior Pak Ltd.

22. Ngāti Hauā - 2 members

Platinum members - NDT Weld NZ Ltd.

Gold members - Etech Industries NZ Ltd.

23. Ngāi Ruahine - 2 members

Platinum members - Ballance Agri-Nutrients, Vebrec NZ.

24. Ngā Rauru - 4 members

Platinum members - BPL Group, Rees Engineering Services Ltd.

Gold members - Axiom Machining Limited, Simpson Mobile Weld Testing Ltd.

25. Te Āti Hau - 2 members

Platinum members - Jireh Contracting & Engineering (1998) Ltd.

Gold members - Q-West Boat Builders

26. Ngāti Kahungunu ki Heretaunga - 10 members

Platinum members - Engineering Technical Resource Ltd, Patton Engineering Ltd, Sigma Consulting Engineers Ltd, SNP Welding, Strata Group Consulting Engineers Ltd, Swiss Engineering.

Gold members - ATI Engineering, IBA Engineering, Quality Auto Machinists (1988) Ltd, Razos Engineering.

27. Muaūpoko - 1 member

Platinum members - Base Consulting Engineers Ltd.

28. Ngāti Toa - 17 members

Platinum members - Acme Engineering Ltd, Atco Steel Developments, Aztech Engineering Ltd, Betteridge Engineering Ltd, Burnsfield Engineering Ltd, Dick Joyce Consultants Ltd, ETS Engineers Ltd, Kea Engineering Consultants, Kerslake & Partners, MJH Engineering Ltd, NZ Army Trade Training School, Petone Engineering, Phoenix Engineering, Real Steel Ltd, Sawrey Consulting Engineers, Whakatiki Engineering Ltd.

Gold members - Murray Landon.

29. Te Āti Awa - 37 members

Platinum members - Abseil Access Ltd, Alpha Training & Development, Chapman Sanders Consultants Ltd, CHP Wellington Ltd, Clendon Burns & Park Ltd, Collab Engineers Ltd, Don Thomson Consulting Engineers Ltd (DTCE), Dunning Thornton Consultants Ltd, Energyworks Ltd, KiwiRail, Nagel Consultants Ltd, Novare Design Ltd, OCEL Consultants Ltd, Opus International Consultants Ltd, Pipes NZ Ltd, Plant & Platform Consultants Ltd, Plumb Ltd, Red Jacket Ltd, Sentinel Inspection Services Ltd, Silvester Clark Consulting Engineers, Spencer Holmes Ltd, Tranzweld, Tse Taranaki & Associates Limited, Worley.

Gold members - Croucher & Crowder Engineering Co. Ltd, Dialog Fitzroy, Fraser Fire & Rescue, George St Engineering (GSE Engineering), Greymouth Petroleum, Howard Wright Ltd, KAS Customs Limited, Morrow Equipment Co, Seaview Engineering, Wainuiomata Training Centre, Warner & Mould Construction Ltd, Westside Welding Ltd, Windsor Engineering.

30. Ngāti Kahungunu ki Wairarapa - 3 members

Platinum members - Eastern Consulting, Progressive Engineering Co Ltd.

Gold members - Loader Construction Engineering Ltd.

31. Ngāti Koata, Ngāti Rārua, Ngāti Tama, Ngāti Kuia & Te Āti Awa - 10 members

Platinum members - 3d Forge, Briton Engineering, Kernohan Engineering Ltd, PT Industries, Transport Design & Certification, Tu Tika Ltd.

Gold members - A W Trinder Ltd, Brightwater Engineers Ltd, Sharland Engineering Ltd, Welding Services Nelson Ltd.

32. Rangitāne - 22 members

Platinum members - Burleigh Engineering Ltd, C&R Engineering Ltd, Cuddon Engineering, David Smart Consulting, Davidson Group Ltd, Eaststeel, Eckford Engineering 2002 Ltd, Marlborough Engineering Services Ltd, Opus Palmerston North, PFP Systems (NZ) Ltd, Randall & Associates, Steel Pencil Ltd, Vert-X Ltd.

Gold members - ALRO Truck Smash Repairs, Cudden Ltd, J J Niven Engineering Ltd, Keith M J Adams, Mike Christie Sheetmetals, Profab Central Engineering, Snorkel Elevating Work Platforms, Stevensons Structural Engineers Ltd, Webforge NZ Ltd.

33. Ngāti Apa - 1 member

Platinum members - Weld Fabrication Engineering Ltd.

34. Ngāti Tahu - 1 member

Platinum members - RNZAF Metalshop, Woodbourne.

35. Ngāi Tahu & Ngāti Mamoe - 75 members

Platinum members - 3Way Solutions Ltd, Ara Institute of Canterbury, Boniface Consulting Ltd, BT Mining Ltd, Buchanan & Fletcher Ltd, Cavotec Moormaster Ltd, Centraus Structural Consulting Ltd, Cephas Rock Ltd, CGW Consulting Ltd, Corbett Consulting, Davis Ogilvie & Partners Ltd, DC Welding, Design Engineering Ltd, Eastcoast Steelwork Ltd, ENI Engineering Ltd, EPSNZ Ltd, Evans Douglas Consulting Engineers, Ewing Construction Ltd, GHD Ltd, Gray Bros Engineering, Gridline Ltd, formerly Weber Consulting, J F Contracting Ltd, John Jones Steel Ltd, Kirk Roberts Consulting Engineers Ltd, KM Mechanical Ltd, Kotahi Studio Ltd, Lewis Bradford & Associates, LiftX, Linear Design, LTH Ltd, Lyttelton Engineering Ltd, Marriott Consulting Engineers Ltd, Metacorp Recyclers Smorgon Steel Recycling, Milward Finlay Lobb Ltd, Motovated Design and Analysis Ltd, Networked Engineering Solutions, North End Engineering, NZ Welder Supplies Ltd, Olympicon Ltd, Orica Powder & Industrial Coatings, P J Hindin Engineering, Pegasus Industrial Engineering Ltd,

Powell Fenwick Consultants Ltd, Pressure Equipment Integrity Ltd, Quoin Structural Consultants, R D Sullivan & Associates, Rangiora Engineering & Structures Ltd, Ruamoko Solutions Ltd, Southern QA Ltd, Structex Harvard Ltd, Structex Ltd, Studio2 Ltd (trading as Structex), TM Consultants Ltd, Tomssoffroad & Custom Ltd, Viden Consulting Engineers Ltd, VIP Steel Ltd, Welding & Engineering Ltd, Weldworks United, Zigliani Technologies Ltd.

Gold members - Angus Robertson Mechanical, Calder Stewart Steel, Clough Agricultural Ltd, CPIT Aoraki, Dispatch and Garlick Limited, GT Liddell Contracting Ltd, Mace Engineering Ltd, Millar Engineering Ltd, Networked Engineering Solutions, Parr & Co Ltd, Phoenix Steel, Read Industrial Ltd, Smartweld Ltd, Stark Brothers Ltd, Taurus Engineering Ltd, Wyma Engineering NZ.

36. Ngāi Tahu, Ngāti Mamoe & Waitaha - 26 members

Platinum members - Batchelar McDougall Consulting Ltd (BMC), Calder Developments Ltd, Morgan Engineering & Marine (2021) Ltd, Nick Morris Engineering Ltd, E B McDonald Ltd, Farra Engineering Limited, Hanlon & Partners, Kaipipi Ltd, MWS Otago Ltd, Nigel Harwood Engineering Consultant Ltd, PW Engineering Ltd, Stork Technical Services NZ Ltd, Todd Engineering Ltd, Transtech Dynamics.

Gold members - Action Engineering Ltd, Bradken Dunedin, Dan Cosgrove Ltd, Dart Engineering, Ede Engineering, E-Type Engineering Ltd, Morgan O'Shea Engineering, Otago Polytechnic, Queenstown Engineering 2009 Ltd, Sitesteel Ltd, The Blacksmiths Ltd, Zealsteel.

Farra Engineering

Team member Wayne preparing rail components for export.





Stevensons Structural Engineers

On the workshop floor

Invest it.

We can't claim to be our industry's futurist, if we haven't got our eyes cast to the horizon! That's why we have a number of projects on our radar for execution in FY23.

Sustainability focuses to expand.

We did a lot in the sustainability arena this year, and we are on the verge of launching our biggest offering yet in FY23 - Hōtaka Whakakore Puhanga Waro, our Carbon Emissions Offsetting Program for steel products. It features the development of the world's first comprehensive steel product offset calculator based on life cycle assessment and environmental product declarations.

A lot of our other sustainability projects are in the last stage, particularly for our Structural team and its publications and reporting deliverables, however, the research in material passports and the development of sustainable solutions will be continued.

Structural research

Our team will continue to take part in various research projects in diverse areas from durability to seismic design, construction 4.0, sustainability and other structural engineering topics aligned with our wider HERA strategy.

We have also identified two new high priority topics to develop new design guides for. These came via an extensive membership survey that was executed in the past year. These are underway and expected to be delivered this coming financial year.

Key focuses will be:

- updating Moment Resisting Steel Frames reports;
- updating slab panel methods reports;
- delivering solutions in composite beam and slab software;
- development of guidance and corrections to clauses in AS/NZS 2327:2017 Amd1:2020;
- advanced procedure to design steel carpark

building in severe fires; and

- supporting training webinar development for guides and technical reports developed through the year.

Welding research - Sovereign Manufacturing Automation for Composites Cooperative Research Centre (SoMAC CRC)

We've partnered with industry and academia to participate in the competitive funding for the SoMAC CRC application. The SoMAC CRC has brought together 30 industry partners and 7 research organisations in a \$260 million funding bid under Australia's Cooperative Research Centres program.

Australia and New Zealand are entering a decade of transformation with the arrival of intelligent manufacturing automation and emergence of new high-value industries. The SoMAC CRC will address these opportunities and strengthen our current industry with digital-export-ready, cost-competitive, high-quality platform capability. The SoMAC CRC's vision is to transform Australia's established composite technologies capability into Sovereign leadership, creating a world-class, highly automated, digitally enabled, network of designers, manufacturers and service providers. Over its 10 year term and beyond, the SoMAC CRC will strive to reposition Australia as a world leader in the rapidly growing \$100 billion composites market - of which we will be a partner in this transformation process if funding is successful.

Innovation Centre moving forward

Due to the impacts of Covid-19, our aspirations to build an Innovation Centre dedicated to helping our members stay on the cutting edge were put on hold.

This will move forward in FY23, with an added commitment to achieve a green star rating for the structure to align with our sustainability values.

Count it.

We're able to deliver value through income generated from several sources.

The source of most significance to us, is the industry contribution we receive through the Heavy Engineering Research Levy Act 1978.

The Heavy Engineering Research Levy Act, 1978 is a common good research levy imposed on all heavy engineering goods comprising items defined by certain tariff codes within the Act.

These are defined in Schedules 2 and 3 of the Act and put simply, cover heavy steel and welding consumable sales.

Broadly speaking, we use this levy for the promoting and conducting of research and other scientific work into or relating to the heavy engineering industry.



Eastbridge Limited

Mangaweka Bridge construction in progress



Ronita Kishore
Finance Manager

**NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION
INCORPORATED**

**FINANCIAL STATEMENTS
FOR THE YEAR ENDED 31 MARCH 2022**

NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION INCORPORATED

**Financial Statements
FOR THE YEAR ENDED 31 MARCH 2022**

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NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION INCORPORATED

**Directory
FOR THE YEAR ENDED 31 MARCH 2022**

Registered office	HERA House 17-19 Gladding Place Manukau City Auckland
Number	218280
Nature of business	Research Association
Board Members	Troy Coyle (CEO HERA) Dave Anderson, John Jones Steel (Chair) Noel Davies (Chair of HERA Foundation) Mathew Black, New Zealand Steel Ltd (Nominee of General Manager of NZ Steel) Dieter Adam, NZMEA
	<u>Ordinary and Associate Members</u> David Moore - Grayson Engineering Ltd Craig Stevenson- Aurecon New Zealand Ltd Raed El Sarraf- WSP Opus Darren O'Riley, Steel Construction New Zeland Inc. Yvonne Chan - AUT Jayden Mellsop - Eastbridge Ltd Jane Warren - Dixon Manufacturing Ltd Ben Jensen - Jensen Steel Fabricators Ltd Matthew Kidson - Kernohan Engineering
Independent auditor	RSM Hayes Audit Level 1, 1 Broadway, Newmarket 1023
Bankers	Bank of New Zealand
Solicitor	Gaze Burt Auckland

NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION INCORPORATED**Board Report and Statement of Responsibility
FOR THE YEAR ENDED 31 MARCH 2022****Board Report**

The Board of New Zealand Heavy Engineering Research Association Incorporated present this Annual Report, being the financial statements of the Association for the financial year ended 31 March 2022, and the independent auditor's report thereon.

Statement of Responsibility

The Board is responsible for the maintenance of adequate accounting records and the preparation and integrity of the financial statements and related information.

The independent external auditors, RSM Hayes Audit, have audited the financial statements and their report appears on pages 95 to 96.

The Board is also responsible for the systems of internal control. These are designed to provide reasonable but not absolute assurance as to the reliability of the financial statements, and to adequately safeguard, verify and maintain accountability for assets, and to prevent and detect material misstatements.

Appropriate systems of internal control have been employed to ensure that all transactions have been executed in accordance with authority and correctly processed and accounted for in the financial records. The systems are implemented and monitored by suitably trained personnel with an appropriate segregation of authority and duties. Nothing has come to the attention of the Board to indicate that any material breakdown in the functioning of these controls, procedures and systems has occurred during the year under review.

The financial statements are prepared on a going concern basis. Nothing has come to the attention of the Board to indicate that the entity will not remain a going concern in the foreseeable future.

In the opinion of the Board:

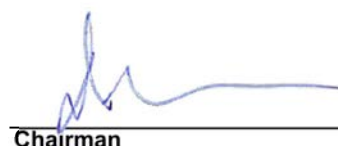
-The statement of comprehensive revenue and expense is drawn up so as to present fairly, in all material respects, the results of the entity for the financial year ended 31 March 2022;

- The statement of financial position is drawn up so as to present fairly, in all material respects, the financial position of the entity as at 31 March 2022;

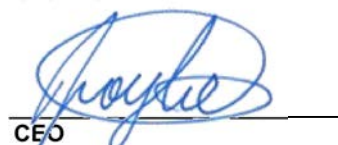
The statement of cash flows is drawn up so as to present fairly, in all material respects, the cash flows of the entity for the financial year ended 31 March 2022.

- There are reasonable grounds to believe that the entity will be able to pay its debts as and when they fall due.

For and on behalf of the Board:


Chairman

13 June 2022
Date


CEO

13 June 2022
Date

**RSM Hayes Audit**

PO Box 9588
Newmarket, Auckland 1149
Level 1, 1 Broadway
Newmarket, Auckland 1023

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Independent Auditor's Report**To the members of
New Zealand Heavy Engineering Research
Association Incorporated****Opinion**

We have audited the financial statements of New Zealand Heavy Engineering Research Association Incorporated (the Society), which comprise:

- the statement of financial position as at 31 March 2022;
- the statement of comprehensive revenue and expense for the year then ended;
- the statement of changes in net assets/equity for the year then ended;
- the statement of cash flows for the year then ended; and
- the notes to the financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying financial statements on pages 97 to 108 present fairly, in all material respects, the financial position of New Zealand Heavy Engineering Research Association Incorporated as at 31 March 2022, and its financial performance and its cash flows for the year ending 31 March 2022 in accordance with Public Benefit Entity Standards Reduced Disclosure Regime issued by the New Zealand Accounting Standards Board.

Basis for opinion

We conducted our audit in accordance with International Standards on Auditing (New Zealand) (ISAs (NZ)). Our responsibilities under those standards are further described in the *Auditor's responsibilities for the audit of the financial statements* section of our report.

We are independent of the Society in accordance with Professional and Ethical Standard 1 *International Code of Ethics for Assurance Practitioners (including International Independence Standards) (New Zealand)* issued by the New Zealand Auditing and Assurance Standards Board, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Other than in our capacity as auditor we have no relationship with, or interests in, the Society.

Other information

The Board is responsible for the other information on pages 1 to 94 (but does not include the financial statements and our auditor's report thereon), which we obtained prior to the date of this auditor's report. Our opinion on the financial statements does not cover the other information and we do not express any form of audit opinion or assurance conclusion thereon.

THE POWER OF BEING UNDERSTOOD
AUDIT | TAX | CONSULTING

RSM Hayes Audit is a member of the RSM network and trades as RSM. RSM is the trading name used by the members of the RSM network. Each member of the RSM network is an independent accounting and consulting firm which practices in its own right. The RSM network is not itself a separate legal entity in any jurisdiction.



In connection with our audit of the financial statements, our responsibility is to read the other information identified above and, in doing so, consider whether the other information is materially inconsistent with the financial statements, or our knowledge obtained in the audit, or otherwise appears to be materially misstated. If, based on the work we have performed on the other information that we obtained prior to the date of this auditor's report, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.

Responsibilities of the Board for the financial statements

The Board is responsible, on behalf of New Zealand Heavy Engineering Research Association Incorporated (the Society), for the preparation and fair presentation of the financial statements in accordance with Public Benefit Entity Standards Reduced Disclosure Regime, and for such internal control as those charged with governance determine is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, the Board is responsible, on behalf of the Society, for assessing the Society's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the Board either intends to liquidate the Society or to cease operations, or has no realistic alternative but to do so.

Auditor's responsibilities for the audit of the financial statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance but is not a guarantee that an audit conducted in accordance with ISAs (NZ) will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements. A further description of the auditor's responsibilities for the audit of the financial statements is located at the XRB's website at:

<https://www.xrb.govt.nz/assurance-standards/auditor-responsibilities/audit-report-8/>

Who we report to

This report is made solely to the members as a body. Our audit has been undertaken so that we might state to the members those matters we are required to state to them in an auditor's report and for no other purpose. To the fullest extent permitted by law, we do not accept or assume responsibility to anyone other than the New Zealand Heavy Engineering Research Association Incorporated and the members, for our work, for this report, or for the opinions we have formed.

RSM Hayes Audit
Auckland

14 June 2022

NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION INCORPORATED

Statement of Comprehensive Revenue and Expense FOR THE YEAR ENDED 31 MARCH 2022

	Notes	2022	2021
		\$	\$
Revenue from non-exchange transactions	11	2,757,229	2,145,393
Revenue from exchange transactions	11	975,909	1,076,336
Total revenue		3,733,138	3,221,729
Expenses			
Employee salaries and wages		1,775,340	1,634,083
Member services		271,033	172,391
Seminar expenses		30,236	54,381
Consulting expenses		66,067	109,828
External research		155,510	94,833
HERA House expenses		101,873	98,179
Conference expense		-	11,187
Depreciation expense	8	101,487	109,920
Rent expenses		330,409	310,024
Other expenses	12	346,200	205,233
Total expenses		3,178,155	2,800,059
Finance income		5,221	8,836
Finance costs		-	-
Net finance income		5,221	8,836
Net surplus before tax		560,204	430,506
Income tax expense	17	-	-
Net surplus for the year		560,204	430,506
Other comprehensive revenue and expense		-	-
Total comprehensive revenue and expense for the year		560,204	430,506

The above financial statement should be read in conjunction with the notes to the financial statements.

NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION INCORPORATED**Statement of Changes in Net Assets/Equity
FOR THE YEAR ENDED 31 MARCH 2022**

	Accumulated comprehensive revenue and expense	Total
	\$	\$
Closing equity 31 March 2020	1,696,085	1,696,085
Total comprehensive revenue and expense for the year	430,506	430,506
Closing equity 31 March 2021	2,126,591	2,126,591
Total comprehensive revenue and expense for the period	560,204	560,204
Closing equity 31 March 2022	2,686,795	2,686,795

NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION INCORPORATED**Statement of Financial Position
As at 31 March 2022**

	Notes	2022 \$	2021 \$
ASSETS			
Current assets			
Cash and cash equivalents	5	615,309	420,011
Receivables from exchange transactions	6	73,881	98,628
Receivables from non-exchange transactions	6	335,516	349,980
Investments- term deposits		1,178,069	878,069
Prepayment		-	102,169
Inventories		-	8,058
		<u>2,202,775</u>	<u>1,856,915</u>
Non-current assets			
Property, plant and equipment	8	516,231	415,788
Investments- term deposits		100,000	-
		<u>616,231</u>	<u>415,788</u>
TOTAL ASSETS		<u>2,819,005</u>	<u>2,272,703</u>
LIABILITIES			
Current liabilities			
Payables (from exchange transactions)	10	37,411	29,329
Payables (from non- exchange transactions)	10	640	68,066
Employee benefits		94,159	48,717
		<u>132,210</u>	<u>146,112</u>
TOTAL LIABILITIES		<u>132,210</u>	<u>146,112</u>
TOTAL NET ASSETS		<u>2,686,795</u>	<u>2,126,591</u>
EQUITY			
Accumulated comprehensive revenue and expense		2,686,795	2,126,591
TOTAL EQUITY		<u>2,686,795</u>	<u>2,126,591</u>

The above financial statement should be read in conjunction with the notes to the financial statements.

The above financial statement should be read in conjunction with the notes to the financial statements.

NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION INCORPORATED

Statement of Cash Flows
FOR THE YEAR ENDED 31 MARCH 2022

	Notes	2022 \$	2021 \$
CASH FLOWS FROM OPERATING ACTIVITIES			
Receipts from customers		3,772,349	3,094,870
Interest received		5,221	8,836
Cash paid to suppliers and employees		(2,980,342)	(2,918,593)
Net cash inflow from operating activities		797,228	185,113
CASH FLOWS FROM INVESTING ACTIVITIES			
Sales/(Purchases) of term deposits		(400,000)	(9,133)
Purchase of property, plant and equipment	8	(201,930)	(199,229)
Net cash outflow from investing activities		(601,930)	(208,362)
CASH FLOWS FROM FINANCING ACTIVITIES			
Repayment from related party loan		-	-
Net cash outflow from financing activities		-	-
Net increase in cash and cash equivalents		195,298	(23,249)
Cash and cash equivalents at 1 April		420,011	443,260
Cash and cash equivalents at 31 March	5	615,309	420,011

The above financial statement should be read in conjunction with the notes to the financial statements.

NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION INCORPORATED

Notes to the Financial Statements
For the Year Ended 31 March 2022

1. REPORTING ENTITY

New Zealand Heavy Engineering Research Association Incorporated (the "Society") is an Incorporated Society which was incorporated under the Incorporated Societies Act 1908 on the 30th day of August 1978.

These group financial statements incorporated HERA Certification Ltd. which had no transactions on its own.

These financial statements were authorised for issue by the Board on the date indicated on page 94.

2. BASIS OF PREPARATION

a) Statement of compliance

The Society is a public benefit entity for the purpose of financial reporting and the financial statements comply with Public Benefit Entity Standards Reduced Disclosure Regime ("PBE Standards RDR"). For the purposes of complying with NZ GAAP, the Society is a public benefit not-for-profit entity and is eligible to apply PBE Standards RDR on the basis that it does not have public accountability and it is not defined as large. All reduced disclosure regime exemptions have been adopted.

b) Measurement basis

The financial statements have been prepared on the historical cost basis.

c) Functional and presentation currency

The financial statements are presented in New Zealand Dollars (\$), which is the functional and presentation currency, rounded to the nearest dollar.

There has been no change in the functional currency of the Society during the year.

d) Changes in accounting policy

There is no change in accounting policy during the year.

3. SIGNIFICANT JUDGEMENTS AND ESTIMATES

The preparation of the Society's financial statements requires management to make judgements, estimates and assumptions that affect the reported amounts of revenues, expenses, assets and liabilities, and the accompanying disclosures, and the disclosure of contingent liabilities. Uncertainty about these assumptions and estimates could result in outcomes that require a material adjustment to the carrying amount of assets or liabilities affected in future periods.

a) Judgements:

In the process of applying the Society's accounting policies, management has made the following judgements, which have the most significant effect on the amounts recognised in the financial statements:

- Revenue recognition: the recognition of non-exchange revenue (conditions vs restrictions);
- Classification of non-financial assets as cash generating or non-cash generating assets for the purposes of assessing impairment indicators and impairment testing.

The majority of property, plant and equipment held by the Society is classified as non-cash generating assets.

b) Assumptions and estimation uncertainties

The key assumptions concerning the future and other key sources of estimation uncertainty at the reporting date, that have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year, are described below. The Society based its assumptions and estimates on parameters available when the financial statements were prepared. Existing circumstances and assumptions about future developments, however, may change due to market changes or circumstances arising beyond the control of the Society. Such changes are reflected in the assumptions when they occur.

NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION INCORPORATED

**Notes to the Financial Statements
For the Year Ended 31 March 2022**

3. SIGNIFICANT JUDGEMENTS AND ESTIMATES (CONT'D)

b) Assumptions and estimation uncertainties (cont'd)

Useful lives and residual values

The useful lives and residual values of assets are assessed using the following indicators to inform potential future use and value from disposal:

- The condition of the asset based on the assessment of experts employed by the Society;
- The nature of the asset, its susceptibility and adaptability to changes in technology and processes.
- The nature of the processes in which the asset is deployed
- Availability of funding to replace the asset
- Changes in the market in relation to the asset

Changes in accounting estimates

There have been no changes in the accounting estimates for the current reporting period.

4. SIGNIFICANT ACCOUNTING POLICIES

a) Revenue

Revenue is recognised to the extent that it is probable that the economic benefits or service potential will flow to the Society and the revenue can be reliably measured, regardless of when the payment is being made. Revenue is measured at the fair value of the consideration received or receivable, taking into account contractually defined terms of payment and excluding taxes or duty.

The specific recognition criteria described below must also be met before revenue is recognised.

i) Revenue from exchange transactions

Revenue from the sale of goods

Revenue from the sale of goods in the course of ordinary activities is measured at the fair value of the consideration received or receivable, net of returns, trade discounts and volume rebates.

Revenue is recognised when the significant risks and rewards of ownership have been transferred to the customer, recovery of the consideration is probable, the associated costs and possible return of goods can be estimated reliably, there is no continuing management involvement with the goods, and the amount of revenue can be measured reliably.

Rendering of services

Revenue is measured at the fair value of the consideration received or receivable under the contract or agreement.

Where the outcome of a transaction involving the rendering of services can be estimated reliably, revenue is recognised by reference to the stage of completion based on the progress of work performed.

ii) Revenue from non-exchange transactions

Non-exchange transactions are those where the Society receives an inflow of resources ((i.e. cash and other tangible or intangible items) but provides no (or nominal) direct consideration in return.

With the exception of services-in-kind, inflows of resources from non-exchange transactions are only recognised as assets where both:

- It is probable that the associated future economic benefit or service potential will flow to the Society, and
- Fair value is reliably measurable.

Inflows of resources from non-exchange transactions that are recognised as assets are recognised as non exchange revenue, to the extent that a liability is not recognised in respect to the same inflow.

NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION INCORPORATED

**Notes to the Financial Statements
For the Year Ended 31 March 2022**

4. SIGNIFICANT ACCOUNTING POLICIES (CONT'D)

ii) Revenue from non-exchange transactions (cont'd)

Liabilities are recognised in relation to inflows of resources from non-exchange transactions when there is a resulting present obligation as a result of the non-exchange transactions, where both:

- It is probable that an outflow of resources embodying future economic benefit or service potential will be required to settle the obligation, and
- The amount of the obligation can be reliably estimated.

The following specific recognition criteria in relation to the Society's non-exchange transaction revenue streams must also be met before revenue is recognised.

Grants, Donations, Legacies and bequests

The recognition of non-exchange revenue from Grants, Donations, Legacies and bequests depends on the nature of any stipulations attached to the inflow of resources received, and whether this creates a liability (i.e. present obligation) rather than the recognition of revenue.

Stipulations that are 'conditions' specifically require the Society to return the inflow of resources received if they are not utilised in the way stipulated, resulting in the recognition of a non-exchange liability that is subsequently recognised as non-exchange revenue as and when the 'conditions' are satisfied.

Stipulations that are 'restrictions' do not specifically require the Society to return the inflow of resources received if they are not utilised in the way stipulated, and therefore do not result in the recognition of a non-exchange liability, which results in the immediate recognition of non-exchange revenue.

b) Employee benefits

i) Short term employee benefits

Short-term employee benefit liabilities are recognised when the Society has a legal or constructive obligation to remunerate employees for services provided with 12 months of reporting date, and is measured on an undiscounted basis and expensed in the period in which employment services are provided.

c) Finance income

Finance income comprises interest income on financial assets. Interest income is recognised as it accrues in surplus or deficit, using the effective interest method.

d) Financial instruments

Financial assets and financial liabilities are recognised when the Society becomes a party to the contractual provisions of the financial instrument.

The Society derecognises a financial asset when the contractual rights to the cash flows from the asset expire, or it transfers the rights to receive the contractual cash flows in a transaction in which substantially all the risks and rewards of ownership of the financial asset are transferred. Any interest in transferred financial assets that is created or retained by the Society is recognised as a separate asset or liability.

The Society derecognises a financial liability when its contractual obligations are discharged, cancelled, or expire.

The Society derecognises financial assets and financial liabilities when there has been significant changes to the terms and/or the amount of contractual payments to be received/paid.

Financial assets and liabilities are offset and the net amount presented in the statement of financial position when, and only when, the Society has a legal right to offset the amounts and intends either to settle on a net basis or to realise the asset and settle the liability simultaneously.

The Society classifies financial assets as loans and receivables.

The Society classifies financial liabilities as at amortised cost.

Financial instruments are initially measured at fair value, plus for those financial instruments not subsequently measured at fair value through surplus or deficit, directly attributable transaction costs.

Subsequent measurement is dependent on the classification of the financial instrument, and is specifically detailed in the accounting policies below.

NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION INCORPORATED

Notes to the Financial Statements
For the Year Ended 31 March 2022

4. SIGNIFICANT ACCOUNTING POLICIES (CONT'D)

d) Financial instruments (cont'd)

i) Loans and receivables

Loans and receivables are financial assets with fixed or determinable payments that are not quoted in an active market, and are measured initially at fair value.

Loans and receivables are subsequently measured at amortised cost using the effective interest method, less any impairment losses.

Loans and receivables comprise cash and cash equivalents and receivables.

Cash and cash equivalents in the statement of financial position comprise cash at bank and in hand and short-term deposits with an original maturity of three months or less that are readily convertible to known amounts of cash and which are subject to an insignificant risk of changes in value.

For the purposes of the statement of cash flows, cash and cash equivalents consist of cash and cash equivalents as defined above.

ii) Financial liabilities at amortised cost

Financial liabilities classified as at amortised cost are non-derivative financial liabilities that are not classified as fair value through surplus or deficit financial liabilities.

Financial liabilities classified as amortised cost are subsequently measured at amortised cost using the effective interest method.

Financial liabilities classified as amortised cost comprise payables.

e) Impairment of non-derivative financial assets

A financial asset not subsequently measured at fair value through surplus or deficit is assessed at each reporting date to determine whether there is objective evidence that it is impaired. A financial asset is impaired if there is objective evidence of impairment as a result of one or more events that occurred after the initial recognition of the asset, and that the loss event(s) had an impact on the estimated future cash flows of that asset that can be estimated reliably.

f) Property, plant and equipment

i) Recognition and measurement

Items of property, plant and equipment are initially measured at cost, except those acquired through non exchange transactions which are instead measured at fair value as their deemed cost at initial recognition.

Items of property, plant and equipment are subsequently measured at cost less accumulated depreciation and accumulated impairment losses.

Cost includes expenditure that is directly attributable to the acquisition of the asset.

When parts of an item of property, plant and equipment have different useful lives, they are accounted for as separate items (major components) of property, plant and equipment.

Any gain or loss on disposal of an item of property, plant and equipment (calculated as the difference between the net proceeds from disposal and the carrying amount of the item) is recognised in surplus or deficit.

ii) Subsequent expenditure

Subsequent expenditure is capitalised only when it is probable that the future economic benefits associated with the expenditure will flow to the Society. Ongoing repairs and maintenance is expensed as incurred.

iii) Depreciation

For property, plant and equipment, depreciation is based on the cost of an asset less its residual value and for buildings is based on the revalued amount less its residual value.

Significant components of individual assets that have a useful life that is different from the remainder of those assets, those components are depreciated separately.

NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION INCORPORATED

Notes to the Financial Statements
For the Year Ended 31 March 2022

4. SIGNIFICANT ACCOUNTING POLICIES (CONT'D)

Depreciation is recognised in surplus or deficit on a straight-line basis over the estimated useful lives of each component of an item of property, plant and equipment.

The estimated useful lives are:

Office Equipment	10%-40%
Office Furniture	15%
Fixture & Fittings	15%
Motor Vehicles	20%
Training Equipment	10%-20%

Depreciation methods, useful lives, and residual values are reviewed at reporting date and adjusted if appropriate.

g) Impairment of non-financial assets

The carrying amounts of the Society's non-financial assets are reviewed at each reporting date to determine whether there is any indication of impairment. If any such indication exists, then the asset's recoverable amount is estimated.

The recoverable amount of an asset or CGU is the greater of its value in use and its fair value less costs to sell. In assessing value in use, the future remaining service potential (for non-cash-generating assets) is discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset or CGU.

Impairment losses are recognised in surplus or deficit. An impairment loss is reversed only to the extent that the asset's carrying amount does not exceed the carrying amount that would have been determined, net of depreciation or amortisation, if no impairment loss had been recognised.

h) Equity

Equity is the Association's interest in the Society measured as the difference between total assets and total liabilities. Equity is made up of the following components:

Accumulated comprehensive revenue and expense

Accumulated comprehensive revenue and expense is the Society's accumulated surplus or deficit since the formation of the Society adjusted for transfers to/from specific reserves.

i) Goods and services tax

All amounts are shown exclusive of goods and services tax (GST), except for receivables and payables that are stated inclusive of GST.

j) Leases

i) Classification and treatment

Leases in terms of which the Society assumes substantially all the risks and rewards of ownership are classified as finance leases.

Upon initial recognition the leased asset is measured at an amount equal to the lower of its fair value and the present value of the minimum lease payments. Subsequent to initial recognition, the asset is accounted for in accordance with the accounting policy applicable to that asset.

The Society does not have finance leases.

Operating leases are leases that do not transfer substantially all the risks and benefits incidental to ownership of the leased item to the Society. Operating lease payments are recognised as an operating expense in surplus or deficit on a straight-line basis over the lease term.

NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION INCORPORATED

Notes to the Financial Statements
FOR THE YEAR ENDED 31 MARCH 2022

5. CASH AND CASH EQUIVALENTS

	2022	2021
	\$	\$
Cash and cash equivalents include the following components:		
Current Account	211,279	20,558
Call Account	273,900	273,764
Term deposits (maturity > 90 days)	130,130	125,689
	615,309	420,011

The Association has a Visa credit card facility with Bank of New Zealand. The total limit of all credit cards is \$30,000 (2021: \$30,000).

6. RECEIVABLES

	2022	2021
	\$	\$
Receivables from exchange transactions		
Accounts receivable	73,881	98,628
Bad debt provision	-	-
	73,881	98,628

Receivables from non-exchange transactions

Accrued income - steel and welding levies	335,516	349,980
	335,516	349,980

At 31 March, the ageing analysis of receivables from exchange transactions is as follows:

	Total	< 30 days	30-60 days	61-90 days	>90 days
	\$	\$	\$	\$	\$
2022	73,881	43,931	11,628	4,865	13,456
2021	98,628	3,911	87,392	160	7,165

7. RELATED PARTY TRANSACTIONS AND BALANCES

HERA Foundation is a related party to the Society. The Society has some board members serving on the Foundation's governing body.

The Society had the following related party transactions with HERA Foundation during the year as follows:

- rental expenses on buildings of \$330,409 (2021: \$310,024)
- receipts of grants totaling \$13,500 (2021: \$8,500)

Key management personnel compensation

The total remuneration paid to key management personnel for the year was \$697,589 (2021: \$641,482). The total number of key management personnel was 4 (2021: 4).

There were no other material related party transactions as at balance date, and there are no other material balances outstanding regarding transactions with related parties.

8. PROPERTY, PLANT AND EQUIPMENT

Reconciliation of property, plant and equipment for the year ended 31 March 2022

	Opening balance	Additions	Disposals	Depreciation	Closing balance
Office Furniture	19,385	-	-	11,678	7,707
Fixtures & Fittings	68,762	71,795	-	14,946	125,611
HERA House refurb (Pūtātara and Fab4.0Lab)	193,620	-	-	23,573	170,047
Motor Vehicles	23,720	-	-	13,554	10,166
Office Equipment	77,485	15,368	-	31,764	61,090
Training Equipment	32,816	114,766	-	5,972	141,610
	415,788	201,930	-	101,487	516,231

	2022			2021		
	Cost	Accumulated depreciation	Carrying value	Cost	Accumulated depreciation	Carrying value
	\$	\$	\$	\$	\$	\$
Metallurgy Equipment	-	-	-	-	-	-
Office Furniture	226,747	219,040	7,707	226,747	207,362	19,385
Fixtures & Fittings	152,778	27,167	125,611	80,983	12,221	68,762
HERA House refurb (Pūtātara and Fab4.0Lab)	304,749	134,702	170,047	304,749	111,129	193,620
Motor Vehicles	144,436	134,271	10,165	144,436	120,717	23,720
Office Equipment	327,859	266,770	61,089	312,491	235,006	77,485
Training Equipment	260,572	118,962	141,610	145,806	112,990	32,816
	1,417,141	900,912	516,231	1,215,212	799,425	415,788

NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION INCORPORATED

Notes to the Financial Statements
FOR THE YEAR ENDED 31 MARCH 2022

9. FINANCIAL INSTRUMENTS

The table below shows the carrying amounts of the Society's financial assets and financial liabilities.

i. Classification of financial instruments

	Financial Assets	Financial Liabilities
	Loans and receivables	Amortised cost
	\$	\$
31 March 2022		
Cash and cash equivalents	615,309	-
Term deposits		
Receivables	409,397	-
Investments -Term Deposits	1,278,069	
Payables	-	37,411
	2,302,775	37,411
31 March 2021		
Cash and cash equivalents	420,011	-
Receivables	448,608	-
Investments -Term Deposits	878,069	
Payables	-	37,956
	1,746,688	37,956

10. PAYABLES

Exchange transactions

	2022	2021
	\$	\$
Accounts Payable	37,411	29,329
	37,411	29,329

Non-Exchange transactions

Income received in advance	-	37,956
GST payable	640	30,110
	640	68,066

11. REVENUE

Revenue from non-exchange transactions

	2022	2021
	\$	\$
Steel & Welding Levies	2,743,729	2,136,893
Government research funding from MBIE - AGGAT	-	-
Grants from HERA Foundation	13,500	8,500
	2,757,229	2,145,393

Revenue from exchange transactions

Membership Subscriptions	122,390	182,584
Conference income	13,542	22,081
Consulting & Industry Projects	330,618	408,797
Services to third parties	18,294	8,820
Publication	18,252	36,531
Welding Modules	470	1,626
Rent	132,874	131,768
Seminar & Courses	339,469	284,129
	975,909	1,076,336

12. OTHER EXPENSES

	2022	2021
	\$	\$
Other expenses includes:		
Metals NZ	40,000	20,000
Recruitment	7,728	2,568
Insurance	43,278	18,478
Vehicle	29,789	35,732

NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION INCORPORATED

**Notes to the Financial Statements
FOR THE YEAR ENDED 31 MARCH 2022**

13. CAPITAL COMMITMENTS

There are no capital commitments at the reporting date (2021: Nil).

14. CONTINGENT ASSETS AND LIABILITIES

There are no contingent assets and liabilities at the reporting date.

15. EVENTS AFTER THE REPORTING DATE

There are no events which require disclosure or any adjustment in the financial statements.

16. OPERATING LEASE COMMITMENTS

The Society has entered into contractual agreement for building lease and photocopier lease with the outstanding commitments as follows:

Future minimum rentals payable under non-cancellable operating leases are as follows:

	2022	2021
	\$	\$
Within one year	356,331	341,448
After one year but not more than five years	614,641	1,259,110
More than five years	-	852,500
	<u>970,972</u>	<u>2,453,057</u>

17. INCOME TAX EXPENSE

HERA is a research society established mainly to promote and encourage scientific or industrial research and it has applied the income tax exemption in section CW 49 of the Income Tax Act. The tax exemption treats all income as exempt and it applies where the association is approved by the Royal Society of New Zealand and where none of its funds are used or available to be used for the private pecuniary profit of a member, proprietor, shareholder or associate. The New Zealand Inland Revenue has approved HERA's status under section CW 49 of the Act. HERA has also received an approval from the Royal Society of New Zealand on 2 October 2018 confirming that HERA meets the criteria required to promote/encourage scientific or industrial research under section CW49 of the Income Tax Act 2007.

18. GOING CONCERN

These financial statements have been prepared on a going concern basis. The Board believes that the entity will be able to meet its financial and regulatory obligations for the foreseeable future and that the going concern assumption adopted in the preparation of these financial statements is appropriate.



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