

Leading the way.

2023 ANNUAL REPORT
PŪRONGO Ā-TAU

HERA

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.

Ka tika a muri, ka ora a mua.

If support is given from the back, then those in front will be successful.

HERA works hard to secure our industry's tomorrow by innovating today. Behind the scenes we are building a tribe of passionate metal minds by delivering R&D solutions, technical excellence, knowledge transfer and training.

We connect and inspire. We futureproof our industry.

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Our people.



We acknowledge the following staff who left during FY22 (from left):
 Administrator (temporary position), **Charles Andrew**
 Innovation and Transformation Architect, **Greg Buckley**
 Structural Engineer, **Reza Kordani**
 Administrator (temporary position), **Taylah Nicol**

From left:

Customer Services Manager, **Rebecca Symonds**
 Customer Support Assistant, **Ngato Livingstone**
 General Manager Comms 4.0, **Kim Nugent**
 Structural Fire Research Engineer, **Fanqin Meng**
 General Manager Structural Systems, **Kaveh Andisheh**
 Senior Structural & Sustainability Engineer, **Amir Shah Mohammadi**
 Finite Element Analyst, **Nandor Mago**
 CEO, **Troy Coyle**
 Finance Manager, **Ronita Kishore**
 Welding Engineer, **Robert Ryan**
 Principal Welding Engineer, **Volkan Yakut**
 General Manager Welding Centre, **Michail Karpenko**
 Research Engineer, **Hafez Taheri**
 Automation and Welding 4.0 Engineer, **Holger Heinzl**
 Senior Welding Engineer, **Ozgur Erdem**

Ka whāia te wāhie mo takurua ka mahia te kai mō te tau

**If you look for firewood in the winter, you will have
plenty of food all year round.**

We are always looking ahead. Gathering the data
and insights ahead of future disruptions so our
members are prepared and have the tools and
understanding to thrive.

**This has been a
successful year
for HERA that has
solidified long-
term investment
in Industry 4.0
initiatives and
training.**



Our leaders.



Dave Anderson | Chair

Technical Director, John Jones Steel

As I complete my three year term as Chair, it is timely to reflect on the successes of HERA during this time.

Aotearoa New Zealand's society certainly has had many challenges throughout the Covid-19 disruptions, and HERA was no different. I'm happy to report we fared reasonably well thanks to the dedication of our staff who were able to pivot to working from home to remain productive.

As we all recover from the previous two years, HERA have been successful on many new research fronts, in addition to our usual work in progress.

The Endeavour funded Construction 4.0 program spanning four years is one such success that is now locked in (following our second attempt). Additionally, we have also partnered with the Auckland University of Technology (AUT) in their Endeavour funded project on developing earthquake resilient buildings.

Our Innovation Centre extension to HERA house is in the final design stage with construction planned shortly - this will complement our Construction 4.0 focus.

HERA is also one of two international partners in the Australian Government funded Sovereign Manufacturing Automation for Composites Cooperative Research Centre (The SoMAC CRC). This is a \$260 million, ten year project involving six Australian universities and 29 industry partners with a focus on the manufacturing of composite materials.

We are also happy to report that BRANZ funding has been secured for a HERA lead project in partnership with WSP New Zealand & Aurecon. This research is focused on circular design and looks to provide a framework for life cycle assessment of modules A through to D.

The last three years have certainly been interesting and challenging times. I'd like to thank the HERA board, Troy and all the HERA staff for their support, dedication and good advice over this period - we certainly have a good foundation to work from into the future.

DAVE ANDERSON
CHAIR, HERA



Troy Coyle | CEO

HERA

FY2023 was a successful year for HERA and its ability to support heavy engineering research. Our success in obtaining the \$10.3 million MBIE Endeavour funding for the project "Developing a Construction 4.0 transformation of Aotearoa New Zealand's construction sector" positions us as a centre of national excellence for industry 4.0 research.

Looking at the big picture

In FY2023, HERA solidified its long-term investment to create the Fab4.0Lab and build capability in this area, by successfully gaining \$10.3 million Endeavour funding for a four year program of work in construction 4.0. This large, collaborative research program (involving 9 universities and more than 18 PhDs/Masters) will position HERA as an international leader in construction 4.0 and is the largest research program of its kind in Aotearoa New Zealand. This will expand our research capabilities in circular design, Monitoring 4.0, sustainability, Mātauranga Māori interfaces, and also includes technology transfer of this capability into the sector.

In last year's annual report, we noted we would start to build capability in structural fire research and review the impact of that. We have received strong membership support for development of this capability and have now made this a permanent role within HERA.

In FY2023, we focused on Design Guidance, noting that this was one of the key areas that members wanted us to focus on.

Financial performance

FY2023 was again a strong year for HERA. The levy income was very close to budget but what ensured our strong financial performance was the unbudgeted income from research grants. This income stream was unbudgeted as the likelihood of success was less than 20%. This success was surprising and the culmination of a long-term commitment to expanding HERA's research capabilities. It was also the result of a deliberate focus on diversifying income sources to attempt to reduce reliance on the levy income. This strategy has now proven to be successful and has allowed HERA to further invest in research equipment and human resources to support our industry - something that we would not have been able to achieve otherwise.



CEO outlook.

We have an unprecedented program of research, training and publication planned for the year ahead, with continued focuses on structural fire engineering, seismic, Industry 4.0, Mātauranga Māori interfaces, sustainability, design guidance and software development.

Our people

In FY2023, HERA invested in its industry support capabilities, through the following appointments:

- Fanqin Meng (making the Structural Fire Research Engineer a permanent position);
- Ozgur Erdem (newly created Senior Welding Engineer role);
- Dr Amir Shah Mohammadi (newly created Senior Structural Sustainability Engineer role); and
- Ngato-Zharnaye Livingstone (newly created Member Support Assistant).

Reflecting on HERA's expansion in technical capability

This year marked a milestone for me - being in the CEO role for five years! So, I wanted to share what I see as the key technical successes for HERA over that period:

Welding Centre

- Staff numbers grown by 4 FTE;
- creation of Fab4.0Lab (includes a cobot, laser scanners, VR, and welding 4.0 power sources, 4.0 data loggers, a welding cobot integration kit, mixed reality technology HoloLens, 3D scanner for quality control, and 3D printer)
- delivery of a productivity program and Industry 4.0 assessments;
- focus on seismic program to resolve uncertainties around weld details used in joints critical to seismic connections, tolerances and other fabrication details;
- development of a welding capability review program for SMEs and SFC CC2 assistance;
- focus and development of circular design and Constructability 4.0 capability;
- Fabrication 4.0 program created to implement the roadmap, including an Industry 4.0 cluster, Industry 4.0 (SIRI) assessments, university lectures, Fab4.0Lab demonstrations, research to develop fabrication monitoring systems for certification activities, development of MQTT sensor network, and development of digital technologies for HERA's training and examination activities;



Life cycle assessment and sustainability.

This is a key part of our Endeavour funded Construction 4.0 program. The creation of HERA's life cycle analysis capability commenced with the appointment of Dr Shah Mohammadi. We also anticipate greater consideration of sustainability issues, particularly carbon, in our Design Guidance and we will continue the development of the first material passport to be developed in either New Zealand or Australia.



Seismic research.

We will increase our investment into our seismic research program and will participate in an AUT-led Endeavour project focused on developing earthquake resilient buildings.



Industry 4.0 and Monitoring 4.0.

We plan further expansion of our Fab4.0Lab facilities to support our research capabilities in Construction 4.0.

We will also start to create the Tabs4.0Lab to enhance our entry into Monitoring 4.0 research.



Positioning HERA and steel.

We will continue to 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.

This is a key part of our Construction 4.0 program and we have noted a significant focus in this area from sister organisations, such as Engineering New Zealand Te Au Rangahau, along with our research collaborators and funding bodies.



Making steel the material of choice

We are focused on developing design software and digital tools that takes advantage of technical advancements in national standards, simplifies the design process and addresses the technical issues experienced by our members and wider industry in areas such as fire, seismic, structural and durability design.



Our wins.

<p>\$10.3m funding secured via the Endeavour Funding Grant for Construction 4.0 transformation project.</p>	<p>We responded to 800+ requests for free technical advice.</p>	<p>Secured Endeavour funding for: * Seismic FEA & structural fire research; & SoMAC</p>
<p>56 ↓ active 'composite beam & slab software to AS/NZS 2327:2017' users recorded since its public release.</p>	<p>2 new welding courses developed. One for FICA/CBIP safety inspections & one for NZTA heavy vehicle certifiers.</p>	<p>2 design guides were developed and delivered to the industry.</p>
<p>5 📄 technical research publications delivered to our industry.</p>	<p>62 audits to AS/NZS ISO 3834 and/or SFC carried out as contract services to HERA Certifications.</p>	<p>398 professionals upskilled through our courses, webinars and training offerings.</p>

- performance of coating weathering steels research;
- new training includes Site Erection (a collaboration with SCNZ), Elevated Work Platforms, Welding Engineering for Forestry Industry Contractors, and training course for Transport Engineers (with Engineers NZ); and
- the successful securing of the Sovereign Manufacturing Automation for Composites (SoMAC) grant.

Structural Systems

- Staff numbers grown by 2FTE;
- focus on reinvigorating design support, including expanding our design software portfolio and design guides;
- development of our sustainability program, including material passport, steel corrosivity map, development of numerical indentation simulation, and plans to expand into LCA research and develop design guidance;
- creation of our structural fire program, including updating the slab panel method, development of advanced structural fire performance-based design procedures, advanced updated design to design steel car parks under severe fires, and training in composite design under severe fire;
- the development of our Design 4.0 and Monitoring 4.0 capability and research program;
- the successful securing of Endeavour funding for seismic finite element analysis (FEA);
- development of composite software for composite beams and slabs to AS/NZS 2327 and addition of web openings;
- development of corroded structures assessment technical solutions; and
- re-invigoration of the HERA Bridge Group.

Ngā mihi to the tribe of engaged metalminds that continued to support us through FY2023.

DR TROY COYLE
CEO, HERA

Our 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, New Zealand.



Dave Anderson
HERA Chair Technical Director,
John Jones Steel.



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



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



Wolfgang Scholz
HERA Foundation
Treasurer. Director, Ideas
in Design Ltd.
to 5 Mar 2023



Darren O'Riley
General Manager, SCNZ.



Malcolm Hammond
Managing Director, MJH
Engineering
from 15 Mar 2023



David Moore
Managing Director, Grayson
Engineering Ltd.



Dieter Adam
Executive Director, The
Manufacturers' Network.



Jane Warren
Director & Joint Owner,
Dixon Manufacturing Ltd.



Jayden Mellsop
Contract Manager &
Director, Eastbridge Ltd.
to 20 Feb 2023



Jeremy Smith
Head of Product
Applications &
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.

Whaiwhia te kete mātauranga.

Fill the basket of knowledge.

Research and development is an important piece of the mahi we carry out at HERA. It allows us to ensure our members are equipped with the right technical guidance and understanding to deliver their work.

**We continue
to deliver R&D
solutions so
our members
are supported
in technical
excellence and
knowledge
transfer.**



Our research.



Kaveh Andisheh
General Manager Structural Systems

Driving resilience

Seismic research

Our seismic research is a collaborative effort between ourselves and the University of Auckland (UoA), Auckland University of Technology (AUT), University of Waikato, and international partners.

Its aim is to improve the resilience of steel structures and productivity in steel fabrication through advanced testing and simulation methods, with a focus on developing guidelines for the use of fillet welds as a substitute for butt welds in structural steel applications designed to NZS 3404.

The research work has involved contributions from one PhD and four Bachelor students, resulting in the publication of two peer-reviewed papers and two master's theses. Two PhD candidates from the University of Waikato have received HERA Foundation scholarships and are allocated to this project.

This is a collaborative research project which also involves input from our structural team to implement the Japanese "effective notch strain concept" to resolve uncertainties surrounding some of the weld details used to join critical seismic connections, tolerances, and other fabrication details. It also involves the testing of large and small scale specimens using advanced numerical modelling, of which the results will be used to develop corresponding HERA guidelines and inform standards committees around proposed changes.



Michail Karpenko
General Manager Welding Centre

Enhance and optimise bolted connections in seismic resisting systems

This research aims at addressing the following points through analytical, numerical (FEM), and experimental research:

- review of the installation of the HSFG PC8.8 bolts specifically in moment end plates relating to the required number of threads in the loaded face of the bolts. It is thought that this most likely lead to the relax of the current requirements of NZS 3404;
- investigation into the use of classes higher than 8.8 bolts (e.g. 10.9 and 12.9) which are becoming more commonly used despite their installation and performance not having been researched thoroughly to be following the 8.8's procedure; and
- specification of the ideal lubrication material and procedures which are currently not specified in details in the current standards.

Earthquake resilient buildings

We are collaborating on the "Sustainable Earthquake Resilient Buildings for a Better Future" five year research program led by AUT and funded by MBIE's Endeavour Fund.

The main objective of this project is to optimise the benefits of friction sliding systems in earthquake resistant buildings by developing reliable, cost-effective, and adaptable friction sliding systems for buildings subjected to severe earthquakes and fires following an earthquake.

High strength grade bridges

This project aims to develop a design guide for use of high-strength steel material in bridges, it is envisaged this work will be completed in two stages.

The initial stage of research will focus on the literature review, the availability of international structural design standards, the market availability of high-strength steel and the benefit and limitations of high-strength steel. A design example comparing the weight of grade 350 steel to grade 690 steel used in a simple bridge configuration will also be carried out for a section capacity check at the ultimate limit state.

In the second stage of the project, a detailed study will be carried out to develop design recommendations for the design of high-strength steel material in bridges.

Performance of coastal weathering steel in Aotearoa New Zealand's coastal environments

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.

To evaluate the performance of coastal weathering steels in Aotearoa New Zealand's coastal environment we are conducting exposure tests and updating our recommendations in HERA Report R4-97. In December 2022, three sets of samples were exposed at different test sites (Auckland Harbour Bridge site accounting for two locations, and Judeford the other). The first lot of samples will be retrieved and evaluated in December 2023 following 12 months of exposure.

Development of an online corrosivity map

Understanding that navigating data sets to inform projects in terms of corrosivity zones can be challenging for designers, we have successfully developed, and now host, an online corrosivity zone map software application which enables our members to search by address and determine a recommended corrosion classification in alignment with NZS TS 3404.

Across this financial year, the amended version of this online map was released for beta testing.

Feasibility study in to cost-effective NDT methodologies

This research project is aimed at studying non-destructive testing methodologies to identify the mechanical properties of structural steel elements in Aotearoa New Zealand.

In particular, we are assessing the feasibility of implementing a more cost-effective methodology to identify the mechanical properties of structural steel in New Zealand. So far, we have identified that hardness testing is a methodology requiring further research.

Cost-effective intumescent design tool for steel products

This research project will develop a tool for engineers, fabricators, and specifiers to optimise the intumescent costs from an element perspective.

In this tool, users will only need to input their designed member information and then the software would generate the cost estimation based on the input. In addition, the software will also estimate the cost of various sections with equal or greater capacity than the original option, allowing the user to select the most cost-effective option with minimum total cost.

Update HERA report R4-133

This project will undertake a comprehensive review of HERA Report R4-133, to incorporate the latest guidance outlined in AS/NZS 2312:2014, AS/NZS 5131:2014 and SNZ TS 3404.

It is also proposed to develop a series of "Acceptable Solutions" relating to common durability details such as addressing the corrosion risk associated with dissimilar metals, accelerated corrosion of baseplates at steel to concrete interfaces to "Ring Bark Corrosion" of embedded steel in either concrete or directly into the ground. This revision will also develop guidance to address common issues relating to intumescent coatings and the potential to provide both fire protection and meet the required durability in different atmospheric corrosivity environments.

Hardness tests to identify mechanical properties of structural steel elements

This research aims to identify the mechanical properties of structural steel by utilising hardness testing. To achieve this, various types of hardness tests will be performed on steel specimens and monotonic tensile tests will be conducted.

Once it is known what the most reliable type of hardness test is, it will be used to develop equations that demonstrate the correlation between hardness and the mechanical properties of structural steel.

Structural fire performance

Investigate minimum dimension requirements for CFST columns in fire

This research will assess the suitability of the minimum dimension requirement (160mm) for concrete filled steel tube columns in compliance with AS/NZS 2327: 2017.

Following this comparison with the design results using the approach from AS/NZS 2327: 2017, further CFST column structural fire design discussions and recommendations will be given.

Development of advanced structural fire performance-based design procedure for steel structures

This project looks to develop a detailed HERA guide on performance-based fire design of multi-storey steel and composite (steel/concrete) structures.

Making steel the material of choice

Development of windows executive composite beam design software

This project looks at developing a windows executive executable composite beam software according to AS/NZS 2327, of which industry standard hot rolled and welded beams will be included. It is believed that the availability of this software to members will boost their productivity and remove a barrier to composite design.

Making steel a low-carbon material choice

Led by WSP, this research involved the delivery of an updated literature review and dissemination of guidelines to unlock the sustainability benefits of steel.

We also conducted a high-level Living Cycle Analysis (LCA) on various buildings and bridges using different structural materials and end-of-life scenarios. The results have shown that including stage D (end-of-life scenarios) is critical to the comprehensive environmental evaluation of buildings and bridges.

As an outcome of this work, we have also identified recommendations for future research in steel sustainability areas.

Development of a steel circularity passport

Structural steel materials have the potential to be re-used across multiple construction projects over time. Our research project aims to support this happening by providing the required methodology and data structure for collecting and handling reliable and standardised information on the structural steel elements and systems for a building to facilitate future end-of-life recovery, reuse, repurposing and recycling.

This project will develop the first Australasia material passport in the construction industry. So far, the second draft of literature review, common language, and steel circularity passport best practice has been prepared. A survey has also been sent to HERA members and key industry players to identify barriers to steel reuse in New Zealand.

Key releases.



Slab panel method software.

A design procedure that enables the use of and ensures steel composite decking is the go-to solution for industry.



HERA Report R4-156 Seismic Design of Moment Resisting Frames (MRF).

A result of significant edits to the MRF section of R4-76 & changes to NZS3404 and NZS 1170.5, as well as lessons learned from the Christchurch earthquakes.



Online corrosivity map.

Enabling search by address to quickly and precisely determine a recommended corrosion classification for projects.

State of art review of carbon sequestration

This research will undertake a desktop state of the art review of the different types of carbon sequestering, their efficacy, and their pros and cons.

The learnings from this study will be used to refine guidance relating to the LCA, especially that related to the end-of-life use of the structure. It is also envisioned it will influence the LCA review, especially if the argument can be made that biogenic carbon sequestration should be taken as commencing from the beginning of a structure's life, and not as a negative value when assessing Module A (as it is currently assumed).

Circular design for a changing environment

This program will be carried out as part of a HERA/BRANZ research collaboration. The objective being to create a framework and a pilot program that will assist design engineers and other professionals in designing low carbon buildings. The project will deliver the following:

- a design guidance framework independent of material and typology which can be used as a template by the sector to prepare design guidance with the aim of achieving the lowest embodied carbon;
- specific guidance for design engineers to reduce carbon in typical low-rise building typologies in the pilot stage based on steel, steel-concrete, and steel-timber usage; and
- identification of knowledge gaps that require future research to focus on providing guidance for design engineers to reduce carbon in other areas of design. The framework and this information will be used to inform subsequent stages beyond the scope of this project.



Seismic tests of welded connections at the Auckland University of Technology (AUT). From left: Prof. Charles Clifton, Dr Shahab Ramhormozian, Dr Michail Karpenko, Kevin Yip, Yu Zhou and Hafez Taheri. | **Photo 1**

Review of recorded data of seismic tests at AUT. | **Photo 2**

Attendees of the 'Welding Engineering for Safety Inspections of Cable Logging Yarders' course held at HERA. | **Photo 3**

In action.

Research in play.

Recognising the importance of structural fire research, we have welcomed Fanqin and his expertise as a permanent FTE.

This has enabled creation of our structural fire program, including updating the slab panel method, development of advanced structural fire performance-based design procedures, advanced updated design to design steel car parks under severe fires, and training in composite design under severe fire.



Fanqin Meng
HERA Structural Fire Research
Engineer.

Investigating how far passive protection on the primary beam needs to extend when the slab panel method is used.

When the slab panel method (SPM) design procedure is used, unprotected secondary beams are connected into protected primary beams. This raises the question as to how far the passive protection on the primary beam needs to extend over the connection and into the end of the secondary beam, in order to minimise the temperature rise in the primary beam from heat flowing in via the unprotected secondary beam.

HERA Report R4-131 is focused on the two most commonly used secondary beam to primary beam connections - the Web Plate (WP) connection and the Flexible Endplate (FE) connection.

Simulation results

The heat transfer analyses in ABAQUS determined the effect of protection at the ends of unprotected secondary beams on the temperature distribution of connected primary beams. Two fire protection conditions are given here: (1) the web plate protected and secondary beam unprotected; (2) the web plate and the first 400mm of the secondary beam protected. The comparison results indicated that applying different protection length at the ends of unprotected secondary beams produces a negligible effect on the primary beam flange temperature.

Discussion and conclusion

The results indicated the bending moment capacity of the primary beam is identical in both of the main two conditions. The primary beam web temperature is 130°C hotter as against being applied also along 400mm of secondary beam. This slightly reduces the shear capacity of the beam web at the point of secondary beam attachment - however, any reduction will be more than compensated for by the shear capacity of the concrete slab over the beam for which the contribution is currently ignored in fire engineering design and in ambient temperature design.

In addition, for solid web beams, the shear capacity is always much greater than needed so a small loss due to localised higher temperature will not lead to premature failure.

This investigation showed that coat backs on secondary beams are not required when the slab panel method is used to design composite slabs under fire conditions. It also illustrated the key areas that require fire protection on primary beams without coat back on secondary beams.

Further investigation is required for beams with multiple unstiffened web openings.

Authors of full report: Fanqin Meng, Charles Clifton, and Kaveh Andisheh.



Fab 4.0.

A Fab 4.0 roadmap to digital transformation in fabrication

The world is currently experiencing the Fourth Industrial Revolution, where manufacturing and industrial processes are being transformed through the use of digital technologies like automation.

These 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 we have developed and adopted a HERA Industry 4.0 roadmap with the objective to establish links with technology suppliers and provide guidance and inspiration to our members in this space.

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

This year, this commitment has led to the formation of an Industry 4.0 cluster group to promote the adoption of Industry 4.0 technologies to, and provide a platform for members to safely share ideas. This has been achieved through networking meetings with invited guest experts, with topics covered being:

- **Reverse engineering - 3D part scanning.** We explored how this technology creates a point cloud of an object, which is then processed into a 3D mesh; as well as typical applications including inspection and reverse engineering of objects.
- **Optimising production flow and increasing profit.** This session looked at the application of the “Theory of Constraints” - a business management paradigm where the output of a system is limited by its slowest process, (called the bottleneck). It recognises that optimising such flow, leads to increased throughput and improved productivity.
- **Can cobot welding solve our labour shortage?** This meeting explored the automation of fabrication using welding where typically the items are large in size, made in small numbers, and made to individual designs.
- **Industry 4.0 assessment.** We discussed how assessment is the first step in a continuous innovation cycle and how innovation potential is identified based on the current state of Industry 4.0 in a company compared to a reference industry, cost structure, and business objectives.

Industry 4.0 focused research

We partnered with the University of Auckland to conduct research into the following topics:

- **Automated Optical Weld Analysis System:** This project involves developing a system that measures weld sizes using a cobot and a line scanner.
- **Weld Monitoring System:** This project involves monitoring the arc-on time of a fleet of welding equipment.
- **Digital NDT:** This project involves the vertical integration of fabricator and 3rd party inspection companies.
- The work was accomplished by student from the Technology Management and Bachelor of Engineering programs.

The Fab4.0Lab - an onsite technology hub

Our lab is a space that allow our members to explore technology and understand the potential it has to improve their workshop processes. It currently features a multi-purpose cobot arm which is available for programming demonstrations using cobot-specific functionality and off-line programming software. We also have a 3D part scanner and software for reverse engineering to enable the creation of digital models of physical objects; and real-time monitoring for welding processes using our weld pool observation camera.

The lab's capabilities are continuously expanding, where we are waiting on the arrival of a second cobot system and technology to measure and validate welding process parameters in the coming months.

Industry 4.0 assessments

This year we were proud to launch our Industry 4.0 assessment offering to our members. Developed in collaboration with the University of Wollongong, it is aimed at understanding where a business sit in terms of adoption of Industry 4.0. It achieves this by getting an accurate picture of the company's current state in order to develop an innovation roadmap.

Overseen by our Automation and Welding 4.0 Engineer, Holger Heinzl; the assessment covers the whole company and is based on principles of SIRI (smart industry readiness index), with a particular focus being on the automation of welded fabrication.

Industry 4.0 highlight.

HERA Industry 4.0 Cluster Group member

Grayson Engineering

David Moore, Managing Director.

Grayson Engineering is a recognised market leader with over 50 years in the steel fabrication industry. From large scale stadiums to sculptures, bridges, towers, industrial sheds and everything in between - the organisation has completed a wide range of projects while continually investing in CNC equipment and technology.

David on Industry 4.0 saying: "We found ourselves involved with Industry 4.0 when collaborating with a company in modular construction. This started us on the track of developing a robotic welding line to deal with the repetitive processes of the project."

"The more we can automate mundane processes, the more time our team can spend on the quality finishing touches."



Construction 4.0.

In FY23 we were proud to announce that we were successful in the prestigious Endeavour Fund 2022 round and awarded close to \$10.3m to support a four year Construction 4.0 research project.

Our research program is focused on transforming the construction sector in Aotearoa New Zealand using Construction 4.0 approaches. Fundamentally, it will improve productivity for the construction sector more broadly, with key outcomes including better economic performance, building and infrastructure affordability, and a larger workforce which is more skilled, innovative, and digitally literate.

Led by HERA with our CEO Dr Troy Coyle as Impact Lead, collectively, we have representatives from nine universities, along with BRANZ.

Why was it needed?

Currently there is a profound limitation in the way we perform construction in Aotearoa New Zealand. Complex decisions are being made based on simple data inputs and in linear silos with little inter-connection or data-derived decision support. This project will improve design to construction (and beyond) by bringing together industry and a team of global experts rigorously vetted, who will use complexity science to build upon developing nascent global Construction 4.0 knowledge."

Why is this research different?

Informed by experts in Mātauranga Māori and its interface with engineering, and by specialists in

sustainability and resilience in the built environment, it makes this research unique globally and aligned to social outcomes and intergenerational wellbeing.

A core research theme will also focus on technology transfer in traditional industries and policy development and implementation, to ensure that the project outcomes are readily adoptable.

Add to this our linkages internationally, to industry, and to existing research programs, we believe this will ensure project outcomes avoid redundancy and are international best practice.

Industry Advisory Group (IAG) governance

Ensuring the success of our research project is our Industry Advisory Group, whom will play a key role in developing out this program of works and making sure that its intended impacts are achieved and the sector is well positioned to uptake the results.

Adopting a Co-Chairing model to uphold the programs commitment to mātauranga Māori, the IAG is Co-Chaired by Spark B2B Marketing Chapter Lead, Nicky Luis; and TOA Architect, Saul Roberts. We have received an excellent list of expressed interest to form the rest of the IAG body, and look forward to confirming appointments in early FY24.

Collectively, the IAG will provide ongoing research direction and perspective, relevancy, identification of potential barriers to adoption, advice, and opportunities for broader engagement and uptake.

In focus... Construction 4.0 research themes.



Circular design

Challenging existing design procedures and processes in New Zealand construction to uptake automation, digitisation, connectivity and modularisation for productivity gains and economic impact.

PROJECT LEAD:
MICHAIL KARPENKO
HERA General Manager Welding Centre



Monitoring 4.0

Extending the benefits of adopting structural health monitoring beyond a tool for decision making on a single structure by integrating structural health monitoring into the entire design, construction, and maintenance cycle.

PROJECT LEAD:
KAVEH ANDISHEH
HERA General Manager Structural Systems

Circular design.

This research theme is led by our General Manager Welding Centre, Michail Karpenko and supported by our General Manager Structural Systems, Kaveh Andisheh and University of Michigan Prof. Pingsha Dong. There is also collaboration with UoC, AUT, UoA, and the University of Miskolc. The core aim of this research theme is to question conventional design procedures and processes utilised in Aotearoa New Zealand's construction industry.

Automation/digitilisation/connectivity of construction methods and processes is the central competitive factor for traditional manufacturing groups, but alongside modularisation is also becoming increasingly important for construction. The design solutions created in this project will enable the adoption of Industry 4.0 technologies, and are expected to result in significant increases in productivity within the construction sector which will likely lead to double-digit productivity gains.

This research theme also seeks to reduce waste, conserve resources and promote sustainability by designing buildings and infrastructure that are flexible, adaptable, and resilient so they can be easily disassembled, reused, or recycled at the end of their useful life.

So far, a reusable optimised design for the entire seismic frame has been developed. This has been through the optimisation of steel structural dimensions which has resulted in a weight reduction directly in steel used, which in turn results in a reduction in environmental impact. Further works have included the development of a decision making tool for the selection of structural details taking into account mātauranga Māori, and optimised connection details for maximum efficiency in production.

Monitoring 4.0

This research theme is led by our General Manager Structural Systems Kaveh Andisheh, and supported by Prof. Babak Moaveni of Tufts University (USA) and the University of New Hampshire (USA). It looks to create a framework that can serve two purposes:

1. enable objective and improved monitoring of structural systems using in-situ data and numerical models, and
2. develop optimal plans for instrumentation that provide maximum information gain while keeping monitoring and instrumentation costs low.

This framework will result in a calibrated digital twin that can be incorporated into cyber-physical to allow the comparison of the overall performance of structural systems against design expectations, and identify any errors in modelling. This work supports the overarching data standardisation program as well as circular design and smart construction research themes.

Industry 4.0 highlight.

HERA Industry 4.0
Cluster Group member

BDM Vircon

Cedric Easthorpe,
Business Manager.

DBM Vircon is one of the world's largest structural modelling and steel detailing companies with considerable experience in commercial, industrial, infrastructure and digital engineering projects. With offices spread across the globe, their operations are inter-connected by a state-of-the-art wide-area network, with robust backups and disaster recovery systems.

Cedrick on Industry 4.0 saying:
"Staying up to date with software packages, use of our Tekla cloud-based platform, and having our extremely robust data security and cyber security systems means we are able to have multiple offices across different time zones working in the same model."

Industry 4.0 highlight.

HERA Industry 4.0 Cluster Group member

Red Steel


Bob Hawley, Managing Director.

Red Steel specialises in structural steelwork and undertakes contracts predominantly in the lower North Island of Aotearoa New Zealand from its purpose-built facility in Pandora, Napier.

They have a commitment to incorporating emerging technologies into their business having undertaken an Industry 4.0 assessment to benchmark themselves against other manufacturing businesses both in Aotearoa and globally.

Bob on Industry 4.0 saying: "If we can take away time-consuming aspects of a role by a machine doing it automatically, then lets use it. Labour is a scarce resource so we need to utiise it as best we can!"


Our other key research themes for developing a Construction 4.0 transformation of Aotearoa New Zealand's construction sector:



Data connectivity standardisation

Exploring ways to create true connectivity for construction data so it can be readily generated, captured, shared, stored and processed across platforms, data producers and users.

PROJECT LEAD: PROF. XUN XU
University of Auckland Head of Laboratory for Industry 4.0 Smart Manufacturing Systems



Knowledge transfer

Addressing the gap of knowledge that exists between Construction 4.0 and Mātauranga Māori by building a uniquely Māori framework to address the challenges of Construction 4.0.

PROJECT LEAD: A/PROF KENNETH HUSTED
Auckland University of Technology (AUT) Architecture and Future Environments, Co-Head Huri te Ao Hoahoanga



Smart construction

Delving into the properties, invariant signatures, and structural performance of construction objects such as footings, slabs and beams to create a new end-to-end computational platform for design and manufacture, to open the door to full automation of prefabrication and modularisation to improve building performance, environmental profile and productivity.

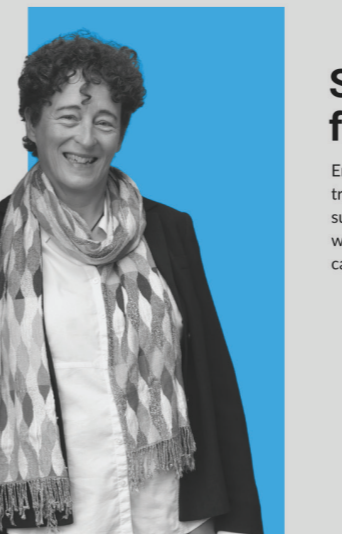
PROJECT LEAD: DR ALICE CHANG-RICHARDS
University of Auckland Senior Lecturer & Leading Specialist in Construction Technology



Mātauranga Māori & Construction 4.0

Addressing the gap of knowledge that exists between Construction 4.0 and Mātauranga Māori by building a uniquely Māori framework to address the challenges of Construction 4.0.


PROJECT LEAD: A/PROF FLEUR PALMER
Auckland University of Technology (AUT) Architecture and Future Environments, Co-Head Huri te Ao Hoahoanga



Sustainable future

Ensuring that our Construction 4.0 transformation is environmentally sustainable using whole-of-life and whole-of-building modelling to meet carbon budgets.

PROJECT LEAD: PROFESSOR SARAH MCLAREN
Massey University and Director of NZ Life Cycle Management Centre



Emerging technologies

Investigating emerging artificial intelligence approaches applicable to our research programmes and adapting them to the complex requirements of Construction 4.0 data.

PROJECT LEAD: PROFESSOR ROBERT AMOR
The University of Auckland

Trusted expertise.

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 (Chair, then Director);
- Construction Industry Council (Director);
- Pro Vice Chancellor's Advisory Board (AUT);
- Hanga Aro Rau, Workforce Development Council for Manufacturing, Engineering and Logistics (Co-Chair);
- Steel Construction New Zealand (Director);
- MBIE's Building Advisory Panel;
- Steering Group for Advanced Manufacturing Industry Transformation Plan and co-sponsor for the Sustainability and Innovation working groups within it;
- AUT Engineering Industry Advisory Group
- National Association for Steel Framed Housing (NASH);
- Metals NZ; and
- HERA Cert.

This year, we were also able to re-invigorate the HERA bridge group. This is made up of our members across a range of areas including fabricators, manufacturers, bridge consultants, and bridge constructors.

The role of this group is to identify innovation, training and research and development opportunities for steel bridges to ensure that steel is material of choice in such structures across Aotearoa. The first group meeting was held in September 2022.

Technical advice

We support the toughest projects through technical support and services.

In FY23 our team provided technical support to a wide range of needs from the interpretation or application of standards, to technical enquiries requiring in-depth 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 and durability design;
- corroded structures;
- composite structures and composite design;
- seismic design of steel and metal composite structures;
- low-damage seismic solutions for steel buildings;
- structural earthquake engineering for steel and composite structures
- structural fire engineering; and more.

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

Expertise in play.

Review of welding grade CO₂ gas and gas mixtures.

Welding grade CO₂ gas is critical for the welding fabrication industry - welding being a key enabling technology in critical industries such as steel construction, pressure equipment, maintenance and similar. This is because CO₂ is used as a shielding gas to protect the weld in the welding processes Metal Active Gas (MAG) and Flux Cored Arc Welding (FCAW).

Amidst challenging global supply chains following the COVID-19 pandemic, we received reports from industry around challenges facing the global carbon dioxide (CO₂) business which were beginning to emerge. There were also reports that local CO₂ shortages were also crippling New Zealand's food industry (as the larger user of CO₂ gas in the country). This was of particular concern given the closure of the Kapuni CO₂ Plant.

In response, our General Manager Welding Centre, Michail Karpenko carried out an urgent technical review of welding grade CO₂ gas and gas mixtures and the impacts of shielding gas choices, also running a free webinar to discuss issues around supply and disseminate these learnings more broadly.

Given welding processes underpins a significant proportion of Aotearoa New Zealand's economic activity, our CEO also initiated correspondence to advocate for industry to MBIE - making aware the impacts of rising cost increases, global supply chain barriers and similar.

Trusted solutions.

Software development

Driven to make steel the material of choice, we are committed to continued collaboration with national and international software developers.

The aim of this work being to simplify the design process for steel and metal composite structures, to increase uptake of this material with designers.

Our key focus this year has been the development of a web-based design software to design composite slabs and beams according to AS/NZS 2327. We expect to release the software for final evaluation and user acceptance testing in FY24.

During FY23, the main development milestones for software development have been to:

- fix IT-related issues identified in user testing for the web-based design software to design composite slabs and beams according to AS/NZS 2327;
- release our Online Corrosivity Map for durability design of structural steel components and structures with further development studied;
- release our Slab Panel Method software, version 4 for structural fire design of metal composite flooring systems, adding experimentally tested Dovetail composite flooring to the package; and
- significantly progress development of a new composite beams software to design a composite beam with web opening.

Publications and reports

A key output of our technical team are the delivery of our reports, design guides and publications.

These resources keep industry up to date with the latest standards, research and technical guidance to design and develop safe, resilient and cost effective structures.

This year, the following resources were made available:

- H. Taheri, M. Karpenko, G.C. Clifton, S. Ramhormozian, P. Dong, J.B.P. Lim: Seismic application of fillet and partial penetration butt welds. NZSEE Conference, Auckland, April 2023.
- D. Chandramohan, K. Roy, H. Taheri, M. Karpenko, Z. Fang, and J. Lim: A State of the Art Review of Fillet Welded Materials, MDPI 2022
- Weathering Steel Bridges – An Australasian Experience, Austroad 2022.
- Steeling ourselves for a sustainable future, IPWEA Conference.
- Developing Construction 4.0 transformation of Aotearoa New Zealand Construction Sector, NZSEE 2023
- **R4-159:** Common language in structures as steel banks.

Structural consultancy services

We help our members and professionals in Aotearoa New Zealand's steel industry on a variety of complicated structural engineering problems.

One way in which we do this is through the use of general purpose Abaqus software for realistic simulations to help solve complex structural engineering problems. This year successfully delivering several simulations to find solutions for our clients and members.

Design guides

Our structural team continues to develop technical solutions and design guides.

Assisting professionals and engineers in seismic design, sustainability, durability, structural fire, and steel and composite structures. This year developing and updating the following guides:

- **Guidance and corrections to clauses in AS/NZS 2327:2017 Amd1: 2020 (2nd revision)**, which aims to correct existing errors in the most recent version of composite structures standard: composite steel-concrete construction in buildings (AS/NZS 2327). The first revision was submitted to Standard Australia and was used to develop a scoping document for AS/NZS 2327. The second revision addressed errors and a lack of details in provision of composite beam design with web penetration. At this stage, the guideline has been shared with AS/NZS 2327 committee members.
- **R4-156: "Seismic design of moment resisting steel frames"**. This 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 since R4-76 was published. It includes lessons learned in the Christchurch earthquake series and a number of other research papers and follows the capacity design procedures from NZS3404:1997 including amendments 1 and 2. It also includes a capacity design based worked example of a multi-storey steel framed building, covering the determination of the seismic and gravity design actions following an equivalent static approach.
- **R4-155: Optimised Sliding Hinge Joint design guide (2nd revision)**. This accounted for significant edits due to recent research and developments, inclusion of industry feedback (from using OSHJ's in building projects across Aotearoa (New Zealand) since R4-155 was first published in 2020) and addition of a detailed design example.

In FY23

424 

free reports were downloaded for use by our members across 28 different resources.

Our trusted design guides and technical reports are referenced globally.

Most recently, HERA R4-97 (weathering steel bridge design guide for bridges in New Zealand) was referenced in the American National Steel Bridge Association weathering steel publication and European weathering steel design guide.

Standards and compliance.

Committees

Welding:

- WD-002 - Welding consumables;
- WD-003 - Welding of structures;
- ME-001 - Pressure equipment;
- MT-014 - Corrosion of metals; and
- ISO/TC 167 - Steel and aluminium structures.

Structural:

- AS/NZS BD-023 - Structural steel;
- AS/NZS BD-032 - Composite construction;
- AS/NZS BD-006 - General design requirements and loading on structures;
- AS/NZS BD-090 - Bridge design;
- AS/NZS MT-001 - Iron and steel;
- AS/NZS ME-029 - Fasteners.
- NZS P3404 - Steel structures; and
- NZS TS 1170.5 - Structural design action - Part 5: earthquake actions New Zealand.

**AS/NZS - joint NZ and Australian committees, Standards Australia*

**NZS - Standards New Zealand*

Standards updates

This year we have actively worked on the update and revision of the following standards:

Welding:

- AS/NZS ISO 14341:2022: Welding consumables – wire electrodes and weld deposits for gas shielded metal arc welding of non alloy and fine grain steels – classification;
- AS/NZS ISO 17634:2022: Welding consumables – tubular cored electrodes for gas shielded metal arc welding of creep-resisting steels – classification;
- AS/NZS ISO 17632:2022: Welding consumables – tubular cored electrodes for gas shielded and non-gas shielded metal arc welding of non-alloy and fine grain steels – classification;
- AS/NZS 4855:2022: Welding consumables – covered electrodes for manual metal arc welding of non-alloy and fine grain steels – classification;
- AS/NZS ISO 636:2022: Welding consumables – rods, wires and deposits for tungsten inert gas welding of non-alloy and fine-grain steels – classification;
- AS/NZS 4857:2022: Welding consumables – covered electrodes for manual metal arc welding of high-strength steels – classification;
- AS/NZS ISO 18273:2022: Welding consumables – wire electrodes, wires and rods for welding of aluminium and aluminium alloys – classification standard;
- AS/NZS ISO 14343:2022: Welding consumables – wire electrodes, strip electrodes, wires and rods for arc welding of stainless and heat resisting steels – classification standard;
- AS/NZS ISO 18276:2022: Welding consumables – tubular cored electrodes for gas-shielded and non-gas-shielded metal arc welding of high strength steels – classification standard;
- AS/NZS 4856:2022: Welding consumables – covered electrodes for manual metal arc welding of creep-resisting steels – classification;

- AS/NZS ISO 17633:2022: Welding consumables – tubular cored electrodes and rods for gas shielded and non-gas shielded metal arc welding of stainless and heat-resisting steels – classification;
- AS/NZS ISO 3834.1:2023: Quality requirements for fusion welding of metallic materials, Part 1: Criteria for the selection of the appropriate level of quality requirements;
- AS/NZS ISO 3834.2:2023: Quality requirements for fusion welding of metallic materials, Part 2: Comprehensive quality requirements;
- AS/NZS ISO 3834.3:2023: Quality requirements for fusion welding of metallic materials, Part 3: Standard quality requirements;
- AS/NZS ISO 3834.5:2023: Quality requirements for fusion welding of metallic materials, Part 5: Documents with which it is necessary to conform to claim conformity to the quality requirements of AS/NZS ISO 3834.2, AS/NZS ISO 3834.3 or AS/NZS ISO 3834.4; and
- Draft AS/NZS 5100.6:2022: Bridge design steel and composite construction.

Structural

- AS/NZS 2327: Composite structures;
- NZS 3404: New Zealand Steel Structures Standard;
- AS/NZS 5100.6: Bridge steel and composite structures, where revised draft has been released for public comments;
- AS/NZS 1170.2: Wind loading, where a new scoping document, proposals review and endorsement revisions are now in progress;
- AS/NZS 1594: Hot rolled steel flat products; and
- TS 1170.5: Development of New Zealand technical specification TS 1170.5:202X Structural Design Actions - Part 5 Earthquake Actions New Zealand and SNZ TS 1170.5 Supp 1:202X Structural design actions – Part 5: Earthquake actions – New Zealand Commentary.

Our team represents the industry on several standards committees in both Aotearoa, New Zealand and Australia.

In FY23

16 

welding related standards were updated and revised; and

6 

structural related standards were updated and revised.

Zero carbon steel.

Carbon offsetting program now available for steel

HERA was beyond excited to launch our new Zero Carbon Steel Program – Hōtaka Whakakore Puhanga Waro this year!

It marked a great leap forward for the construction sector who will now be able to offer a zero carbon steel option for most steel products used in New Zealand. It also demonstrates how collaboration along a full supply-chain can drive change.

As part of the offsetting program, we commissioned thinkstep-anz to develop a robust set of program rules to determine the underlying requirements for calculating the emissions for offsetting to ensure integrity of the program.

We have also partnered with Ekos, a leader in carbon management and environmental financing, to administer the offsetting process. Emissions are offset via Ekos through the calculator within this program – with the offsets being sourced from native forest projects in the Pacific Islands. These projects deliver multiple biological, ecological and social co-benefits beyond simply carbon sequestration.

Acknowledging that steel is a known hard-to-abate product, this program provides a carbon neutral steel option now. It also builds upon all of the circular economy benefits that steel offers through its reuse and recycling, noting that 85% of all steel waste from construction in NZ is recycled.

We're not aware that a program of this type, at this level of detail, exists anywhere else in the world, and we expect the program to change the conversation around the carbon performance of steel, with the sector knowing that a reliable option for net zero carbon steel now exists.

Who is this program for?

The main users of the program will be either the building product suppliers or fabricators, who may decide to bring it into their front end to offer zero-carbon options to their customers or end-users (i.e. building owners).

Suppliers can also use the program to bid for projects offering a zero-carbon option (with the anticipated offsets included in the quoted fee), leaving the end-user to pull an affordability lever or a carbon lever.

Steel Fabricator Certification (SFC) audit at HERA member company D&H Steel Construction.



Innovation Centre to be a 6 star greenstar build.

Registered for assessment with the NZ Green Building Council under the Green Star - Design & As Built NZv1.0 rating tool, this centre will showcase a range of Industry 4.0 technologies and expand our research, training and demonstration capabilities that have already been created in the Fab4.0Lab.

Building Green 4.0.



HERA Cert.

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.



Michail Karpenko
HERA Certifications Ltd General Manager

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.

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).

In the reporting year FY2023, the HERA team performed a total of 62 audits as contractors to HERA Certifications Ltd.

Two new companies have been certified by HERA experts to the requirements of SFC CC2 and one to SFC CC3. Two fabricators achieved Certified Fabricator Endorsement to SFC Construction Category 3. More than ten applicant companies are working toward achieving certification, and one company has cancelled their CC3 certification.

Michail Karpenko
General Manager



Total number of current certifications issued:



**Hapaitia
te ara tika
pumau ai te
rangatiratanga
mo ngā uri
whakatipu.**

**Foster the pathway of knowledge to strength,
independence and growth for future generations.**

We want our members to last the test of time.
Providing training and support allows them to do
that - by helping them to follow global best practice,
ensure they are evaluating and adopting new
technologies for commercial success, and
are recognised for their outstanding
commitment to quality.

**Building a skilled
& strong workforce
is important to
HERA. We want
our members to
be employers
of choice,
cost-effective,
productive and
efficient.**



Our training.

A record:

237 

professionals attended our welding focused courses in FY23.

Welding focused training and support

Qualification and examination

We provide education and training for those who have responsibility for the supervision and inspection of steel fabrication through the HERA AS/NZS 2214 Welding Supervisor Course.

This consists of one week (40 hours) full-time in the classroom, and a distance learning component on our bespoke e-learning platform.

The one-week classroom component is held in Auckland and Christchurch bi-annually, and is followed by distance learning online for the completion of a series of assignments.

We have also developed an online Welding Supervisor Course that includes a full record of lectures and assignments, of which three of these sessions were held in addition to our in-class ones in the reporting year.

We also offer the HERA Welding Inspector Level 1 course which leads to qualification as a Welding Inspector – Steel Structures and Certificate of Proficiency in Visual Testing of Welded Joints to AS/NZS ISO 17637:2019. It is an essential course for personnel involved in the visual inspection of welded structural steelwork to AS/NZS 5131.

This year we have worked with the Forest Industry Contractors Association (FICA) and CBIP to develop a 'Welding Engineering for those carrying out Engineering Safety Inspections of Cable Logging Yarders' course. This was offered online as a series of eight lectures with an additional in-class training day in November 2022.

We have also been working with Engineers NZ to develop a training course for NZTA Welding Engineering for Heavy Vehicle Certifiers which we hope to launch in FY24.

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). To cover these topics, we developed a nine part webinar series to help, which was provided on-demand.

Advanced weld design webinars

In FY23, reports on challenges facing the global CO₂ business began to emerge. This was concerning for our members as welding grade CO₂ gas is critical for welding fabrication as it is used as a shielding gas to protect the weld in a range of welding processes.

To discuss this concern, a free 'members only' webinar on 'Welding CO₂ gas and alternative gas mixtures' was held 9 February 2023. This webinar provided background information on the use of welding CO₂ gas and Argon-based gas mixtures and the issues to be taken into account while considering alternative gases.

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. It is offered by member organisations based on their time-zone/region.

As part of this collaboration, in July 2022 we offered an eCourse called 'The Bottleneck Analysis – Theory of Constraints (TOC),' a methodology for identifying the most important constraints that stand in the way of achieving a goal, and then systematically improving that constraint until it is no longer the limiting factor.

This live eCourse ran over two sessions and included Q&A for a total of eight hours of training. It was presented by international expert in the field, Arrie van Niekerk. The training focused on the implementation of TOC for steel fabricators with links to Industry 4.0.

Tragically, our dear friend Arrie van Niekerk passed away in October 2022, so we would like to take the time to acknowledge him and his contributions over the years. We will remember him as a passionate educator who was deeply knowledgeable in his area of expertise.

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 at the SCNZ Fabricator Forums on the SFC Site Erector Certification program 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.

Structural training and support

Our structural team has developed a range of digital training materials this year with a total of 81 professionals attending. The webinars were:

- moment resisting steel frame design;
- design of composite beams and slabs using HERA composite software;
- updated slab panel method to design metal composite flooring systems in severe fires; and
- optimised sliding hinge joint.

The structural team also ran an in-house presentation on composite beam and slab design which was attended by over 80 professionals on the day.

Mātauranga Māori focused training and support

Bringing mātauranga Māori into the every day.

Disruptions come from everywhere, and it is HERA's role to anticipate them, prepare our industry for them, and dare to place our industry as early adopters and leaders of them. Mātauranga Māori is one such disruption that HERA sees on the business horizon that we know most of the heavy engineering industry is not yet poised to ride the tide of change on.

That is why our team continues our journey to deepen our understanding of mātauranga Māori and build a genuine relationship with Māori. Our team has weekly training sessions on Te Reo Māori, tikanga and Māori connections to engineering.

We are noticing more industry associations becoming more vocal in this space and supportive of mātauranga Māori as an important aspect of any business based in Aotearoa New Zealand. In particular - Engineering NZ, Te Ao Rangahau; Te Kahui Whahanga, New Zealand Institute of Architects, Callaghan Innovation, and many companies within the consultancy sector who have been communicating their commitment to embedding mātauranga Māori. HERA was also very happy to be approached by BRANZ to provide insights and actions to assist their own journey in this space so they might also start similar initiatives this year.

Tikanga Māori

In assisting our industry to navigate iwi engagement for their projects, it fast became clear that a base understanding of tikanga Māori and the customs of interacting and navigating marae (meeting houses), hui (meetings) and wananga (learning sessions) was necessary.

This year, we partnered with Tūtira Mai - a Māori cultural training consultancy, to assist in developing tikanga training with a focus on the construction sector and the members we represent.

Training session at Te Noho Kotahitanga Marae, Unitec Mt Albert

After test piloting our tikanga training session, one of the key feedback points received was that this training would make more sense if there was more understanding of Te Tiriti o Waitangi documents and the role they play in the workplace. This is not surprising given procurement models, policy and legislation are increasingly siting the principles of participation, partnership and protection.

As such, we partnered with Timoti Harris of Empowering NZ to deliver training. So successful was our first training session, we ran an additional session.



Kim Nugent
HERA General Manager Comms 4.0,
Mātauranga Māori Lead



March 2023: Attendees for training at Te Noho Kotahitanga in front of whareniui - Ngākau Mahaki.

Whanake highlight 2022

Lydia Frater

**Bachelor in Civil Engineering,
University of Canterbury.**

Ko Lydia tōku ingoa
Nō Ōtautahi ahau
Ko Ngā Puhi tōko iwi
Ko Ngaitu Te Auru tōku hapu
Ko Whakaruruhau tōku waka
Ko Pukerata (Ōtaua) tōku marae
Ko Pūhanga Tohorā tōku maunga
Ko Tuhua Mohi ingoa whānau

"Wahine Māori (Māori women) are very underrepresented in engineering which can become discouraging. I want to change this and prove engineers can be all different types of people, and that engineering is possible for anyone."

"With representation, it dismisses stereotypes of engineers in Aotearoa and the world, allowing for problem solving to be done correctly - with diversity of thought, through different cultures and backgrounds."

Our future engineers.

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 through our Whanake scholarship. This 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 continued support for Sarah Lewis who was our first recipient in 2020. In her final year of studying a Bachelor of Engineering majoring in mechatronics at Massey University Palmerston North, this year saw her intern at the University of Auckland working on a project to help assemble an automated satellite which will hopefully be launched into space to help track data for university research purposes.

We also continue to support Lily Sanson, our 2021 recipient who is in her third year of studying a Bachelor of Civil Engineering at the University of Canterbury. She has been doing exceptionally well, this summer working with AECOM as an intern as part of a team designing the new two large hangers under construction at the Ōhakea Air Force base - a \$250 million construction program!

In 2022, we welcomed newly inducted recipient Lydia Frater. In her first year of studies for a Bachelor of Civil Engineering at the University of Canterbury - we look forward to tracking her progress!

University of Auckland's MECHA support

We were pleased to once again 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.

We also sponsored their 'speed interview' event, with our Structural Engineer Reza Kordani representing us on the evening in assisting students in practicing and preparing for real life interview scenarios.

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.

This year profiling:

- **Sia Nourani**, PhD candidate in Mechanical Engineering at the University of Canterbury - a researcher who is passionate about designing and manufacturing;
- **Yu Zhou**, Bachelor of Engineering (Hons) with a major in Architectural Engineering at the Auckland University of Technology - who is currently specialising in steel based structures and assisting with HERA research to give insight to how steel plays a vital role in Aotearoa New Zealand;
- **Dean Mehlhopt**, Diploma in Mechanical Engineering at Open Polytechnic - who thrives on solving problems and creating designs that are user friendly and have optimal buildability;
- **Cameron Beechey**, Bachelor in Civil Engineering at the University of Auckland - who is focused on becoming a chartered engineer and working at a structural engineering firm in the future; and
- **Aqueel Hafeez**, Bachelors in Civil Engineering (Hons) at the University of Waikato.



University of Auckland final year project

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

Attended and judged by our Automation and Welding 4.0 Engineer, Holger Heinzl; and at the time - Structural Engineer, Reza Kordani; it was an impressive array of projects from the Department of Mechanical & Mechatronics.

This year awarding the prize to students Aniqah Jamaluddin and Carl Miguel Ponio who worked under the supervision of Jan Polzer for their project titled: "Development and Industrial Testing of a Smart, Robust, Mechatronic System to Optimise the Production of Pipes."

Their works demonstrated ingenuity and perseverance in providing a novel solution to improve the productivity of a welding process.



Auckland University of Technology (AUT) Māori or Pacific Graduand Engineering award

Each year AUT hosts an award night to recognise and celebrate their top graduands.

We were honoured to sponsor the award prize for the AUT Top Māori or Pacific Graduand award in Bachelor of Engineering (Hons). This award recognises the contribution made to improving the capacities of Māori and Pacific peoples, through academic achievement.

This year awarding Shahil Khan this honour for his works in software engineering in collaboration with AUT's School of Engineering, Computer and Mathematical Sciences.



University of Canterbury 'highest scoring' student recognition

This year we extended our scope of support to universities - for the first time sponsoring the UoC undergraduate research program.

This award recognised final year engineering students who have completed their research project focused on structural steel in steel structures to a very high calibre, resulting in receiving the highest scoring in ENCN493.

This year awarding Andre Donald and Toby Simpson who worked under the supervision of Prof. Gregory MacRae for their research topic titled: "Chevron Buckling Restrained Brace Frame Seismic Behaviour Considering Out-of-Plane Effects."

Their project studied the behaviour of chevron braced frames with buckling restrained braces (BRBs) considering out-of-plane and in-plane frame seismic deformations, where the likely axial strength increase due to out-of-plane deformations was considered.

For a frame configuration realistic of that used in New Zealand practice, simple analyses indicated that gusset plate yielding occurred under the likely deformations, thereby compromising the ability of the system to behave desirably under further earthquake shaking. By providing significant gusset plate stiffeners, the performance was improved and system yielding outside the core of the BRB was prevented and out-of-plane drifts less than 1.5%.



Rotary forum - connecting with the next generation

After a hiatus due to Covid-19 lockdowns, HERA was thrilled to once again host the Rotary National Science and Technology students at HERA House in January 2023. We see this as a great way to help inspire future engineers to work in the metals industry by showcasing and highlighting the real opportunities that exist within our sector.

This years cohort consisted of 22 students who were seeking further insight into potential future career pathways.

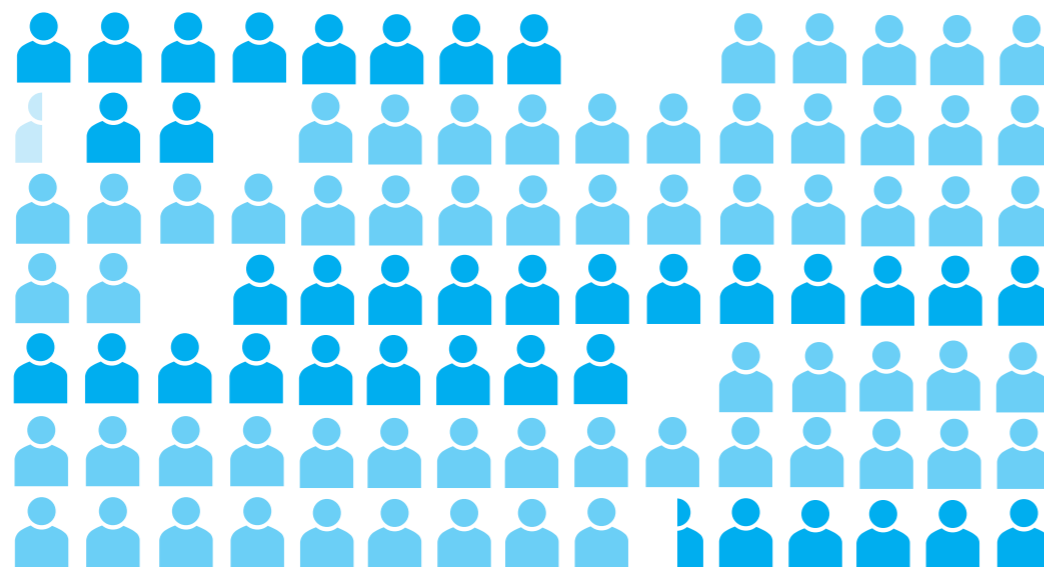
Our Automation and Welding 4.0 Engineer, Holger Heinzl, welcomed the students into HERA House with an engaging morning session, followed by technical presentations and a panel discussion to encourage the students to engage and interact with the speakers.

The panel focused on science and engineering, the role of an engineer, the opportunities available in this career pathway and more. It included three members of our HERA team - Holger Heinzl, our Structural Systems Finite Element Analyst, Nandor Mago and our Research Engineer, Hafez Taheri.

The students were also able to experience some of the amazing automation equipment and facilities at HERA House - spending roughly half an hour on each station for our 3D Scanner, Virtual Reality Set and Cobot Programming with our team.

This year we welcomed 152 students to our membership.

8% Ara Institute of Canterbury; 5% Auckland University of Technology; 0.5% Open Polytechnic; 2% Otago Polytechnic; 28% University of Auckland; 21% University of Canterbury; 29% University of Waikato; & 6.5% Dalian Jiotong University, Fiji National University, Massey University, Unitec, University of Bristol, Waikato Institute of Technology & Weltec.



Our team.

We have expertise where it matters!

FY23 has been a rewarding and successful year for HERA - and this is because of our people!

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

Last year we created a new position in structural fire research engineering, welcoming Fanqin Meng to the team on a fixed-term basis. He has proven to be an amazing team addition, which has led to him being offered a full time role this year.

We have also welcomed Senior Structural Sustainability Engineer, Dr Amir Shah Mohammadi who is the replacement to Reza Kordani. He is an expert in consulting and research for multi-storey buildings, structural software applications, knowledge transfer and sustainable structural solutions, and we look forward to the skills he will bring to the team.

This year, our Welding team also grew. Welcoming Ozgur Erdem in to the newly created Senior Welding Engineer role. Ozgur has nine years of training experience at the Welding Institute (TWI) where he lectured Welding Inspection trainings in 18 different countries including Saudi Arabia. Simultaneously, he was also the Country Operations Manager for Turkey and North Africa. As such, he will be a fantastic addition to our team to support our Welding course and training offerings.

Our administration team has also expanded in alignment with supporting our growing team. We have had a number of short contracts to test bed the role, welcoming Charles Andrews, and Taylah Nicol to the team before onboarding Ngato-Zharnaye Livingstone to the newly created Member Support Assistant role in a full time capacity.

Sadly, we said goodbye to our Innovation and Transformation Architect Greg Buckley in December 2022. We thank him for his contributions over the time

he has been with us at HERA.

Industry presentations

Our team regularly attends industry events and delivers presentations both within Aotearoa New Zealand and abroad. We see this as an important way to not only connect and engage with our members, but to disseminate a wide variety of technical knowledge.

This year presenting at the:

- Zero Carbon Steel to the Life Cycle Association annual conference: <https://lcanz.org.nz/2022/03/27/autumn-webinar-zero-carbon-steel-recording-now-available/>;
- Zero Carbon Steel to the New Zealand Institute of Architects: <https://vimeo.com/694259674> with 242 members in attendance, April 2022;
- Structure in Fire (SiF 2022) Conference: Presenting on the "Performance of Vertical Load Carrying Beam to Column Subassemblages under Fully Developed Fire": <https://www.sif2022.org/program>, November 2022.
- Zero Carbon Steel at Decarbonising NZ Conference (Brightstar) Industry leader's Panel: Enabling organisations to develop the capability to achieve government plans: <https://www.brightstar.co.nz/events/decarbonising-new-zealand-2022/agenda>, December 2022; and
- Panel member at Building Together - Is policy enabling or hindering progress? (Minter Ellison) along with Janine Stewart, Dean Kimpton and Craig Hobbs: <https://www.minterellison.co.nz/insights/building-together-re-set-for-the-future-1>, March 2023.
- SouthMACH 2023

We have also provided training for the next generation of engineers by lecturing at the University of Waikato and the University of Wollongong.

TechTuesday on MetalMind

This year, our Structural Systems team test bed an interactive technical forum on our members only App - MetalMind. This was a unique opportunity to directly communicate on a technical level with members and field technical advice on a live and collaborative space.

Industry events and conferences

We also find our attendance in conferences integral to staying up to date with the most recent developments and research gaps in the areas we operate within.

This year our team attended the following seminars and/or conferences:

- SCNZ conference and structural steel seminar, October & June 2022;
- Chapter Zero NZ 'Now or never' - reaching New Zealand's sustainability targets, August 2022;
- SCNZ Gala Awards Dinner, Nov 2022 where our GM Welding Centre Michail Karpenko received the Chair Award;
- Structures in Fire (SiF 2022, Hong Kong), November 2022;
- Launch of the Advanced Manufacturing Industry Transformation Plan, March 2023; and
- Building our Digital Community Conference, March 2023.



From top: Our Structural Fire Engineer Fanqin Meng & Holger Heinzel in attendance at the Engineering NZ Awards representing HERA as bronze sponsor; General Manager Welding Centre Michail Karpenko receiving the Chair Award at the SCNZ Gala Awards Dinner; Structural Fire Engineer Fanqin Meng presenting at the 12 International Conference in Fires in Hong Kong; and HERA CEO attending the launch of the Advanced Manufacturing Industry Transformation Plan.

Waiho i te toipoto, kaua i te toiroa

Let us keep close together, not wide apart.

A very important piece of work that we do, is ensuring that we keep connected with our members, maintaining relationships, and driving thought leadership and dialogue that keeps us moving forward together.

**We are building a
tribe of passionate
metalminds -
offering guidance,
insight and
advocacy in
key areas of
importance.**

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

<h3>R&D focuses</h3> <p>for content focused on: greater safety in severe fires, vanadium research, weathering steel, and research and development year review and reflection.</p>	<h3>Industry 4.0</h3> <p>for content focused on: Industry 4.0 HERA focuses, Industry 4.0 being key to sectorial transformation and where to start, Endeavour Fund research.</p>	<h3>Sustainability</h3> <p>for content focused on: steels role in Aotearoa's future, launch of Zero Carbon Steel Program, latest steps in decarbonisation, steel recycling, module D & life cycle analysis.</p>
<p>2023</p> <p>142K people reached</p>	<p>2023</p> <p>288K people reached</p>	<p>2023</p> <p>744K people reached</p>
<p>2022</p> <p>65K people reached</p>	<p>2022</p> <p>1.7M people reached</p>	<p>2022</p> <p>137K people reached</p>
<h3>Materials equality</h3> <p>for content focused on: right material for the design, advocating for cradle to cradle to cradle.</p>	<h3>Industry spotlight</h3> <p>for content focused on: profiling leaders of our industry and the work they do, including our own CEO, Troy Coyle, as well as Red Steel, Grayson Engineering and BDM Vircon.</p>	<h3>Diversity & inclusion</h3> <p>for content focused on: women in engineering, mātauranga Māori, diversity in leadership, student profiling.</p>
<p>2023</p> <p>Not a specific focus</p>	<p>2023</p> <p>404K people reached</p>	<p>2023</p> <p>371K people reached</p>
<p>2022</p> <p>824K people reached</p>	<p>2022</p> <p>135K people reached</p>	<p>2022</p> <p>36K people reached</p>



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.

As such, we have focused on highlighting the key role steel plays in the future of Aotearoa, the launch of our zero carbon steel program - Tātaitai Puhanga Waro and our steel recycling credentials.

Steel fire performance

With the onboarding of Fanqin Meng, we have been able to step up in our technical support in the area of structural steel performance in severe fires.

As such, a key focus has been profiling our works in this space - in particular recent updates on the design of composite steel floor systems in severe fires which provides advanced technical solutions based on recent research and development, and cost-effective and sustainable solutions that increase the safety of buildings.

Industry 4.0

A technical focus on Industry 4.0 has seen HERA increase our capabilities and supporting facilities in this space.

Industry 4.0 is key to sectoral transformation and we have been focused on communicating the opportunities it represents for our industry. This has come in the form of case studies on member companies who demonstrate Industry 4.0 within their business, research leading the way in this space and of course, announcements on HERA securing our Endeavour Fund support for our four year research to build a world leading construction sector.

#BreakingTheBias

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.

That is why this year we have made a concerted effort to highlight the wahine (women) in our industry.

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.



Our podcast.

Our Stirring the Pot podcast celebrated its third season running this year.

These are all focused on practical conversations that challenge, inspire and inform our industry.

www.hera.org.nz/podcast/








In FY23, we delivered the following podcast episodes:

- **Ep.65: Jill Cooper - Is steel really sustainable?** Discussing steel decarbonisation and what an ideal domestic steel industry would look like.
- **Ep.66: Wairangi Jones - Cultural cringe and colonisation in the workplace.** Exploring how employee culture impacts their views of work and influences their actions, and why you should care.
- **Ep.67: Helen Davidson & Ceinwen McNeil - Diversity should be the norm.** Talking the big issues for women in the workplace.
- **Ep.68: Matt Woodley - Decarbonise or die!** Focusing in on developing technology that looks to decarbonise the construction industry.
- **Ep.69: Sahar Hosseini - Cracking the steel standard!** Exploring steel production in Aotearoa New Zealand and the testing and examining procedures that ensure the quality of the products.
- **Ep.70: Chris Litten - BRANZ, independent and impartial?** Sharing the mahi that BRANZ does and opportunities the steel industry has to collaborate.
- **Ep.71: Alan McClintock - A lifetime in welding.** Tales from Alan's career and how he came to work at HERA.
- **Ep.72: Holger Heinzl - Industry 4.0... SIRIously a no brainer!** Discussing HERA's new Industry 4.0 assessment offering for industry.
- **Ep.73: Kim Nugent & Troy Coyle - A missed body of knowledge, the case for Mātauranga Māori.** Talking on the work HERA is undertaking to create a program centred around Mātauranga Māori to help industry be genuine cultural partners.
- **Ep.74: Megan Girdwood - Extractables from steel bi-products.** Sharing new research in developing a closed-loop, green process to extract vanadium from a co-product of the NZ steel making process.
- **Ep.75: Stephen Powell - Brain drain to brain gain.**

Breaking down barriers to initiate new programs for apprenticeships, attracting and fostering talent, and staff retention.

- **Ep.76: Lydia Frater & Lily Sanson - Whanake!** The future of work and how Māori engineers fit in to it.
- **Ep.77: HERA - A \$10.3m injection for research!** Discussing the Endeavour Funding of close to \$10.3 million secured to carry out a four year Construction 4.0 research project.
- **Ep.78: Mackenzie Horwood Verstappen - Tauwi tautoko, the call for non-Māori support.** Exploring how tauwi (non-Māori) can advocate and hold space for Māori to lift the cultural burden and how to make a culturally safe environment genuinely.
- **Ep.79: Rebecca Symonds - Demystifying HERA membership.** Sharing what HERA membership involves, the value it brings as well as some of the key initiatives coming up.
- **Ep.80: David Hemopo & Waikaraka Ruwhiu-Toms - Partnering to invest for impact.** Encouraging young Māori to be active participants in STEMM (science, technology, engineering, maths, mātauranga) and the STEMM economy of tomorrow.
- **Ep.81: Kaveh Andisheh - Looking under the hood.** Highlighting the work Kaveh does within the Structural team.
- **Ep.82: Ken Webster - Building better. Building less. Building different.** Chatting about the underlying concepts of the circular economy and how it interrelates with construction.
- **Ep.83: Kelly McClean - Closing the loop.** Exploring why the circular economy should be a focus for construction sector and how it can be achieved.
- **Ep.84: Timoti Harris - Deconstructing bias.** Te Tiriti o Waitangi and its implications in the workplace.
- **Ep.85: John Luxton - Succession planning for SME's.** Fostering foster next generation leaders through succession planning.
- **Ep.86: Marie-Salome Duval-Chaneac - Engaging in sustainability.** Understanding additive manufacturing and how it relates to and can be utilised by industry.
- **Ep.87: Rob Woolner - Vocational education and business skill development.** Exploring alternative education pathways for youth through vocational education and business skill development.

Across a range of social media platforms we are finding ways to connect with and inspire our industry and membership.

Platform	2023	2022
	447 followers	375 followers
	3635 followers	3032 followers
	268 followers	257 followers
	5K downloads	2.4K downloads
	294 followers	227 followers
	618 followers	589 followers
	79 followers 1.3K views 152.6 watch time hours	74 followers 1.7K views 385.6 watch time hours

NB. A significant reduction in metrics can be noted for YouTube between FY22 and FY23 due to the removal of webinar hosting of our technical content to a different platform and also an increase in face to face training with reduction of Covid-19 restrictions that were in place in FY22 resulting in fewer video presentations being developed.

Our members.

Our tribe of metal minds currently sit at 543 member companies.

Broken down by membership tier there are:

- 295 Platinum 'Ordinary'
- 245 Gold 'Associate'
- 3 Affiliate



Rebecca Symonds
HERA Manager Customer Experience

Our Platinum 'Ordinary' members

- 3d Metal Forge
- 3Way Solutions Ltd
- Access Engineering Ltd
- ACCESS SPECIALTIES (2017) LIMITED
- Ace Engineering Ltd
- ACH Consulting Ltd
- Acme Engineering Ltd
- AECOM
- Airey Consultants Ltd
- Aksa Ltd
- Akzo Nobel Coatings Ltd
- Alpha Training & Development
- Alrite Steel & Services NZ
- Altex Coatings Ltd
- ANZ Modular Ltd
- Asterix Structures
- Atco Steel Developments
- Atlantic Engineering Co Ltd
- Auckland Naco Ltd
- Aurecon NZ Ltd
- Aztech Engineering Ltd
- Babbage Consultants Ltd
- Ballance Agri-Nutrients
- Base Consulting Engineers Ltd
- Batchelar McDougall Consulting Ltd (BMC)
- BB & Sons Ltd
- BCD Group Ltd
- BE Hall Ltd (trading as ARC Welding & Safety Supplies Ltd)
- Beca Ltd
- Betteridge Engineering Ltd
- BG&E Consulting Ltd
- Bill Cassidy & Associates
- Black Steel Mobile Ltd
- Bloxam Burnett & Olliver Ltd
- Blueprint Consulting Ltd
- BMT Structural Ltd
- BPL Engineering Ltd
- Bromley Steel
- Brown & Thomson Engineers
- BSK Consulting Engineers Ltd
- BT Mining Ltd
- Buller George Turkington Ltd (BGT Structures)
- Burleigh Engineering Ltd
- Burnsfield Engineering Ltd
- BW Engineering
- C L C Consulting Group Ltd
- C&R Engineering Ltd
- Cable Price (NZ) Ltd
- Calder Developments Ltd
- Calibre Consulting Ltd
- Canterbury Steel Structures Ltd
- CCL 2015 Ltd (Cook Costell)
- Certified Welding Ltd
- CGW Consulting Ltd
- Chambers Consultants Ltd
- Chapman Sanders Consultants Ltd
- Chester Consultants Ltd
- Chris W Howell & Associates Ltd
- Clendon Burns & Park Ltd
- Compusoft Engineering
- Concepsus Consultants
- Corbett Consulting
- Coulter Engineering Services Ltd
- Create Ltd
- Cullen Engineering Co Ltd
- D & H Steel Construction Ltd
- D C Weld Ltd
- D&D Engineering Works
- David Smart Consulting
- Davidson Group Ltd
- Davis Ogilvie & Partners Ltd
- Day Consultants Ltd
- DBM Vircon
- DC Welding Ltd
- Dean Steel
- Design Engineering Ltd (DE Group)
- Design Management Consultants Ltd
- Design Production Ltd
- Dev Marine (NZ) Ltd
- DHC Consulting Ltd
- Dixon Manufacturing Ltd
- Dobbie Engineers Ltd
- Dodd Civil Consultants
- Don Thomson Consulting Engineers Ltd (DTCE)
- D-Tech Services Ltd
- Dunning Thornton Consultants Ltd
- Earthquake and Structural Engineering Consultants Ltd
- East Coast Steelwork Ltd
- Eaststeel
- EB Engineering Solution
- Eckford Engineering 2002 Ltd
- Engco Consulting Engineers Ltd
- Engenium Ltd
- Engineering Design Consultants (EDC)
- ENI Engineering Ltd
- Enovate Limited
- Envivo Ltd
- EPSNZ Ltd
- EQStruc Ltd
- Equipment Engineering Ltd
- ETS Engineers Ltd
- Ewing Construction Ltd
- EWP Technical Solutions
- F&S Design Group Ltd
- Farra Engineering Limited
- Fergusson Welding (2016) Ltd
- Forbes Consultants
- Ford Steel Engineering Ltd
- Forge Fabrication
- Fortis Weld Inspection Ltd
- Fraser Thomas Ltd
- Genesis Energy
- Genesis Engineering Ltd
- GHD Ltd
- Gilbert Sheetmetal & Engineering
- Gisborne Engineering Ltd
- Global Steel Detailing
- Gough Brothers Engineering
- Gray Bros Engineering
- Gray Consulting Engineers Ltd

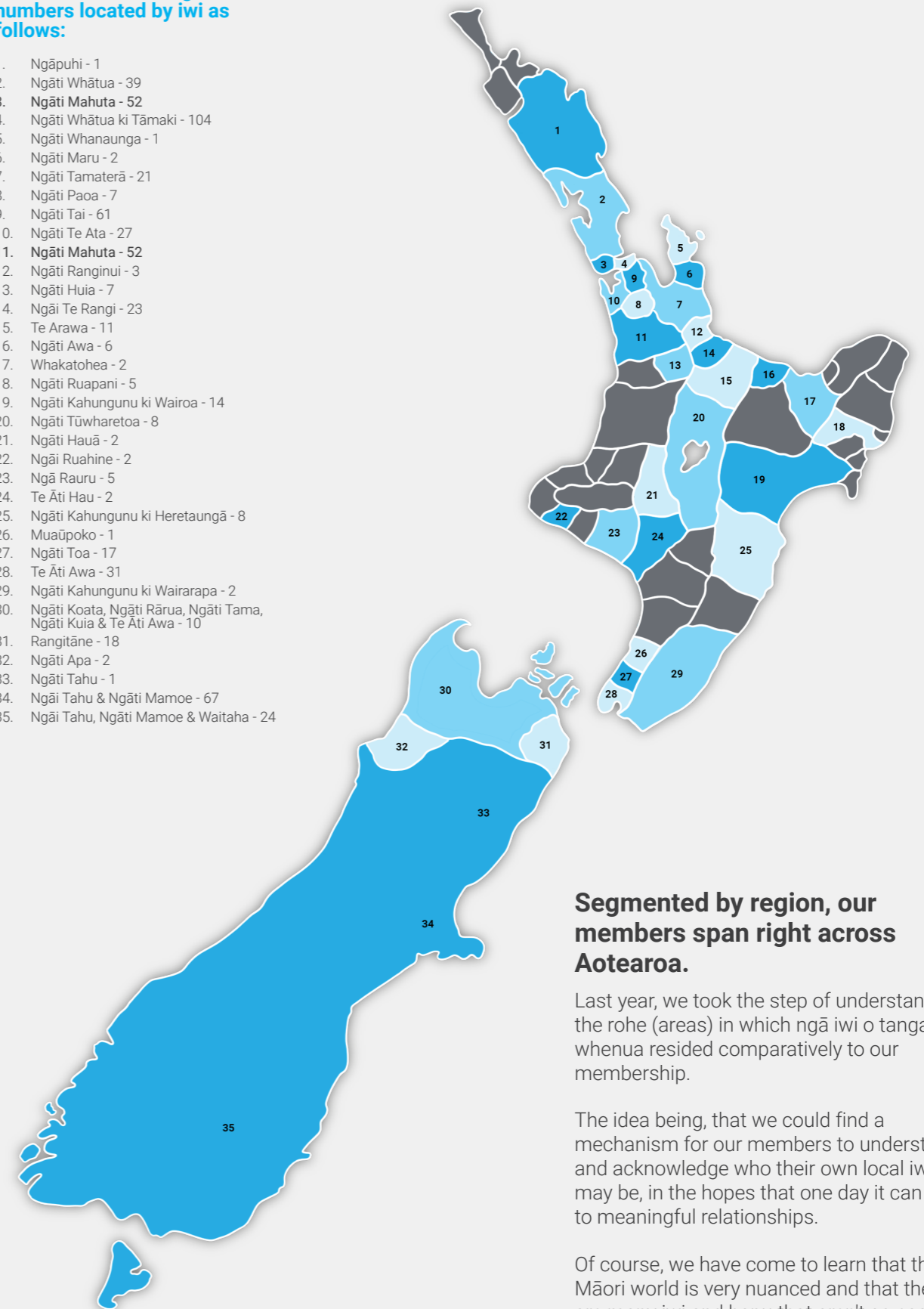
- Grayson Engineering Ltd
- Greer Consulting Engineers
- H J Asmuss Ltd
- H3 Structural Ltd
- Halberd Engineering
- Hanlon & Partners
- Hawthorn Geddes Engineers & Architects
- Helix Flight Manufacturer Machines Ltd
- Hellacious Enterprises Ltd
- HFC Structures Ltd
- Hill Design Engineering Ltd
- Hilti NZ Ltd
- Hi-Spec Stainless Ltd
- HLK Jacob Ltd
- Holmes NZ LP
- Hornell Industries Ltd
- HSM Engineering Ltd
- Hyland Consultants Ltd
- Ideas in Design Ltd (IIDL)
- Index Engineering Ltd
- Infrabuild
- Innovus Limited
- Inspection & Testing Services NZ Ltd
- Insteel Ltd
- Integrated Maintenance Group Ltd
- Island Engineering 2020 Ltd
- ITSS Engineering Ltd
- J & R Slecht Ltd
- J F Contracting Ltd
- Jacobs NZ Ltd
- Jensen McArley & Associates Ltd
- Jensen Steel Fabricators Ltd
- Jireh Contracting & Engineering (1998) Ltd
- JLG Industries (New Zealand)
- John Jones Steel Ltd
- JP Engineering Services Ltd
- Kaipipi Ltd
- Kawerau Engineering Ltd
- Kea Engineering Consultants
- Kemmpi International
- Kernohan Engineering Ltd
- Kerslake & Partners
- KGW Consulting Engineers
- Kirk Roberts Consulting Engineers Ltd
- KiwiRail
- KM Mechanical Ltd
- KnowHowe Engineering Ltd
- Konnect Fastening Systems Ltd
- Kordia Ltd
- Kotahi Studio Ltd
- Lateral Engineering Ltd
- Lautrec Technology Group Ltd
- Legacy Steel Ltd
- Lewis Bradford & Associates
- LiftX
- LM Structural Ltd
- Lough Associates
- Lyttelton Engineering Ltd
- M+G Consulting Engineers Pty Ltd
- Macweld Ltd
- Mainarc Engineering Ltd
- Manktelow Consulting Engineers Ltd
- Manukau Institute of Technology
- Markplan Consulting Ltd
- Marubeni Itochu Steels Oceania
- Materials & Testing Laboratories
- Matrix Applied Computing Ltd
- McCannics Waikanae Holdings
- McConnell Dowell Constructors Ltd
- McNaughton Consulting Engineers
- MEC Engineering Consultant
- Mercury NZ Ltd
- MetalTest & Associates Ltd
- MH Design Ltd
- MHM Automation
- Micius Consultants Ltd
- Milward Finlay Lobb Ltd
- Mitchell Vranjes Consulting Engineers
- MJH Engineering Ltd
- Modern Construction
- Monocrane 2010 Ltd
- Morgan Engineering & Marine (2021) Ltd
- Morgan Steel
- Mountains ARARAT Ltd
- MSC Consulting Group
- MSME Ltd
- MTL Ltd
- MTR Engineering Ltd
- Mulcahy Engineering
- MWS Otago Ltd
- Nagel Consultants Ltd
- Naki Draughting Technical Services
- NDT Weld NZ Ltd
- New Zealand Steel Ltd
- Nigel Harwood Engineering Consultant Ltd
- North End Engineering
- North Harbour Engineering Ltd
- Novare Design Ltd
- NZ Army Trade Training School
- NZ Welder Supplies Ltd
- OBD Consultants Ltd
- Obelisk Industrial Ltd
- Omega Engineering Consultants Ltd
- Optimech International Ltd
- Otahuhu Welding Ltd
- P J Hindin Engineering
- Pacific Steel
- Pakuranga Engineering Ltd
- Patton Engineering Ltd
- Pegasus Industrial Engineering Ltd
- Pengelly Engineers Ltd
- Peninsula Engineering Ltd
- Peter Swan Ltd
- Petone Engineering
- PFS Engineering Ltd / MacArthur Engineering & Sheetmetal
- Philips Diesel Ltd
- Phoenix Engineering
- Pipe & Tube Welding Eng Ltd
- Pipes NZ Ltd
- Plant & Platform Consultants Ltd
- Plumb Ltd
- Port Of Tauranga Ltd
- Powell Fenwick Consultants Ltd
- Prendos NZ Ltd
- Pressure Equipment Integrity Ltd
- Proconsult
- Progressive Engineering Co Ltd
- Pryor Consultants
- PT Industries
- PTL Structural Consultants
- PW Engineering Ltd
- Q Designz Ltd
- Quoin Structural Consultants
- R D Sullivan & Associates
- R&S Steel Engineering Ltd
- R.J.Nelligan & Associates Ltd
- Randall & Associates
- Rangiora Engineering & Structures Ltd
- RC Macdonald
- Real Steel Ltd
- Red Jacket Ltd
- Redco NZ Ltd
- Rees Engineering Services Ltd
- Revex Piling Ltd
- RFT Engineering (2016) Ltd
- Robin King Engineers
- Rockweld Limited T/A Auckland Welding School
- RS Eng Ltd
- RSL Steel Enterprises (NZ) Ltd
- Ruamoko Solutions Ltd
- Sable Engineering Ltd
- Sawrey Consulting Engineers
- SCS Structures Ltd
- Securitron Systems 1991 Ltd
- Sentinel Inspection Services Ltd
- SGS NZ Ltd
- Sigma Consultants Limited
- Sigma Consulting Engineers Ltd
- Silvester Clark Consulting Engineers
- Sim Fabrication
- SNC Steel Ltd
- SNP Welding
- SoBeer Limited
- Southern Institute of Technology
- Southern QA Ltd
- Speedfloor NZ Ltd
- Spencer Holmes Ltd
- Stainless Engineering Co Ltd
- Stantec New Zealand Ltd
- Steel & Tube Holdings Ltd
- Steel Co Ltd
- Steel Master Co Ltd
- Steel Pencil Ltd
- Steelcraft Engineering Ltd
- Steelworks NZ Ltd
- Steltech Structural
- Stephen R Mitchell Consultants
- Stiffe Hooker Ltd
- Stiles & Hooker Ltd
- Stork Technical Services NZ Ltd
- Strata Group Consulting Engineers Ltd
- Stratum Consultants Ltd
- Structex Ltd
- Structural Concepts
- Structural Sense
- Structure Design
- Structureflex Ltd
- Takanini Engineering Ltd
- Tanker Engineering Specialists Ltd
- Taymac Ltd
- Techlogic NZ
- Tectonix Structural Engineers
- Tectonus Limited
- TH Consultants
- Thermarock Engineering Ltd
- Thorburn Consultants (NZ) Ltd
- Thorne Dwyer Structures (TD Structures)
- TiDA Ltd
- Titan Marine Engineering
- TM Consultants Ltd
- Todd Engineering Ltd
- Tonkin & Taylor
- Transport Design & Certification
- Transtech Dynamics
- Tray-dec (NZ) Ltd
- Triangle Steel Construction
- Trueteel Ltd
- Tu Tika Ltd
- Turnco Engineering Ltd
- Two Degrees Mobile Ltd
- Universal Engineering Ltd
- University of Auckland, School of Engineering
- Vartec Industrial
- Vebrec NZ
- Vert-X Ltd
- Viden Consulting Engineers Ltd
- VIP Steel Ltd
- Vulcan Steel
- Waikato Engineering Design Ltd
- Waikato Institute of Technology (WINTEC)
- Waikato Steel Fabricators
- Warren Engineering Ltd
- Watson Engineering (Thames) Ltd
- Weld IT Ltd
- Welding & Engineering Ltd
- Welding Engineers (NZ) Ltd
- Welding Inspection & Compliance Services Ltd.
- Weldtest NZ Ltd
- Weldwell New Zealand
- West Coast Steelworx
- WestArc Engineering Ltd
- Whakatiki Engineering Ltd
- Wilkinson Transport Engineers
- Wood and Thomson Engineering Ltd
- Worley
- WSP NZ
- X-Ray Laboratories Ltd
- Zanaty Engineering Design
- Zigliani Technologies Ltd

Our Gold 'Associate' members

- A W Trinder Ltd
- ABB Switchgear Division
- Action Engineering Ltd
- Active Engineering Ltd
- Advanced Boiler Services
- Advanced Plasma Technology
- Aimecs Ltd
- Airworks (NZ) Ltd
- Alert Engineering
- All Steel Services Ltd
- Alloy Yachts International
- Allwin Steel Enterprises Ltd
- ALRO Truck Smash Repairs
- Alstom Northern Wagons
- Angus Robertson Mechanical
- Apex Greenhouses
- APV NZ Ltd
- Arcwell Engineering Ltd
- Atco Controls
- Ateck Steel Construction
- ATI Engineering
- Awesome Awnings Ltd
- Axiom Machining Limited
- Babcock NZ Ltd
- Baily Engineering Ltd
- Baker Cranes Ltd
- BDX Group
- Bedford Engineering Ltd
- Bernard Jordan
- Best Bars Ltd
- Bitumen Equipment Ltd
- Blake Steel Ltd
- BOC Gases New Zealand Ltd
- BOP Gear Cutters Ltd
- Bradken Dunedin
- Brightwater Engineers Ltd
- CALD Enterprises Limited
- Calder Stewart Steel
- Cambridge Steel Fabricators & Engineers
- Cambridge Welding Service
- (1953) Ltd
- Campbell Tube Products Ltd
- Canco Engineering Ltd
- CAS Enterprises Ltd
- CFM Engineering Ltd
- Chemical Industry Engineering Ltd
- Christian Church Community Trust
- Clough Agricultural Ltd
- Consolidated Engineering Company
- Contract Connections Ltd
- Cook Brothers Construction
- Courtney Engineering Ltd
- CPIT Aoraki
- Croucher & Crowder Engineering Co. Ltd
- Cuddon Ltd
- Culham Engineering Ltd
- D R Howells Engineering Co Ltd
- Dan Cosgrove Ltd
- Dart Engineering
- Del Engineering Ltd
- Demack Engineering 2008
- Dialog Fitzroy
- Dispatch and Garlick Limited
- Domett Trailers Ltd
- Donovan Group NZ Ltd
- Drury Construction Ltd
- DSK Engineering
- Eastbridge Ltd
- Eastern Boiler Service
- Eastern Institute of Technology
- Ede Engineering
- EHL Group
- Electropar Limited
- Engineering Contractors Ltd
- Enterprize Steel
- Etech Industries NZ Ltd
- E-Type Engineering Ltd
- Fabrication Solutions Ltd
- Fairfax Industries Ltd
- Farmex Engineering
- Fletcher Steel - Dimond
- Flux Welding & Fabrication Ltd
- Fraser Fire & Rescue
- Fruehauf Trailers
- Gamman Industrial Componentry Ltd
- General Engineering Northshore
- Genweld NZ Ltd
- George St Engineering (GSE Engineering)
- Gisborne Development Incorporated
- GLG NZ Manufacturing Ltd
- Global Engineering Ltd
- Global Welding Supplies
- GM Engineering Services Ltd
- Gray Construction
- Greymouth Petroleum
- GT Liddell Contracting Ltd
- Hayes International
- HEB Construction Ltd
- Honnor Welldrillers Ltd
- Howard Wright Ltd
- Howick Engineering Ltd
- HSRD
- Hydraulink Fluid Connectors Ltd
- Hytools NZ Ltd
- Iain Codling Stainless Steel
- IBA Engineering
- Ipsco Ltd
- ISSA Engineering Ltd
- J & D McLennan Ltd
- J J Niven Engineering Ltd
- J P Marshall & Co Ltd
- Jay Cee Welding Ltd
- JCD Engineering Ltd
- Jetweld Engineering
- KAS Customs Limited
- Keith M J Adams
- Lakeland Steel Products Ltd
- Laser Welding Ltd
- LHT Design
- Linear Design
- Loader Construction Engineering Ltd
- Longveld Engineering Ltd
- Mace Engineering Ltd

We have the following member numbers located by iwi as follows:

1. Ngāpuhi - 1
2. Ngāti Whātua - 39
3. **Ngāti Mahuta - 52**
4. Ngāti Whātua ki Tāmaki - 104
5. Ngāti Whanaunga - 1
6. Ngāti Maru - 2
7. Ngāti Tamaterā - 21
8. Ngāti Paoa - 7
9. Ngāti Tai - 61
10. Ngāti Te Ata - 27
11. **Ngāti Mahuta - 52**
12. Ngāti Ranginui - 3
13. Ngāti Huia - 7
14. Ngāi Te Rangī - 23
15. Te Arawa - 11
16. Ngāti Awa - 6
17. Whakatohea - 2
18. Ngāti Ruapani - 5
19. Ngāti Kahungunu ki Wairoa - 14
20. Ngāti Tūwharetoa - 8
21. Ngāti Hauā - 2
22. Ngāi Ruahine - 2
23. Ngā Rauru - 5
24. Te Āti Hau - 2
25. Ngāti Kahungunu ki Heretaungā - 8
26. Muaūpoko - 1
27. Ngāti Toa - 17
28. Te Āti Awa - 31
29. Ngāti Kahungunu ki Wairarapa - 2
30. Ngāti Koata, Ngāti Rārua, Ngāti Tama, Ngāti Kuia & Te Āti Awa - 10
31. Rangitāne - 18
32. Ngāti Apa - 2
33. Ngāti Tahu - 1
34. Ngāi Tahu & Ngāti Mamoe - 67
35. Ngāi Tahu, Ngāti Mamoe & Waitaha - 24



Segmented by region, our members span right across Aotearoa.

Last year, we took the step of understanding the rohe (areas) in which ngā iwi o tangata whenua resided comparatively to our membership.

The idea being, that we could find a mechanism for our members to understand and acknowledge who their own local iwi may be, in the hopes that one day it can lead to meaningful relationships.

Of course, we have come to learn that the Māori world is very nuanced and that there are many iwi and hapu that aren't so easily captured in this way.

- Machine Part Welding Ltd
- Malabou Manufacturing Ltd
- Maskell Productions
- MB Century Limited (Century Drilling & Energy Services Ltd NZ)
- Metal Spray Supplies NZ
- Michael Harris N Z Ltd
- Mike Christie Sheetmetals
- Millar Engineering Ltd
- Millers Mechanical (NZ) Ltd
- Milmeq Limited
- Mobridge
- Modern Transport Engineers Ltd
- Morgan O'Shea Engineering
- Morrow Equipment Co
- Mouat Engineering Ltd
- MSC Consulting Group
- Murray Landon
- Napier Engineering & Contracting Ltd
- Nelson Stud Welding
- Networked Engineering Solutions
- Niche Modular Construction
- Noble Engineering Services
- NorthShore Towbars 2006 Ltd
- NZMP Kauri
- Otago Polytechnic
- Otahuhu Engineering Ltd
- Outside Broadcasting
- Pacific Engineering Projects Ltd
- Pacific Timber Engineering Ltd
- Page Macrae Engineering Ltd
- Parr & Co Ltd
- Patchell Industries Ltd
- Pearson Engineering Ltd
- Phoenix Metal Recyclers + Metalman
- Phoenix Steel
- Piako Transport Engineering
- Pilcher Engineering Ltd
- Port of Napier
- Pro Custom Concepts
- Profab Central Engineering
- Pyramid Engineering
- Quality Auto Machinists (1988) Ltd
- Queenstown Engineering 2009 Ltd
- Q-West Boat Builders
- Ranfab NZ Pty Ltd
- Razos Engineering
- Read Industrial Ltd
- Red Steel
- Rex Barnes Engineering
- Rigweld Engineering Services Ltd
- RNZAF Metalshop, Woodbourne
- RNZN (Royal NZ Navy)
- Roadmaster Trailers Ltd
- Robert Page Engineering Ltd
- Rocktec Ltd
- ROTIG
- Rotorua Steel Structures 2018
- Ruakaka Engineering
- SAFE Engineering
- Seaview Engineering
- Select Engineering Ltd
- Service Engineers Ltd
- Shape NZ
- Sharland Engineering Ltd
- Sheetmetals (1983) Ltd
- Shipco 360
- Simpson Mobile Weld Testing Ltd
- Sitesteel Ltd
- Skookum Technology Ltd
- Smartweld Ltd
- Snaga Industries
- Snorkel Elevating Work Platforms
- South Auckland Engineering Ltd
- South Pacific Industrial Limited
- Southern Cross Engineering Co Ltd
- Specialised Container Services
- Specialist Energy Engineering Solutions
- Specweld Ltd
- Stafford Engineering
- Stainless DownUnder
- Stainless Steel & Aluminum Welding Academy Ltd
- Stark Brothers Ltd
- Stewart & Cavalier Ltd
- Stud Welding New Zealand Ltd
- Superior Fabrication Ltd
- Superior Pak Ltd
- Taslo Engineering
- Tasman Engineering Co
- Taurus Engineering Ltd
- Technical Welding Services Ltd
- Tira Ltd
- The Blacksmiths Ltd
- The School of Welding
- Tidd Ross Todd Ltd
- TP Engineering Ltd
- Traction Lab Ltd
- Transfleet Equipment Ltd
- Transport & Engineering Repairs Ltd
- Trident 2000 Ltd
- Truckbuild NZ Ltd
- Tru-test DTS Limited
- Truweld Engineering
- Twig Industries
- Ullrich Aluminium Co Ltd
- Verissimo Engineering
- Villa Maria Estate
- Wainuiomata Training Centre
- Waratah NZ Ltd
- Warner & Mould Construction Ltd
- Webforge NZ Ltd
- Weld Fabrication Engineering Ltd
- Welding Services Nelson Ltd
- Welding Technology Ltd
- Weldlok (NZ) Ltd
- Well & Boe Ltd Engineering
- Westside Welding Ltd
- Wilson Bros Engineering Ltd.
- Wilson Precast Construction
- Windsor Engineering
- WM Ross Engineering Ltd
- Wyma Engineering NZ
- Zealsteel
- Zeanova

Our Affiliate members

- Auckland University of Technology
- CoreBrace
- New Zealand Geothermal Association

Our levy.

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 undertaking and disseminating our research and providing associated training to the heavy engineering industry.

Consolidated financial report.

Our vision

Securing tomorrow's
industry by innovating today

Our mission

Build a passionate tribe of
metalminds who innovate
successfully



Ronita Kishore
HERA Finance Manager

**NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION
INCORPORATED**

**CONSOLIDATED FINANCIAL REPORT
FOR THE YEAR ENDED 31 MARCH 2023**

NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION INCORPORATED**Consolidated Financial Report
FOR THE YEAR ENDED 31 MARCH 2023**

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NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION INCORPORATED**Directory
FOR THE YEAR ENDED 31 MARCH 2023**

Registered office	HERA House 17-19 Gladding Place Manukau City Auckland
Incorporation Number	218280
Nature of business	Research Association
HERA Board Members	Dr Troy Coyle (CEO HERA) Dave Anderson, John Jones Steel (Chair) Noel Davies (Chair of HERA Foundation) Jeremy Smith, New Zealand Steel Ltd (Nominee of General Manager of NZ Steel) Dieter Adam, NZMEA
	Ordinary and Associate Members David Moore - Grayson Engineering Ltd Craig Stevenson- Aurecon New Zealand Ltd Raed El Sarraf- WSP New Zealand Darren O'Riley - Steel Construction New Zealand Inc. Yvonne Chan - AUT Jane Warren - Dixon Manufacturing Ltd Wolfgang Scholz - Ideas in Design Limited (resigned 5 March 2023) Matthew Kidson - Kernohan Engineering (resigned 5 March 2023) Jayden Mellsop - Eastbridge Ltd (resigned 20 February 2023) Malcolm Hammond - MJH Engineering (Joined 15 March 2023)
HERA Certifications Limited Board Members	Wayne Carson - D&H Steel Construction Ltd (Chair) Andrew Boyd - Auckland Council David Moore - Grayson Engineering - HERA Executive Kevin Cowie - Steel Construction New Zealand Inc Malcolm Hammond - MJH Engineering Scott Johnstone - John Jones Steel Dr Troy Coyle - HERA CEO
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 Members' Report and Statement of Responsibility
FOR THE YEAR ENDED 31 MARCH 2023****Board Members' Report**

The Board of New Zealand Heavy Engineering Research Association Incorporated present this Annual Report, being the consolidated financial report incorporating consolidated financial statements and consolidated statement of service performance of the society for the financial year ended 31 March 2023, 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, service performance and related information.

The independent external auditors, RSM Hayes Audit, have audited the consolidated financial report and their report appears on pages 3 to 5.

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

In the opinion of the Board:

-The consolidated statement of comprehensive revenue and expense is drawn up so as to present fairly, in all material respects, the financial performance of the group for the financial year ended 31 March 2023;


- The consolidated statement of financial position is drawn up so as to present fairly, in all material respects, the financial position of the group as at 31 March 2023;

- The consolidated statement of cash flows is drawn up so as to present fairly, in all material respects, the cash flows of the group for the financial year ended 31 March 2023;

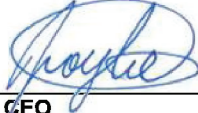
- The consolidated statement of service performance is drawn up so as to present fairly, in all material respects, the service performance of the group measured against suitable service performance criteria for the year ended 31 March 2023;

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

For and on behalf of the Board:



Chairman



CEO

21 June 2023

Date

21 June 2023

Date

**RSM Hayes Audit**

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

T +64 (9) 367 1656
www.rsmnz.co.nz

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

We have audited the consolidated general purpose financial report (hereinafter referred to as "consolidated financial report") of New Zealand Heavy Engineering Research Association Incorporated ("the society") and its subsidiary (together, "the group"), which comprises the consolidated financial statements on pages 6 to 18 and the consolidated statement of service performance on pages 19 to 28.

The complete set of consolidated financial statements comprises the consolidated statement of financial position as at 31 March 2023, the consolidated statement of comprehensive revenue and expense, consolidated statement of changes in net assets/equity, consolidated statement of cash flows for the year then ended, and notes to the consolidated financial statements, including a summary of significant accounting policies.

In our opinion the accompanying consolidated financial report presents fairly, in all material respects:

- the financial position of the group as at 31 March 2023, and its financial performance and its cash flows for the year then ended; and
- the service performance for the year ended 31 March 2023 in accordance with the entity's service performance criteria.

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 of the consolidated financial statements in accordance with International Standards on Auditing (New Zealand) (ISAs (NZ)) and the audit of the consolidated statement of service performance in accordance with the ISAs (NZ) and New Zealand Auditing Standard (NZ AS) 1 *The Audit of Service Performance Information*. Our responsibilities under those standards are further described in the *Auditor's responsibilities for the audit of the consolidated financial report* section of our report.

We are independent of the group 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, New Zealand Heavy Engineering Research Association Incorporated or its subsidiary.



Other matter

The corresponding consolidated service performance information for the year ended 31 March 2022 is unaudited.

Other information

The board members are responsible for the other information. The other information comprises the directory and the board members' report and statement of responsibility on pages 1 to 2 (but does not include the consolidated financial report and our auditor's report thereon), which we obtained prior to the date of this auditor's report. Our opinion on the consolidated financial report does not cover the other information and we do not express any form of audit opinion or assurance conclusion thereon.

In connection with our audit of the consolidated financial report, our responsibility is to read the other information identified above and, in doing so, consider whether the other information is materially inconsistent with the consolidated financial report 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 members for the consolidated financial report

The board members are responsible, on behalf of the society, for:

- (a) The preparation and fair presentation of the consolidated financial statements and consolidated statement of service performance in accordance with Public Benefit Entity Standards Reduced Disclosure Regime issued by the New Zealand Accounting Standards Board;
- (b) Service performance criteria that are suitable in order to prepare service performance information in accordance with Public Benefit Entity Standards Reduced Disclosure Regime; and
- (c) Such internal control as the board members determines is necessary to enable the preparation of consolidated financial statements and consolidated statement of service performance that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial report, the board members are responsible for assessing the group'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 members either intends to liquidate the society or group or to cease operations, or has no realistic alternative but to do so.

Auditor's responsibilities for the audit of the consolidated financial report

Our objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole, and the consolidated statement of service performance, 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) and NZ AS 1 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 or collectively, they could reasonably be expected to influence the decisions of users taken on the basis of this consolidated financial report.

A further description of the auditor's responsibilities for the audit of the consolidated financial report is located at the XRB's website at:

<https://www.xrb.govt.nz/assurance-standards/auditors-responsibilities/audit-report-13/>



Who we report to

This report is made solely to the members, as a body. Our audit work 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 group and the members as a body, for our audit work, for this report, or for the opinions we have formed.

RSM Hayes Audit
Auckland

21 June 2023

NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION INCORPORATED**Consolidated Statement of Comprehensive Revenue and Expense
FOR THE YEAR ENDED 31 MARCH 2023**

	Notes	2023	2022
		\$	\$
Revenue from non-exchange transactions	11	2,614,052	2,757,229
Revenue from exchange transactions	11	1,203,747	975,909
Total revenue		3,817,799	3,733,138
Expenses			
Employee salaries and wages		1,932,728	1,775,340
Member services		329,249	271,033
Seminar expenses		43,429	30,236
Consulting expenses		85,738	66,067
External research		93,037	155,510
HERA House expenses		120,906	101,873
Conference expense		58,598	-
Depreciation expense	8	112,170	101,487
Rent expenses		353,542	330,409
Office expenditure		213,908	153,141
Other expenses	12	293,174	193,059
Total expenses		3,636,479	3,178,155
Finance income		39,643	5,221
Net finance income		39,643	5,221
Net surplus before tax		220,964	560,204
Income tax expense	17	12,686	-
Net surplus for the year		208,278	560,204
Other comprehensive revenue and expense		-	-
Total comprehensive revenue and expense for the year		208,278	560,204

NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION INCORPORATED**Consolidated Statement of Changes in Net Assets/Equity
FOR THE YEAR ENDED 31 MARCH 2023**

	Accumulated comprehensive revenue and expense	Total
	\$	\$
Closing equity 31 March 2021	2,126,591	2,126,591
Total comprehensive revenue and expense for the year	560,204	560,204
Closing equity 31 March 2022	2,686,795	2,686,795
Total comprehensive revenue and expense for the year	208,278	208,278
Closing equity 31 March 2023	2,895,073	2,895,073

NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION INCORPORATED**Consolidated Statement of Financial Position
AS AT 31 MARCH 2023**

	Notes	2023 \$	2022 \$
ASSETS			
Current assets			
Cash and cash equivalents	5	1,529,145	615,309
Receivables from exchange transactions	6	236,549	73,881
Receivables from non-exchange transactions	6	199,960	335,516
Investments- term deposits	9	1,441,271	1,178,068
Prepayments		2,000	-
		<u>3,408,925</u>	<u>2,202,774</u>
Non-current assets			
Property, plant and equipment	8	677,100	516,231
Investments- term deposits	9	-	100,000
		<u>677,100</u>	<u>616,231</u>
TOTAL ASSETS		<u>4,086,026</u>	<u>2,819,005</u>
LIABILITIES			
Current liabilities			
Payables (from exchange transactions)	10	170,201	131,570
Payables (from non- exchange transactions)	10	1,008,066	640
Income tax payable	17	12,686	-
		<u>1,190,953</u>	<u>132,210</u>
TOTAL LIABILITIES		<u>1,190,953</u>	<u>132,210</u>
TOTAL NET ASSETS		<u>2,895,073</u>	<u>2,686,795</u>
EQUITY			
Accumulated comprehensive revenue and expense		<u>2,895,073</u>	<u>2,686,795</u>
TOTAL EQUITY		<u>2,895,073</u>	<u>2,686,795</u>

NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION INCORPORATED**Consolidated Statement of Cash Flows
FOR THE YEAR ENDED 31 MARCH 2023**

	Notes	2023 \$	2022 \$
CASH FLOWS FROM OPERATING ACTIVITIES			
Receipts from customers		3,664,414	3,772,349
Interest received		39,643	5,221
Receipts from MBIE		1,232,743	-
Receipts from IRD		103,664	-
Cash paid to suppliers and employees		(3,702,561)	(2,980,342)
Net cash inflow from operating activities		<u>1,337,903</u>	<u>797,228</u>
CASH FLOWS FROM INVESTING ACTIVITIES			
Sales/(Purchases) of term deposits		(163,202)	(400,000)
Purchase of property, plant and equipment		(273,039)	(201,930)
Sale of property, plant and equipment		12,174	-
Net cash outflow from investing activities		<u>(424,067)</u>	<u>(601,930)</u>
Net increase in cash and cash equivalents		913,836	195,298
Cash and cash equivalents at 1 April		615,309	420,011
Cash and cash equivalents at 31 March	5	<u>1,529,145</u>	<u>615,309</u>

NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION INCORPORATED**Notes to the Consolidated Financial Statements
For the Year Ended 31 March 2023****1. REPORTING ENTITY**

New Zealand Heavy Engineering Research Association Incorporated (the "society") which is an Incorporated society established under the Incorporated Societies Act 1908 on the 30th day of August 1978. HERA Certifications Limited is 100% owned by the society and incorporated and domiciled in New Zealand. The consolidated financial statements comprise the society and its wholly owned subsidiary.

These financial statements were authorised for issue by the Board on the date indicated on page 2.

2. BASIS OF PREPARATION*a) Statement of compliance*

The society is a public benefit entity for the purpose of financial reporting and the consolidated 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 group during the year.

d) Basis of consolidation

The Group financial statements are prepared by adding together like items of assets, liabilities, equity, revenue, expenses, and cash flows on a line-by-line basis. All significant intra-group transactions, revenue and expenses are eliminated in full on consolidation.

Subsidiaries

The Society consolidates in the Group financial statements all entities where the Society has the capacity to control the financial and operating policies of an entity so as to obtain benefits from the activities of the entity.

e) Changes in accounting policy

During the year, the Group adopted the following new standards for the first time:

(i) PBE IPSAS 41 - Financial Instruments. There was no material effect on the current or prior periods from the adoption of this standard.

(ii) PBE FRS 48 Service Performance Reporting. PBE FRS 48 is effective for annual periods beginning on or after 1 January 2022 and was adopted by the Group on that date. This standard establishes principles and requirements for presenting service performance information useful for accountability and decision-making.

3. SIGNIFICANT JUDGEMENTS AND ESTIMATES

The preparation of the group'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 group'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 group is classified as non-cash generating assets.

NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION INCORPORATED**Notes to the Consolidated Financial Statements
For the Year Ended 31 March 2023****3. SIGNIFICANT JUDGEMENTS AND ESTIMATES (CONT'D)**

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 group 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 group. Such changes are reflected in the assumptions when they occur.

*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 group;
- 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 group 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.

Interest received

Interest income is recorded using the effective interest rate. Effective interest rate is the rate that exactly discounts the estimated future cash payments or receipts over the expected life of the financial instrument or a shorter period, where appropriate, to the net carrying amount of the financial asset or liability.

Interest income is included in finance income in the statement of comprehensive revenue and expense.

NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION INCORPORATED**Notes to the Consolidated Financial Statements
For the Year Ended 31 March 2023****4. SIGNIFICANT ACCOUNTING POLICIES (CONT'D)****ii) Revenue from exchange transactions**

Non-exchange transactions are those where the group 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 group, 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. Amounts collected as an agent of a third party will not give rise to an increase in assets or recognised as revenue of the group.

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 group'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 group 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 group 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 group 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 group becomes a party to the contractual provisions of the financial instrument.

NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION INCORPORATED**Notes to the Consolidated Financial Statements
For the Year Ended 31 March 2023****4. SIGNIFICANT ACCOUNTING POLICIES (CONT'D)****d) Financial instruments (cont'd)****i) Financial assets at amortised cost**

Financial assets at amortised cost are non-derivative financial assets with fixed or determinable payments that are not quoted in an active market. Such assets are carried at amortised cost using effective interest method.

Cash and cash equivalents in the consolidated 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 consolidated 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 financial assets

Short-term receivables are recorded at the amount due, less an allowance for expected credit losses (ECL). This allowance is calculated based on lifetime ECL. In measuring ECL, short-term receivables have been assessed on a collective basis where they possess shared credit risk characteristics. They have been grouped based on the days past due. Where a short-term receivable does not possess these similar characteristics, its ECL is individually assessed. Short-term receivables are written off when there is no reasonable expectation of recovery.

Previous accounting policy for impairment of receivables under PBE IPSAS 29 for comparative information: 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.

NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION INCORPORATED**Notes to the Consolidated Financial Statements
For the Year Ended 31 March 2023****4. SIGNIFICANT ACCOUNTING POLICIES (CONT'D)****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.

Upon disposal of revalued items of property, plant and equipment, any associated gain or losses on revaluation to that item are transferred from the revaluation surplus to accumulated surplus.

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 group. 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.

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	15%-40%
Office Furniture	15%
Fixture & Fittings	15%
Training Centre	25%
Motor Vehicles	20%
Metallurgy Lab	15%
House Refurbishment	10%

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 group'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.

NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION INCORPORATED**Notes to the Consolidated Financial Statements
For the Year Ended 31 March 2023****4. SIGNIFICANT ACCOUNTING POLICIES (CONT'D)****h) Equity***Accumulated comprehensive revenue and expense*

Accumulated comprehensive revenue and expense is the group's accumulated surplus or deficit since the formation of the group 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 group 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 group 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 group. 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 Consolidated Financial Statements
FOR THE YEAR ENDED 31 MARCH 2023****5. CASH AND CASH EQUIVALENTS**

	2023	2022
	\$	\$
Cash and cash equivalents include the following components:		
Current Account	1,253,212	211,279
Call Account	275,933	273,900
Term deposits (original maturity < 90 days)	-	130,130
	<u>1,529,145</u>	<u>615,309</u>

The Society has a Visa credit card facility with Bank of New Zealand. The total limit of all credit cards is \$30,000 (2022: \$30,000).

6. RECEIVABLES

	2023	2022
	\$	\$
Receivables from exchange transactions		
Accounts receivable	236,549	73,881
	<u>236,549</u>	<u>73,881</u>
Receivables from non-exchange transactions		
Accrued income - steel and welding levies	199,960	335,516
	<u>199,960</u>	<u>335,516</u>

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
	\$	\$	\$	\$	\$
2023	236,549	181,929	1,597	25,859	27,164
2022	73,881	43,931	11,628	4,865	13,456

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.

Related party transactions

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

- rental expenses on buildings of \$353,542 (2022: \$330,409)
- No grants received in FY2023 (2022 : \$13,500)

Key management personnel compensation

The total remuneration paid to key management personnel for the year was \$747,777 (2022: \$697,589). The total number of key management personnel was 4 (2022: 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 2023**

	Opening balance	Additions	Disposals	Depreciation	Closing balance
Office Furniture	7,707	7,595	-	2,063	13,239
Fixtures & Fittings	125,611	5,221	-	23,074	107,758
HERA House refurb (Pūtātara and Fab4.0Lab)	170,047	-	-	23,574	146,474
Motor Vehicles	10,166	-	-	10,166	-
Office Equipment	61,090	7,680	-	30,115	38,655
Training & Research Equipment	141,610	252,543	-	23,178	370,975
	<u>516,231</u>	<u>273,039</u>	<u>-</u>	<u>112,169</u>	<u>677,100</u>

	2023			2022		
	Cost	Accumulated depreciation	Carrying value	Cost	Accumulated depreciation	Carrying value
	\$	\$	\$	\$	\$	\$
Office Furniture	234,342	221,102	13,239	226,747	219,040	7,707
Fixtures & Fittings	157,999	50,241	107,758	152,778	27,167	125,611
HERA House refurb (Pūtātara and Fab4.0Lab)	304,749	158,276	146,474	304,749	134,702	170,047
Motor Vehicles	67,770	67,770	-	144,436	134,271	10,165
Office Equipment	335,539	296,884	38,655	327,859	266,770	61,089
Training Equipment	513,116	142,140	370,975	260,572	118,962	141,610
	<u>1,613,517</u>	<u>936,414</u>	<u>677,100</u>	<u>1,417,141</u>	<u>900,912</u>	<u>516,231</u>

NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION INCORPORATED**Notes to the Consolidated Financial Statements
FOR THE YEAR ENDED 31 MARCH 2023****9. FINANCIAL INSTRUMENTS**

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

i. Classification of financial instruments

	Financial Assets	Financial Liabilities
	At Amortised cost	At Amortised cost
31 March 2023	\$	\$
Cash and cash equivalents	1,529,145	-
Term deposit - 3 to 12 months	1,441,271	-
Receivables	436,509	-
Payables	-	15,927
Endeavour Payables	818,188	-
	<u>4,225,113</u>	<u>15,927</u>
31 March 2022		
Cash and cash equivalents	615,309	-
Receivables	409,397	-
Investments - Term Deposits	1,278,069	-
Payables	-	37,411
	<u>2,302,775</u>	<u>37,411</u>
10. PAYABLES	2023	2022
	\$	\$
Exchange transactions		
Accounts Payable	15,927	37,411
Employee Benefits	131,274	94,159
Other Payables	23,000	-
	<u>170,201</u>	<u>131,570</u>
Non-Exchange transactions		
Endeavour Payables	818,188	-
Income in advance	101,517	-
GST payable	88,360	640
	<u>1,008,066</u>	<u>640</u>

The Endeavour payables balance includes amounts owed to subcontractors and advisory groups involved in the Endeavour Program.

11. REVENUE

	2023	2022
	\$	\$
Revenue from non-exchange transactions		
Steel & Welding Levies	2,145,298	2,743,729
Grants from HERA Foundation	-	13,500
R&D Tax Credits	103,664	-
Grants from MBIE - Endeavour Funding	365,090	-
	<u>2,614,052</u>	<u>2,757,229</u>

Revenue from exchange transactions

Membership Subscriptions	162,304	122,390
Conference income	17,000	13,542
Consulting & Industry Projects	122,038	93,909
Services to third parties	-	18,294
Publication	64,345	18,252
Welding Modules	1,062	470
Rent	145,146	132,874
Seminar & Courses	421,264	339,469
SFC Audits for HERA Certification	258,414	236,712
Profit on sale of assets	12,174	-
	<u>1,203,747</u>	<u>975,912</u>

12. OTHER EXPENSES

	2023	2022
	\$	\$
Other expenses mainly includes:		
Metals NZ	40,000	40,000
Recruitment	38,197	7,728
Insurance	43,358	43,278
Vehicle	34,258	29,789
Scholarships	105,277	45,966

NEW ZEALAND HEAVY ENGINEERING RESEARCH ASSOCIATION INCORPORATED**Notes to the Consolidated Financial Statements
FOR THE YEAR ENDED 31 MARCH 2023****13. CAPITAL COMMITMENTS**

There are no capital commitments at the reporting date (2022: 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:

	2023 \$	2022 \$
Within one year	367,288	356,331
After one year but not more than five years	269,855	614,641
More than five years	-	-
	637,143	970,972

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.

HERA Certifications Limited is a registered NZ Limited Company. The New Zealand Inland Revenue Department reactivated the company on 22 July 2022. The company is required to file income tax and imputation returns for each year, resuming the 31 March 2023 income year.

HERA Certifications Limited generated a net profit of \$45,306 resulting in an income tax liability of \$12,686 per the corporate tax rate of 28%.

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.

**Consolidated Statement of
Service Performance for the year
ended 31st March 2023****Our vision: Securing tomorrow's industry by
innovating today.**

This is achieved through our mission to build a passionate tribe of metal minds who innovate successfully.

Our strategy consists of three key elements:

- delivering R&D solutions;
- developing, and maintaining a skilled workforce; and
- connecting and inspiring.

HERA vision and mission

Vision = Securing tomorrow's industry by innovating today

Mission = Build a passionate tribe of metal minds who innovate successfully

HERA strategy

By focusing on these areas, we aim to future-proof the heavy engineering industry and ensure its continued success. HERA aims to continually deliver solutions to the heavy engineering industry. The planned approach is supporting steel to be material of choice through developing design guides, conducting research in areas such as seismic, structural fire, durability, and sustainability, and enhancing expertise in areas such as weld design, metallurgy, inspection, fabrication, and the application of key standards.

In addition, we aim to support our members by establishing a national and international technical support framework, extending steel structure lifespans, providing ongoing support to HERA Certifications, and developing and maintaining national standards. We focus on R&D, particularly in the areas of automation, productivity, seismic, structural fire, and Industry 4.0. We prioritise delivering research that positions us as a global leader in our sectors of steel-related manufacturing and construction research.

We are committed to supporting the transition to a low-carbon economy, with a focus on decarbonisation solutions that promote steel's role in this transition.

HERA is engaged in various initiatives and programs

aimed at developing and maintaining a skilled workforce in the steel industry. Some of the key activities include offering e-courses on advanced welding and fabrication, non-destructive testing, steel sustainability, structural design, seismic design, and fire design, as well as conducting seminars on design to new standards. We also offer training for engineers and architects on steel decarbonisation and provide a qualification framework and training for key technical personnel.

In addition to these, we have developed customised training courses for industry groups such as CBIP, NZNDTA, Engineers NZ, FICA, NZSSDA, and others. We have also established the HERA Innovation Centre and Fab4.0Lab to support future training requirements and create technology demonstrations. Inspirational speakers are invited to deliver presentations on new technologies and projects using steel. Other initiatives include Metalmind and related content, training to enable members to achieve industry certification, performance-based certification for key technical personnel, and continued e-learning and distance learning development. Overall, these initiatives are aimed at quenching the skills needs of the industry and supporting and encouraging members to use key messages. We place a lot of importance on creating a sense of community among stakeholders and fostering inspiration and motivation to work towards common goals. We desire to build connections and collaborations between individuals and organizations, and to create a shared sense of purpose and enthusiasm for the work being done within the industry.

**Some of the key messaging used in communications
by us include:**

- Research outcomes, research publications, research grants
- Six reasons to choose steel
- Case studies and media profiling of HERA
- Industry 4.0 (particularly Fab4.0 and Construction 4.0)
- Construction4.0hub as a repository for related research outcomes
- The fact that all building materials have their place and what the benefits of steel are
- Targeted scholarships
- Advanced Manufacturing
- Design Innovation
- Maintaining an international Technology Support Network
- Support to Sustainable Steel Council
- Thought-provoking digital content and media commentary on key issues
- Steel is the rockstar of the circular economy
- Thought leadership on diversity and inclusion in our industry, with an emphasis on women and Māori in engineering

Comparative summary: Delivering R&D solutions.

In FY23, significant progress was made in various aspects of delivering R&D solutions and technical expertise compared to the previous year, FY22.

Funding for proposals

In FY23, we successfully secured funding for two projects, namely the Endeavour Construction 4.0 and the Sovereign Manufacturing Automation for Composites (SoMAC) CRC. The Endeavour Construction 4.0 grant, awarded by the Ministry of Business, Innovation and Employment, is valued at \$10.3 million and will be distributed over a span of four years, starting from October 1, 2022. This substantial funding infusion significantly enhances HERA's research capabilities and is expected to bring about transformative changes in the construction sector of New Zealand.

Additionally, the SoMAC funding was granted approval in May 2022 and is anticipated to be received during FY24. This represents a notable improvement from FY22, wherein a proposal for Construction 4.0 funding was submitted but unfortunately unsuccessful.

Technical papers and reports

FY23 saw an increased effort in third party publications, with 5 papers submitted for publication in journals and/or conference proceedings. These were:

- H. Taheri, M. Karpenko, G.C. Clifton, S. Ramhormozian, P. Dong, J.B.P. Lim: Seismic application of fillet and partial penetration butt welds.
- D. Chandramohan, K. Roy, H. Taheri, M. Karpenko, Z. Fang, and J. Lim: A State-of-the-Art Review of Fillet Welded Materials, MDPI 2022 - Materials | Free Full-Text | A State of the Art Review of Fillet Welded Joints (mdpi.com)
- Adolf F. Hobbacher and M. Karpenko: Provisions

for avoiding brittle fracture in steels used in Australasia including effects of seismic action, Welding in the World, Springer 2022 - Provisions for avoiding brittle fracture in steels used in Australasia including effects of seismic action | SpringerLink

- N. Mago, K.Andisheh: R4-159: Common language in structures as steel banks (SASB) <https://www.hera.org.nz/product/hera-report-r4-159/>
- K.Andisheh: Composite structures standards (AS/NZS 2327) – errata, guidance and recommendations <https://www.hera.org.nz/hera-publications/>

In comparison, FY22 had a focus on HERA Publications, with a combination of 7 technical papers and reports published. These were:

- HERA Report R8-43:2021 The use of effective full penetration of T-butt welds in welded moment connections
- HERA Technical Guide No 04:2021: Commentary on the stud welding standard AS 1554.2:2021
- 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

SFC audits

The number of audits conducted in FY23 increased to 62, indicating growth in this area compared to the 56 audits performed in FY22.

Steel research and Welding Centre panel projects

Annually, HERA submits proposals to the Steel Research Panel and the Welding Centre Panel. The Steel Research panel is made up of representatives that are submitted to the panels are developed in response to the technical needs of HERA members.

In FY22, 4 panel projects were approved and 10 were approved in FY23.

The following projects were approved by the Steel Research panel in FY23:

- Developing steel fire protection optimal design software.
- Update HERA report R4-133.
- Developing windows executive composite beam software.
- Investigate minimum dimension requirements for SHS columns in fire.
- Enhance and optimise bolted connection in seismic resisting system.
- High strength grade steel for bridge superstructure.
- State-of-art review of carbon sequestration.
- Steel carpark under severe fire

The following R&D projects were approved by the Welding Centre panel in FY23:

- Composite products lifecycle 4.0 – Quality, structural health monitoring and reuse
- Specification of cost-effective weld details in steel construction High cycle fatigue and seismic applications which includes the following projects:
 1. Evaluating the performance of fillet and partial penetration welds in seismic connections
 2. Effect of ancillary weld details and fabrication defects on the welded joints under seismic loading
 3. Evaluation the weld sizing criteria in NZS 3404 standard (safety and overstrength factors)
 4. Statistical distribution of weld sizes, defects, and properties in welded joints
 5. Specification of spiral welded pipes for structural seismic applications

6. Robotic fabrications and limitations for seismic applications
7. Performance of fillet welds under the minimum design service temperature
8. Using fillet and partial penetration welds for high cycle fatigue applications - bridge girders
9. Performance of the seismic connection with plasma cut holes under the low and high cycle fatigue.
10. Metallographic assessment of seismic steel joints
11. Development of the simplified weld size selection matrix for NZS 3404
12. Evaluation of the economic benefits from the use of optimised weld details

The following projects were approved by the Steel Research panel in FY22:

- Non-destructive testing to identify mechanical properties of steel structures: feasibility study.
- Develop online corrosivity map to facilitate steel durability design.
- Steel circularity passport.
- Making steel a low carbon choice material.

In FY22, the Welding Centre Panel approved a 3-year R&D programme Digital Transformation in Fabrication (Fab 4.0 Roadmap)

Design guidelines

There were two design guidelines published in FY23. These were:

- R4-156: Seismic design of moment resisting steel frames.
- R4-155: Optimised Sliding Hinge Joint design guide (2nd revision)

FY22 had two publications. These were:

- R4-131:2022, Design of Composite Steel Floor Systems for Severe Fires (slab panel method (SPM) design guide),
- HERA Guidance and corrections to clauses in AS/NZS 2327:2017 Amd1: 2020,

Indicator	FY23 Actuals	FY22 Actuals
Funding for proposals	2 submitted 2 secured	1 submitted 0 secured
Technical papers and reports	5 published	7 published
SFC audits	62 audits	56 audits
Panel projects	10 approved	4 approved
Design guidelines	2 published	2 published

These comparative figures demonstrate progress in various areas of our R&D activities and technical expertise. We continue to focus on securing funding, publishing research, conducting audits, addressing technical enquiries, delivering research outcomes, and sharing knowledge through presentations. Despite challenges faced, such as staff changes and pandemic-related disruptions, we remain committed to driving innovation and making valuable



Comparative summary: Developing & maintaining a skilled workforce.

In FY23, significant progress was made in various aspects of developing and maintaining a skilled workforce compared to FY22.

Courses, workshops, webinar attendees

HERA coordinates a diverse range of in-person and online courses, workshops, and webinars to meet the ongoing professional development needs of its members and industry stakeholders. Each year, webinars are customized based on consultations with the membership to address technical solution development and implementation demands, attracting varying levels of participation. In FY23, there were 378 attendees, while in FY22, the number reached 848. The breakdown of attendees for specific courses, workshops, and webinars is as follows:

- Inspection for Welders – In FY22, there were 70 attendees whilst FY23 had 10.
- Welding Supervisor – In FY22, there were 98 attendees whilst FY23 had 135.
- Welding Inspector 1 – In FY22, there were 6 attendees whilst FY23 had 19.
- What Every Engineer should know about welding – this was a one-off webinar offered in FY22 with 14 attendees.
- Specification of the Effective Full Penetration Butt Weld (EFPBW) detailed in HERA Report-R8 – this was a one-off webinar in FY22 used as a platform to disseminate the latest research results achieved in our Seismic Research Program. There were 300 attendees online and 83 viewing the follow-up webinar on the implementation of the EFPBW.
- Composite Beam and Slab Design software webinar – this was introduced for free to HERA members in FY22 with 121 attendees. In FY23,

there were 18 attendees.

- Composite slab design under severe fire webinar – this was first offered in FY23 with 4 attendees.
- Moment Resisting Frame webinar – there were 64 attendees in FY22 and 46 in FY23.
- Optimised Sliding Hinge webinar – there were 47 attendees in FY22 and 12 in FY23.
- Weathering Steel for Bridge Applications webinar – this was a one-off offer in FY22 with 17 attendees.
- Slab Panel Method webinar – this was a one-off offer with 14 attendees.
- Weathering Steel for Building Applications webinar - this was a one-off offer in FY22 with 14 attendees.
- Theory of Constraints for Welding and Fabrication e-course – this was a one-off offer in FY23 with 14 attendees.
- Welding Engineering for Safety Inspections of Cable Logging Yards – this was a one-off offer webinar in FY23 with 9 attendees.
- Welding CO2 Gas and Alternative Gas Mixtures webinar - this was a one-off offer webinar in FY23 with 44 attendees.
- Welding Standards Update – AS/NZS and ISO standards - this was an online seminar in FY23 with 67 attendees.

Lectures

In FY23, the Welding Centre team delivered two lectures at the University of Waikato in April 22 on Industry 4.0 in Construction and at the University of Wollongong in July 2022 on Industry 4.0 in Steel Fabrication. There were no lectures conducted in FY22.

Conference/Workshop presentations

There were 12 presentations done in FY23 and 3 in FY22.

The presentations made by HERA in FY23 were:

- Zero Carbon Steel at Decarbonising NZ Conference (Brightstar) Industry leader's Panel: Enabling organisations to develop the capability to achieve government plans 5 dec 2022 <https://www.brightstar.co.nz/events/decarbonising-new-zealand-2022/agenda>
- Panel member at Building Together - Is policy enabling or hindering progress? (Minter Ellison) along with Janine Stewart, Dean Kimpton and Craig Hobbs <https://www.minterellison.co.nz/insights/building-together-re-set-for-the-future-1>
- <https://vimeo.com/694259674> - Te Kāhui Whaihanga GIB Webinar | Opportunities for Zero Carbon Steel
- Panel decarbonising the supply chain at the NZ Green Building Council Summit 2022 New Zealand Green Building Council - Housing Summit 2022 (nzgbc.org.nz)
- Industry Trends, CHEMMAT 720 Guest Lecture at University of Auckland, 25 August 2022
- Industry 4.0, Guest Lecture at University of Waikato, September 2022 SoMAC Partner Presentation, SoMAC AGM, University of Sydney, November 2022
- Site Erector Certification, SCNZ Forum June 2022
- Engineers: Getting the Welds you Want and Need , presentation at SCNZ Steel Structures Seminar, Nov 2022
- The GOOD, The BAD and the UGLY (weld), presentation at SCNZ Steel Structures Seminar, June
- Latest tools for efficient design of steel & composite steel structures, presentation at SCNZ Steel Structures Seminar, November 2022
- Overview of the current AS/NZS 2327 and HERA design software, presentation at Auckland Structural Group, July 2022
- Advanced modelling, Presentation at BECA, Auckland, April 2022.

The presentations made by HERA in FY22 were:

- Zero Carbon Steel to the Life Cycle Association annual conference <https://lcanz.org.nz/2022/03/27/autumn-webinar-zero-carbon-steel-recording-now-available/>

- Decarbonising New Zealand 2021 15 Nov 2021 Case study: Steel decarbonisation in action <https://www.brightstar.co.nz/events/decarbonising-new-zealand/agenda>
- Requirements for the Certification of Site Erectors, SCNZ Forums June 2021

Tauira (student) membership growth

The number of Tauira students increased from 123 in FY22 to 152 in FY23.

Scholarships and internships

In FY23, one Whanake scholarship was awarded to Lydia Frater, and in FY22, to Lily Sanson.

In FY22, John Cole and Hayley Ngo, were awarded internships. FY23 did not have any internship offers.

Breakdown of student membership segmentation	FY23 Actuals	FY22 Actuals
Total student member numbers	152	123
From Ara Institute of Canterbury	8%	1%
From Auckland University of Technology	5%	35%
From Open Polytechnic	0.7%	4%
From Otago Polytechnic	2%	-
From University of Auckland	28%	1%
University of Canterbury	21%	27%
University of Waikato	29%	26%
Others	6.5%	8%

* Others is made up of Dalian Jiotong University, Fiji National University, Massey University, Unitec, University of Bristol, Waikato Institute of Technology and Weltec.

Other support - SFC assistance packages

Four Steel Fabricator Certification (SFC) assistance packages were provided in both FY22 and FY23, demonstrating continued support for industry development.

Indicator	FY23 Actuals	FY22 Actuals
Technical courses, workshops, webinar attendees	378 attendees	882 attendees
Lectures	2 lectures	0 lectures
External presentations	12 delivered	3 delivered
Taura (student) members	152 taura	123 taura
Scholarships & internships	1 Whanake 0 internship	1 Whanake 2 internship
SFC assistance packages	4 packages	4 packages

Overall, FY23 demonstrated significant progress in developing and maintaining a skilled workforce through the introduction of new courses, increased training opportunities, and engagement in webinars and internships.



Comparative summary: Connecting & inspiring.

In FY23, significant progress was made in connecting and inspiring stakeholders within the industry.

Industry 4.0 cluster events

Four industry 4.0 cluster events were organised in both FY23 and FY22, indicating consistent efforts to foster collaboration and knowledge sharing within the cluster.

Stirring the Pot podcasts

An average of two podcasts per month were released in both FY23 and FY22, ensuring the availability of valuable content for stakeholders.

Networking events

Two networking events were organised in FY23, maintaining the same level of engagement as in FY22. These events offer opportunities for industry professionals to connect and build relationships such as our AGM, Endeavour Funding meet and greet and similar.

Metalbase newsletter

The Metalbase newsletter saw consistent monthly releases, with one release per month in both FY23 and FY22. This regular update ensures the latest up-to-date and relevant information is delivered to members and wider subscription followers. In FY23, in addition to communications in the Metalbase, the Welding Centre Team published two articles in the "interests' goop" magazine.

MetalMind - HERA App

The number of MetalMind users increased from 227 in FY22 to 294 in FY23, reflecting growing adoption and utilisation of this resource for industry professionals.

Public relations (PR) reach

According to HERA's external PR Consultant, the PR reach value increased in FY23, reaching \$739,965 compared to \$366,359 in FY22. This shows the return on investment is growing. The readership reach also increased from 1,378,391 in FY22 to 1,954,861 in FY23. This was crucial as it increased the visibility of HERA's various engagements focusing on the ripples and change events influenced across the industry by HERA.

Social media followers and subscribers

Across various social media platforms, there was an increase in followers/subscribers in FY23 compared to FY22. Specifically:

- LinkedIn users increased by 20%
- Facebook followers increased by 19%
- Twitter followers increased by 4%
- Instagram followers increased by 5%
- YouTube subscribers increased by 6.75%

This amplifies HERA's presence across not only the membership and engineering fraternity but also across the greater NZ populous.

Membership numbers

The membership base decreased from 681 members in FY22 to 543 members in FY23. In FY23, a cleanse of the database was carried out resulting in the removal of liquidated and closed businesses, as well as cancellations accounting for the material discrepancy in the membership base. The FY22 data is reflective of HERA's membership base pre-database cleanse.

In summary, these achievements demonstrate the commitment to connect and inspire stakeholders, expand membership, leverage digital platforms, and effectively communicate industry-related information. Continued efforts in these areas aim to foster collaboration, knowledge sharing, and industry growth.

Indicator	FY23 Actuals	FY22 Actuals
Industry 4.0 cluster events	4 held	4 held
Stirring the Pot podcasts	23 episodes	22 episodes
Networking events	2 held	2 held
Metalbase newsletter	1 per month 12 total	1 per month 12 total
MetalMind - HERA App	294 users	227 users
Public relations (PR) reach	\$739,965 value 1,954,861 reach	\$366,359 value 2,904,548 reach
Social media followers and subscribers	3635 LinkedIn 447 Facebook 268 Twitter 618 Instagram 79 YouTube 1.3K views 152.6 watch hours	3032 LinkedIn 375 Facebook 257 Twitter 589 Instagram 74 YouTube 1.7K views 385.6 watch hours
Membership numbers	543 total members 295 Platinum 245 Gold 3 Affiliate	681 total members 438 Platinum 238 Gold 5 Affiliate

NB. FY22 data is reflective of HERA's membership database pre-database cleanse which was carried out in FY23. This work removed liquidated & closed businesses, cancellations and similar - accounting for the large discrepancy in numbers.



HERA House, 17-19 Gladding Place
PO Box 76-134 Manukau, Auckland
2241
New Zealand

www.hera.org.nz