

Who is HERA?

HERA is the Research Association for the New Zealand metals engineering industry. Established in 1979 under the Heavy Engineering Research Levy Act of 1978 as a member-based, not-for-profit Research Association, HERA today serves around 600 industry members as their leading resource support centre.

HERA PURPOSE

- Service heavy engineering sector interest
- Facilitate access to markets
- Provide Research & Development, technical training, advice and support
- Provide a respected voice for the aspirations and concerns of members
- Lead the movement towards a sustainable and internationally competitive industry

HERA Executive 2011/2012:



Jacob Bonish



Alistair Fussell

From left:

Sean Gledhill
 Noel Davies
 Prof Thomas Neitzert
 Dr Wolfgang Scholz
 Peter Hutton (Chairman)
 Scott Fuller
 Terry Duff
 John Frear (Deputy Chairman)
 David Moore (Past Chairman)
 Peter Herbert
 Mike Lehan

Company Affiliation

AURECON
 Hydraulink Fluid Connectors
 Auckland University of Technology
 HERA
 Fitzroy Engineering
 NZ Steel
 Southern Cross Engineering
 Bestbars Limited
 Grayson Engineering
 SC Technik
 Page & Macrae

Membership Representation

Ordinary & Associate Members
 Heavy Engineering Educational & Research Foundation (HEERF)
 Ordinary & Associate Members
 Director
 Ordinary & Associate Members
 President NZ Steel
 Ordinary & Associate Members
 Ordinary & Associate Members
 Ordinary & Associate Members
 NZ Manufacturers & Exporters Association
 Ordinary & Associate Members

Inset

Jacob Bonish
 Alistair Fussell

Tenix NZ Ltd
 Steel Construction New Zealand

Ordinary & Associate Members
 Co-opted representing SCNZ industry



About the Cover

Promoting the multi-faceted capabilities of New Zealand's metals engineering industry. Big is not always beautiful, as a small country and industry can show itself to be fast to respond, flexible and multi-talented. New Zealand's culture of independent thinking, highly-skilled and educated workforce, and 'never say never' attitude has bred generations of engineers who contribute greatly to the industry's success.

Like a pathfinder, HERA is proud to be there to assist members in seeking out and tapping into the new opportunities that are emerging, be it oil & gas, clean energy, earthquake and fire-resisting steel construction or innovative technologies supporting the other sectors of the New Zealand economy.

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HERA STRATEGIC FOCUS:

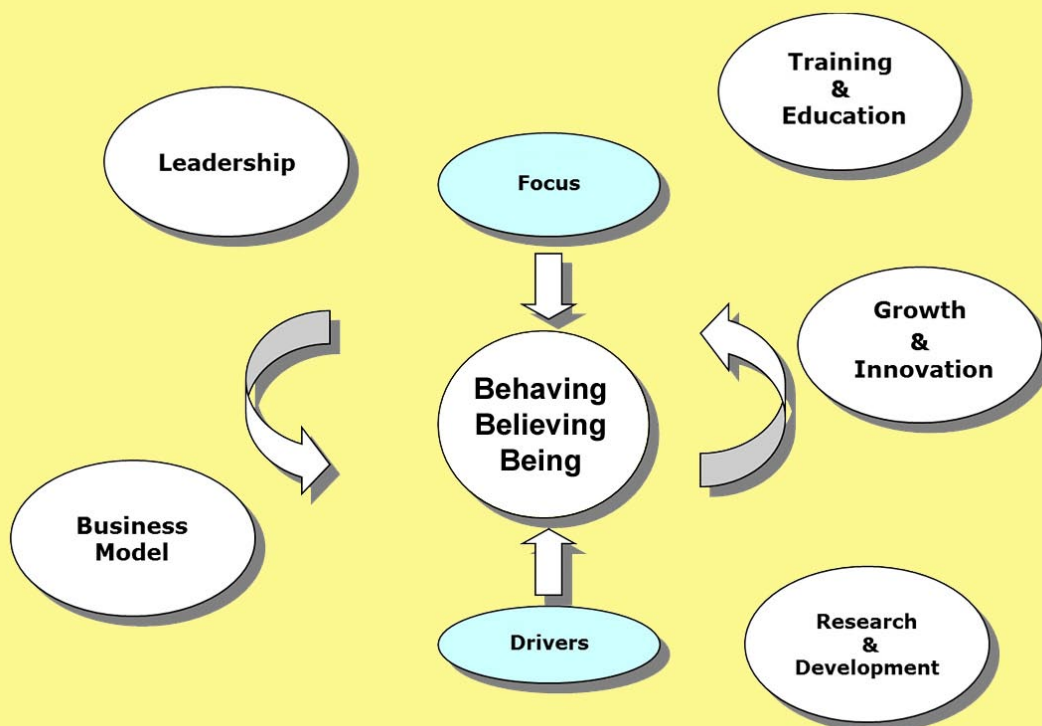
INDUSTRY VISION

To have New Zealand’s Metals Engineering Industry achieve world-class standards for profitability, quality and sustainability

HERA MISSION

HERA to be the catalyst for research, innovation, growth and development in New Zealand’s Metals Engineering Industry

An outcome of the 2011 HERA strategy review was to limit the HERA focus to 5 drivers as outlined in the diagram and this Report is structured accordingly:





P. C. Hutton

Peter Hutton
HERA Chairman

2011/2012 HERA Year in Review:

- Over 4% growth in annual heavy steel usage marks steady growth for heavy engineering industry
- Heavy engineering product collective show exports surpassed imports but at lower levels than previous year
- HERA divisions report consistent and successful work outcomes with increased level of self-generated income
- HERA's Financial Year: A deficit in a tight commercial environment but in order of budget
- Industry approved increase in levy funding progressed with HERL Act Amendment passing its first reading in Parliament
- One Voice Industry Advocacy - 1st HERA Position Paper on Public Policy well-received

Industry Activity – Slow But Steady Recovery

About 39% of HERA's income comes from levied industry contributions which are proportional to industry activity. As shown in the long term chart, 2011/12 heavy steel volumes used by the New Zealand industry increased by 4.1% to close to 130,000 tonnes as compared to the previous year.

Despite the dramatic set back in growth during the 2009/10 Global Financial Crisis (GFC), an average growth in heavy steel consumption of 5.1% annually can be seen since the 1990 all-time low. This puts our industry sector's growth well ahead of the average New Zealand economic annual GDP growth, which for the same period was 2.5%.

As in the previous two years the industry reported free capacity and, combined with steel cost stability, has led to a very competitive offering with tight profit margins.

As the graph of a collective of heavy engineering imports and exports shows, there are large fluctuations between years due to distortion by significant imported or exported items.

On the positive side, the trade balance in this collective was in New Zealand's favour for the first time since 2005, and

imports dropped by about 18% as compared to last year. On the negative side, the value of exports compared to last year dropped by about 14%.

HERA Business Model

As a result of last year's strategic review, HERA continued its focus on performing more income generating commercial work, which included specialist training activities in Australia and China, and the establishment of new HERA services such as 'HERA Verified'.

This increased commercial focus was created in order to maintain HERA capabilities and compensate for last year's lack of success in winning research funding from the contestable Government research pool.

The resulting tight funding was compounded by lower-than-agreed levels of industry research funding, as a result of delays in the implementation of the industry-approved increase to the Heavy Engineering Research Levy (HERL).

However, in the context of the industry-funded research levy, good progress was made during the year with the Amendment of the HERL Act via Statutory Amendment Bill (SAB) No 3, and the passing of its first reading in Parliament.

by HERA and its Heavy Engineering Educational and Research Foundation (HEERF), the Executive accepted a negative budget concluding with expenses exceeding income by \$136k.

However, when the HEERF surplus is also taken into account, the asset balance of both organisations stayed roughly unchanged as compared to the previous year, providing an overall satisfactory financial result in a continued challenging environment.

Growth and Innovation

HERA's support for industry growth and innovation has to be seen in the context of facilitating the transformation of a largely contracting-based heavy engineering industry into one which owns IP, and provides higher value products and services with very strong export focus.

A clear example of this support effort is the newly created verification scheme under the 'HERA Verified' trademark. The 'HERA Verified' mark is awarded to testify that products or services have been independently verified by HERA against specific standards.

Furthermore, it is proposed to roll-out this scheme in the form of steel fabricator accreditation in co-operation with SCNZ and the fabrication industry.

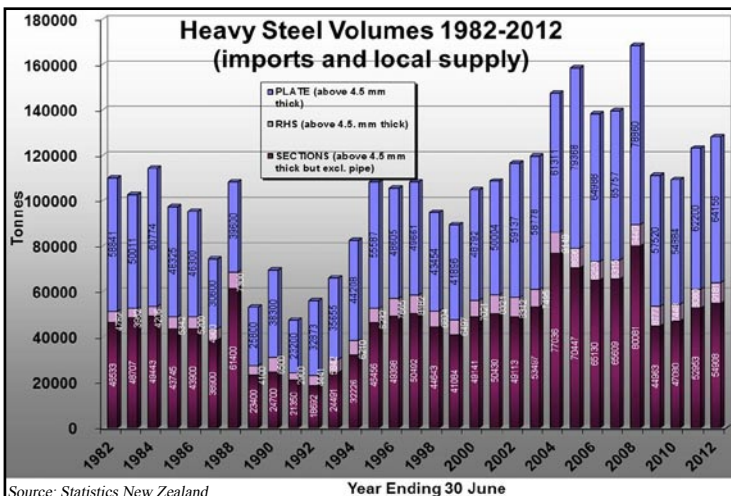
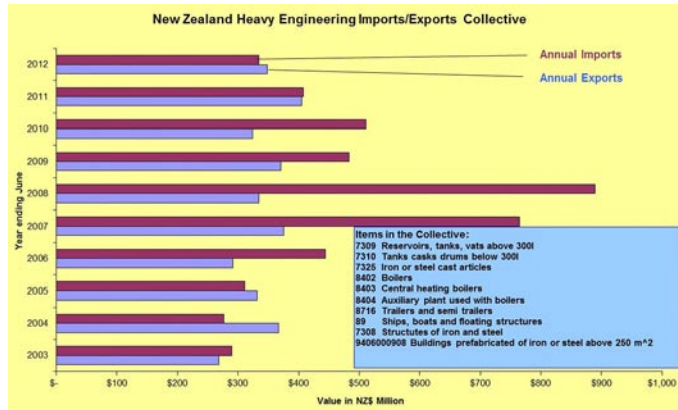
The focus on quality assurance will give innovative members a chance to demonstrate leadership in addressing compliance and continued improvement. Moreover, it will raise client confidence in New Zealand heavy fabrication.

HERA R&D

The industry business model transformation from contractors to IP ownership cannot happen without continued industry-led R&D. HERA sees itself as the catalyst for industry to engage on this pathway.

The adjustment in HERA's R&D focus announced in the previous year is a demonstration of this effort and was continued through the industry development division's Clean Energy Technology programme.

In co-operation with two industry members and the University of Canterbury, it successfully started a multi-year Tech NZ-funded programme creating research capability and products in low temperature geothermal and waste heat energy conversion.

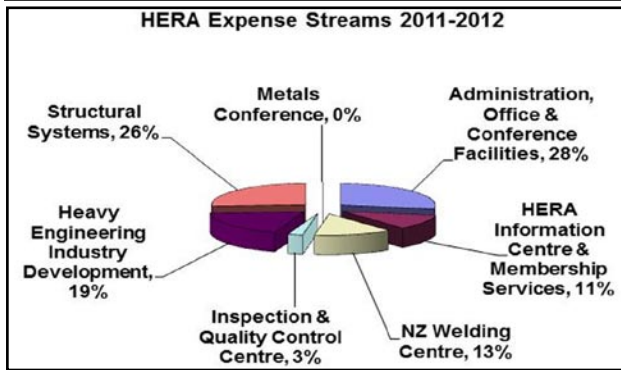
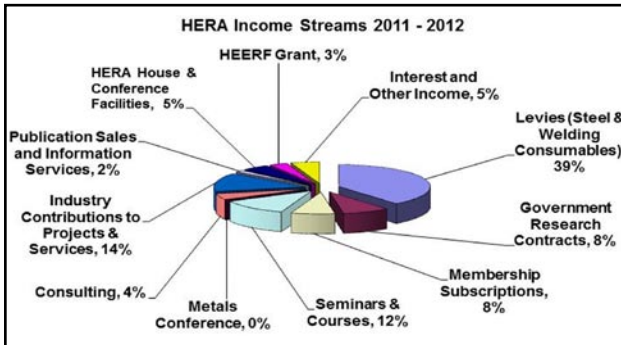


Source: Statistics New Zealand

The Minister responsible for the Act, Hon Steven Joyce, confirmed his support for an increase in industry research funding following a meeting with the Chairman and the Director.

The much more likely realisation of higher industry research contributions in the next financial year is noted with relief. The continued focus on generating commercial income to maintain HERA capabilities is reducing performing high priority R&D for the entire sector, such as proposed work for seismic damage avoiding steel construction systems.

Backed by financial reserves kept for difficult times



Additionally, based on the development of the research roadmap, a comprehensive co-operative funding application was put to Government in response to the call for proposals for export geothermal energy product and services development.

Another behind-the-scenes action relates to marine-based energy and the establishing of a New Zealand Marine Energy Centre in co-operation with AWATEA. As a result of the focus change, the HERA expense stream for Heavy Engineering Industry Development has changed and has moved to 19% from 9% in the previous year.

However, the traditional R&D focus was also progressed with further work in the structural and welding technology areas.

Noteworthy Structural Systems division research outcomes were the development of:
- Design rules for shear connectors in high strength materials
- Design values and safety factors for innovative New Zealand steel deck products and
- Revising the principal design for earthquake design of steel-framed buildings
HERA Report R4-76.

The New Zealand Welding Centre (NZWC) progressed its research into the corrosion performance of lower cost alternative stainless steel grades, and its productivity and fatigue performance aspects of heavy welded structural beams, e.g. used in bridge construction.

Training & Education

Training and education is seen as the cornerstones for continual industry improvement. HERA demonstrated its ongoing commitment to this by an increase in spending in HERA education and training by a massive 25%.

HERA staff adjusted the educational programme and responded in the development of new seminars, and getting leading overseas experts to complement its offering.

But as demonstrated by Structural Systems General Manager Dr Stephen Hicks, HERA expertise is also recognised and in demand internationally, which was evidenced by seminars given for the Australian Steel Institute and the British Standards Institution in China.

Leadership

HERA is charged with the task to lead the movement towards a sustainable and internationally competitive industry. This has required a strong emphasis on advocacy, which has been contributed to through HERA staff regularly developing motivational or critical articles in HERA News and associated media, or in frequent engagements in, or submissions to industry, Government or associated stakeholders' bodies.

HERA represents industry in countless roles including industry-relevant national, Australian/New Zealand or international Standards bodies. There is no doubt our industry voice has gained momentum over the last few years as a result of the call for increased leadership.

Joining forces with other metals industry associations under the 'one-voice' Metals NZ banner has contributed to this vocal stance, and HERA's role in providing the secretariat for this new organisation is instrumental in its increased success.

With a combined membership of around 600 member companies, we represent a significant and strategically important force in the New Zealand economy. We need to get this message out to all New Zealanders in order to gain the corresponding support and recognition.

The development and publication of the first *New Zealand Metals Engineering Industry Position on Public Policy Issues 2012* document found widespread recognition amongst the membership, government and industry leaders.

The document touches on many significant issues for our industry including threats from imports and our drive to increase the benefits from local fabrication. Having a membership-endorsed policy document as guidance strengthens the advocacy role, and its future publication as a Metals NZ document will enhance its value.

Outlook

Despite the continued uncertainty around the world economic performance, industry confidence is up and especially our consultant members are very busy, which relates to more than the Canterbury rebuild.

HERA's expectation is that steel volumes for the coming year will at least match this year's figures, so the core levy funding is budgeted accordingly.

The year ahead will include the 2013 Metals NZ Industry Conference, which will bring our industry leadership together under the theme *Better Business = Better Profits*. It will be a great opportunity to learn and network, and will incorporate the Metals Industry Awards Gala Dinner, where we celebrate our industry's successes.

Gratitude

HERA's contribution to industry development would not be possible without the incredible support it receives from industry, its partner organisations and key stakeholders outside the industry, including from Government and its departments, and research providers.

Our thanks to all those who contribute, and this includes the HERA employees. We look forward to continued close and valued co-operation with everyone involved.



Wolfgang Scholz
Director

2011/12 Success Stories

Heavy Engineering Industry Development Division

- o 2012 US Geothermal Trade delegation
- o Low Enthalpy Heat-to-Electrical Energy research project progressed
- o Above Ground Geothermal & Allied Technology (AGGAT) Workshop, led to development of draft AGGAT Research Roadmap R5-47:2012
- o Advanced Low Enthalpy Geothermal & Allied Power Generation Technology funding submission in support of AGGAT agenda
- o Established international relationships towards collaborations to develop Organic Rankine Cycle technologies
- o Initial proposal for establishing of New Zealand Marine Energy Centre, in conjunction with AWATEA

Structural Systems Division

- o Development of 'HERA Verified' Initiative
- o Expertise acknowledged internationally through training and consultancy services, as well as invitations to represent NZ on R&D committees
- o Completion of *Composite Bridge Design Guide* for NZTA, launched with series of national seminars
- o The *Steel and Composite Bridge Design Standard AS 5100.6* revised as joint AS/NZS Standard under the Chairmanship of Dr Stephen Hicks
- o Development of design rules for shear connectors in high strength materials for light-weight steel construction

New Zealand Welding Centre

- o First part of the long-term project *Performance Evaluation of Alternative Stainless Steel Grades* accomplished and a series of seminars presented in December 2011
- o The Standard AS/NZS 1554 Part 6 successfully revised under NZWC leadership and now published
- o 240 people attended NZWC seminars and courses in 2011-12
- o NZWC advice instrumental in resolving complex welding fabrication issues

Inspection & Quality Control Centre

- o Maintained training & advisory programme with part-time commitment of former Manager Peter Hayward

HERA Information Centre

- o Conference & Seminar room bookings increased by 16%
- o Successful corporate sponsorship of monthly HERA News
- o All HERA publications made available online for purchase

FOCUS: HERA BUSINESS MODEL

During 2012, HERA transitioned to a management model facilitating succession planning, and providing support to the Director through the establishment of a senior management team consisting of the Director, Dr Stephen Hicks and Nick Inskip.

To reflect this change in responsibility, Nick Inskip and Dr Stephen Hicks are now General Managers of the Industry Development and Structural Systems divisions respectively. The new model focuses on advancing issues and performance related to HERA's strategic intent.

Guided by the previous years' HERA strategy reviews, emphasis was placed on the development of the HERA business model, including the generation of new revenue streams to lessen the dependency on industry levy and winning Government-funded research contracts.

This included the development and promotion of the HERA brand as a world-class research and industry services provider and also the export of HERA services.

HERA Exports to China

The structural Eurocodes are arguably the most technically advanced design codes in the world and promote innovation in structural design. As an expert on Eurocode 3 and Eurocode 4, HERA's Dr Stephen Hicks supported the British Standards Institute (BSI) by delivering a 3-day seminar in Beijing on the design of steel and composite structures using the structural Eurocodes.



The audience consisted of 100 engineers and technicians from the North China Electric Power

Engineering (NCPE), who have undertaken construction projects involving more than 20 countries, including Nigeria, Belarus, Kazakhstan and Indonesia.

New Services for HERA Members

Considerable progress was made in establishing new and additional HERA services, such as 'HERA Verified' and a *Steel Fabricator Accreditation Scheme*. Both are aimed at strengthening industry credibility and will support it in winning export and local business.



'HERA Verified' is a quality mark awarded to testify that manufacturers' technical data or services

have been independently verified by HERA.

In the interests of providing added assurance to specifiers and clients, greater confidence can be given to products and services covered by 'HERA Verified', which demonstrates that they have been produced using the appropriate procedures to the latest Standards and that performance values quoted



HERA member Acme Engineering fabricated and erected this rain radar tower for the NZ Meteorological Service just outside of Hokitika

by manufacturers have been derived correctly.

Products to be sold in the EU that come under certain European Directives must bear the CE mark; it is a legal requirement. CE marking on a product is the manufacturers' declaration that the product complies with the essential requirements of all the Directives that apply to it.

It indicates to the appropriate bodies that the product may be legally offered for sale in their country. For construction products, the test programme followed to achieve 'HERA Verified' will be satisfactory to achieve CE Marking if the test procedures and analyses follow the formal approaches documented in the Eurocodes.

HERA has also assisted a number of New Zealand businesses in obtaining CE Marking for a wide range of products, which are not only confined to construction and civil engineering, through their excellent international links with Notified Bodies.

A new HERA service quietly established last year is the advertising opportunity for members within the monthly HERA News. At the same time, this can be considered a sponsorship of HERA. By successfully implementing this service, the

BELOW: Tube plate used in an evaporator fabricated by HERA member A&G Price. It is super duplex stainless steel and is notoriously difficult to drill and machine. Each hole needed to be drilled to a very high tolerance with double grooves that allow for expansion of the tubes into the grooves. The challenge of drilling 13,000 holes in 6 plates was managing the forging effect and ensuring all hole centers were equal, and could achieve alignment



HERA Information Centre has effectively reduced the cost of HERA News. HERA's Conference & Seminar room bookings increased over the last year due to flexibility and good service leading to an increase in income from those facilities by 16%. All HERA publications were also made available online for purchase.



Another element of the HERA strategy is working with other stakeholders and intertwining with each other in support of common success. Signing an MOU with the New Zealand Building Research Association (BRANZ) and the exchange of reciprocal memberships with the New Zealand Geothermal Association (NZGA), the Bio Energy Association of New Zealand (BANZ) and Prefab NZ are examples of this year's executed activities.



ABOVE: BRANZ CEO Pieter Burghout and the HERA Director Dr Wolfgang Scholz at the signing of the MoU

HERA's growth and innovation focus is grounded in co-operation with industry, and innovation and growth-enabling stakeholders. Activities centre on three areas - General heavy engineering industry development, steel construction and the overarching welding fabrication technology.



Dr Boaz Habib with Minister Wayne Mapp at the Taupo Clean Energy Centre launch in October 2011

HERA Industry Development Roadmap Process

The general heavy engineering industry development activities are based around the HERA Industry Development Roadmap Process, which links market opportunities to companies and to the research required to support the development of products, and to provide a pathway to market.

In particular, this process supports companies to transit to becoming innovative, high-value manufacturers of export-oriented, market-leading products. Priority is given to the development of Clean Energy business opportunities, specifically low temperature geothermal and waste heat-to-electrical energy conversion, and wave and tidal energy.



HERA Roadmap Process: Transforming companies to innovative high-value manufacturers

This year, HERA Industry Development General Manager Nick Inskip led a geothermal trade delegation to the USA. Commencing with the Geothermal Energy Association's *International Geothermal Energy Showcase* held in Washington, DC, the delegation then visited a range of geothermal and allied technology companies across the USA.



The NZ Geothermal delegation at the Rocky Mountain oilfield testing centre

The delegates, who represent companies engaged in current and pending Organic Rankine Cycle projects, also visited the Rocky Mountain Oilfield Testing Centre in Wyoming. There they were exposed to a number of innovative turbine technologies. Prospects for potential joint ventures and technology transfer were explored.

In support of HERA member companies involved in the development of heat-to-electrical energy devices and other clean energy projects, HERA appointed Dr. Boaz Habib as Research Engineer Clean Energy with the Industry Development division.

Work continued during the year on the online version of the HERA member

Industry Capability Register with the input of geothermal capabilities - as detailed in the HERA Report R5-35:2010 *Geothermal Capability Register* - as sub-profiles. The HTML coding is complete, as is the 'key word' search facility, with beta testing now underway.

Joint Standard on Steel and Composite Bridge Design

In the steel construction area, growth and innovation are driven by engagement in industry Standards development on both national and international levels.



Supported by the Steel Bridge Development Group and other key stakeholders, Standards New Zealand has confirmed that the *Bridge Design Standard for Steel and Composite Construction AS5100.6* will be revised as a joint Standard.

At the IABSE Annual Meeting in London in September 2011, Structural Systems General Manager Dr Stephen Hicks was elected for a 4-year term on the Working Commission 2 (WC2) for Steel, Timber and Composite Structures, and is joined by representatives from 14 countries.

Structural Systems General Manager Dr Stephen Hicks, who is the sole New Zealand representative, was appointed Chair on the sub-committee responsible for revising AS 5100.6. It is anticipated that a Draft for Public Comment will be released in 2012/2013.

HERA in Major European Fire Research Programme



Dr Hicks is also a member of the European Cost Action TU0904: *Integrated Fire Engineering and Response* body as the only non-European representative. Through the generous support of the Royal Society of New Zealand, Dr Hicks attended the Crete Management meeting.

As well as New Zealand, this EU-funded project includes a network of 22 European countries. With the general theme of performance-based integrated fire engineering and response, it brings together about 80 representatives drawn from the various research disciplines of fire engineering: Fire safety, structural design, building control and fire services in various countries.

Stephen presented a paper co-authored with Martin Feeny (Holmes Fire) and Associate Professor Charles Clifton (University of Auckland) on the Britomart East office building in Auckland. For this particular project, HERA's Slab Panel Method (SPM)

software, supplemented with advanced finite element analyses, was used to minimize the amount of applied fire protection required on long-span secondary beams.

From these studies, it was shown that approximately 80% of the secondary beams did not require passive fire protection, which resulted in savings of approximately \$300,000 to the project. The final paper will be published within a report by the European Commission.

HERA Participates in IABSE Working Commission



The International Association for Bridge and Structural Engineering (IABSE) is a scientific / technical Association comprising about 4,000 members in 100

countries. Being elected on to one of its Working Commissions is a great recognition, combined with an opportunity to learn and contribute to innovation at an international level.

At the IABSE Annual Meeting in London in September 2011, Structural Systems General Manager Dr Stephen Hicks was elected for a 4-year term on the Working Commission 2 (WC2) for Steel, Timber and Composite Structures, and is joined by representatives from 14 countries.

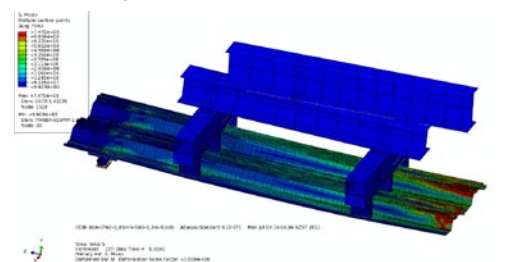


The distinctive Rewa Rewa Bridge by Peter Mulqueen from HERA member company Novara Design wins IABSE Outstanding Paper Award. Fabricator Fitzroy Engineering is also a HERA member

New Zealand Steel Floor Deck Products go from Strength-to-strength

Working closely with Tata Steel International, the Structural Systems division extended the work previously undertaken on the ComFlor 60 and ComFlor 80 products in New Zealand-made high strength steel.

As well as managing the testing that was undertaken at the University of Auckland and Imperial College London, UK, the new work consisted of evaluating the design properties from tests using probability-based methods given in ISO 2394 and EN 1990.



HERA maintains advanced FEA capabilities, used here for floor systems modeling

FOCUS: GROWTH & INNOVATION

Using finite element models to investigate the sensitivity of material strengths and geometrical tolerances, the appropriate safety factors were evaluated for these products. The additional benefit of using harmonized Standards in the assessment is that the work will facilitate CE marking of the products, which is mandatory in some countries. The rollformers used to produce the ComFlor products were supplied by HERA member Tandarra Engineering.

Structural Systems Publications

- El Sarraf, R., Iles, D., Easey, D. & Hicks, S. *Steel-Concrete Composite Bridge Design Guide*, NZ Transport Agency Research Report
- Hicks, S.J. and Smith, A.L. *Design of Floor Structures Against Human Induced Vibrations*, Steel Construction - Design and Research, 4, No.2, July 2011, pp. 114-120.
- Paton-Cole, V.-P., Gad, E.F., Clifton, C., Lam,

N., Davies, C. and Hicks, S. *Out-of-plane Performance of a Brick Veneer Steel-framed House Subjected to Seismic Loads*, *Construction and Building Materials*, 28 (2012), pp. 779-790.

NZ Welding Centre Supports Industry Quality Management

The NZWC is in an ongoing programme to assist industry in productivity improvement across all areas of welding fabrication. As part of this programme, it has developed an electronic documentation process that supports fabricators to achieve compliance with Quality Management Standard AS/NZS 3834 by intuitively following programme instructions.

The paperwork associated with the Standard was seen as one of the obstacles in its implementation. The programme helps to overcome this and

following trials, it will be used in HERA's industry training and consultation.

Consistent quality assurance has been identified as a key ingredient of any complex growth and export-oriented industry sector. To assist industry in the control of structural steelwork quality, the NZWC, in co-operation with SCNZ, has developed a project proposal for an accreditation system for steel fabrication.

To be developed and piloted in the next year, the new accreditation system will lift the level of quality control within fabricators, and at the same time improve their productivity. It will also provide end-users with the confidence that fabricators will meet expectations in line with differing job demands, from standard fabrication to more sophisticated products such as bridges or public stadia.



The L&MM plant is the largest, and arguably the most innovative, alluvial gold mining plant recently commissioned in NZ. It uses a feeder and horizontal scalping screen, followed by state-of-the-art jigs and concentrators to recover the alluvial gold. The re-build and commissioning of this floating plant provided significant heavy engineering work for several South Island engineering businesses. Inset: HERA member Niemac Industrial fabricated the primary scalping screen plasma cut from AR plate



HERA member Fitzroy Engineering's export success: The 650 tonne, \$36 M Yolla module on its way to the Bass Strait – Fitzroy also won the actual installation job. Inset: Yolla MLE Accommodation & utilities module in place on the Yolla gas platform, Bass Strait, Australia



HERA member JJ Niven Engineering manufactured the major structural components and conducted assembly of a 100/30/5 tonne x 19.8m span overhead travelling hot metal crane for Pacific Steel's plant in Auckland. The crane would be the largest hot metal production crane in New Zealand. Even more impressive is that it is made with local capability and expertise, despite competition from cheaper imports.



Aspects of weathering steel ballast deck railway bridges being fabricated at HERA member Culham Engineering in Whangarei. The first bridges go into service on 1st September.



HERA member Structurflex was the designer and build contractor for this elegant solution for a school sports venue, while HERA member Graysons Engineering was fabricator. The design is a great example of how lightweight PVC membrane /ETFE foil, supported over an elegant steel structure with galvanized steel cables, could provide substantial cover (2450m² plan area).



HERA member Tenix New Zealand fabricated these separators for client Contact Energy's Te Mihi power station

HERA R&D is closely linked to the growth and innovation focus described previously, and advanced across all HERA divisions.

Export Products in Clean Energy

For the Industry Development division, this year saw the achievement of a number of milestones with the completion of the first 12 months of the Heat to Electrical Energy Research Programme: *Tech NZ HERX 1001 – Clean Energy Conversion*.

The programme has two participating HERA member companies, with emerging interest from other members, and represents the research component of the HERA Industry Development Roadmap Process. The research is provided by the University of Canterbury by a team of researchers under the leadership of Associate Professor Dr Susan Krumdieck.

An extension of the Clean Energy Conversion programme saw extensive work go into translating the aspirations of HERA member companies interested in developing geothermal and allied products, and then incorporating them into a research proposal to the Ministry for Science and Innovation's 2012 funding round.

The proposal, entitled *Advanced Low Entropy Geothermal and Allied Power Generation Technology*, focuses on five core research themes based around the support needs of companies pursuing opportunities in the Above Ground Geothermal and Allied Technology (AGGAT) sector. It has found ready research partnerships in the University of Canterbury and the University of Auckland.



Participants of the AGGAT research workshop held at HERA House

A number of HERA reports related to geothermal and allied technologies were developed and published during the year:

- R5-43:2012 – *Direct Use Geothermal - Remote Heat Exchanger Case Study*
- R5-44:2012 – *Remote Heat Exchangers - Issues and Options*
- R5-46:2012 – *A Technical Review of Binary Cycle Power Plants*
- R5-47:2012 – *Above Ground Geothermal and Allied Technologies Research Roadmap*
- R5-48:2012 – *Heat Source Characterisation of Waste Heat Generation Facilities*
- R5-49:2012 – *Review of Issues Related to Heat Exchanger Fouling*

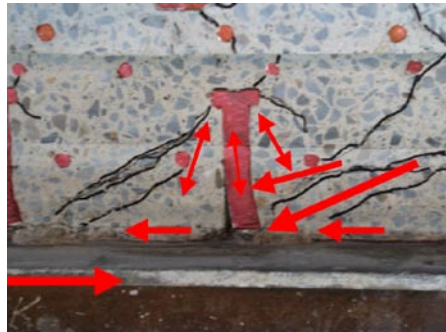
Development of Design Rules for Shear Connectors in High Strength Materials

The design resistance of headed stud shear connectors is critical in the design of composite beams to enable the required bending resistance to be achieved in both bridges and buildings.

The resistance of a stud embedded within a solid concrete slab or concrete encasement is determined in most international Standards by considering the possibility of stud shank failure or crushing of the concrete, and strongly correlates to concrete strength.

Following the proposed introduction of concrete with increased strengths of up to 100 MPa in the Australian bridge Standard AS 5100.6, structural reliability analyses were undertaken by HERA structural engineers Audsley Jones and Dr Stephen Hicks that extends earlier probabilistic work.

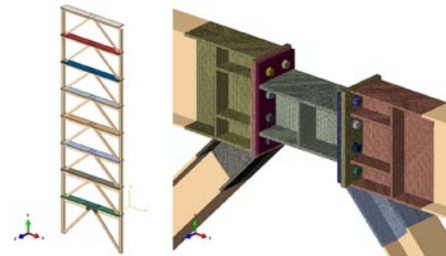
Design equations and associated safety factors for studs embedded in high strength concrete were developed. The results of this investigation are currently being considered for implementation within AS/NZS 5100.6 by the Committee responsible for this Standard.



Interaction of forces with stud shear connectors in composite floor

HERA Seismic Design Guide Review

The principal guide for earthquake design of steel-framed buildings is HERA Report R4-76. In the interests of developing a document that can be easily maintained in the future, the new edition of R4-76 will be published in several volumes: the first of which will be Eccentrically Braced Frames (EBF's).



EBFs with replaceable links for easy exchange after an earthquake

Volume one of HERA R4-76 is currently being developed in collaboration with SCNZ and University of Auckland Associate Professor Dr. Charles Clifton. It is anticipated that this publication will be formerly launched in early 2013.

Innovation in Welded Fabrication

The NZWC, in cooperation with the NZ Stainless Steel Development Association (NZSSDA) and Konstanz University of Germany, has finalized the first part of the long-term project concerned with performance evaluation of alternative and generally lower cost stainless steel grades in welded conditions in NZ's coastal environment.

The project results were presented at the International Corrosion Congress in Perth in November 2011, and subsequent industry application seminars across NZ. This corrosion research, combined with research from the productivity research programme, led to the publication of a number of NZWC conference papers that covered aspects of welding technology, including fatigue design, welding cost, technical standards, stainless steel metallurgy and corrosion aspects.

NZWC Publications:

- Karpenko, M., McClintock, A.: *Weld*

Design Considerations For Flange to Web Junction for Runway Beams – Welding Costs and Fatigue Performance. 6th Asian Pacific IIW International Congress and 56th WTIA Annual Conference, Cairns, September 2011

- Karpenko, M., McClintock, A.: *Welding and Corrosion Aspects of New Ferritic and Manganese Bearing Stainless Steels.* 6th Asian Pacific IIW International Congress and 56th WTIA Annual Conference, Cairns, September 2011
- Karpenko, M., Guempel, P.: *Welding Aspects and Corrosion Performance of New Ferritic and Manganese Bearing Stainless Steels in The Coastal Environment.* 18th International Corrosion Congress, Perth 2011
- Karpenko, M.: *Changes To AS/NZS 1554.6.* Presentation Given at the Welding Workshop at 18th International Corrosion Congress, Perth 2011
- Karpenko, M., McClintock, A.: *Effects of Welding and Corrosion Resistance on New Ferritic and Manganese-Bearing Austenitic and Duplex Stainless Steels.* Australasian Welding Journal, First Quarter 2012
- Karpenko, M., Niedermayer J, McClintock, A., Asarkaya M.: HERA Report No R8-30:2012: *Weld Design Considerations for I-Beam Girders – Welding Costs and Fatigue Performance*

International Collaboration in Welding

There is a traditionally strong co-operation between the NZWC and the Welding Technology Institute of Australia (WTIA) in virtually all business areas. Through the International Institute of Welding (IIW), there are strong links to a variety of leading welding research institutions. The NZWC performs its research in close co-operation with international experts in corresponding areas, maintaining a high quality research standard.

In recognition of his contribution to research and welding industry development, HERA Director Dr Wolfgang Scholz was given the opportunity to present the prestigious Jaeger Lecture at the IIW Asian Pacific Welding Congress held in Cairns, Australia.

The presentation covered the contribution HERA's research is making to local and international developments, and demonstrated the value and effectiveness of New Zealand industry's investment in R&D.



Dr Baldev Raj (left), President International Institute of Welding (IIW) 2011-2014 with HERA Director Dr Wolfgang Scholz, presenter of the Jaeger Lecture

FOCUS: TRAINING & EDUCATION

Although HERA is primarily a research provider, it also provides a key role in industry training through filling the gaps that are not provided through conventional education providers. Seminars and courses account for 12% of HERA's income, up by some 25% as compared to the previous year. This effort was led by the NZWC and the Inspection & Quality Control (I&QC) Centre.

Filling the Gaps in New Zealand Welding Education

HERA is a NZQA and International Institute of Welding (IIW) accredited training provider, and its broad course programme includes its well-established Welding Supervisor Certificate. The NZWC advocates for the establishment of a uniform approach to training, qualification and certification for welding supervisors and welding inspectors.

A career path is proposed, aimed at the seamless progression from the Welding Supervisor to the CBIP and/or International Welding Inspector (IWI B) qualification. The intention is to offer an initial combined course in early 2013.

In support of a new ME degree in Yacht Engineering at the University of Auckland, the NZWC Manager Dr. Michail Karpenko developed and presented a series of lectures on *Welding Aspects for Yacht Designers*. The developed course programme will also be offered in the future as an independent HERA seminar programme.



Robert Shaw (left) and NZWC Manager Michail Karpenko visiting the Pacific Tower building in Christchurch

In conjunction with post-Canterbury earthquake investigations and educational efforts, the NZWC invited Robert Shaw, President of the Steel Structures Technology Center in the USA, to visit New Zealand. Robert is one of the world's leading experts on seismic connections and his seminars took place in Auckland, Christchurch and Wellington in January/February 2012.

Robert shared his experience in the assessment, retrofitting and detailing of welded and bolted connections in moment frame, braced frame and steel plate shear wall systems with 115 New Zealand colleagues, many of them young engineers with little experience in this area. The visit was also used to discuss the pending revision of the HERA Seismic Design Guide.

A seminar covering results of the research project *Corrosion Performance and Fabrication Aspects of alternative Stainless Steel Grades* was held in Auckland and Christchurch in November/December 2011. It was attended by over 50 people.

Fitness-for-service assessment is becoming the tool of choice to increase reliability and safety of aging welded structures, and equipment that contain imperfections

and defects. The outcome of a Fitness-for-Service assessment is a decision to run the component as-is, alter it, repair it, or replace it. In order to keep HERA member companies up-to-date with the latest developments in the field, Dr Annette Karstensen from Quest Integrity Group presented a comprehensive three-day training course on this subject in May. Fifteen people attended the course, including two HERA staff.

A *Welding Procedures* seminar and workshop was held in Auckland, Christchurch and Hamilton in May 2012, and attended by over 30 people. It provided a step-by-step guide on the development, qualification and documentation of welding procedures in accordance with the latest editions of AS/NZS 1554.

A *Stainless Steel Welding* seminar was given in Auckland, Hamilton and Christchurch in June 2012 with over 30 attendees. The seminar gave practical guidance for the use of the new edition of the Standard AS/NZS 1554.6:2012, including development and verification of welding procedures.

Support was given to the Department for Building and Housing (DBH) in formulating their Practice Advisory *Long Span Steel Roof Trusses: Welding and Section Checks Needed For Some*, which DBH developed in conjunction with the publication of the Southland Stadium roof collapse. A seminar *What Every Engineer Should Know About Welding* has been developed as a result and will be held early in the 2012/13 year.

Supporting Fabrication Quality Control

The I&QC Centre is assisting both the inspection and fabrication industry, and through its manager Peter Hayward, has very well-attended NDT and related training held on-site at companies and through courses at HERA House.

Peter Hayward, although officially retired 2 years ago, continues to provide the services in a part-time role. Due to continued financial constraints, HERA decided to continue running these services on this basis until the levy increase request has been accepted by parliament.

Structural Steel Design Advances

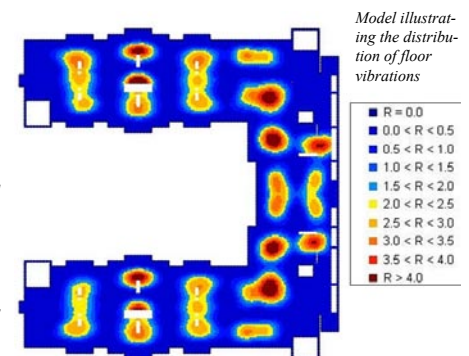
Design of Steel Concrete Composite Bridges seminars were given in Auckland and Wellington by the Structural Systems division. They attracted designers from a range of specialties and companies, to learn about composite bridge design and the new NZTA *Steel-Concrete Composite Bridge Design Guide* that was co-authored by HERA. The seminar provided an overview of the *Bridge Design Guide* together with a full set of examples worked on: the design of shear connectors and thermal actions; fatigue; and the seismic design of the substructure.

In addition, an update on the latest developments in the proposed joint Standard for the *Design of Steel and Composite Bridges* AS/NZS 5100.6 was given. The seminars were concluded with durability design according to NZS 3404.1: 2009 and AS/NZS 2312, which included determination of coating life and cycle cost, weathering steel, coating application together with inspection and maintenance management.

Dr Stephen Hicks also delivered a series of national one-day seminars on floor vibrations in Sydney, Adelaide, Brisbane

and Perth on behalf of the Australian Steel Institute (ASI). Dr Hicks co-authored SCI Publication 354, which contains two design methodologies for steel-framed construction: the General method (appropriate for any type of structure); and the Simplified method which is amenable to hand calculations.

The General approach has been widely used internationally for office and hospital floors, which have included One Shelley Street in Sydney, as well as the International Broadcast Centre built for the 2012 London Olympics in the UK. The use of these methods can potentially save significant costs. This was clearly demonstrated in the St Richards Hospital in Chichester, where the use of the SCI P 354 methodology led to steel weight savings of approximately 50%.



WorldSteel Visitor on Sustainable Steel

Clare Broadbent, manager of Life Cycle Assessment from Worldsteel, took time out to visit members of the Sustainable Steel Council on her recent visit to New Zealand. Clare delivered an in-depth presentation addressing issues such as what Worldsteel can offer steel producers and organisations within New Zealand, an introduction to Life Cycle Thinking, Life Cycle Analysis (LCA), Life Cycle Inventory (LCI) and the value of Environmental Product Declarations (EPD's). Clare demonstrated that due to a difference in processing, manufacturing and whole life consideration, a high recycled content material may not be as environmentally friendly as a material with low recycled content, and individual consideration of each case is required.



Geothermal turbine repair is routine work for HERA member Allied Industrial Engineering with an end-to-end process that includes repairs using specialist welding equipment and large machine tools and post-repair NDT inspection

As outlined in its strategy, HERA leadership is aimed at playing an effective role towards a sustainable New Zealand metals engineering industry. A sustainable metal engineering industry means an industry which achieves world class standards for competitiveness, quality and sustainability and in conjunction with these attributes long term profitability.

The leadership role requires the engagement of HERA staff in the numerous sector organisations and bodies with the brief to actively lead and contribute to industry development. However it also means telling the New Zealand metals engineering industry story in a compelling communications programme.

HERA support for Metals New Zealand – A United Industry Voice



In co-operation with the member organisations of Metals New Zealand and under the Chairmanship of HERA Executive member Noel Davies, HERA Director and Secretary of Metals NZ performed extensive industry advocacy on Metals NZ's and HERA's behalf.

HERA in consultation with the HERA Executive and the membership developed a policy framework document published as HERA Report R5-42:2012 with the title *New Zealand Metals Engineering Industry Position on Public Policy Issues 2012*. The document was used as a briefing document for the incoming Government and was acknowledged by MBIE Minister Hon Stephen Joyce.

It found wide recognition with some of the policies being adopted by the Construction Industry Council, and has been acknowledged with support by leading industry voices such as NZMEA CEO John Walley. The document has been adopted by Metals NZ, and it is intended to keep this a living industry voice document through continual updating.

Countless issues during the reporting year generated HERA responses. The most significant ones were:

• HERA Submission to Christchurch Draft Central City Plan

Dr Stephen Hicks presented the HERA submission for the Draft Central City Plan to the hearings panel consisting of the Deputy Mayor and members of the Christchurch City Council.

In the presentation, the advantages of using local procurement were given, together with the disadvantages of the proposed height restriction given in the Draft Plan. It was highlighted that modern steel-framed multi-storey buildings, with heights well above the proposed height restriction, demonstrated excellent seismic resilience in the Christchurch earthquakes; in particular, the 22-storey Pacific Tower, which used composite construction together with an EBF and MRF lateral load resisting system, required only minimal repair.

Low-damage technologies resulting in only a 0.5% premium to the standard building cost, such as that used in the Institution of Structural Engineers' award-winning Te Puni Student Accommodation Building in Wellington, was encouraged.

• HERA Submission to Canterbury Earthquakes Royal Commission

The HERA submission noted the lack of focus in the interim report on what building systems worked well, and in particular which systems could continue being serviceable with no or little effort after the earthquakes. HERA also proposed that NZ research supports the development of sustainable damage avoiding technology, including the development of seismic performance rating systems.

• Presentation to Parliament on Low Seismic Damage Technology

University of Auckland Associate Professor and former HERA staff member Dr Charles Clifton represented HERA and steel construction technology in a Royal Society speaker series to Parliamentarians. This series outlined what can already be achieved with standard and more advanced damage avoiding structural steel systems.

• Local Industry Participation Advocacy

In numerous presentations to business leaders and parliamentarians, HERA Executives and staff advocated for fair and equal trade practices, the need to give local industry opportunities to tender, and for early engagement with procurers to reap the full benefits from local manufacture.

Business opportunity meetings were held in co-operation with Metals NZ with focus on the Auckland Waterview Connection, the Mighty River Power electricity generation development programme, and the Whanagarei Lower Hatea centre bridge section being imported from China.

• Submissions to Government Policy Documents

HERA responded to a number of requests for input in relation to the restructuring of MSI, the transformation of Industrial Research Limited into an Advanced Technology Institute. HERA also responded to the Industry Advisory Committee for High Value Manufacturing's request for research proposals.

Building Industry Export Opportunities

Industry Development General Manager Nick Inskip continued in his role representing the metals industry on the Executive of the Aotearoa Wave and Tidal Energy Association (AWATEA). He chairs the working group on the develop-



The MIT Campus and Transport Interchange building was a great example of pre-fabrication and collaboration. This amazing building over a live train station would have been near impossible without pre-fabrication. HERA members Holmes Consulting, MJH Engineering and Mainzeal are involved in the project.

ment of a New Zealand Marine Energy Centre (NZMEC) and has been active in promoting the long-term industry opportunities that will accrue from the successful establishment of the centre.

A draft proposal for the establishment of a New Zealand Marine Energy Centre was developed and presented to Government late in 2011. The receipt of a report on the economic benefits of the European Marine Energy Centre (EMEC) and further economic modelling undertaken by Infometrics, has been important input to progressing the development of a full business case for formal presentation to Government.



Langlee Wave Power CEO Julius Espedal (centre), and HERA member Tangaroa Energy Director Kevin McGrath (to his left) at the signing of their MoU at HERA House to develop local wave energy devices. Looking on are the HERA Director and Industry Development Manager

HERA has maintained an active involvement in the championing of an NZ Inc approach to geothermal, with a particular focus on above ground technologies. A key component of which is developing the research agenda for above ground technologies in support of a comprehensive New Zealand export capability. The *NZ Geothermal Capability Register* HERA Report R5-35, available both online and printed, is a key HERA contribution to this initiative.

Steel – The World's Most Recycled Material



The Structural Systems division drives the Sustainable Steel Council (SSC) consisting of stakeholders in the metals supply chain. Structural Systems along with support from the SSC members have been undertaking development of the SSC web site.

FOCUS: LEADERSHIP

This web site will provide a place for SSC members to share information related to the sustainability of steel over all aspects of its life cycle; from raw materials, fabrication, design, installation to end of life.

The New Zealand Green Star rating system was introduced by the New Zealand Green Building Council (NZGBC), and was developed to evaluate the environmental design, efficiency and performance of New Zealand buildings.



The NZGBC's current effort is on developing the Steel Credit awarded in conjunction with sustainable use of steel within a building. As the SSC representative, HERA has been working closely with the NZGBC on the Products and Materials Industry Group (PMIG), which is reviewing the current material credits. It is hoped that the revision to the steel credit will be completed within the next 12 months and, as well as recognizing long products, will encourage sustainable practice throughout the complete value chain.

HERA has also been invited by BRANZ to represent the interests of the SSC on the LCA Tools Advisory Group, whose goals are to:



- Develop a New Zealand specific materials Life Cycle Inventory (LCI) database which follows internationally accepted protocols.
- Increase uptake of Type III Environmental Product Declarations (EPDs), based on a New Zealand methodology and data.

In response to the call to assist those affected by the Canterbury earthquakes, the SSC supported the NZGBC in the development of the *Building a Sustainable Environment* (BASE) rating tool specifically for the Christchurch recovery efforts. The Christchurch City Council is proposing that office, retail, apartments and mixed use buildings within the central city must achieve a 'Pass' score under BASE.

Other noteworthy Structural Systems contributions were steel construction industry representation at the Construction Industry Council (CIC), the Executive of Steel Construction New Zealand and Australian sister organisation, the Australian Steel Institute.



Left: Green steel innovation LanzaTech Pilot Plant at NZ Steel – NZ Steel and biofuel company LanzaTech struck a deal to extend their 2008 pilot project to convert waste gases into low carbon fuels



Supporting the Stainless Steel-based Fabrication Industry

The NZWC is closely linked to the NZSS-DA due to collaborative research and training activities. The NZWC Manager Dr Michail Karpenko is the Secretary for the NZSSDA. The NZWC also works with ACC contributing to the Metal Manufacturing Safer Industry Programme. There is close collaboration too with Competenz, as the NZWC contributes to the Sector Advisory Group for Fabrication and Welding. Alan McClintock chairs the Industry Advisory Committee of MIT.

The NZWC represents NZ welding fabricators on the joint AS/NZ Welding Standards Committee WD-003 Welding and ME-001 Pressure Equipment. The NZWC has taken a leading role in the revision process of the stainless steel welding Standard AS/NZS 1554.6.

This included the initiation of the revision process and management of all revision activities. A significant amount of time and effort was dedicated to the project with the outcome that the new version of the standard was published in May 2012.

Emerging Young Leader



HERA's first female graduate structural engineer, Audsley Jones, deserves special mention as a future leader. Not only has she shown talent as a well-educated and fast learning fresh graduate engineer from the University of Auckland,

in her own time and with some HERA support, she has developed outstanding initiatives.

The first of which is her engagement in the IPENZ Futureintech scheme as an ambassador for science and technology in schools. Audsley has presented at a range of local schools and age levels explaining her role as a structural



Green leadership: In order to control its energy costs, HERA member South Auckland Forging Engineering (SAFE) has invested \$250,000 in installing 360 photovoltaic solar panels expected to deliver 70% of its power needs



engineer, and on what civil engineers do.

Along with continual engagement within the local education community, Audsley has also spared her time as a mentor to two high school students undertaking a research and development project for the Transpower Neighbourhood Engineers Award through Futureintech. This award aims to create a greater awareness of the engineering profession and encourage innovative thinking in the areas of engineering and technology.

Her second initiative no doubt was the much more adventurous quest to study earthquake engineering in Nepal and Pakistan. On a six-week engineering-focused trip in early 2012, Audsley visited both Kathmandu and Pokhara in Nepal, investigating the magnitude of damage from an earthquake in Nepal and reviewing structural plans, with an emphasis on earthquake resilience, for four buildings in Pokhara.

In Pakistan, Audsley spent the majority of her time in Murree, north of Rawalpindi (old Islamabad), designing a rainwater catchment system for an international school's retreat home, and reviewing possible extensions to the boarding house.

Audsley was approached by international donors of a college to review building plans for earthquake resilience, and to carry out a site visit to inspect the construction in Rawalpindi. This opportunity provided insight into Pakistani construction methods and quality control carried out by the site engineer, which has resulted in a relationship between Pakistani consultants and HERA being developed.

No wonder with that level of talent and engagement, the HEERF Executive has approved Audsley's application for a PhD scholarship.



GEA Evap/Dryer NZ's \$150 m work will include the world's largest yielding stainless steel dairy spray dryer. The second dairy spray dryer at the Darfield site will be capable of producing 30 tonnes per hour of milk powder from 4.4 Million Litres per day of milk. To keep the plant full will require milk from 260,000 cows."

AUDIT REPORT

We have audited the summary financial report of the New Zealand Heavy Engineering Research Association Inc aka HERA, and the Heavy Engineering Education and Research Foundation aka HEERF for the year ended 30th June 2012.

Responsibilities of Executive and Auditor

The Executive members are responsible for the preparation of a summary financial report in accordance with generally accepted accounting practice in New Zealand; It is our responsibility to express to you an independent opinion on the summary financial report presented by the Executive.

Basis of Opinion

Our audit was conducted in accordance with New Zealand Auditing Standards and involved carrying out procedures to ensure the summary financial report is consistent with the full Annual Report on which it is based. We also evaluated the overall adequacy of the presentation of information in the summary Annual Report against the requirements of FRS-39: Summary Financial Reports.

Other than in our capacity as auditor, we have no relationship with or interests in the New Zealand Heavy Engineering Research Association (HERA) and Heavy Engineering Education and Research Foundation (HEERF).

Unqualified Opinion

In our opinion, the information reported in the summary annual report on relevant pages complies with FRS-39: Summary Financial Reports and is consistent with the full Annual Report from which it is derived and upon which we expressed the unqualified audit opinion referred to above.

We have completed our work for the purposes of this report on the 1st of September 2012.



CST Nexia Audit
Chartered Accountants
Manukau City

STATEMENT OF FINANCIAL PERFORMANCE FOR YEAR ENDED 30 JUNE 2012

| | Note | 2012 | 2011 |
|---|------|------------------|------------------|
| Revenue | | \$ | \$ |
| Levies (Steel & Welding Consum.) | | 797,539 | 758,325 |
| Government Research Contracts (GRC) | | 168,196 | 214,434 |
| GRC-Deferred Income | 10 | 1,858 | 28,839 |
| Consultancy and Industry Project | | 367,631 | 334,489 |
| Services to 3rd Parties | | 18,502 | 54,268 |
| Member Subscriptions | | 156,550 | 169,068 |
| Interest | | 710 | 962 |
| Other Income | | 41,144 | 38,475 |
| Publications | | 31,059 | 36,549 |
| Welding Modules | | 27,367 | 31,470 |
| Rent | | 75,503 | 79,430 |
| Metals Conference | | - | 117,702 |
| Seminars & Courses | | 244,541 | 198,067 |
| HEERF | | 64,733 | 149,076 |
| Transfer from Backdated Welding Levy | | 36,637 | 14,661 |
| Total Revenue | 10 | 2,031,970 | 2,225,815 |
| Expenditure | | | |
| Staff Expenses | | 1,010,612 | 1,073,901 |
| Member Services | | 66,476 | 67,950 |
| Office & Other Expenses | | 155,885 | 137,757 |
| Seminar Expenses | | 110,680 | 72,536 |
| Consulting Expenses | | 12,709 | 12,005 |
| Metals Conference | | - | 117,702 |
| External Research | | 470,813 | 423,214 |
| HERA House Expenses | | 76,980 | 73,128 |
| Rent Expenses | | 206,860 | 206,860 |
| Depreciation Expenses | | 57,110 | 69,355 |
| Total Expenditure | | 2,168,125 | 2,254,408 |
| NET (Deficit) SURPLUS FOR THE YEAR | | (136,155) | (28,593) |
| Equity beginning of Year | | 204,092 | 232,685 |
| Equity at the End of Year | | 67,937 | 204,092 |

BALANCE SHEET AS AT 30 JUNE 2012

| REPRESENTED BY | Note | 2012 | 2011 |
|---------------------------------------|------|----------------|----------------|
| Assets | | \$ | \$ |
| Current Assets | | | |
| Cash at Bank | 2 | 11,734 | 68,336 |
| Term Deposits | 3 | 1,151 | 20,338 |
| Accounts Receivable | 4 | 263,656 | 197,146 |
| Inventory | | 7,568 | 9,132 |
| Other Prepayments | 5 | 66,364 | 64,072 |
| TOTAL CURRENT ASSETS | | 350,473 | 359,024 |
| Non Current Assets | | | |
| Fixed Assets | 6 | 155,001 | 132,326 |
| TOTAL NON CURRENT ASSETS | | 155,001 | 132,326 |
| TOTAL ASSETS | | 505,474 | 491,350 |
| Equity & Liabilities | | | |
| Accumulated Funds | | | |
| Accumulated Funds | 7 | 67,937 | 204,092 |
| TOTAL EQUITY | | 67,937 | 204,092 |
| Current Liabilities | | | |
| Accounts Payable | | 119,631 | 118,272 |
| GST Payable | | 17,911 | 4,500 |
| Holiday Pay Provision | | 33,951 | 33,905 |
| Advance from HEERF | | 50,000 | - |
| Income in Advance | 10 | 86,044 | 130,581 |
| TOTAL CURRENT LIABILITIES | | 307,537 | 287,258 |
| NON-CURRENT LIABILITIES | | | |
| Loan - HEERF | | 130,000 | - |
| TOTAL EQUITY & LIABILITIES | | 505,474 | 491,350 |

The specific disclosures included in the summary financial statements have been extracted from the full financial report dated 24/08/12. The summary financial statements cannot be expected to provide as complete an understanding as provided by the full financial statements. A full set of the audited financial statements is available on request from HERA.

HEAVY ENGINEERING RESEARCH ASSOCIATION

NOTES TO THE 2012 FINANCIAL STATEMENTS

1. Statement of Accounting Policies

(a) General Accounting Policies
The Heavy Engineering Research Association (HERA) follows Generally Accepted Accounting Principles (GAAP) recognised as appropriate for the measurement and reporting of earnings and financial position on historical cost basis. Accrual accounting is used to match expenses and revenues. Reliance is placed on the fact that HERA is a going concern.

HERA is an Incorporated Society and these financial statements have been prepared in accordance with the Incorporated Societies Act 1908.

(b) Particular Accounting Policies

The particular accounting policies, which materially affect the measurement of financial performance and the financial position, are: The Association is exempt from income taxation and therefore there is no income tax liability.

Fixed assets are valued at cost less depreciation. Depreciation has been calculated on all fixed assets using the straight-line method at rates varying between 10% - 40% based on cost.

Books held as inventory are valued at the lower of cost or net realisable value on a FIFO basis after due allowance for damaged or obsolete books.

HERA is a qualifying entity under the New Zealand Society of Accountants Differential Reporting Framework.

The Association qualifies under the size criteria. The Association has not taken advantage of the differential exemptions available to it in respect of FRS 19 – Accounting for GST. Except for this, the association has taken advantage of all other exemptions available to it under the differential reporting framework.

(c) Changes in Accounting Policies

There have been no changes in accounting policies. Accounting policies have been applied on a basis consistent with previous years.

| | 2012 | 2011 |
|------------------------|---------------|---------------|
| 2. Cash at Bank | | |
| Current Account | 6,891 | 62,720 |
| CSA | 4,843 | 5,616 |
| | 11,734 | 68,336 |

| | 2012 | 2011 |
|----------------------|--------------|---------------|
| 3. Investment | | |
| Call Account | 1,151 | 20,338 |
| Term Deposit – BNZ | - | - |
| | 1,151 | 20,338 |

| | 2012 | 2011 |
|-------------------------------|----------------|----------------|
| 4. Accounts Receivable | | |
| Trade Receivable | 263,656 | 203,012 |
| Less Doubtful Debt | - | (5,866) |
| | 263,656 | 197,146 |

| | 2012 | 2011 |
|---|---------------|---------------|
| 5. Other Receivables & Prepayments | | |
| Accrued Income | 63,080 | 56,477 |
| Prepayment | 3,284 | 7,595 |
| | 66,364 | 64,072 |

| | | ACCUM. DEPRECIATION | NET BOOK VALUE |
|--------------------------|----------------|---------------------|----------------|
| 6. Fixed Assets | | | |
| 2012 | COST | | |
| Metallurgy Equipment | 12,430 | 12,430 | - |
| Office Furniture | 20,861 | 19,667 | 1,194 |
| Fixtures & Fittings | 82,955 | 82,295 | 660 |
| HERA House Refurbishment | 147,053 | 79,981 | 67,072 |
| Motor Vehicles | 158,649 | 112,001 | 46,648 |
| Office Equipment | 178,585 | 139,540 | 39,045 |
| Training Equipment | 86,037 | 85,655 | 382 |
| | 686,570 | 531,569 | 155,001 |

| | | ACCUM. DEPRECIATION | NET BOOK VALUE |
|--------------------------|----------------|---------------------|----------------|
| 2011 | COST | | |
| Metallurgy Equipment | 12,430 | 12,430 | - |
| Office Furniture | 20,306 | 19,036 | 1,270 |
| Fixtures & Fittings | 82,955 | 79,641 | 3,314 |
| HERA House Refurbishment | 147,053 | 65,275 | 81,778 |
| Motor Vehicles | 156,980 | 139,674 | 17,306 |
| Office Equipment | 199,497 | 172,644 | 26,853 |
| Training Equipment | 86,037 | 84,232 | 1,805 |
| | 705,258 | 572,932 | 132,326 |

| | 2012 | 2011 |
|-----------------------------|---------------|----------------|
| 7. Accumulated Funds | | |
| Opening Accumulated Fund | 204,092 | 232,685 |
| Net Surplus | (136,155) | (28,539) |
| | 67,637 | 204,092 |

| | 2012 | 2011 |
|--------------------------------------|------|--------------|
| 8. Operating Lease Commitment | | |
| The commitments are as follows: | | |
| Current | - | 5,718 |
| Non Current | - | - |
| Total payable for the lease contract | - | 5,718 |

9. Related Party Transaction

Heavy Engineering Educational and Research Foundation (HEERF) is a related party to the Association. It is related by the administrative and management expertise the Association provides to the Foundation, in the form of grants provided to the association for the research projects it undertakes. It is also the Association's landlord, owning HERA House.

10. Income in Advance

Majority of Revenue in Advance represent income in advance from various agencies, which funds the Association for research and services. The funding received for programmes (projects) that were completed during the year is recognised as revenue in that year.

Government Research Contract - Composite Structural Assemblies

The project concerned with funding from FRST is the Composite Structural Assembly (CSA) project which was completed in September 2010. Therefore the unspent balance of \$4,843 (2011: \$6,341) has been treated as income in advance.

Backdated Welding Levies

The Association has been advised in June 2005 by NZ Customs Service that the new levy rate set in March 2003 of 5 cents per kg of welding consumables has not been applied for imported welding consumable. Therefore, only the old rate of 2 cents per kg was collected.

As advised by the NZ Customs service, the total backdated consumables levy amount owed to HERA was \$214,399. In 05/06 year \$176,812 was received, in the year 07/08 an additional \$4,822 has been received. The remaining amount of \$1,572 is written off as the importer went into receivership.

HERA has agreed with the welding supply companies that the backdated welding levy will be exclusively for welding industry purpose and only following consultation with the NZ Welding Centre panel and welding supply industry. \$36,637 (2011: \$14,661) has been used in the financial year for dedicated welding projects.

Therefore the unspent balance of \$78,420 (2011: \$115,057) backdated welding levy has been treated as income received in advance.

Other

The balance of income in advance totalling \$3,281 represents membership for 12/13 paid by members in 11/12 financial year (2011: \$9,183)

11. BNZ Bank Account

The Association has a Visa credit card facility with BNZ. The limit on all cards is \$26,000. (2011: \$26,000)

12. Audit Fees

Audit fees have been included in office and other expenses to the value of \$5,000 (2011: \$5,000). There was no other remuneration paid to the Auditors.

13. Capital Commitments

As at 30 June 2012, there were no outstanding capital commitments. (2011: \$nil)

14. Contingent Liabilities

As at 30 June 2012, there were no outstanding contingent liabilities. (2011: \$nil)



Sophia Johnson and Sean Nola from the University of Auckland receive the HERA Engineering Prize from NZWC Manager Dr Michail Karpenko in the presence of HOD, Prof Gordon Mallinson. HEERF is the source for various engineering student prizes presented annually.




Noel Davies
HEERF Chairman

Chairman's Report

The Heavy Engineering Educational & Research Foundation (HEERF) is a Charitable Trust established by HERA to promote the study of and understanding of the use of ferrous and non-ferrous metals in the engineering industry.

HEERF receives income from the property "HERA House", which HERA settled on the Trust and an endowment fund created in 2005/06, receiving donations from those interested to support the HEERF objectives.

In 2011/2012, the Foundation contributed close to \$50k to HERA's research and industry development efforts through the support of engineering students, visiting experts and promoting careers in metal fabrication and engineering. HEERF scholarships included support of a PhD at Auckland University and one within a comprehensive

student research programme at Canterbury University. However, the overall HEERF grant was lower than typical as two approved PhD scholarships were delayed and are now starting in the new financial year.

In response and agreement with a HERA Executive resolution, HEERF provided HERA with a loan to cover their budgeted loss for the year and also to assist in funding research in advance of its payment through a Government grant.

As reported in the last 2 years, as a result of a HERA Executive request, the planned refurbishment of the HERA House Atrium was not started due to holding out for HERA achieving a more stable base funding via the industry-approved Research Levy increase, which is now before Parliament for approval. It is hoped that this more stable situation will be achieved during 2012/13, and refurbishment can commence in the year ahead.

An exciting research and visiting scholar programme has already been outlined to the Trustees for the 2012/2013 year, and we are looking forward to ongoing top class research supporting the future of our New Zealand metals engineering industry.

Statement of Financial Performance for Year Ended 30 June 2012

In line with its objectives, the Foundation funded a number of projects related to the metals engineering industry, including student support for research projects.

| Balance Sheet as at 30 June 2012 | | | Income & Expenditure for year ended 30 June 2012 | | |
|----------------------------------|-----------|------------------|--|------|--|
| NOTE | 2012 | 2011 | 2012 | 2011 | |
| | \$ | \$ | \$ | \$ | |
| ACCUMULATED FUNDS | | | | | |
| Equity funds at start of year | 2,163,622 | 2,102,055 | | | |
| Net surplus for the year | 137,474 | 61,567 | | | |
| Equity funds at end of year | | <u>2,301,096</u> | <u>2,163,622</u> | | |
| REPRESENTED BY | | | | | |
| Current Assets | | | | | |
| Bank | 96,973 | 20,733 | | | |
| Call Account | 39,630 | 88,851 | | | |
| Short Term Deposit | 678,343 | 744,430 | | | |
| Student Award - N. Calavrias | 5,300 | 5,129 | | | |
| Endowment Fund | 450 | 445 | | | |
| Advance to HERA | 50,000 | - | | | |
| Accrued Income | 7,470 | 9,593 | | | |
| GST Receivable | - | 214 | | | |
| K.Smith - Bequest | 6 | <u>34,928</u> | | | |
| | | 914,513 | 904,323 | | |
| Total Fixed Assets | 4 | 1,262,494 | 1,297,524 | | |
| Loan HERA | | 130,000 | | | |
| TOTAL ASSETS | | 2,307,007 | 2,201,847 | | |
| Current Liabilities | | | | | |
| Accounts Payable | 1,890 | 38,225 | | | |
| GST Payable | 4,021 | - | | | |
| TOTAL LIABILITIES | | 5,911 | 38,225 | | |
| NET ASSETS | | 2,301,096 | 2,163,622 | | |
| INCOME | | | | | |
| Rent | | 206,860 | 206,860 | | |
| Interest | | 32,677 | 35,602 | | |
| Bequest Interest | | 1,826 | 1,390 | | |
| N. Calavrias Interest | | 176 | - | | |
| Total Income | | 241,539 | 248,981 | | |
| EXPENDITURE | | | | | |
| Blding Maintenance | | 3,031 | - | | |
| Blding Managmt Fee | | 6,000 | 6,000 | | |
| Trust Administration | | 10,000 | 10,000 | | |
| Grants to HERA | | 48,733 | 133,076 | | |
| Bank Charges | | 71 | 108 | | |
| K.Smith Award | | - | 2,000 | | |
| Audit Fees | | 1,200 | 1,200 | | |
| | | 69,035 | 152,384 | | |
| Depreciation | | 35,030 | 35,030 | | |
| Total Expenditure | | 104,065 | 187,414 | | |
| Net Surplus/ Deficit | | 137,474 | 61,567 | | |

1. Statement of Accounting Policies

(a) General Accounting Policies
The Heavy Engineering Educational and Research Foundation (the Foundation) is a charitable trust established under the Charitable Trusts Act 1957. These financial statements have been prepared in accordance with the Act.

The Foundation follows Generally Accepted Accounting Practice (GAAP) recognised as appropriate for the measurement and reporting of earnings and financial position on historical cost basis. Accrual accounting is used to match expenses and revenues.

(b) Particular Accounting Policies
The particular accounting policies, which materially affect the measurement of financial performance and the financial position, are:

Income Tax

The Foundation has a charitable status from the Inland Revenue Department, hence is exempt from income tax.

Fixed Assets

Fixed assets have been shown at cost less depreciation. Buildings are depreciated using the straight-line method at 1% of the cost price, Air Conditioning Unit at 6% and Roof & Cladding at 10%.

Differential Reporting

The Foundation is a qualifying entity under the New Zealand Society of Accountants Differential Reporting Framework.

The entity qualifies under the size criteria, and because it is not publicly accountable.

The Foundation has not taken advantage of the differential reporting exemptions available to it in respect of FRS-19: Accounting for Goods and Services Tax.

(c) Changes in Accounting Policies
There have been no changes in accounting policies. Accounting policies have been applied on a basis consistent with previous years.

2. Capital Commitments & Contingent Liabilities

There are no capital commitments or contingent liabilities as at 30 June 2012. (2011: nil)

There were no capital commitments as at 30 June 2012. (2011: Nil)

3. Related Parties

The Foundation is related to New Zealand Heavy Engineering Research Association (HERA). Members of the Foundation are appointed by the HERA Executive. HERA is the tenant of the land and building owned by the Foundation and pays rent. The Foundation pays fees to HERA for the management and administration of the building. The Foundation during the year has given a loan of \$180,000 (2011: Nil)

5. Post Balance Date Events

There were no significant post balance date events. (2011:\$nil)

6. K. Smith - Bequest

The income from the bequest is to be applied to a prize which shall be given biannually subject to the term set by the late Mr K.Smith. This bequest is deposited with BNZ. This bequest has been recognised as income.

4. Fixed Assets

| | COST | ACCUM. | BOOK VALUE |
|---------------------------|--------------------|----------------|------------------|
| | \$ | DEP. | \$ |
| | | \$ | |
| Land | 244,602 | - | 244,602 |
| Land Development | 24,489 | | 24,489 |
| Capital Work in Progress* | 93,808 | | 93,808 |
| Building Upgrade | 151,019 | 118,795 | 32,122 |
| Air Condition Units | 157,300 | 74,512 | 82,788 |
| Building | 1,049,091 | 264,406 | 784,685 |
| | \$1,720,309 | 457,815 | 1,262,494 |

HEAVY ENGINEERING RESEARCH ASSOCIATION MEMBERS

Total HERA membership as of June 30 2012 was 585 members. They are:

AFFILIATE MEMBERS

| | | | |
|--------------------|-----------------------------------|------------------------|--------------------------------------|
| C J Wallis Pty Ltd | Fulton Hogan (Northren Civil) Ltd | Hawkins Infrastructure | Vulcan Steel Ltd |
| Fletcher Easysteel | Geodis Wilson NZ Ltd | TBS Farnsworth Ltd | Welding Technology Inst of Australia |

ASSOCIATE MEMBERS

| | | |
|---------------------------------------|--------------------------------------|--|
| A & S Engineering Ltd | Fruehauf Limited | Pearson Engineering Ltd |
| A W Trinder Ltd | G T Liddell Contracting Ltd | Peninsula Engineering Ltd |
| ABB Power Ltd | Gamman Industrial Componentry Ltd | Phoenix Steel Ltd |
| Acrow Limited | General Engineering North Shore | Piako Transport Engineering |
| Active Engineering Ltd | George Grant Engineering (GGE) | Pilcher Engineering Ltd |
| Advanced Plasma Technology | Gisborne Development Incorporated | Port of Napier Ltd |
| Aimecs Ltd | Global Engineering Products Ltd | Precision Turning & Manufacturing Ltd (Hydraulink) |
| Airwork (NZ) Ltd | Gray Construction | Pyramid Engineering |
| All Steel Services Ltd | Greymouth Petroleum | Quality Auto Machinists (1988) Ltd |
| Alloy Yachts International Ltd | Harford Greenhouses | Queenstown Engineering 2009 Ltd |
| ALRO Truck Smash Repairs | Hayes International | Razos Engineering Ltd |
| Alstom Northern Wagons | HEB Construction Ltd | Read Industrial Ltd |
| ANDAR-ADM Group Ltd | Honnor Welldrillers Ltd | Red Steel Limited |
| Angus Robertson Mechanical | Howick Engineering Ltd | Reel Stainless |
| APV New Zealand Ltd | Hydraulink Fluid Connectors Ltd | Refrigeration Engineering Co Ltd |
| ATCO Controls Ltd | Iain Codling Stainless Steel | Renold New Zealand Ltd |
| ATI Engineering Ltd | Ipsco Ltd | Rex Barnes Engineering |
| Awesome Awnings Ltd | J & D McLennan Ltd | RNZAF |
| Axiam Engineering Ltd | J J Niven Engineering Ltd | Roadmaster Trailers Ltd |
| Bailey Engineering Ltd | J P Marshall & Co Ltd | Rocktec Ltd |
| Baker Cranes Ltd | Jay Cee Welding Ltd | ROTIG Ltd |
| BBC Technologies Ltd | Jetweld Engineering | Ruakaka Engineering |
| Bedford Engineering Ltd | Keith M J Adams | Service Engineers Ltd |
| Best Bars Ltd | Kernohan Engineering Ltd | Sharland Engineering |
| Bitumen Equipment Ltd | Kerry Dines Ltd | Ship Constructors Ltd |
| BOP Gear Cutters Ltd | Kopu Engineering Ltd | Simpsons Mobile Weld Testing Ltd |
| Bradken Dunedin | Lakeland Steel Products Ltd | Snorkel Elevating Work Platforms |
| Brightwater Engineers Ltd | Laser Welding Ltd | Soanes & Vision Engineering Ltd |
| C J Saunders Engineering Ltd | Leonard Products Ltd | South Auckland Forgings Engineering Ltd (SAFE) |
| Calder Stewart Steel | Linear Design | Southern Cross Engineering Ltd |
| Cambridge Welding Service (1953) Ltd | Longhare Engineering Ltd | Southern Equipment Centre |
| Campbell Tube Products Ltd | Longveld Engineering Ltd | Specialised Container Services |
| Canco Engineering Ltd | Mace Engineering Ltd | Specialist Energy Engineering Developments (S.E.E.D) |
| CAS Enterprises Ltd | Machine Part Welding Ltd | Stafford Engineering Ltd |
| CFM Engineering Ltd | Maskell Productions Ltd | Stainless Down Under |
| Christian Church Community Trust | MB Century Ltd | Stainless Engineering Co Ltd |
| Clough Agriculture Ltd | McEwan Engineering | Stark Bros Ltd |
| Consolidated Engineering Company Ltd | Michael Harris (NZ) Ltd | StaTec Manufacturing |
| Contract Connections Ltd | Mike Christie Sheetmetals Ltd | Steel Structures Ltd |
| Cook Brothers Construction | Millers Mechanical (NZ) Ltd | Steelbro NZ Ltd |
| Courtney Engineering | Mobridge Ltd | Steelfort Engineering Company Ltd |
| Croucher & Crowder Engineering Co Ltd | Modern Transport Engineers Ltd | Steelpipe Limited |
| Culham Engineering Co | Mooloo Stockcrates Ltd | Stevensons Structural Engineers Ltd |
| D R Howells Engineering Co Ltd | Morgan Engineering & Marine Ltd | Stewart & Cavalier Ltd |
| Dan Cosgrove Ltd | Morgan O'Shea Engineering | Street Marine Ltd |
| Dawn Group Ltd | Morrow Equipment Co (NZ) | Stud Welding New Zealand Ltd |
| Dimond | Mouats Engineering Ltd | Superior Pak Ltd |
| Domett Trailers | MSC Engineering | Taslo Engineering |
| Donovan Group NZ Ltd | Mulcahy Engineering Ltd | Tasman Engineering Company |
| DSK Engineering Ltd | Murray Landon | Technical Welding Services (1998) |
| Eastbridge Ltd | Napier Engineering & Contracting Ltd | The 4711 Training Centre |
| Eastern Institute of Technology | NDA Group | The School of Welding |
| Ede Engineering | Necklen Engineering Ltd | Tidd Ross Todd Ltd |
| Electropar | Nelson Reliance Eng Co Ltd | Traction Lab Ltd |
| Engineering Contractors Ltd | Nelson Stud Welding Ltd | Transfleet Equipment Ltd |
| Enterprize Steel | Nepean Engineering Ltd | Transport & Engineering Ltd |
| Eric Paton Ltd | Niema Industrial Ltd | Trident 2000 Ltd |
| Etech Industries NZ Ltd | Noble Engineering Services Ltd | Truweld Engineering Kerikeri Ltd |
| Fairbrother Industries Ltd | North Shore Towbars 2006 Ltd | Ullrich Aluminium Co |
| Fairfax Industries Ltd | NZMP Kauri | Verissimo Engineering Ltd |
| Farmex Hawkes Bay Ltd | Otago Polytechnic | Victoria Park Alliance |
| Felix Research Labs | Otahuhu Engineering Ltd | W M Ross Engineering Ltd |
| Flotech | Pacific Timber Engineering Ltd | |
| Fraser Fire & Rescue | Parr & Co Limited | |
| | Patchell Industries Ltd | |

Wainuiomata Training Centre
Waratah NZ Limited
Warner Construction Ltd
Webforge NZ
Weld Fabrication Engineering Ltd
Weld Tests Hawkes Bay
Welding Services Nelson Ltd
Welding Technology Ltd
Wells & Boe Ltd
Whangaparaoa Engineering
Whangarei Engineering Company Ltd
Wilson Bros Engineering Ltd
Wilson Precast Construction Ltd
Windflow Technology Ltd
Windsor Engineering
Wyma Engineering NZ Ltd
Zealsteel Ltd
Zeanova Ltd

ORDINARY CONSULTANTS

Abacus Engineering Ltd
ACH Consulting Limited
Advance Boiler Services NZ Ltd
AECOM
Airey Consultants Ltd
Alan Reay Consultants Ltd
Allan Estcourt Ltd
Antro Enterprises Limited
Aurecon New Zealand Ltd
Babbage Consultants Ltd
Base Consulting Engineers Ltd
Batchelar McDougall Consulting Ltd
Beca Carter Hollings & Ferner Ltd
Belcher Industries Ltd
BGT Structures (Auckland) Ltd
Bill Cassidy & Associates
Bloxam Burnett & Olliver Ltd
Blueprint Consulting Limited
BPL Group
Brian Carter Consulting Engineer Ltd
Brown & Thomson
BSK Consulting Engineers Ltd
Buchanan & Fletcher Ltd
C L C Consulting Group Ltd
Cameron Gibson & Wells Ltd
Chambers Consultants Ltd
Chapman Oulsnam Speirs Limited
Chapman Sanders Consultants
Charles Consulting
Chester Consultants Ltd
Chris W Howell & Associates Ltd
Civil Engineering Central Ltd
Clendon Burns & Park Ltd
Compusoft Engineering
Coulter Engineering Services Ltd
CPG New Zealand Ltd
David Smart Consulting Ltd
Davidson Group Ltd
Davis Ogilvie & Partners Ltd
Day Consultants
DBCon Ltd
Design Engineering (SI) Ltd
Design Management Consultants Limited
DezignWorks BOP Ltd
DHC Consulting Limited
Dick Joyce Consultants Ltd
Dobbie Engineers Ltd

Dodd Civil Consultants
Don Thomson Consulting Engineers Ltd
Dunning Thornton Consultants Ltd
Eastern Consulting Ltd
EMC-2
Engineered Cold Systems Ltd
Engineering Design Consultants Limited
ETS Engineers Ltd
Evan Douglas Consulting Engineers
Fairclough and King Consultants Ltd
Fletcher Construction - Engineering
Flo-Dry Engineering Ltd
Forbes Consultants
Fraser Thomas Limited
GDC Consultants Ltd
Geoff Kell Consulting Ltd
GHD Ltd
Gray Consulting Engineers Ltd
GVK Design & Engineering Consultants
Hadley & Robinson Ltd
Hanlon & Partners Ltd
Harrison Grierson Consultants Ltd
Hawthorn Geddes Engineers & Architects
HCS Engineering Ltd
HFC-Harris Foster Consultants Ltd
Hill Design Engineering Ltd
HLK Jacob Limited
Holmes Consulting Group
Hugh Barnes Consultants Ltd
Index Engineering Ltd
JAWA Structures Ltd
JNG Engineers Ltd
Kerslake & Partners
Kevin O'Connor & Associates Ltd
Kirk Roberts Consulting Engineers
KM-Mechanical Ltd
Knowles Consulting Ltd
Kordia Ltd
Les Boulton & Associates Ltd
Lewis & Barrow Ltd
Lewis Bradford & Associates Ltd
LHT Design
Lough Downey Ltd
M.A. Corkery & Associates Ltd
Macdonald Barnett Partners Ltd
Manktelow Consulting Engineers Ltd
Marino Consultants & Associates
Markplan Consulting Ltd
Marriott Consulting Engineers
Matrix Applied Computing Ltd
MEC Engineering Consultants
Mechanical Technology Ltd
Metal Test Ltd
MH Design Ltd
Mighty River Power Limited (MRP)
Milward Finlay Lobb Ltd
Mitchell Vranjes Consulting Engineers Ltd
Mobil Oil New Zealand Limited
MSC Consulting Group Ltd
MTEC Consultants Ltd
MWH New Zealand Ltd
Nagel Consultants Ltd
Nigel Harwood Engineering Consultant
Novare Design Ltd
O'Loughlin Taylor Spence Ltd
OCEL Consultants NZ Ltd
Optimech International Ltd
Opus International Consultants Ltd
Paul Gellatly Consulting Engineer

PB Parsons Brinckerhoff
Peter Swan Consulting Engineers
Peter Walker Consultants Ltd
Peters and Cheung Ltd
PFP Systems (NZ) Ltd
Plant & Platform Consultants Ltd
Pont Consultants
Powell Fenwick Consultants Ltd
Protocol Services Ltd
Q Designz Limited
Quality Inspection Services Ltd
R B Knowles & Associates Ltd
R D Sullivan & Associates
R J Nelligan & Associates Ltd
R W & V Roberts Consultancy
Randall & Associates Ltd
RCR Energy Systems Ltd
Redco NZ Ltd
Richardson Stevens Consultants (1996)
Ruamoko Solutions Ltd
Sawrey Consulting Engineers Ltd
Sigma Consultants Ltd
Silvester Clark Consulting Engineers
Sinclair Knight Merz (SKM)
Southern QA Ltd
Spencer Holmes Ltd
Stephen Mitchell Engineers
Stiffe Hooker Ltd
Stiles & Hooker Ltd
Strata Group Consulting Engineers Ltd
Structex Limited
Structural Concepts Ltd
Structure Smith Ltd
Tangaroa Energy Rakaia Amps Ltd
TH Consultants Ltd
Thorburn Consultants (NZ) Ltd
Thorne Dwyer Structures
Tonkin & Taylor
Transfield Worley Ltd
Transport Design & Certification
Transport Technology Ltd
Transtech Dynamics Ltd
Tse Taranaki & Associates Limited
TSV Consulting
URS New Zealand Ltd
Verstoep & Taylor Ltd
W Stringer Consulting
Waikato Engineering Design Ltd
WH & NF Johnston Ltd

ORDINARY FABRICATORS

A & G Price
Acme Engineering Ltd
Active Welding Limited
Allied Industrial Engineering Ltd
Amtec Engineering Ltd
Atco Steel Developments Ltd
Babcock (NZ) Ltd
BDC Engineering
BLM Engineering Co Ltd
Bromley Steel
Bucher-Alimentech Ltd
Burleigh Engineering Ltd
Chapman Engineering Ltd
Consortium Engineering Services
CSP Pacific

HEAVY ENGINEERING RESEARCH ASSOCIATION MEMBERS

Cylinder Testing NZ
 D C Weld Ltd
 D&H Steel Construction Limited
 Dexion New Zealand
 Dispatch and Garlick Ltd
 E B McDonald Ltd
 E4 Engineering
 East Coast Steelwork Ltd
 Energyworks Ltd
 Equipment Engineering (2008) Ltd
 Ewings Construction Ltd
 Fabrication & Pipe Services Ltd
 Falcon Hammersley Ltd
 Farra Engineering Limited
 Fitzroy Engineering Group Ltd
 Gary Douglas Engineers Ltd
 Gisborne Engineering Ltd
 Gray Bros Engineering
 Grayson Engineering Ltd
 Hornell Industries Ltd
 HSM Engineering Ltd
 Intergrated Maintenance Group Limited
 J & R Slecht Limited
 J Steel Australasia Pty Ltd
 Jensen Steel Fabricators Ltd
 John Jones Steel Ltd
 Kawerau Engineering Ltd
 Kraft Engineering Ltd
 Lyttelton Engineering Ltd
 M J H Engineering Ltd
 Mahurangi Sheetmetals Ltd
 Mainarc Engineering Services Ltd
 Martin Engineering
 MaxiTRANS Industries (NZ) Pty Ltd
 McConnell Dowell Constructors Ltd
 McGrath Industries Limited
 McKenzie & Ridley (Kawerau) Ltd
 McLaren Stainless Ltd
 Mercer Stainless Ltd
 Metso New Zealand Limited
 MGE Engineering Ltd
 Modern Construction Ltd
 Morgan Steel
 Newton Weld Equipment Ltd
 Oceania Aviation Ltd
 Otahuhu Welding Ltd
 P J Hindin Engineering
 Page & Macrae Limited
 Pakuranga Engineering Ltd
 Parfoot Engineering Group
 Patton Engineering Ltd
 Pegasus Industrial Engineering Ltd
 PFS Engineering Ltd
 Pipe & Tube Welding Engineering Ltd
 Powerhouse Forestry Ltd
 Pro Steel Engineering Ltd
 RCR Energy Systems Ltd
 RNZN Operational Support Group
 Roadrunner Manufacturing (NZ) Ltd
 Robert Page Engineering Ltd
 Sabre Engineering
 South Pacific Industrial
 Southern Spars Limited
 Speedfloor NZ
 Steltech Structural Limited
 Stevenson Engineering Ltd
 Tanker Engineering Specialists Ltd
 Taymac Limited
 Ten4 Ltd

Tenix
 Texco Steel Ltd
 Titan Marine Engineering
 Track Industries Ltd
 Tranzweld
 Turnco Engineering Limited
 United Engineering Services Ltd
 Universal Engineering Ltd
 Waikato Steel Fabricators Ltd
 Warren Engineering
 Weld IT Ltd
 Weldtrade Engineering Ltd
 Weldwell New Zealand
 Weldworks United
 Whakatiki Engineering (1984) Ltd
 Wilkinson Transport Engineers
 Wine Country Sheetmetal & Engineering

ORDINARY PRODUCT SUPPLIERS

Aerodyn Energie Systeme
 Air Liquide New Zealand Ltd
 Akzo Nobel Coatings Ltd
 Alfa Group Ltd
 Altex Coatings Ltd
 Aotea Machinery Ltd
 Ballance Agri-Nutrients Ltd
 BC Design Group Ltd
 BOC Gases New Zealand Ltd
 Cable Price (NZ) Ltd
 Combustion Control Ltd
 Crow Refractory Ltd
 Denis Cunningham Ltd
 Digitalweld
 Dulux Powder & Industrial Coatings
 Eastland Engineering 2004 Ltd
 H J Asmuss & Co Ltd
 Independent Technology Ltd (ITL)
 Juken New Zealand Ltd (Wairapa)
 Lincoln Electric Co (NZ) Ltd
 Mainzeal Property & Construction Ltd
 Modern Maintenance Products Ltd
 New Zealand Steel Ltd
 Onesteel NZ Limited
 Pacific Steel
 Pipes NZ Limited
 PPT
 Sandvik New Zealand Ltd
 Steel & Tube Holdings Ltd
 TATA Steel International (Australasia)
 The Fletcher Construction Co. Ltd T/A
 Piletech
 Traydec (NZ) Ltd
 Trustpower Ltd
 Watty (NZ) Ltd
 Weldwell New Zealand

ORDINARY SERVICES PROVIDERS

Advance Boiler Services NZ Ltd
 Advanced Training Academy
 Alpha Training & Development Centre Ltd
 Aoraki Polytechnic
 Auckland Council
 Auckland University of Technology (AUT)
 Bay of Plenty Energy Ltd
 Bay of Plenty Polytechnic
 BDS VirCon
 Bureau Veritas (NZ) Ltd
 CADPRO Systems Ltd
 Christchurch Polytechnic Institute of Technology (CPIT)

Contact Energy
 CSP Coating Systems
 Forman Insulation
 Genesis Energy
 Independent Oilfield Inspection Services
 INS Inspection Services Ltd
 KiwiRail Limited
 Manukau Institute of Technology
 Materials & Testing Laboratories
 Meridian Energy Ltd
 Metal Tech Education Ltd
 Metal Test Ltd
 Motovated Design and Analysis Ltd
 Napier Sandblasting Co Ltd
 New Zealand Refining Co Ltd
 New Zealand Transport Agency (NZTA)
 NZ Army-Trade Training School
 NZ Welding School
 Onsite Engineering Services Ltd
 Port of Tauranga Limited
 Quality Inspection Services Ltd
 SGS New Zealand Limited
 Southern Institute of Technology
 Southern QA Ltd
 Steel Drafting Ltd
 Steel Pencil Limited
 Stork Cooperheat New Zealand Ltd
 Structurflex Limited
 Survey NZ Ltd
 Techlogic NZ
 Technical Support Services DOL
 Transport Technology Ltd
 UCOL
 Unitec Institute of Technology
 University of Auckland & UniServices
 Victoria University of Wellington
 Waikato Institute of Technology (WINTEC)
 Weatherford New Zealand
 Wellington Institute of Technology (WELTECH)
 Wells Architect Planners Ltd
 X-Ray Laboratories Ltd

RECIPROCAL MEMBERS

American Institute of Steel Construction
 American Welding Society
 Australasian Corrosion Association
 Australian Steel Institute
 Bio Energy Association of New Zealand
 British Constructional Steelwork Association
 Building Research Association of New Zealand
 Canadian Institute of Steel Construction
 Competenz
 DVS - German Welding Society
 National Association of Steel Framed Housing
 National Library of New Zealand
 New Zealand Geothermal Association
 NZ Institute of Economic Research
 Power Crane Association of NZ
 PrefabNZ Inc
 Steel Construction Institute UK
 Steel Construction New Zealand
 Waikato Engineering Careers Association

HERA is a proud member of:





HERA STRUCTURE

The Association is based at HERA House in Manukau, Auckland. Within HERA House are the offices of HERA and associated organisations such as Metals NZ, NASH and SCNZ, as well as a conference facility which can cater for up to 120 participants.

Through its specialist staff it provides a combination of research, training, advisory, industry development and promotional services making it the national centre for metals-based product design, manufacturing technology and inspection and quality assurance. HERA is an accredited training provider under NZQA and the International Institute of Welding (IIW) guidelines.

HERA also performs industry advocacy functions developing HERA member policy on items relating to R&D and

heavy engineering industry development and communicates this to government and other relevant bodies.

Research is selected on the advice of subject specific industry advisory panels and is usually of applied nature with short- to medium-term implementation. HERA's research activities encompass the areas of steel construction, general heavy engineering including welding/joining, clean energy technology, industry capability and marketing.

HERA incorporates the activities of the Heavy Engineering Industry Development Division, Structural Systems Division, New Zealand Welding Centre, Inspection & Quality Control Centre, and its Information Centre with the following specific services and activities:

Structural Systems Division

- Sets priorities for NZ steel and composite construction R&D through the Steel Research Panel
- Applied research supporting the use of steel and composite elements and systems
- Input into New Zealand's performance-based *Building Control System*
- Technology transfer mainly in the form of advice, training, consultation and including Finite Element Analysis
- Product and services compliance under 'HERA Verified' certification

Heavy Engineering Industry Development Division

- Maintains registry of and promotes capabilities of the membership
- Provides advice on international, tariff

- and marketing issues of significance to the metals industry
- Performs targeted business development initiatives for the heavy engineering sector

New Zealand Welding Centre

- Specialised welding and joining research, including technology transfer to industry of new processes and techniques
- Welding consultation, including practical welding advice
- Educational courses and seminars, including training leading to NZQA and International Institute of Welding (IIW) qualifications
- Providing input into national and international welding-related standards
- Provision of educational material for

welding-related training

Inspection & Quality Control Centre

- Courses covering welding inspection and NDT inspection methods
- Elevated work platform, and pressure vessel inspection courses
- Inspection-related seminars such as *Management Appreciation in Quality Control and Inspection*

HERA Information Centre

- Library with over 11,000 entries and 180 periodicals
- Distribution of HERA publications and publications for a number of New Zealand and overseas organisations
- Membership management, marketing and servicing

HERA STAFF 2012

Administration

Director Dr Wolfgang Scholz
Accounts Officer Kam Subramani

HERA Information Centre

Manager Brian Low
Resources Officer Gillian Casidy
Receptionist Raewyn Porter

Heavy Engineering Industry Development

General Manager Nick Inskip
Research Engineer - Clean Energy Dr Boaz Habbib

Inspection & Quality Control Centre

Manager Peter Hayward

Structural Systems

General Manager Dr Stephen Hicks
Finite Element Analyst Nandor Mago
Structural Engineer Audsley Jones

New Zealand Welding Centre

Manager Dr Michail Karpenko
Senior Welding Engineer Alan McClintock



Standing, from left: Nandor Mago, Dominik Pauko, Audsley Jones, Dr Boaz Habib, Raewyn Porter, Peter Hayward, Kam Subramani, Gillian Casidy, Alan McClintock
Sitting, from left: Brian Low, Dr Stephen Hicks, Dr Wolfgang Scholz, Nick Inskip, Dr Michail Karpenko

HERA

Innovation in Metals



HERA House
17-19 Gladding Place
PO Box 76-134, Manukau
Auckland, New Zealand
Phone + 64 9 262 2885
Fax + 64 9 262 2856
email admin@hera.org.nz
web site www.hera.org.nz

HERA is a proud member of and provides the Secretariat for:



Organisation members of Metals NZ are:

