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# Curriculum Vitae

## Bryce Coulter Mechanical Design Engineer

- Contact:           **Coulter Engineering Services Limited (Local)**  
                          **Coltech Limited (Overseas)**  
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- Tertiary            Bachelor of Engineering (BE) Mechanical, University of Auckland.  
Education:        New Zealand Certificate in Engineering (NZCE) Mechanical,  
                          Waikato Polytechnic.  
                          Trade Certificate in Plastics Engineering.
- Professional      Member of Institute of Professional Engineering, New Zealand  
Qualifications:   (MIPENZ). Registration number 141869.  
                          Chartered Professional Engineer (CPEng).  
                          International Professional Engineers Register (IPER)

### SUMMARY

- Mechanical Design Engineer
- Project and Contract Management
- Plant and equipment layout and design
- Estimating, tender preparation and tender submissions
- Contract negotiations
- Coded pressure vessel design
- Amusement rides design and certification
- Piping design and layout
- Materials handling plant and equipment design, installation and commissioning
- Planning and Scheduling
- Hydraulics and pneumatic, design, installation and commissioning
- Experience in both light and heavy fabrication

**SKILLS****Design and Manufacturing**

The combination of both practical and theoretical training provide me with the necessary skills for planning, design and detailing of a variety of mechanical plant and equipment, from coded pressure vessels, Amusement Rides, hydraulic presses, materials handling equipment, belt and screw conveyors. Metal fabrication in both light and heavy gauge materials, including such items as sheet metal covers, guards, frames, steel structures and pressure vessels.

**Code Designs**

Coded pressure vessel designs to AS1210, PD5500, ASME VIII.  
Amusement Rides and Devices AS3533.  
Code of Practice for Bungy Jumping AS/NZS5848.  
Water tube boiler pressure part designs to AS1228, BS1113.  
Design and Construction of Shell Boilers of welded construction BS2790.  
Boilers Unattended and Limited Attendance AS2593.  
Chimney/stack design to AS/NZS1170.2 and CICIND Model code for steel chimney.  
Mechanical Equipment – steelwork AS3990.  
Lifting Devices AS4991.  
Cranes Hoists and Winches AS1418.  
Base Mounted Drum Hoists ASME B30.7  
Industrial Fall-Arrest Systems and Devices AS/NZS1891.  
Pressure Equipment Hazard Levels AS4343.  
Tanks for Flammable and Combustible Liquids AS1692

**Familiar with the following Approved Code of Practice**

ACOP for Pressure Equipment (Excluding Boilers)  
ACOP for the Design, Safe Operation, Maintenance and Servicing of Boilers  
ACOP for Cranes  
Guidelines for the Prevention of Falls

**Amusement Rides**

Involved in the design and certification of Amusement Rides since 2003, ranging from small Amusement Park mini jeeps and ferris wheel rides to 1000m long Ziplines and 255m high Skyjump installations, in locations in Macau (China) and Las Vegas and Texas in the United States of America.

**Project and Contract Management**

Preparing inquiry and contract documents, subcontractor negotiations and tender evaluation, negotiating contracts, budget preparation, construction/erection management and claim settlement.

**Computers**

Computer literate in the use of AutoCAD and Inventor Professional, Autodesk 3D parametric solid modelling package, Bentley Multi-frame structural analysis, Finite Element Analysis (FEA) Microsoft Project, Excel and Word.

**Qualifications**

New Zealand Certificate in Engineering (NZCE) Mechanical studied in conjunction with the Trade Certificate at both night and day school. An additional mathematics paper taken was prior to studying at University. Entry into University at the third year of a four year Bachelor of Engineering Mechanical degree, BE(Mech).

**Trade experience**

Trade Certificate in Plastics Engineering; work experience involving fitting and turning, die setting, drafting, machine maintenance, hydraulic and pneumatic fitting, including a variety of plastic moulding techniques.

**Hydraulic and pneumatic**

Hydraulic and pneumatic circuit design including the manufacture, installation and commissioning for plant services and machine operation.

**Controls**

Preparation of functional descriptions for computer controlled process engineering for both PLC (Programmable Logic Control) and DCS (Digital Control Systems).

**Materials handling**

Experience in the design of equipment for handling a variety of products including; automated container loading system, log handling equipment, coal, woodwaste, boiler ash and sander dust handling systems.

**Estimating, tender preparation and tender submissions**

Tender preparation for a large variety of mechanical plant and equipment involving all aspects of; preparing specifications for quotations, carrying out bid evaluations, and preparing documents for tender submission

**Contract negotiations**

Participated in the negotiations for major contracts including the following areas; materials handling equipment, silos, storage tanks, pipework, boilers and their associated items of plant and equipment.

**Presentations**

Participated in numerous tender proposal presentations, these included using overhead transparencies. Presentations for hazardous and operability studies (HAZOP's) and training for operators and maintenance personnel of materials handling plants.

**EXPERIENCE: (SUMMARY OF MAJOR PROJECTS ONLY)****Coulter Engineering Services Limited (Self employed)**

- Year 2015
- Inspection and certification of AJ Hackett Bungy NZ recently re-opened Skippers Canyon Bungy as an Amusement Device utilising a battery power ascender winch for performing a top recovery.
  - Design and certification of 6 metre tall self-supporting jib cranes rated at 1 tonne and 2 tonne SWL for Gamminco's new workshops in Tauriko.
  - Engaged by Page and Macrae Limited to carry out the design of the Tank jacking and bracing system for the 92 tonne tank lift at Z Energy Mt Maunganui, taking into consideration the requirements of NZS 1170.2 for wind loading on the tank shell at 148km/hr.
  - Design and manufacture of two electric winches for the 233 metre Bungy Recovery System located on the Macau Tower China. The bungy Retrieval and Tailing winches consist of one 15kW and one 7.5kW electric motor c/w electromagnetic brake, FDI hydraulic disc brake, gearbox and Galvi Emergency. The winches are able to operate separately or combined with a variable speed of between 0 and 5m/s. The winches are designed to lower and recover the patron and/or bungy cord under direct control of the electric motor via the use of the joystick controller.
- Year 2014
- Design and draughting of new nip roller set for bitumen coating paper machine. Paul Industries Limited.
  - Design, draughting and design verification of Steam Buffer Tank to ASME VIII for Cedenco Gisborne. Client McKenzie and Ridley (Kawerau) Limited.
  - Design and design verification (ASME VIII) of Evaporator 4 Pre-heater located at Fonterra Te Awamutu. Client Hendl and Murray Engineering Limited.
  - Design and draughting of 1.2 tonne Forklift Attachment for KiwiRail. Design code AS2359, manufactured by Page and Macrae Limited.
  - Investigation in to testing procedure for Reverse Bungy Rocket Bungy Cords.
  - Design and certification of 125NB Hot Oil pipework for Leader Products Auckland. Client McKenzie and Ridley (Kawerau) Limited.
  - Design and certification of 4 tonne lifting beam for Page and Macrae Limited.
  - Engineering lift to jack and support 80 tonne boiler generator bank at Fonterra Waitoa to enable repair of foundation bearing pads. Used Autopipe to carryout

- stress analysis of boiler frame.
  - Commissioning of New Adventure Rides/Jump for AJ Hackett SkyPark Sochi. Scope of Work includes 69 metre Bungy, 207 metre Bungy and Recovery Capstan, 170 metre high Giant Swing c/w 11kW Pulley Winch and 22kW Patron Recovery Winch. 55kW Flying Fox (Megatroll) Recovery System.
  - Modification to existing Fonterra milk storage tank including upgrade to seismic restraints.
  - Design of turbine rotor cradles for both single point lift and transport, IP cradle 16 tonnes SWL and LP 34 tonnes SWL.
  - Safety Space Report for 39 metres swing for AJ Hackett on Sentosa Island Singapore.
  - Design and draughting for 8 tonne and 13 tonne steel coiler loaders for Strang LPP Pty Ltd to be used for loading of steel coils in to 20 foot containers at numerous wharf sites around the world. Design codes AS4991 and AS 3990.
  - Review of weak black liquor tank to API650 for CHH Tasman to determine repair work required to reinstate tank to original capacity and to comply with current seismic requirements.
  - Engaged by McKenzie and Ridley to carry-out the design check of an existing hot water boiler and pipework for Pan Pac Milton after being shut down for a period of time. Design review found that the existing hot water boiler did not comply with the current seismic requirements of NZS 1170.2, provided recommendation for strengthening with the addition of an external support frame. Design check using Autopipe for both boiler frame and pipework between the boiler and kilns.
- Year 2013
- AJ Hackett Sochi SkyPark – Design and draughting of various items of equipment for new SkyPark Adventure. Scope of Work included; mechanical design, draughting, electrical and control system functional design and ladder logic, construction, workshop testing in New Zealand, shipping to Russia :-
    - 207 metre high Bungy Capstan, 15kW electric drive, main electrical control panel and remote operator panel.
    - 165 metre Giant Swing consisting of 11kW and 22kW electrical drives, main control panel and remote operator panel.
    - 527 metre long Flying Fox Cableway Recovery System, consisting of 55kW electric drive with main electrical and control connected wirelessly to remote operator panel on opposite side of the valley.
  - Investigation in to design and certification of 350 metre long Flying Fox at Retaruke Station.
  - Preliminary design of Emergency Bungy Stop for AJ Hackett Macau.
  - Design and certification of 1 tonne lifting beam for Tauranga Engineering to AS4991.
  - Design of Heavy Fuel Oil tank to API 650 for CHH Tasman Pulp and Paper Mill. Capacity 77 cubic metres.
  - Design of Mobil Scaffolding Platform for working inside 16 metre diameter black liquor tank CHH Kinleith, client Page & Macae Limited.
  - Design and draughting of new SkyJump Auckland 192 metre high jump device.
  - Design and draughting of 4 Leg Cross Beam Spreader for lifting tank strakes design to AS4991.
  - AJ Hackett International to carry out a design review of the proposed jump zone and the associated safety space for the Sentosa Bungy Jump to confirm that it complies with AS/NZS 5848:2000.
  - Biennial inspection of Larex Enterprises Limited , Mini Jeeps, Ferris Wheel, Mobile Pendulum Boat and Ride on Mini Bikes.
  - Biennial inspection and certification of Mini Bikes and Argo at Combat Zone.
  - Re-certification of 2 Seater Go Karts at Finlay Park Adventure Park.
  - Design and design verification of Air Cooled Heat Exchanger to ASME VIII complete with support frame. Client Advance Boiler Services Limited Hamilton.
  - Biennial inspection and certification of Mini Jeeps, Merry-Go-Round and Bungy Trampoline for Smiles Inflatables Limited.

- Design and draughting of 15 tonne steel coiler loader for Strang LPP Pty Limited, to AS4991 a, manufactured by Page and Macrae Limited.
- Design of 80NB steamline and supports for Cedenco Gisborne, installed by McKenzie and Ridley (Kawerau) Limited.
- Preliminary design of Ogo (Zorb) return conveyor systems at Rotorua, conveyor length 160 metres.
- Upgrade of SkyWalk Auckland to include motorised trolley and re-certification as an Amusement Device Ride to AS3533.
- Design verification of 22 tonne safe working load bulk materials handling grab to AS4991. Client Mouats Engineering Limited.
- Design and draughting of Proposed Materials Handling of woodwaste to Boilers #4,5 and 6 at Manildra Starches Australia. Client McKenzie and Ridley (Kawerau) Limited.

## Year 2012

- Design of standard steam header for Advance Boiler Services Ltd
- Design review of milk powder vacuum vessels under a milk powder explosion for Powder Projects Limited.
- Design of support steelwork to facilitate the installation of 200 tonne steam condenser for Page & Macrae Limited on the Te Mihi Geothermal Project.
- Design of 40 tonne spreader beam for steam condenser assembly, client Page and Macrae Limited.
- Modification of ammonia storage vessel of Pipe Fabrication Services to ASME VIII.
- Design of explosion resistant ductwork for use on milk processing plant for Powder Projects Limited.
- Pressure Part design check and design verification of existing ammonia refrigeration plant pipework, approximately 400 metres of pipework ranging in sizes from 25 to 200NB
- Design of a new 13 tonne capacity steel coil lifting system for use on forklifts during the loading of 20 foot shipping containers.
- Re-design of 15 tonne safe working load tank construction lifting jacks to be used during the construction of bulk storage fuel tanks, client Page & Macrae Limited.
- Investigation and report in to the failure of a 10 tonne capacity container handler forklift for Clark Equipment.
- Preliminary design of new 8 seater trailer based Hurricane style Amusement Ride for Larex Enterprises.
- #4 White Liquor Clarifier construction at Kinleith for Page & Macrae Ltd, carryout design of temporary support frame for construction, review tank jacking system, prepare 90 tonne crane lift plan and strengthening requirements and rigging required to install roof.
- Design check of Chinese made ammonia evaporators being imported by Omega QS Services in to New Zealand to ASME VIII.
- Preliminary design of fall arrest/braking system for bungy cord failures for use on bungy operations not operating over water.
- Design and draughting of proposed new Bungy Recovery System of Sky Tower Auckland.
- Bi-annual inspection of amusement rides for Larex Enterprises Ltd.
- Design and design verification of pipework extension resulting from the installation of new Mycom refrigeration compressor at Inghams Waitoa Plant, client Excel Refrigeration (Australia).
- Design of rendering plant intake bin for Conveyor Industries Limited, capacity 80 tonnes.
- Design and design verification of 80NB steamline at Wallace Corp Waitoa from boiler house to feather-blood dryers as ASME B31.1.
- Design new 1400mm square elevator side mount system for Power Hydraulics, platform capacity 350kg.
- Carryout bungy winch inspection and service at AJ Hackett Macau Tower.
- Design and design verification to AS1418.17 of new man cage for McLeod Cranes – Mt Maunganui, 300kg safe working load.

- Design of service access platform for maintenance shut at Tasman Pulp and Paper Mill.
  - Design and draughting of standby generator Silencer Support Frame at Tauranga Hospital.
  - Bi-annual inspection of 4 way bungy trampoline for George Grant.
- Year 2011
- Design of major plant items for McKenzie and Ridley (Kawrau) Ltd on the 7MW Solid Energy boiler at Matura burning lignite coal. Design of pressure vessels including economiser, deaerator and pipework along with structural steel supports for economiser/air heater, deaerator, baghouse, multicyclone, coal hopper and boiler. Design and drafting of ash handling conveyors, coal handling and 37 metre tall free standing chimney.
  - Bi-annual inspection of amusement ride for Skyjump Auckland Ltd.
  - Burner Services Limited. Design and drafting of woodwaste pellet hopper for Rangipo Prison.
  - Steam pipework design and stress analysis for sootblower installation for McKenzie and Ridley (Kawerau) Limited at Westland Dairy.
  - Ravensdown Fertiliser Co-operative, provide assistance to client in regard of overseas pressure vessel design submission for design verification as well as upgrade of support steelwork to meet the New Zealand seismic requirements.
  - Mobil Oil New Zealand Ltd. Design check of several lifting beams and attachments being used on the Mt Maunganui Terminal.
  - Investigate damaged drilling rig mast for HEB Construction and provide recommendations and details for the mast repair.
  - Design 50NB steam pipework for Wallace Corporation from boiler house to Tallow storage tanks.
  - Undertake a site wide review of all steam, condensate and hot water pipework for Bakels Edible Oils plant optimisation and provide recommendations as part of the plant upgrade.
  - Bi-annual inspection of amusement rides for Larex Enterprises Ltd.
  - Re-design of standard finned tube heat exchanger for Advance Boiler Services from AS1210 to AS1228 for use as boiler economisers.
  - Bi-annual inspection of 4 way bungy trampoline for George Grant.
  - Bi-annual inspection of Fishpipe/Rotating Barrel ride for Sacred Echo Limited.
- Year 2010
- Review of safety guarding of cake manufacturing machine to AS4024 and provide report and recommendations for improvements as a result of a Department of Labour investigation following an industrial accident.
  - Review and upgrade of boiler supports as part of relocation of 10.5MW water tube boiler located at Clandeboye to Washdyke for McKenzie & Ridley (Kawerau) Ltd.
  - Upgrade of bunker line walkways under Mt Maunganui wharf for Mobil Oil New Zealand.
  - Design and drafting for Mt Maunganui Engineering Ltd, 8m<sup>3</sup> Air Surge vessels for Southern Pipeline Project, design to PD5500.
  - Prepare tender drawings for the re-tube of the first half of the Bega Co-op boiler generator bank.
  - Design of 40000 litre Sulphuric acid storage tank to API650 for Ravensdown Co-op Napier.
  - Upgrade of 3 tonne lattice beam gantry crane built in 1923 to AS1418 for Pure Pine Moulding Te Puke.
  - Design check of retaining pins and clevis mounts on several underground pipe thrusting units which had previously failed at critical stage of pipe thrusting.
  - Design and design verification of 150NB hot water pipework for AMX Ltd on the installation of timber drying kilns at Reporoa.
  - Design and design verification of 150NB steamline for Advance Boiler Services Ltd, Affco Horotiu.
- Year 2009
- Investigation in to poor performance and regular shut downs of Chilled Water

- System at the Waitakere Hospital. Prepare report and recommendations.
  - Bi-annual inspection of amusement ride for Skyjump Auckland Ltd.
  - Design of temporary staging (dance floor beams) for the re-tubing of boiler generator bank.
  - Prepare tender documents and carry out bid evaluation for replacement heavy fuel oil suction for Exxonmobil Mt Maunganui. Contract value \$200,000.
  - Prepare submission documentation for the upgrade of two boiler (1x Foster Wheeler D-type 14.2MW and 1x shell type Anderson 4.4MW) to unattended operation.
  - Carry out pipe stress analysis and drafting for 80NB steamline for McKenzie and Ridley Kawerau Ltd at the North Island Mussel Processors in Tauranga.
  - Carry out investigate for Waitakere Hospital in to the viability of installing a steam accumulator to overcome steam supply problems to their autoclaves. Prepare report and recommendations.
  - Thermal review of 45MW natural gas fired water tube boiler performance with objective of increase boiler output capacity. Prepare drawings for generator bank tube replacement including re-design of flue gas flow to reduce tube erosion from high flue gas velocities. Contract value \$500,000.
  - Design and drafting of 17 tonne SWL workbox and access platform for demolition and removal of 30 metre tall concrete chimney at Tauranga Hospital for Page and Macrae Ltd.
  - Project manage the design, drafting and design verification of the installation of a new 150NB steamline at Westland Co-op Dairy Hokitika for McKenzie and Ridley Kawerau Ltd. Pipe stress analysis sub-contracted to Babbage Consultants Ltd.
  - Carry out design check of support steelwork on two shell boiler being upgraded to unattended status and being relocated.
  - Investigation in to the feasibility of increasing the span of an existing 15 tonne gantry crane at Page and Macrae Ltd.
  - Upgrade of "Rotating Barrel" amusement device from AS3533 to comply with the requirements of the ASTM amusement device standards.
  - Upgrade of 2000lb/hr shell boiler including support structure and verification of back end temperature calculations.
  - Re-design of 6 tonne capacity barge mounted monorail at Taharoa ironsands for Morgan Steel Ltd.
  - Investigation in to boiler performance and upgrade of 4.5MW water tube boiler for Mobil at Mt Maunganui. Provide upgrade to boiler and burner management system to unattended boiler operation. Project and Contract Management of Project for Exxonmobil. Prepare tender specification, carryout bid evaluation, subcontractor selection. Contract value \$250,000.
  - Bi-annual inspection of amusement rides for Larex Enterprises Ltd.
  - Bi-annual inspection of 4 way bungy trampoline for Smiles Inflatables Limited.
  - Design of 2m<sup>3</sup> and 8m<sup>3</sup> air chambers for Nga Awa Purua Geothermal Taupo site to ASME VIII for Page and Macrae Ltd.
- Year 2008
- Re-design of 4 off silo support structures during the cone replacement and upgrade of silos at Inghams Stock Feed Mt Maunganui.
  - Re-design of 45MW boiler generator bank and drafting for re-tubing of complete generator for McKenzie and Ridley Kawerau Ltd.
  - Design check and certification of an existing un-certified 500kg gantry crane and structure.
  - Design of condensate heat recovery heat exchanger and flash column for McKenzie and Ridley Kawerau Ltd.
  - Design of hyperbaric dive chamber to PD5500.
  - Design and drafting of Skyjump controlled decent amusement device for installation on the Stratosphere Tower Las Vegas. Height 255 metres, speed 65 km/hr. Contract value US\$3.6M. Peer review by Nevada State approved Professional Engineer Lawrence Allen.
  - Design check for the upgrade of Page and Macrae Ltd tank jacks from 15 to 25 tonne safe working load and an increase the lift height from 17 to 20 metres with

- a combined maximum tank lift of 250 tonnes.
  - Design check and prepare Producer Statement for two storey water hydraulic domestic lift.
  - Design of pipework and supports for Whangamata Waste Water Treatment Plant, sub-contract pipe stress analysis out to Babbage Consultants.
  - Pressure filter design and drafting to PD5500 for Water Systems Auckland.
  - Design of mancage to AS1418.17 specific to confirmed space access to wood veneer press for maintenance purposes.
  - Design check and drafting of an amusement device "Rotating Barrel Ride" with certification by Department of Labour.
  - Design of lifting lugs to be attached to 9 tonne forklift allow forklift to be raised and lowered in to ships hold.
  - Pipework design and drafting for new polystyrene moulding plant for Strang Group at Mt Maunganui, systems included steam, condensate, cooling water and waste water. Start up and commissioning of polystyrene expander and moulding machine.
  - Contract management to design suspended scaffolding under Aerodrome bridge at Mt Maunganui and to carryout weekly site inspections for client.
  - Bi-annual inspection of amusement rides for Larex Enterprises Ltd.
  - Pipework design and drafting for addition of 4.5MW steam boiler at CHH Plywood Mill Mt Maunganui
  - Pipework design and drafting for extension to hot water boiler system at Kiwi Lumber Putururu
- Year 2007
- Design for 23 TPH deaerator and storage vessel to PD5500
  - Prepare heavy lift plan for tandem crane lift of various pressure vessel up to 80 tonnes on the Kawerau Geothermal site
  - Bi-annual inspection of amusement ride for Skyjump Auckland Ltd.
  - Design 24 tonne tank shell plate lifting cradle
  - Design for lifting lugs to support 60T clarifier tank at Kinleith Mill during site erection.
  - Design verification of 4T SWL spreader beam and lifting beam to AS4991.
  - Report to Ingham's Feed and Nutrition in to failure of steam control valves.
  - Pressure part design of vacuum chamber to AS1210.
  - Numerous monrail design verification's to AS1418.
  - Pressure part design of stainless steel vacuum receiver to PD5500.
  - Design check of replacement underground bitumen and hot oil pipework for Deltacorp under Tasman Quay at the Port of Tauranga.
  - Design check on bitumen tank modifications to AS1692.
  - Workbox (mancage) design verification to AS1418.17.
  - Various unattended boiler quarterly surveys.
  - Pressure part design of stainless steel pressure vessel and support tower design to PD5500 for Hexion Specialty Chemicals.
  - Design of stainless steel bungy swivel for AJ Hackett Macau Tower.
  - Pressure vessel design for Kawerau Geothermal Project, scrubber and demister vessels designed to ASME VIII. Sub-contract scrubber vessel to Babbage Consultants, nozzle design check by Matrix Consultants using finite element analysis.
  - Bi-annual inspection of amusement rides for Larex Enterprises Ltd.
  - Pressure part design of extension to hyperbaric decompression chamber to PD5500.
  - Investigation and report to Exxonmobil regarding bunker trailer air eliminator problems during re-fuelling of ships at the Port of Tauranga.
- Year 2006
- Design of pipework and supports for Pauanui Waste Water Treatment Plant.
  - Insurance investigation in to the rate of sinking of the Lady Lola of Motiti Island Bay of Plenty.
  - Mechanical maintenance report on equipment situated at Mokai Gravity Canyon



- Flying Fox.
  - Report to Exxonmobil regarding steam and condensate problems associated with relocated 4.5MW natural gas fired boiler at Mt Maunganui.
  - 2 x 5T SWL gantry crane design verification.
  - Review of Piping Support Structural design for Gas Turbine Pipework for Huntly E3P Combined Cycle Power Plant.
  - Design, drafting and supply of 500kg bungy retrieval winch for AJ Hackett on the Macau Tower, operating height 233 metres, project included emergency thruster brake manual disc brake c/w hydraulic boost as well as control cabinets and remote operator station.
  - Site inspection and certification of amusement devices including 320m high mast climb and Skywalk on Macau Tower.
  - Design and drafting of corner mounted domestic elevator guide track and floor structure.
  - 6000L boiler hotwell storage tank, design and drafting of vertical vessel and support structure.
  - Design and drafting of 1500kg hydraulic guide wire tensioning winches for Skyjump WooBang Korea.
  - Bi-annual inspection of amusement rides for Larex Enterprises Ltd.
- Year 2005
- Re-design of Skyjump Auckland incorporating new variable pitch propeller blades and Airmaster control system.
  - Pressure part design of standard finned tube heat exchanger to a maximum design pressure of 41.5 barg to both PD5500 and AS1210.
  - Investigation in to bi-direction Zipline installation in Singapore.
  - On-site inspection and certification of Macau Skyjump device for AJ Hackett.
  - Design and drafting of Skyjump device and hydraulic guide wire tensioning winches for Macau Tower.
  - Bi-annual certification of Skyjump Auckland jump device.
- Year 2003
- Preliminary investigation and testing of variable pitch propeller for installation on Skyjump.
  - Investigation in to the use of a dynamic cable brake for emergency stopping of Skyjump patron during descent.
- May 2004 to August 2006
- Page and Macrae Limited  
Mechanical/Design Engineer  
Pilot Gasification Plant**
- Commissioning of the pilot gasification plant and steam boiler. This involves fine tuning of the control and burner management systems. Training of operators in the safe operation of the plant and in the various methods of starting up and running the plant.
- January to August 2003
- Having completed the preliminary design and testing of the pilot gasification plant I then proceeded to negotiate with Fletcher Plywood Mt Maunganui to couple the gasifier to a second hand boiler and lease an area on their site to install and further test the plant to a commercial stage. This involved the design of the complete plant and associated equipment.
- August to December 2002
- After operating the plant for two months it was found that the original design by the Norweign Engineer Rolf Rummelhoff was not completely suited to the New Zealand Radiata pine and formed clinker as occurs in most woodwaste fired combustion systems in New Zealand. My job involved researching alternative grate systems to determine an appropriate design to build and test on the pilot plant. This required searching the internet, discussions with the Canterbury University, reading both old and new papers on the process of wood gasification.
- November & December 2000
- Mechanical design, erection and commissioning of 1.7MW Pilot Gasifier Combustion Plant in conjunction with Norwegian design engineer Rolf Rummelhoff.

April 2004	<p><b>Research Grant</b> Received a grant in conjunction with the Canterbury University in to the research of Woody biomass integrated gasification combined cycle technology for New Zealand. The research will be spread over a period of four years and at this stage we have only held one meeting at the Canterbury University.</p>
September 2003 to March 2004	<p><b>Skate Table Project</b> Tendered and won a contract to design and manufacture an automated system for loading and unloading 12 metre long containers while still positioned on the trailer. My job involved all aspects of the project including the preliminary design, tender presentation, contract negotiation, detailed design using the Inventor 3D solid modelling package, selection and purchase of all equipment, design of control system including P&amp;ID and fictional description, management of all workshop fabrication, commissioning and site installation. Produced both an Operating and Maintenance manual for the Skate Table.</p>
June to December 2002	<p><b>Waikato Water Project</b> Project Management of Treated Water Plant and associated pipework, subcontract to Waikato Water Joint Venture on Waikato to Auckland pipeline. Value \$2 million.</p>
April to August 2002	<p><b>Contracted to McKenzie and Ridley Limited</b> Foster Wheeler licensee. Design and drawing review on Manildra and Heinz Wattie boilers. Plant layout and tender preparation for various boiler proposals.</p>
April to May 2001	<p><b>Champion Flour Mill Project</b></p> <ul style="list-style-type: none"> <li>• Engineering investigation and contract management for the uplifting and relocation of 3500 tonne capacity grain silo and associated equipment at the Port of Tauranga..</li> </ul>
April to May 2001	<ul style="list-style-type: none"> <li>• Tendered and won the contract with Champion Flour Mill to relocate the 25 metre high bucket elevator and infeed screw conveyors from the relocated 3500 tonne capacity silo to the new mill</li> </ul>
September to October 2000	<ul style="list-style-type: none"> <li>• Tendered and won the contract with Champion Flour Mill at Mt Maunganui to relocate the 3500 tonne capacity silo from on the wharf to the flour mill one kilometre down the road. At the new location the silo was raised and placed on a 6 metre high steel base to increase the capacity of the silo from 3500 to 4000 tonnes capacity</li> </ul>
August 2000	<p><b>Harvey Farms Boiler Installation Project</b> Tendered and won the contract to supply and install a second hand 6000lb/hr shell boiler for Harvey Farms Inghams in Mt Maunganui. Scope included purchase of the boiler and then the installation of both the boiler and its associated pipework.</p>
May to July 2000	<p><b>Log Grapple Design</b> At the request of BHP Logistics at the Port of Tauranga I designed a mechanical log grapple with a lifting capacity of 22 tonnes based on two similar touch mechanisms used for handling bulk products. This unit is the first of its type in New Zealand and enabled the stevedores to load certain lengths of logs up to 50% faster than previous handling systems. Work involved all aspects of the mechanical design over seeing the draughting, submission of the design and drawings to M&amp;I for approval, shop supervision of the fabrication and the final load testing and putting the log grapple in to service.</p>
December 1999	<p><b>MWS Sludge Handling Project</b> Co-ordinating pipework fabrication for the MWS Sludge handling pipework through pipe fabrication workshop</p>
November 1999	<p><b>Harvey Farms Loadout Hopper Project</b> Harvey Farms Ingham Feedmill at Mt Maunganui.</p>

Tendered and won the contract to upgrade and repair the loadout hoppers and associated screw conveyor replacement. Involved co-ordinating work around plant production and shutdowns during the weekends.

May to August  
1998

**Anchor Products Pipebridge Project**

Project Management of Stage One Pipebridge and pipework for Anchor Products Te Rapa. Value \$1.3 million.

May 95 – Dec 97

**Rolls-Royce Industrial Power (Kinleith Project) Trading division of Rolls-Royce Industrial Power New Zealand.**

Assistant Project Manager.

Contract between Rolls-Royce Industrial Power and Electricity Corporation of New Zealand for a 39.6 MWe Woodwaste and Gas Fired Cogeneration Plant at Carter Holt Harvey Pulp and Paper Kinleith.

- Covered all aspects of a large Industrial Contract (value \$45 million).
- Participated in the technical evaluations with two large International companies; Asea Brown Boveri (ABB) Power Generation based in Sydney for the Electrostatic Precipitator (contract value \$2 million) and Turbine Generator unit from WH Allen of England (contract value \$7.5 million).
- Detailed design of particular items of fuel handling plant including the hydraulic systems to ISO 9001
- Negotiated and let subcontracts up to the value of \$3 million
- Prepared Technical Specifications for a large portion of the equipment and plant; electrostatic precipitator, fuel and ash handling systems, fans structural steelwork, hydraulic system
- Project Managed contract to the value of \$3 million
- Supervised the installation of a number of the large items of plant up to the value of \$2 million; fans, fuel and ash handling equipment, hydraulic system
- Updating of Process and Control diagrams for woodwaste, ash handling and hydraulic systems
- Commissioning of woodwaste, ash handling and hydraulic systems

Sept 94 - April 95

**John Thompson (NZ), Trading division of Rolls-Royce Industrial Power New Zealand.**

Project Engineer

- Preliminary design of both the fuel and ash handling systems for the Kinleith Cogeneration Project.
- Prepared cost estimates for a variety of items of plant and equipment including steel structures, fuel and ash handling systems
- Generation of Process and Control diagrams for woodwaste, ash handling and hydraulic systems
- Participated as part of the team in the negotiations between John Thompson (NZ) and ECNZ.
- Prepared Tender Documentation for submission to the client (ECNZ).

Jan 91 - Aug 94

**John Thompson (NZ)**

Project Engineer

Waipa Forestry Corporation of New Zealand - Woodwaste Fired Boiler  
28 tonne per hour steam generation at 45 bar

- Boiler pressure part design to BS1113
- Integration of structural design with pressure part design calculations
- Detailed design of woodwaste bunker and Reclaimer including hydraulic system
- Preliminary design of fuel and ash handling plants
- Project scheduling using Timeline
- Tender preparation and submission

Tachikawa Forest Products - Woodwaste Fired Hot Water Boiler  
4MW hot water generation for timber kiln dryers

- Boiler pressure part design to BS1113
- Integration of structural design with pressure part design calculations
- Detailed design of woodwaste bunker and Reclaimer including hydraulic system
- Preliminary design of fuel and ash handling plants
- Project scheduling using Timeline
- Tender preparation and submission

Southland Co-operative Dairy Company Edendale - Coal Fired Boiler  
40 tonne per hour steam generation at 60 bar

- Boiler pressure part design to BS1113
- Integration of structural design with pressure part design calculations
- Detailed design of Coal Reclaimer including hydraulic system
- Preliminary design of coal handling plant
- Tender preparation and submission

Anchor Products Co-operative Dairy Company Waitoa - Coal Fired Boiler  
40 tonne per hour steam generation at 45 bar

- Boiler pressure part design to BS1113
- Integration of structural design with pressure part design calculations
- Preliminary design of coal handling modifications to existing system
- Tender preparation and submission

Juken Nissho Limited (Gisborne) Boiler 40 tonne per hour steam generation at 27 bar.

- Boiler Pressure Part design to BS1113
- Integration of structural design with pressure part design calculations
- Hydraulic power pack and associated equipment design
- Project scheduling of workshop fabrication using Timeline version
- Preparation and updating of Process and Instrumentation diagrams
- Design, detailing, contract engineering, installation supervision and commissioning of woodwaste handling plant

Kiwi Co-op Dairy - 20 MW Gas Fired Boiler

- Boiler pressure part design to BS1113

Distileria Bago Limited - 40 TPH Gas Fired Boiler

- Boiler pressure part design to BS1113

Canterbury Timber Products - 7.3 and 10.4 MW Hot Oil Heaters

- Pressure Part design to BS1113
- Integration of structural design with pressure part design calculations
- Hydraulic power pack and associated equipment design
- Design of a pneumatic conveying system for conveying sander dust
- Project scheduling of workshop fabrication using Timeline
- Design, detailing, contract engineering, installation supervision and commissioning of woodwaste handling plant

Design, detailing, construction supervision and commissioning of a hydraulic tube swaging press, including hydraulic circuits and PLC design. Designed to reduce boiler tubes in diameter from 76mm to 60mm. Value \$50,000.

Aluminium Smelter - Sicon Conveyor

Contract Management

Contract value \$2 million

Conveyor length 500 metres

Contract won by John Thompson Australia with the New Zealand content managed by John Thompson (NZ).

Plant and equipment tendering and bid evaluation  
Juken Nissho Limited (Masterton) Boiler 40 tonne per hour steam generation at 25 bar.

- Boiler Pressure Part design to BS1113
- Hydraulic power pack and associated equipment design
- Deaerator and flash vessel design to BS5500
- Project scheduling of workshop fabrication using Timeline version
- Preparation and updating of Process and Instrumentation diagrams
- Design, detailing, contract engineering, installation supervision and commissioning of woodwaste and coal handling plants
- Compiling of Plant Operating and Maintenance manuals

Thermal and pressure part design of a variety of air heaters and economisers.

Completed 5 papers in an 8 paper Certificate in Business Studies - New Zealand Institute of Management (NZIM).

1989 - 1990

**BE Studies**

Studied for a Bachelor of Engineering (Mechanical) degree at the University of Auckland.

Employed by New Zealand Steel - Glenbrook preparing Quality Assurance Document and carrying out an audit on the various idlers and drive rolls in the Continuous Galvanising Plant, including a period as charge hand during the annual Christmas shut-down.

1985 - 1988

**Apprenticeship**

Alex Harvey Industries (AHI) Plastic Products Limited

Served an 8000 hour apprenticeship as a Plastics Engineer, during this period also studying for the New Zealand Certificate in Engineering (NZCE) Mechanical. Work experience involving fitting and turning, die setting, Draughting, machine maintenance, hydraulic and pneumatic fitting, including a variety of plastic moulding techniques.