

# Action and *Re* action: home grown timber and imported prefabricated housing.

**Chris Murphy MArch ANZIA.**

Senior Lecturer  
UNITEC NZ  
School of Architecture and Landscape Architecture.  
Auckland New Zealand.

**ABSTRACT:** One thousand prefabricated buildings were imported in a systematic manner by the New Zealand Government from Europe and erected in the Titahi Bay area of Wellington and the Tamaki area of Auckland NZ. These kitset buildings, manufactured in both England and Austria, were shipped to NZ and put together on site in New Zealand by immigrant tradesmen especially selected in their country of origin for the task. The importation, carried out between 1953 and 1956, remains to this day the largest state sponsored importation of prefabricated buildings.

Of all the issues facing the project, the decision to use imported timbers proved to be among the most contentious, striking at the heart of NZ perception of itself as a nation of timber builders. This paper will explore the background to the timber controversy, including the resource availability issues associated with native and exotic species that led to the initial decision. It will also discuss apprehensions within the NZ Forest Service to the importation, quality control issues associated with securing timber quality within Austria and in NZ, and give reasons for the hypothesis that the political issues surrounding the use of imported timber, were instrumental in limiting the long term acceptance of this unique State sponsored building project as a template for future housing procurement.

Conference theme: History of Building Science  
Keywords: History of Construction Technology; Prefabrication; Pre-cut.

## **INTRODUCTION**

In May 1952 The New Zealand Government formally approved the letting of tenders for the construction of 1000 imported prefabricated State houses within the Titahi Bay area of Wellington and the Tamaki area of Auckland. The project was a unique Government led State prefabricated housing venture unsurpassed prior or since in the scale of its undertaking. These kitset buildings, manufactured in both England and Austria, were a significant supplement to the 1950's New Zealand State house building effort. Though similar in size and layout (Figs 1 & 2) to the earlier cottage styled versions of the state house, stylistic innovations such as larger windows, weatherboarded cladding and lower pitched lightweight corrugated sheet roofs marked distinguished them from their concrete tile, brick veneer and weatherboard clad predecessors. (Fig 3)

The decision to import the pre cut timber houses along with the immigrant labourers to build them represented a significant policy shift for a nation that prided itself on its state house building capability and underlies the seriousness of the social and economic pressure on the Government of the day. It also marked a change of direction for the ruling National Government, hitherto reluctant to spend precious overseas funds in a venture many thought was ill conceived and unlikely to produce the cost savings envisaged.



Figure 1: English Prefabricated Imported State Housing, Glen Innes Auckland. Contractor Simms, Sons & Cooke Ltd

“The cost of [these imported prefabricated] houses will not be less than our own. If so, why should we expend overseas funds? Properly organised, we should be exporting prefabricated houses - not importing them.” (Bowden 1950)

Reasons for this change of attitude lie within the political context within which this post war expansion occurred and are summarized as follows.

The re-armament programme, brought about by the cold war, limited funds for building. The 1951 waterfront strike, a strike that remains one of the most bitter in New Zealand's industrial relations history, compounded delivery problems already stretched by the shortage of manpower and materials and ensured the already erratic nature of material supplies remained, leading to downstream hold ups in construction work. Economic productivity suffered as men were transferred to other sites while shortages applied.

Government departments had hitherto been reluctant to commit overseas funds for imported buildings, however continued resistance to applications for import licences meant opening the Government to charges they were hampering essential house building, a charge the Government was extremely sensitive to and vested interest groups obviously happy to exploit. Compounding the demand side of the equation was a population influx from returning servicemen and women and resettled refugees, anxious to commence the next phase of their lives, and wanting, not Transit housing but a State house worthy of the name! (Murphy 2008 145)

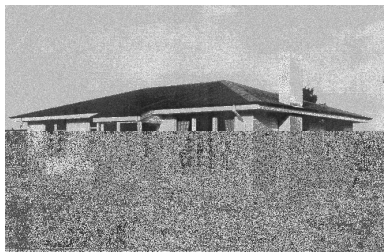


Figure 2: Austrian Prefabricated Housing Titahi Bay Wellington NZ. Contractor Thermo Insulated Units Ltd

These influences contributed greatly to shortages in material supply and labour and to a political environment that required action. The Government hoped the importation of "prefabricated" houses would significantly reduce pressures on the key suppliers struggling to keep up with demand for materials in the post war building expansion. They also hoped the immigrant tradesman recruited especially for the task of erecting them would minimise the existing shortage of skilled tradesmen *willing to work in the State housing industry*. The men would be contracted for the specific purpose of erecting the prefabricated houses in the areas allocated, and would not be free to move or work for other more profitable sectors of the industry elsewhere in New Zealand until their contract had expired and subsequent permanent residency status (if granted) had been achieved. This restriction they hoped would ensure continuity of construction at a time when the acute shortages of labour had builders choosing the more lucrative privately funded projects ahead of the socially responsive social housing initiatives.

Cabinet approval for the construction of the 500 pre-cut houses in the Wellington area came in the form of a letter, dated 6th May 1952, from the Secretary to the Cabinet to the Ministry of Works accepting the tender for the sum of 1,371,000 pounds from Thermo Insulated Units Ltd. The same letter indicated provisional acceptance of the English firm, WJ Simms Sons and Cooke of Sherwood of Nottingham as the supplier of a further 500 pre-cut

houses for the Auckland suburb of Glen Innes, subject to successful negotiations over price. (Secretary to Cabinet 1952)



Figure 3: Early examples of NZ constructed State Housing Examples (Shaw, 1997)

### 1. EXOTIC TIMBER QUALITY

State exotic forests were established in 1896 when an Afforestation Branch of the Lands department was formed and forest-tree nurseries were established at Tapanui, Eweburn and Rotorua. (New Zealand Census and Statistics Report 1952 450) Initial plantings were of a wide variety of species, many of which failed to flourish. As time and further experimentation sharpened experience the "successes" to emerge included *Insignis pine*, the predominant species, together with other species such as *Douglas fir*, *Corsican pine* and *Ponderosa pine*.

Unfortunately the boom afforestation period of the depression years and earlier saw plantings made at a wide initial spacing. A failure to "plug the gaps" with the original species resulted in trees that "...are often open grown and branchy and are producing firewood and pulping material rather than saw-logs". (ibid 451) An Incorrect silvicultural treatments, particularly a lack of thinning and high pruning resulted in many forests stagnating and failing to reach their potential as final crop trees. A comparison of farmed and non-farmed planting can be seen in the photos (Fig 4).



Figure 4: Comparison of farmed (young) and non farmed (aged) Radiata Pine plantings.

Past deficiencies also aggravated supply problems included "*bad Age-class distribution*," a term used to indicate too many plantings of similar age leading to a temporary oversupply over a finite period, with shortages before and after. Other deficiencies included too high a proportion of *insignis pine* in many areas, leading to the possibility of insect or fungal attack on an epidemic scale, and low productivity as a result of many "good soil" areas holding too many poor or under performing species. (ibid 451)

These deficiencies saw many of these State exotic forests, though present by 1950 in sufficient *quantity* to potentially meet local requirements (the 400,000,000 board feet available per annum was estimated to be only slightly short of the current yearly consumption), suffered short comings of a *qualitative* nature that made for complex management and limited the acceptance of the exotic pine as a quality building material in the minds of the building public

### 2 INDIGENOUS AND EXOTIC TIMBER SUPPLIES

Concern by the early 1950's was also mounting about the long term availability and continued indiscriminate use of indigenous timber resources. In 1952 the NZ Forest Service, in its report to Parliament, suggested the need to decontrol prices increases and reduce output as a way of conserving native species and to achieve a better balance between the use of indigenous and exotic softwoods.(New Zealand. Parliament 1952;298 1972) Some members of Parliament resisted this, on the grounds that it "...was not much use leaving timber for house building

later on, if people at the moment had crowded and inadequate homes". Others however acknowledged the time had come to limit use of indigenous timbers where exotic could serve just as well.

"It did seem ridiculous that the price of native timbers was being persistently held down in order to encourage people to use them and to prevent them using exotics...The country could not continue very long to follow that policy, or people in twenty years time were going to say some pretty harsh words about this generation...(New Zealand. Parliament 1950:293 1792)

Contractors had relied traditionally on the extensive use of indigenous timbers to support their building activity and resisted attempts to change. They also lacked the confidence to use exotics as a substitute timber. Some could not make up their minds. The member for Marlborough for example, viewed properly treated exotic timber as sufficiently durable to have :

"..... quite as long a life as hard native timbers, [and] should be encouraged. Treated, they should be used for the bottom of houses and could be used for internal timbers without treatment"

but, on the other hand, and in the same statement, drew the line at their use as suitable structural framing timbers in lieu of imported Oregon:

"...He had heard it suggested that local exotic timber should be used in place of imported Oregon pine. He would hate to walk across some structures which were perfectly safe, built of Oregon, if they were built of New Zealand exotic timbers. They were very short in the grain and did not have a fraction of the strength of Oregon." (New Zealand. Parliament 1950:293 1793)

Key players in the building industry still saw indigenous or selected imported framing timbers (particularly Oregon) as the only viable structural solutions to house building. An exception was the Master Builders Federation, who saw this attitude as aggravating supply problems and the reason that "there is not sufficient timber to keep all the men available for house building fully employed..." The timber shortage, insisted the Master Builders Federation, was due to the rigidity of "the specifications laid down by local bodies and Government Departments which prescribe certain types of timber in short supply while other types are readily available." (New Zealand. (Parliament 1950 293:3703) This was denied by Goosman (Minister in Charge of Housing Construction) who spoke of the availability of alternatives in Ministry documents and agreements with the State Advances Corporation over the use of exotic timbers. However a statement by the secretary of the Dominion Sawmiller's Federation to the fact "...that *Pinus radiata* [an exotic timber] was approaching 40 per cent of the total national output of sawn timber, but its usefulness for building had been but grudgingly admitted" probably summed up the attitude at that time of key architects and specifiers in the Ministry of Works to the use of exotics. (ibid 3703)

### 3. QUALITY OF IMPORTED TIMBER

To the fore in voicing these apprehensions was, appropriately, the New Zealand Forest Service, at first glance seemingly with a foot in each camp, on the one hand wishing restrictions on the use of indigenous timbers for conservation reasons, thus in turn generating more pressure to import, yet criticising the use of imported softwoods in many of privately imported housing.

In fairness to the Forest Service, their issue was more the quality of the imported timber, not imports per se, and hinged around such defects as the unwelcome presence of bark in the timber supplies, potentially shielding insects and larvae, and the use of dip treatment of softwood timber when the Forest Service had made it clear to manufacturers that pressure treatment by a recognised wood preservative was the minimum acceptable. Reports to Mr R.B. Hammond, the Director of the Housing Division expressed concern over timber quality in prefabricated housing as far back as August 1951. An additional report signed by a Mr Barker, timber inspector, dated 29<sup>th</sup> April 1952 stressed again the need for prefabricated imports to be quarantined until inspected and passed for entry. Implicit in its report is the inference that importers of timbers cannot be trusted and must be subjected to rigorous scrutiny. An example of substandard practice given was that of one Dutch importer, where imported house timbers were dipped after the timber had been bundled, resulting in a complete lack of penetration and soakage.

Barker's advice on timber matters followed the Housing Director R B Hammond to Europe even in the post tender inspection of the housing prototypes, and the correspondence indicates a desire to familiarize Hammond with the range of common European timbers, such as *Pinus Sylvestris* (Baltic pine, Baltic redwood, Scots pine) and *Picea Albies* (Spruce, whitewood and white deal) , and inform him about the durability and treatment difficulties associated with such timbers.(Housing Division File, 1952)

At the heart of the discussion, no doubt fuelled by the timber debate at home, was apprehension about the suitability of the selected European timbers such as spruce to absorb the salted treatment via pressure treatment. NZ was about to import from Europe and the UK sufficient timber to construct 1000 houses. It was important issues of durability and treatment were fully canvassed. The discussion even extended to include the British supplier of the Wolman Salts and Tanalith TP, a Mr Hickson, who worried that the Austrian treatment plants were not using the treatments salts "as they should be" and further recommends the timbers be crated to New Zealand

and pressure treated there. (ibid, 1952) Hickson's lack of trust in the European treatment process no doubt influenced Hammond, who, but for the fact that the timber had already been ordered, would have asked for NZ Pinus to be substituted "for some portions of the houses or even the sheds" had it not been "too late when I arrived for Thermo to change.." (Hammond, 1952)

The preference of Hickson and Hammond for pressure treatment of the European timbers runs contrary to that of the Austrian prefabricated house supplier Thermobau, who insisted that Hickson's approach of pressure treatment does not work for German spruce; but that trough soaking does, and is preferred for this type of European log. (Thermobau Insulated Units Ltd, 1952) Unfortunately for the project, German spruce was a major supply timber in Austria, and the alleged difficulties in achieving suitable pressure treatment for the timber occupied much of Hammond's energy in the trip to inspect the housing prototypes. His initial reluctance to accept local advice that soak treatment in tanks produces better results than pressure treatment for this timber was only resolved after his return to London from Vienna to clarify points regarding timber impregnation with experts drawn from timber treatment plants and the Forest Products Research Laboratory in Princess Risborough, England. A compromise solution agreed that the timber should be pressure treated to certain detailed specifications, but that the Austrian contractor Thermobau could submit samples for testing taken from the cold bath soaking treatment and also samples from the pressure treatment. Should the results be the same then "we would consider using bath treatment.." (Hammond, 1952 )

It is tempting to suggest that New Zealand's attitude to Austria suggested a Commonwealth bias for all things British. The implication that major international manufacturers and suppliers in Europe were incapable of getting the timber preservation issues correct indicates a comfort level with the British approach and with the British contractors that was not apparent in their dealings with the Austrians. Simms and Co, the British suppliers of 500 houses destined for Glen Innes Auckland, were mentioned little in the correspondence associated with timber impregnation and prototype inspection. On the contrary Thermobau, the Austrian contractor, received explicit instructions for example to:

“..Put the timber through treatment plant in bundles en route to the port of shipment, but [ensure] hardboard strips to be placed to divide the timber in the bundles to allow for the preservative to get to the inside of the bundles and allow drying. Tanalith U solution is to be used...” (Hammond, 1952, 13<sup>th</sup> Aug)

Other instructions confirmed the use of heart (Baltic) pine to a "sample standard", or where heart pine was not available, that spruce would be acceptable but only if pressure treated to the conditions outlined in the contractual correspondence.

Not all experiences with the Austrian were negative. However, there is the feeling in the correspondence that if only more suitable British firms had been available, they would have been chosen. "The country" concluded the Commissioner of Works at tender time " is likely to receive better service from an English firm but this should not prevent consideration of any other satisfactory offers received. (McKillop, 1952) Thermobau, the Austrian contractor had emerged as a contender only after less suitable British firms had been discarded. They fell into this category of "other", and its representation in the report to the Minister of Works as 'a London firm using Austrian components..' rather than the reality, which would have acknowledged it as 'an Austrian component manufacturer with a London office' was designed to present the firm with a commonwealth flavour, and admits to the preference to look for solutions from England where possible.

Thermobau did have the confidence of the Australian authorities. What appealed to Hammond was its preparedness to accept completely the construction methods as outlined in the plans and specifications of the Victorian Housing Commission. All fabricators had their own systems; some often had difficulty adjusting to the standards of countries into which they were building. The Thermobau houses, conforming as they did with the Victoria Housing Commissions brief, were hence comparable with orthodox Australian construction and by connection, could be made compatible with New Zealand standard construction. Even the horizontal weatherboards, as opposed to the vertical weatherboards of the Simms Sons & Cooke construction, were to Hammond 'more in accordance with NZ practice and is an added recommendation.' (McKillop, 1952)

Hammond was also impressed with the pre cutting systems that existed within Austria and wished to introduce the knowledge gained about pre cutting and prefabricated systems "...into the normal state house building in New Zealand". (Hammond, 1952) Austria and New Zealand shared a tradition of timber construction. New Zealand's timber cutting machinery was, in the opinion of some, antiquated. The machinery and infrastructure within Austria required to produce mass numbers of prefabricated and pre-cut structures was superior. Docking machines, sophisticated dovetail machines and large cutting saws made large scale prefabrication more feasible. (Simanke, 1998)

#### **4. RE ACTION:**

At the heart of the timber debate was the growing opposition to the importation of houses made of timber not originating in New Zealand.

Delays in the tender examination process, emanating from a lack of experience and consultation on the part of the Housing Division for this type of international tender (Murphy, 2008: 145), contributed inadvertently to the timber debate, pushing as it did the ultimate tender acceptance into a period of emerging economic downturn. Had Cabinet's decision to proceed come in the heady economic climate of 1951 when timber scarcity was much more to the fore, the controversy that dogged the project would not have been so evident. As it was, by the latter part of 1952, the importation of the houses and the foreign timber from which they were built were ready targets for an Opposition intent on making political capital from the fact that inferior imported timbers were replacing superior indigenous and exotic timbers grown here in New Zealand. According to Kearins (Waimarino)

"The cream of the indigenous timber was peeled and turned into plywood. When peeled, totara, for instance, was no better than any of the soft timbers, because it was used inside. There were many substitutes for that material. Indigenous trees should be cut into timber [not plywood]. Then, in order to help the exotic timber industry the importation of softwoods should be cut down..." (New Zealand Parliament 1952:298 1792)

Kearins referred to a NZ forestry report as suggesting the timber in the imported prefabricated houses "was not as good as New Zealand exotic timber" and their importation on a larger scale had raised a new problem of inspection and treatment. "Approximately one house in eight required inspection before it could pass the import inspection" suggested Kearins. "In many of the all-wood construction types much low grade timber contained excessive bark, stain and decay, and active insect attack had necessitated complete heat treatment. In New Zealand ... much better timber was available for house building. The importation of prefabricated houses should be stopped. (ibid)

Others, such as MP Walter Nash (soon to be Labour Prime Minister) referred to information that "timber coming into the country in pre-cut houses was worth 338,000.00 pounds. Why should New Zealand import 338,000.00 pounds worth of timber when it was shutting down its own mills because there was not sufficient demand? Was New Zealand's overseas exchange so plentiful that the Government could squander it?" (ibid. 1793)

Opposition was not restricted to members of Parliament. Other vested interests such as the Auckland Timber Merchants Association, the Coppersmiths Manufacturing Guild, the Wellington Manufacturers Association, the NZ Electrical Federation and the NZ Manufacturer's Association all felt compelled to add their voice. The former suggested NZ timber was readily available and wanted as much as possible on the contract. (Auckland Timber Merchants Association, 1952) The latter, in a letter to Goosman, Minister of Housing expressed concern at the importation and requested assurances that such contracts will not be permitted to interfere with the production of NZ Manufacturers producing similar products to those on the schedule of imports. (New Zealand Manufacturer's Association 1952)

The Dominion Sawmillers Federation also took issue with the situation. In an extensive letter to Goosman they acknowledge the long lead in period operating for this project, commenced when the timber supply position was more acute than is now the case. The letter does not seek to oppose the use of all imported timber in the project but takes issue with a published statement from Goosman that "New Zealand Pinus in general had not the all-round suitability of Baltic and other Continental timber" for housing building. With proper care in production, grading, handling and usage they argue (including preservative treatment for sub-floor members), NZ pinus radiata will stand up to all requirements equally "with these European woods, especially of the poor qualities of big shipments of the latter which were recently inspected in Australia". (Dominion Sawmillers Federation 1952)

Also not slow in coming forward were political bodies representing workers interests. "Members are of the opinion", thundered the Palmerston North central branch of the labour party, "that there is ample exotic timber in this country which when treated, is more than equal in quality to any of these Foreign kinds of timber". (Labour Party, Palmerston North Central Branch 1952)

Such comments and the economic reality in the latter part of 1952 had the Government in a more defensive mode. Goosman's (the minister of housing) response that "...I suppose you have not realised that the houses were ordered when there was a timber shortage" (New Zealand Parliament 1952:298 1793) indicated the political dilemma facing a Government with projects spanning economic downturns.

## **5. CONCLUSION:**

The project proceeded with imported timber, in spite of protestations from vested interest groups and apprehensions even from within governmental departments over the quality and quantity issues associated with imported timber. New Zealand timber supplies, confirmed the Director of Forestry, were still insufficient to meet the extra demand created by post war housing boom. (Secretary to Treasury 1952) Figures put out by the accompanying Ministry of Works report on State houses built the previous year still showed a decline in housing from over 4000 for the year to 31st March 1951 to 2493 for the year to 31st March 1952. A similar figure was projected for 1953. These figures, claimed the report, 'are quoted to emphasise the necessity for the erection of imported houses, which do not rely upon the materials and manpower available in New Zealand.' (Commissioner of Works 1952)

New Zealand however was a nation of timber builders. The only timber imported were small quantities of specialist use timbers, such as high strength imported Oregon for structural timbers. Hence it could be expected that, in spite of this post war era of extreme material shortage, any large scale deviation from the long accepted use of home grown timbers in the construction industry would be controversial and viewed as a potential threat to jobs and livelihood. And so it proved. In a nation built on the premise that "Jack was as good as his master" all interested stakeholders in the debate who saw these importations as a threat to the fast growing NZ timber were not circumspect in coming forward and telling their political masters of their unhappiness. Most were reasoned and based on legitimate concerns for their member's welfare. Some comments, such as those from the Palmerston North Central Branch of the Labour Party hint at the myopic nature of New Zealand society in the 1950s. Others, including that from the Makara County Council suggesting that "sash hung windows and the flatter floors with 8' 2" studs will give a rather squat appearance to the building" continue the New Zealand tradition to democratic comment on matters of design, irrespective of background or qualification, where public money is involved. (Makara County Council 1952)

The government responded in the early 1950s to the acute post war housing shortage by instigating the state sponsored imported prefabricated and pre-cut housing scheme of a size not repeated since. The decision was spurred on by sustainability concerns associated with the use of indigenous timbers and quality and quantity issues associated with the use of exotic timber. Conceived at a time of scarcity of labour and materials, a slow uptake and lack of experience meant implementation of the scheme crossed into a period of economic downturn. The ramifications of this downturn heightened antipathy to the scheme and focused attention on the deficiencies of timber imported at the (perceived) expense of New Zealand's own fledgling exotic timber industry. The complaints worked. "Government, indicated Goosman by July 1953, "has no intention at the present of importing further pre-cut or prefabricated houses from overseas..." ( Goosman 1953)

The political issues surrounding the use of imported timber were a factor in restricting the acceptance of this unique Government sponsored project as a template for future housing procurement in New Zealand.

## REFERENCES

- Auckland Timber Merchants Association (24<sup>th</sup> July 1952) *Letter to Hon W.S Goosman, Minister of Works* HC 1/8/1/1/No 3 Access W1353 Wellington: National Archives.
- Bowden, C.M. (28<sup>th</sup> July 1950) *Letter to Cabinet, including an application to import* W1353 HC 1/8/1/2 Wellington: National Archives.
- Commissioner of Works (17<sup>th</sup> April 1952) *Letter to Minister of Works* HC 1/8/1/2/Pr1 Access W1353 Wellington: National Archives.
- Dominion Sawmillers Federation (3<sup>rd</sup> June 1952) *Letter to Hon W.S Goosman, Minister of Works* HC 1/8/1/1/No 3 Access W1353 Wellington: National Archives.
- Goosman, W.S. (20<sup>th</sup> July 1953) *Letter to Federation of Labour* HC 1/8/1/2 Pt 1 Wellington: National Archives.
- Hammond, R.B. (11<sup>th</sup> Aug 1952) *Letter to Commissioner of Works* HC 248/10/B/Pt 1 Wellington: National Archives.
- Hammond, R.B. (13<sup>th</sup> Aug 1952) *Letter to Thermobau Insulated Units Ltd* HC 248/10/B/Pt 1 Wellington: National Archives.
- Housing division file (1952) HC 248/19/B/Pt 1 Wellington: National Archives
- Labour Party, Palmerston North Central Branch. *Letter to Minister for Housing* HC 1/8/1/1/No 3 Access W1353 Wellington: National Archives.
- McKillop, E.R. Commissioner of Works (9<sup>th</sup> Nov 1950) *Letter to Minister of Works* Acc W1353 HC 1/8/1/2 Pt 1 Wellington: National Archives.
- McKillop, E.R. Commissioner of Works ((14<sup>th</sup> Feb 1952) *Letter to Minister of Works* HC 1/8/1/2 Pt 1 Wellington: National Archives.
- Makara County Council (22<sup>nd</sup> Aug 1952) *Letter to Commissioner of Works* HC1/8/1/2 Pt1 Acc W1353 Wellington: National Archives.
- Murphy, C.P. (26<sup>th</sup> Nov 2008) *Sustainability issues leading to the importation of prefabricated post war state housing in New Zealand*. ANZAScA 08. Proceedings of the 42th Annual Conference of the Australian and New Zealand Architectural Science Association. Ed Ning Gu *et al*. University of Newcastle, NSW, Australia 2008
- New Zealand Manufacturer's Association (22<sup>nd</sup> May 1952) *Letter to Hon W.S Goosman, Minister of Works* HC 1/8/1/1/No 3 Access W1353 Wellington: National Archives.
- New Zealand. Parliament (1950) *New Zealand Parliamentary Debates* Wellington: National Archives.
- New Zealand. Parliament (1952) *New Zealand Parliamentary Debates* Wellington: National Archives.
- Secretary to Cabinet (6<sup>th</sup> May 1952). *Memorandum to Ministry of Works* HC 248/11/A Access W 1353 Wellington: National Archives.
- Simanke, Gerhard. (Nov 9<sup>th</sup> 1998) Austrian Consul to New Zealand. *Record of discussions with author*.
- Thermobau Insulated Units Ltd (1952) *Letter to R.B.Hammond*, HC 248/10/B Pt 1 Wellington: National Archives.