# MATANGI FACTORY
# HISTORIC PLACES TRUST
# RESTORATION PROPOSAL

By

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**and**

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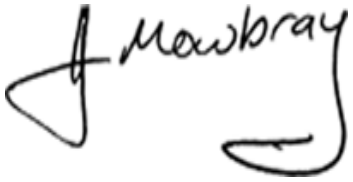

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## HISTORY

Investigating the history of the Glaxo building and site will be an on going project. So far it has been an extraordinarily interesting journey and has resulted in some really exciting finds. For arguments sake, we had no idea that there had been an earlier dairy factory on the site before the Glaxo factory. We were even more surprised when we got a photo of this earlier factory and realised that it was still on site. More surprises were to follow with the discovery of not another one, but another three factories. This made a total of four factories in Matangi before the main "Glaxo building" was constructed between 1917 and 1919.

**THE FIRST FACTORY**

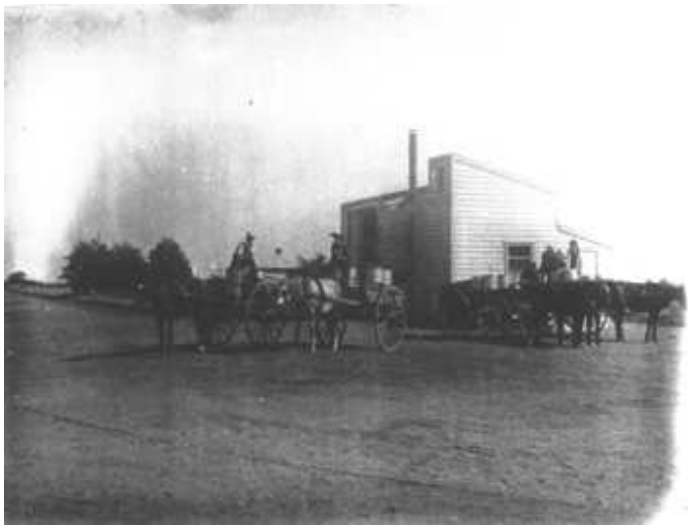
The first factory we now believe to have been built on the site was a creamery. This was built in 1885 and in 1886 was supplying cream to Henry Reynolds' newly built Pukekura Butter Factory. This was the first butter factory in the Waikato and Reynolds was responsible for the original brand name "Anchor", allegedly because he had one tattooed on his arm. Matangi continued to supply cream to Pukekura until Reynolds built another butter factory at Newstead in 1888. At this point Matangi began to supply Newstead. Henry Reynolds was expanding Anchor at a great rate and he commissioned the building of many other creameries and skimming stations through the Waikato to keep up with his demand. In 1896 Henry Reynolds sold all his interests in the dairy industry, including the Anchor brand name, to the New Zealand Dairy Association (N.Z.D.A.).

**Henry Reynolds**

In 1912 the creamery was destroyed by fire but it was re-built shortly after.

We are still trying to determine where this building was located on the factory site.

**The old creamery on the Matangi site, built we believe in 1885 when the site was established. It burnt down in 1912. This photo was taken in 1906.**



**THE SECOND FACTORY**

In 1894 a site in Matangi, adjacent to the railway line at the back of the present factory, was purchased by the New Zealand Packing Company. Sometime before 1900 they built a cheese factory.

In 1900 the cheese factory was taken over by W.T. Murray & Co. Ltd and they altered it to make condensed milk. New buildings were added to the left and right of the cheese factory and a large boiler was installed. While construction took place the Cheese factory continued to operate. Around 1901 W. T. Murray & Co Ltd commenced production of Highlander condensed milk.


In 1916 W. T. Murray & Co. Ltd went into liquidation and production of condensed milk ceased. The Murrays were apparently having problems with the tin plate they were using in the canning process and a lot of milk was spoiled due to the solder on the tins not sealing properly.

W.T. Murray & Co. had also purchased the Milk Preserving Works at Underwood near Invercargill and also produced Highlander condensed milk at this plant. Like the Matangi factory this plant went into receivership and was taken over by another company, the New Zealand Milk Products Company. In 1938 Nestlés got full ownership of this Milk works. Consequently, the "Highlander" brand became known as Nestlé®Highlander®.

The "Highlander" brand first made at Matangi has lived on through the South Island subsidiary and Nestlé.

Interestingly while our investigations pointed to W.T. Murray & Co. having problems with the soldering on their cans, we have also discovered that a Mr. William Sim, who worked as an engineer in the W.T. Murray & Co. Ltd Underwood plant, invented an "automaticcontrivance" a machine used for capping cans without the use of solder at an impressive rate exceeding 60 cans per minute. By 1913 the "Sims capping machine" was capable of capping over 17,000 cans per day. Sim duly took his invention to

America and followed up earlier patent rights in New Zealand with Commonwealth patents and letters of protection.
We are still investigating whether Matangi had a “Sim’s capping machine” Regardless of whether it did or not, this was another extraordinary invention that has come out of the New Zealand Dairy industry essentially transforming canning to the present day.

**William Sim and his capping machine**

In 1916 the building was taken over by the Matangi Cheese Company. They commenced cheese manufacture; this was only a small co-operative with just 15 suppliers. The following pictures show the Cheese Factory operating while the boiler house and associated buildings are under construction.

**The New Zealand Packing Companies cheese building during construction of the condensed milk buildings. Photo believed to have been taken in 1900**

**Photo of the New Zealand Packing Companies Buildings. An extra two buildings have been built onto the left of the main building. These two buildings are still on the site.**

The boiler buildings to the right have since been removed. Other photos we have indicate the flue was removed about 1930. The other buildings to the right would have been removed sometime pre 1946 when the new generator and boiler was built on this site.

After construction of the Glaxo building the building was used as a milk powder store and over the years these buildings have been used for many other things. On some drawings it is labeled processed cheese; other people remember it as a lunch room, a gym, and a billiards room.

**The New Zealand Packing Companies Cheese/Condensed milk factory as it stands today**

**The New Zealand Packing Companies Cheese/Condensed milk factory as it stands today**

**Huge sandwich style beams bolted together make up the truss work inside the building to the immediate left of the original factory.**

## THE THIRD FACTORY

In 1900 a butter factory was opened in Matangi by the N.Z.D.A. Arthur Furze was the prime mover behind this development. Note that at this stage the N.Z.D.A. had purchased and was running Henry Reynolds' butter factories around the North Island as well. This then saved any of the milk collected at the factory from having to leave for processing.

We are once again unsure of the location of this factory. However, it would make sense if it was in the same area as the N.Z.D.A. cheese factory, which was built on the opposite side of the road adjacent to the railway line.

**THE FORTH FACTORY**

In 1914 the N.Z.D.A. built a cheese factory in Matangi on the opposite side of the road to the New Zealand Packing Companies Buildings. When the Glaxo factory was built this building became a workers hostel for the Glaxo employees. It then became a play centre and now once again has reverted back to a hostel.

**Glaxo Hostel around 1920, previously the N.Z.D.A. cheese factory**

**Photo of the N.Z.D.A. cheese factory taken in 1985 as a play centre.**

**Photo of the N.Z.D.A. cheese factory taken in 1985 as a play centre.**

**The N.Z.D.A. Factory as it stands today, as a hostel again.**

## THE FIFTH FACTORY ON THE SITE

The fifth factory to be built on the site was the Glaxo Factory. The following pages go into the history and the development of the site through to the present day. It is this building that has the category II status with the Historic Places Trust and is our primary interest.

## GLAXO

The story of the "Glaxo building" goes back to Bunnythorpe to Joseph Edward Nathan.

In the late 1800's dairy farming was not a stand alone option. Most farmers would keep a few dairy cows to supply the needs of themselves and their families. Anything extra would be sold or bartered at the local store.

1882 saw the advent of refrigerated transport. This transformed the opportunities available for dairy production. Farmers could move their produce not only around the country, but around the world as well. Dairy farming went from a way of life to a way of living, both accessible and profitable.

From 1883, now that the dairy industry was a viable business, numerous dairy factories began to dot the landscape. Most of these factories were small, dealing with only 10-20 farms in the close vicinity including the factories at Matangi.

Most of the small factories were built hurriedly to get in on a booming market and while they have historical significance they had little architectural or cultural significance.

Joseph Nathan saw the advantages of refrigeration early on and was at the forefront of this movement. He built or bought into 17 creameries in the Manuwatu and held shares in dairy factories. With his sons he became interested in dried milk and in 1904 he secured the rights to a roller drying process for drying milk but it was flawed. The Nathans, however, remedied the problems and obtained patents. Their Makino factory became the first in New Zealand to produce dried milk, which it continued to do for a further 70 years.

The target markets for this were the growing cities in England where fresh milk was not readily available and hygiene

considerations made dried milk a very good proposition as an alternative baby food.

**Roller style milk dryer in operation. The milk was sprayed onto the hot surface and then scraped off as the steam heated cylinder rotated.**

After discussion the Nathans decided that "Glaxo" would be the name of their new Baby food. Success was not immediate but came after "the Glaxo Baby Book" was produced in 1908 after nurses employed by Nathan found it difficult to answer the flood of mothers enquiries. By 1922 a million copies of the baby book were published, Glaxo was a household name and the book would endure for over 60 years.


**Glaxo "Baby Book"**

Personal specific mail was sent to doctors, personal visits were made and birth notices were used to mail mothers. The Advertising World Magazine said that, “It was the most successful form of advertising of the present day.” In 1913 they said, “Seven years ago Glaxo was known among a very small section of the community – today it is no exaggeration to say every mother knows about Glaxo.”

By accident Glaxo had invented direct marketing. The Glaxo slogan “Glaxo Builds Bonnie Babies” was known by all New Zealanders at the time and many of us are “Glaxo Babies” and our first solids were Farrex, another of Nathans products.

Joseph Nathan decided to move back to London in 1890 and leave his sons, David and Fred Nathan, in charge of Joseph Nathan and Co. Joseph was regarded as a bit of a socialite and New Zealand was not in his interests. He decided that with the need in England for a product such as theirs he should go back and start up a marketing division of Glaxo and get the product accepted throughout Europe as well as New Zealand. Joseph Nathan and Co Ltd was registered in London in 1899. 26 years after it had first been formed in New Zealand. The name Glaxo was registered 7 years later on the 27th October 1906.

In 1912 Joseph Nathan died and the London side of the operation passed on to Louis Nathan (his cousin) with David Nathan appointed Chairman of New Zealand and Fred Nathan appointed New Zealand director

The London offices of Glaxo had insisted that New Zealand production be broadened as the demands for the product during the war were growing rapidly as Glaxo had been recognized as a supplement for soldiers. Supply in Bunnythorpe was not guaranteed meaning other supply markets had to be pursued. A new trunk line between Auckland and Wellington had opened farming in the Waikato and it was there the Nathans decided to expand to.

The first step was to negotiate with established dairy companies endeavoring to convert one or more of their factories to dried milk production. The Nathans engaged a Hamilton based architect Frederick C. Daniell who specialised in designing factories and commercial premises, for advice.

The first factory in the Waikato to give the Nathans and Glaxo the nod of approval was the Waihou Valley Dairy Company. They

committed to convert their cheese factory at Waihou, five miles west of Te Aroha, to produce milk powder. The Nathans contracted to purchase the output of the factory and at the end of twelve years purchase the buildings if they had not already done so. The Waihou Valley Dairy Company, Glaxo Department, then proceeded to take tenders for the supply of the machinery and equipment. The factory was finally completed and opened on the 6th of December 1916. It had cost £3,500 for renovation £2,300 for the cottages and £5,500 for machinery and equipment.

The Nathans then focused on the N.Z.D.A. In 1917 negotiations were concluded by a committee of six suppliers lead by Mr. Lee Martin and Mr. H. Pacy of the N.Z.D.A. with Joseph Nathan & Company (GLAXO) Ltd. The meeting was concluded with the amalgamation of all of the different factories in Matangi. Into a new entity, the New Zealand Dairy Association Group

In November 1917 a further agreement was made by which the New Zealand Dairy Association (Group)[1] undertook to build a dried milk factory at Matangi. The factory was to handle 25,000 gallons of milk a day. This was to be the biggest most technologically advanced milk factory in the world. It would deal with more milk under one roof than anywhere in the world and would produce over 1826 tons of Glaxos total 2130 ton annual output. Work began on the factory during the First World War. It was one of very few buildings constructed at this time due not only to the limited available labour but also due to the scarcity of building materials

Before construction of the Matangi dairy factory was completed in 1919, talks with the N.Z.D.A. and Glaxo, lead to the continued amalgamation of the N.Z.D.A. (New Zealand Dairy Association), the W.V.D.C. (Waihou Valley Dairy Company) and Sir William Goodfellows W.C.D.C (Waikato Co-operative Dairy Company) The resulting giant Dairy Co-Op was to be known as the N.Z.C.D.C. or, the New Zealand Co-operative Dairy Company.

NZCDC was of course to go on and grow into New Zealand's foremost dairy company, finally merging with "Kiwi" to form Fonterra, New Zealands biggest company.

Developing the dried milk industry in the Waikato proved to be a huge undertaking for the Nathan directors. Not only were there the associated costs with building and equipping new factories but

[1] While the N.Z.D.A. was changed to N.Z.D.A. Group documents continued to refer to it as the N.Z.D.A.

there were related consequences as well. Local councils laid complaints about increased wear on the roads and talks with regard to who was going to reimburse for the increased damage lead to continual frustration. Other negotiations involved the Railways Department over building goods sheds and whether it would be worthwhile developing hydro electric power in the Waikato.

On the 27th of March 1918 David Nathan wrote a letter to H.E. Pacy of the N.Z.D.A., with whom he was becoming quite friendly, saying that he was very worried about the cost of the work at the Matangi factory. He remarked "I do not like these very large factories. They seem too big."
He also commented on the somewhat strained relationship between the Nathans and the N.Z.D.A. (by this stage it had actually led to litigation) He thought they should try and sort things out amongst themselves to avoid any more "…..£800 to £1000 lawyers bills" That particular disagreement was duly settled out of court.

The factory, funded by Glaxo, promoted by N.Z.D.A., designed by Frederick C. Daniell and built by Mr. R. Sanders, was finally opened November 12th 1919, for the cost of about £140,000 for the village, factory and fitting out of the buildings. It was opened amid huge fanfare by the Prime Minister of the time, W. F. Massey. The following is an extract from the Waikato times dated November 13th 1919 detailing the Prime Ministers speech to the large gathering.

## WHERE GLAXO IS MADE

### OPENING OF NEW FACTORY

### MATANGI LEADS THE WORLD

### PRIME MINISTERS CONGRATULATIONS

**Waikato Times 13th November 1919.**

The prime minister, who received an ovation on rising to speak, congratulated the suppliers and the district upon the erection of the magnificent factory.

He had been informed that the building was the biggest and best-equipped in the world, and having inspected the place he quite believed this statement.

The factory was proof that the people of the Waikato had confidence in themselves, their district and their great dairying industry. During his stay in Europe he had seen a good deal of dried milk, where it was greatly appreciated, and personally he did not want anything better. He thought there was not the slightest doubt that dried milk had come to stay, and he was satisfied that in time to come milkmen would be dispensed with altogether and people would purchase their milk in the solid state from the

grocer. The dried milk industry was a comparatively new one, and great credit was due to its pioneers, Messrs Joseph Nathan and Co. In 1916-17, 542 tons of dried milk was manufactured in New Zealand, and this at the time seemed a very large quantity. The following season, however, the amount had increased to 2950 tons, while last season 3225 tons. It was easy to predict, therefore, that the output during the season now commencing would show a still further increase.

He heard that six more factories were to be erected in the Waikato in readiness for next season's opening. This augured well for the industry. Production of dried milk had for some years been going on in America and Canada, and to a certain extent in England. The latest American production figures showed that 5,026,736lb of whole milk powder and 20,599,920lb of skim-milk and butter milk powder, or 44,440 tons was manufactured last year, so that New Zealand, where the industry was comparatively new was really not very far behind this great continent.

Continuing, the speaker said the dominions prosperity depended on its exports. The country had taken on a tremendous liability during the war and to liquidate this it would be necessary to increase the productiveness of the soil and to go in more for scientific farming and dairying, so that the land and animals already producing would be made to increase their yield. He had, he declared, no fear for the future, for he had faith in the country and in the farmer. It was 40 years ago, he said, since he first came to the Waikato, and he could honestly say he liked no place better. (applause) He had seen many countries and been over the greater part of New Zealand, and he could assure his hearers that the lives of the people in the Waikato were cast in pleasant places. He could only ask them to continue as they had been doing, and to go on increasing their productiveness. While in England he had met the heads of the greatest commercial departments of the Empire and believed the interviews he had with them had a great deal to do with the fact that the Dominion got the amount of shipping it did. The future of the Dominion depended on the soil and he urged upon them the importance of increasing productiveness. If they did this all would be well with this glorious little country. (Applause) He had the greatest pleasure in declaring the factory open and once again offered his most hearty congratulations to the directors the suppliers and the district. (Applause)

While the London offices expressed warm appreciation to the job Fred and David Nathan had achieved, the huge financial outlay caused inevitable friction between the New Zealand and London Glaxo offices. This culminated in the London offices proposing that all authority be moved to them and that David Nathan retire

from his position. This was naturally rejected. It was decided that he would take a break instead and was due to go to Australia at the end of March 1920. But on the 20th of March David Nathan took ill; he was rushed to Hospital but unfortunately passed away shortly after admission from a hemorrhage. It would appear that the massive stress and the long hours in the setting up of the Waikato operation had taken their toll.

The Glaxo factory was however regarded as the model factory in the N.Z.C.D.C. group. Extensive gardens were established around the factory. All overseas visitors to the companies head office in Hamilton were taken for a visit at the Matangi Glaxo Factory.

Cheese was produced at the factory for a short time in 1923 after a fire burnt down part of the factory. Another fire in 1932 also resulted in rebuilding part of the factory again. It was not surprising that the fires broke out when you consider that at times the workers room temperature could exceed 47$^{o}$C, with the boilers running and inadequate ventilation it was a recipe for fire

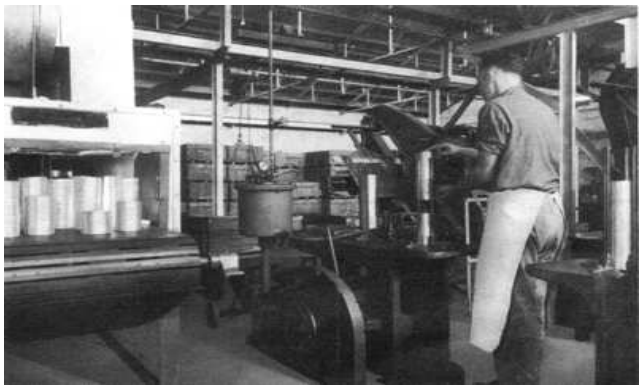
Glaxo has gone on from health foods, supplements and vitamins to pharmaceuticals. Glaxo laboratories were at the cutting edge of medical science. It was one of the biggest players in the creation and production of penicillin. At one stage Glaxos production of the drug made up 90% of all Britain's production, Glaxo also carried out pioneering work in the production of the first British poliomyelitis vaccine. In 1996 Glaxo became the second largest pharmaceutical group in the world and then on 27th December 2000 the name born in frontier New Zealand was hoisted to the top of the merged GlaxoSmithKline (GSK) to become the largest pharmaceutical group in the world.

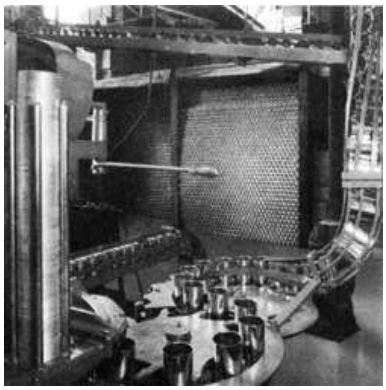
The significant part Matangi played in the creating of the huge Glaxo and Fonterra conglomerates, the two biggest companies to be spawned in New Zealand's history and the extravagance of the factory building is of national significance and worthy of protecting for future generations.

## CANNING

Matangi's influence on the industry did not stop with Glaxo however. Glaxo continued to operate at Matangi until 1936. At this time, production from Glaxos Bunnythorpe plants was deemed to be sufficient for their needs and they pulled out of the Waikato entirely. N.Z.C.D.C. took over production at Matangi and it was used for the production of casein for a short period of time before the factory had a can-making factory added to it, with box making facilities to manufacture condensed milk. We believe this was one of the first fully mechanised can making factories in New Zealand. based on American technology. One also has to wonder how much of William Sims technology came back to Matangi with this investment. Note:(Watties started canning peaches in January 1935 using purchased cans and in 1939 Watties were looking at manufacturing their own cans. We don't know if these were automated as apparently cans were made manually – we are still researching this information). Clive Jensen, an ex-manager of the Matangi factory said this plant was still operating in 1975 but when he returned in 1982 it had been removed. He believes the equipment was shifted to Hamilton operations.

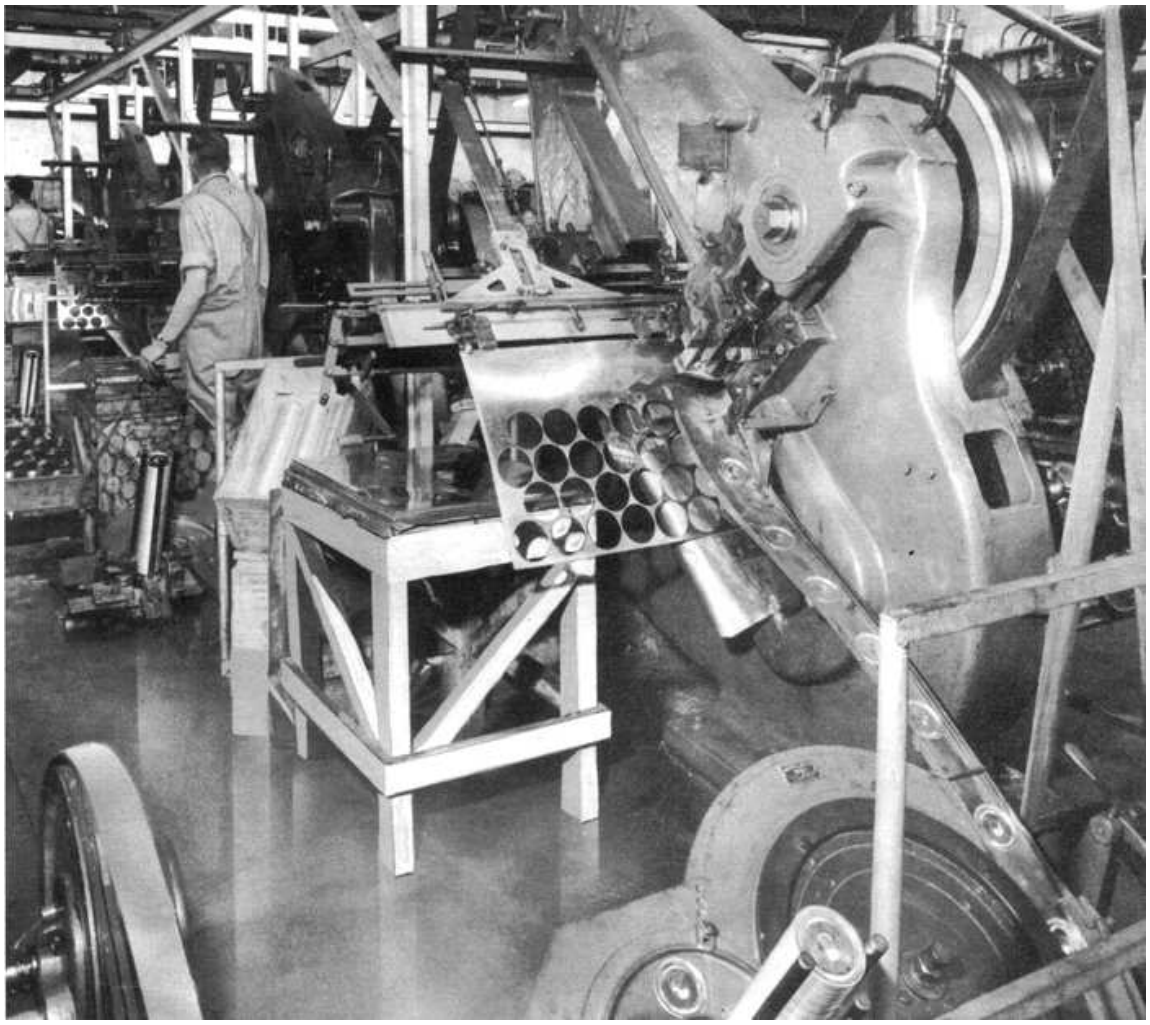
An undated booklet put out by the NZCDC shows Matangi at about this time in the following pages.



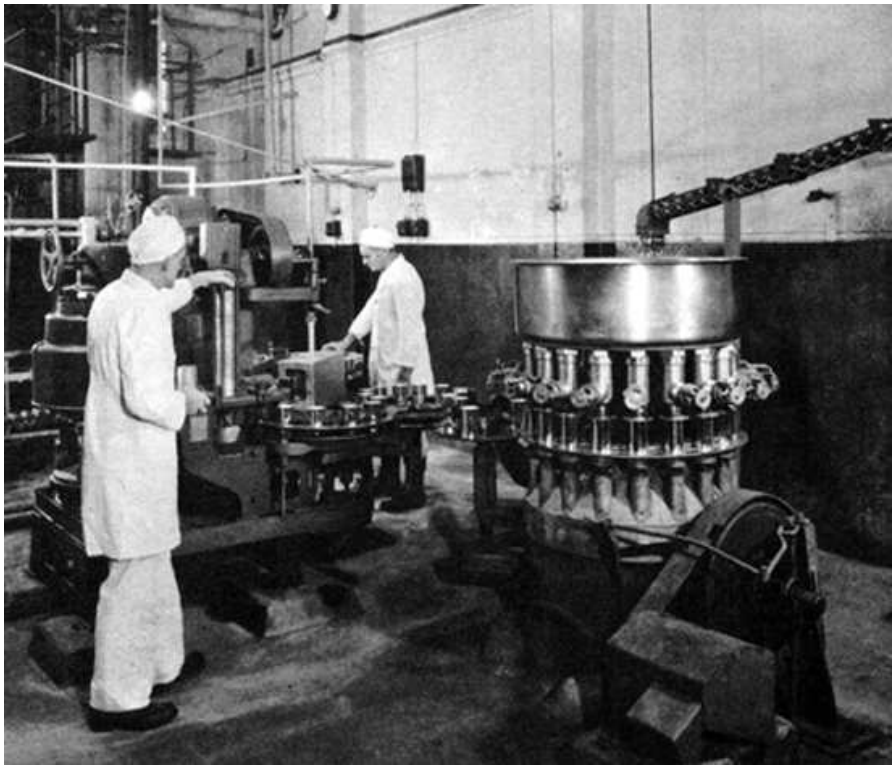


**Left. Treating tops and bottoms with the can sealing solution**

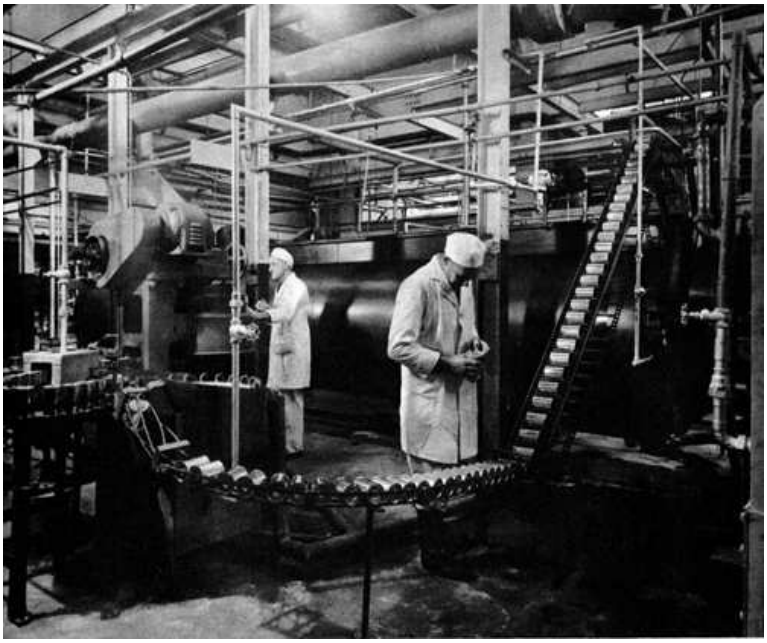
**Right. Fixing the bottoms to fabricated can bottoms**



**Over 20 million 16-oz. tins are required to can the evaporated milk at the Matangi factory. To supply this, the factory runs its own can making facility. (Above. Tops and bottoms being cut with a stagger press)**

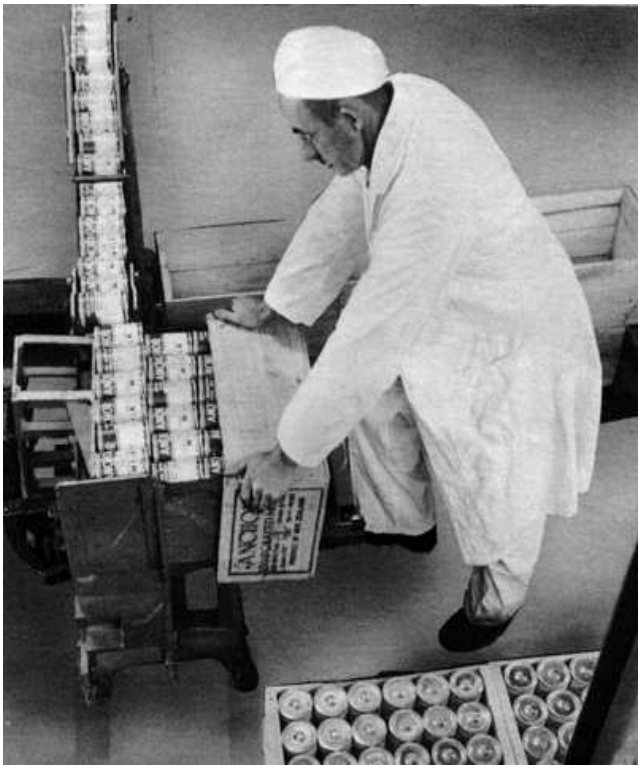


**From the refrigerated holding tanks the evaporated milk passes to the automated filling machines which fill and seal the cans.**



**After the fillers the now full cans are conveyed to the sterilisers through which they pass after careful inspection.**

**After sterilisation control samples are held from each batch and subjected to laboratory control and analysis.**



**Not until each batch is passed by the laboratory is it graded, labeled and ready for export.**

After the canning plant installation the factory was able to be run as a general purpose unit, able to change output depending on the market demands. It was mainly producing powdered and condensed milk. In 1936 20,000,000 cans of condensed milk were made and cheese was made on an “as required” basis.

## TRANSPORT

Matangi and Te Awamutu were the first factories in the world to use milk tankers. The use of tankers to carry the milk was a move that would introduce huge efficiencies into milk transport and allow for the development of today’s giant dairy plants. This was a major turning point for the New Zealand dairy industry. Up until this time the milk cans were delivered by the farmers or factory truck to the landing at the front of the factory twice a day. At Matangi the milk arrived by horse and cart and motor lorry twice daily from the farms in the area.. Samples of the milk were taken for testing, the milk was weighed and tipped into the holding vats below the landing floor. This was called a tipping station. We had wondered what the diamond patterned steel embedded in the floor of the landing was for. Apparently this steel made it easy to slide the cans across the floor, while ensuring people did not slip over.

**Tipping station at Matangi. Note the bottles on the right side, for taking milk samples.**


**The two different methods of milk transport, the old and the new. This photo was taken at the Bunnythorpe "Glaxo" factory.**

When the tankers were introduced the vat area at the front was concreted over to create a dungeon under the floor. The service stairs to the tipping vats are still in this dungeon, which can now only be accessed by a hole in the floor. The windows were removed and the walls cut down and horizontal vats were installed to take the bulk milk from the tankers. Later these tanks were also removed, the openings were blocked up and freestanding tanks were built on concrete plinths at the front of the factory.


**Tanker delivering milk to a factory. The horizontal tanks at Matangi would have been very similar to those in the above picture.**

**The giant free-standing tanks in 1985 in front of the Glaxo building.**

**Concrete plinths in front of the Glaxo building.**

During World War II production at Matangi turned to supporting the war effort by producing condensed milk for the U.S. forces. A strike in 1941 by manpowered workers meant that the farmer suppliers had to work the factory by night while still farming during the day.

**The upgraded factory with the new boiler house/power station along with can and box making factory to the right.**
**The factory is still using milk cans, which can be seen, along the front of the factory. The old boiler flue is still standing as well. It was later knocked down and only a small part remains, apparently this took two attempts to blast down, the Glaxo photographer was blown off his feet by the first explosion and all the east facing windows were blown out but the flue remained intact.**

In 1946 it was decided to build a stand-alone coal fired 3-megawatt power station. The high pressure steam was used to power the generator turbines and the low grade steam, after the turbine was used to run the factory. The clean, boiling hot condensate from the factory would then be returned to the boiler, thus maintaining a very high thermal efficiency.

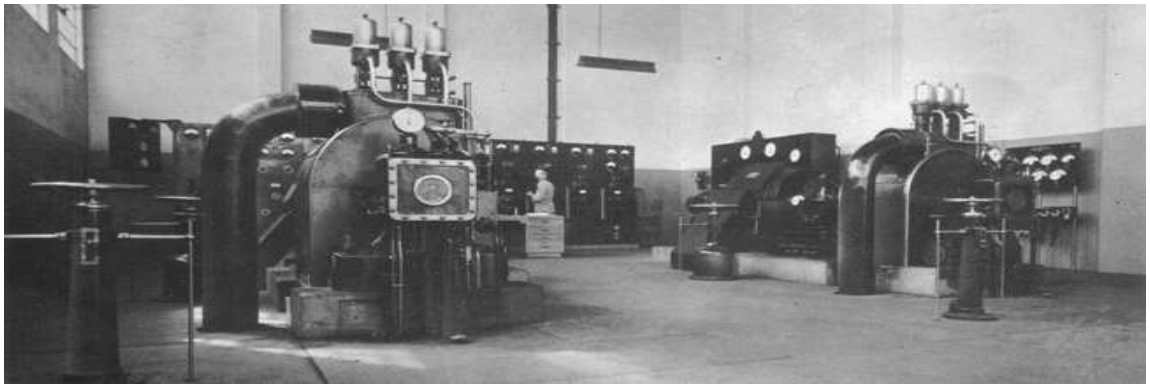
This was completed in 1947 and can be seen in the aerial view of the factory in the right hand corner of the factory complex.

This sort of co-generative power station would have been one of the first such installations in New Zealand and would have secured the factories steam and electricity requirements.

The following pages from the undated booklet show the co-generation process.

**Coal consumption could easily exceed 100 tons per day for a large factory like Matangi. (note: this photo not of Matangi it is very similar however)**

While the pictures are not of the Matangi factory itself the coal handling systems, the turbine room and the boilers look the same as the installations in Matangi.



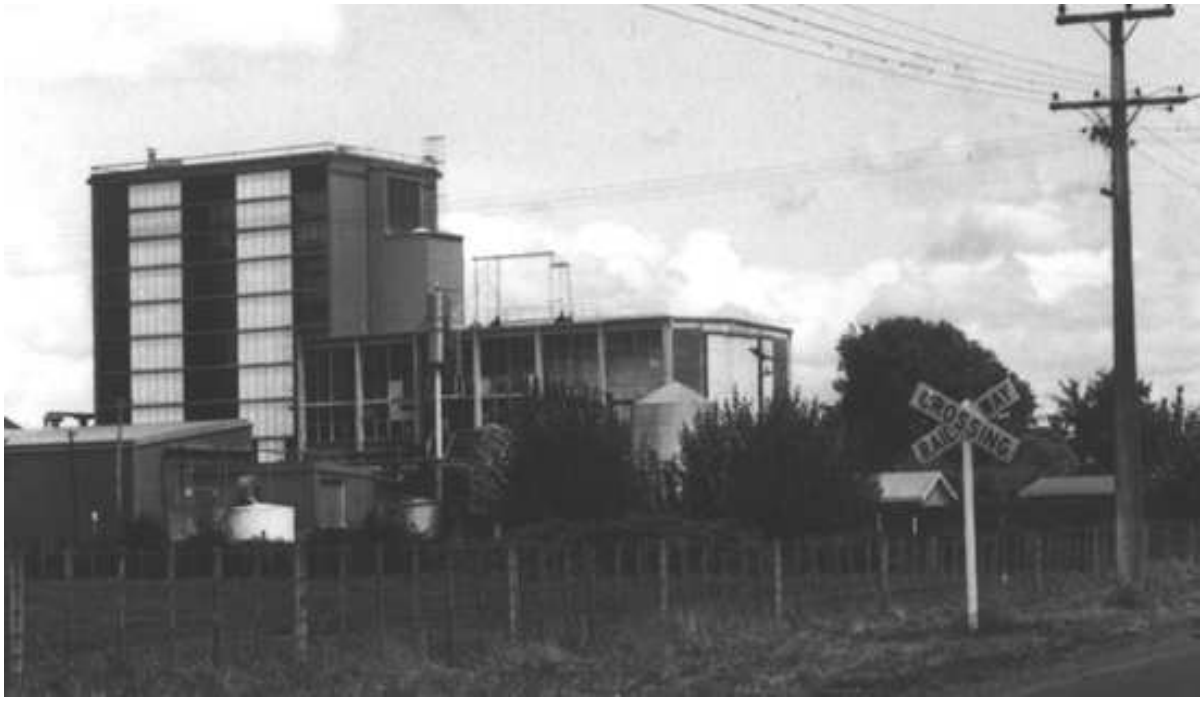
**Steam consumption in milk powder factories could exceed 100,000 lbs. daily**

## EVAPORATION AND SPRAY DRYING.

Following the war considerable investment was made in new plant at Matangi, with a large number of experiments being conducted. During 1950 and 51 processed cheese was manufactured. At about this time the factory was also annually producing about 2000 tons of condensed milk. 1954 saw the manufacture of cheese being stopped and replaced by the manufacture of casein. An experimental plant was established in 1962 to allow manufacture of skim milk and anhydrous milk fat for the production of reconstituted condensed milk. The experiment was successful and a full sized 5-effect evaporator set was installed in 1965.

Roller dryers were very limiting because they would tend to burn the milk. If it was burnt the powder was not able to be re-dissolved as a drinking liquid. Evaporated condensed milk on the other hand could be reconstituted but it was more expensive to transport due to it being heavier because of a higher moisture content. At the time the dairy industry was caught between two different technologies with their various different pros and cons.

In 1956 the first spray dryer was installed in New Zealand at the Morrinsville Lockerbie factory. Spray dryers were able to produce powdered milk that could be reconstituted for drinking milk. The evaporator system at Matangi was no longer the preferred technology due to the high transport costs. In 1967 a spray dryer and a small research and development dryer were also installed at Matangi.




**Spray dryer to the left and 5-effect evaporators in the lower building on the right, photo 1985.**

**Another view of The spray tower and 5-effect evaporators at Matangi. The Glaxo building is off to the right out of shot.**

## RESEARCH AND DEVELOPMENT

At this stage Matangi was an extraordinarily versatile site, able to make a whole range of products. It was producing canned evaporated milk, technical rennet caseinates, whey powder and baby milk powder. Due to its versatility Matangi became one of the key R&D laboratories for the NZCDC. Matangi ran some trial goats milk through its dryers and was responsible for much of the development work into the first caseinates.

Casein was traditionally made by precipitating skim milk with either lactic acid (producing lactic casein) or coagulated by rennin extract, (producing rennet casein) The curds were pressed to remove excess moisture then milled, dried, sorted and packed. Casein is insoluble, while caseinates are soluble. The technologies developed at the Matangi factory taking the wet casein curds and spray drying them to make a soluble product, became the basis of the caseinate factories at Paerata and Reporoa. The modification involved the adding of spray dryers to casein plants to make caseinating plants.

During this latter period Matangi was mainly producing condensed milk and caseinates. The factory made condensed milk from late October through until early April, as this was the only time of the year the milk was suitable for condensing due to evaporated milk requiring high heat stability. The rest of the season the factory made a product called “Technical rennet casein” This had major markets in Japan, the Persian Gulf, Latin America and the Caribbean. Rather than follow the course of the other skim milk products rennet casein tended towards a more industrialized market. Here it filled various different niches – coagulated by rennin extract it was a very versatile product utilized in costume jewelry, buttons, glues, fibres, foodstuffs and in printing papers. The residual whey was made into whey powder. This was used for such things as stock supplements and pharmaceutical products.

Matangi’s manufacturing pattern of supplying demand was continued for several years with 1974’s output consisting of 4,619 tons of milk powder, 2,044 tons of casein and 1,603 tons of condensed milk.

By 1980 manufacture of specialty products such as canned milkshakes and canned milk puddings had been developed, Matangi at this time had a annual canning production of 8.5 million cans, most of this however did consist of condensed milk.

The development of U.H.T. technology and tetrapaks superceded canned condensed milk and in 1982 production of condensed milk ceased at Matangi, in the last season it produced 2.8 million cans of condensed milk 272,000 cans of chocolate milkshake 20,000 cans of strawberry milkshake.

The twilight years of the factory were spent with the production and manufacturing of technical rennet casein. Along with making a few short runs of high fat milk powder for specific customer needs. The factory also fulfilled an important role in taking all milk produced out of season from as far south as the Rangitaiki Plains and as far north as Paerata and Takanini.

Matangi factory finally closed its doors and became silent in 1987 to very little fanfare. Newer factories took the extra milk and the Factory at Matangi was sold to Mr. Brunt, he on-sold it to Mr. and Mrs. Lamb, who in turn sold it to the Mowbrays.

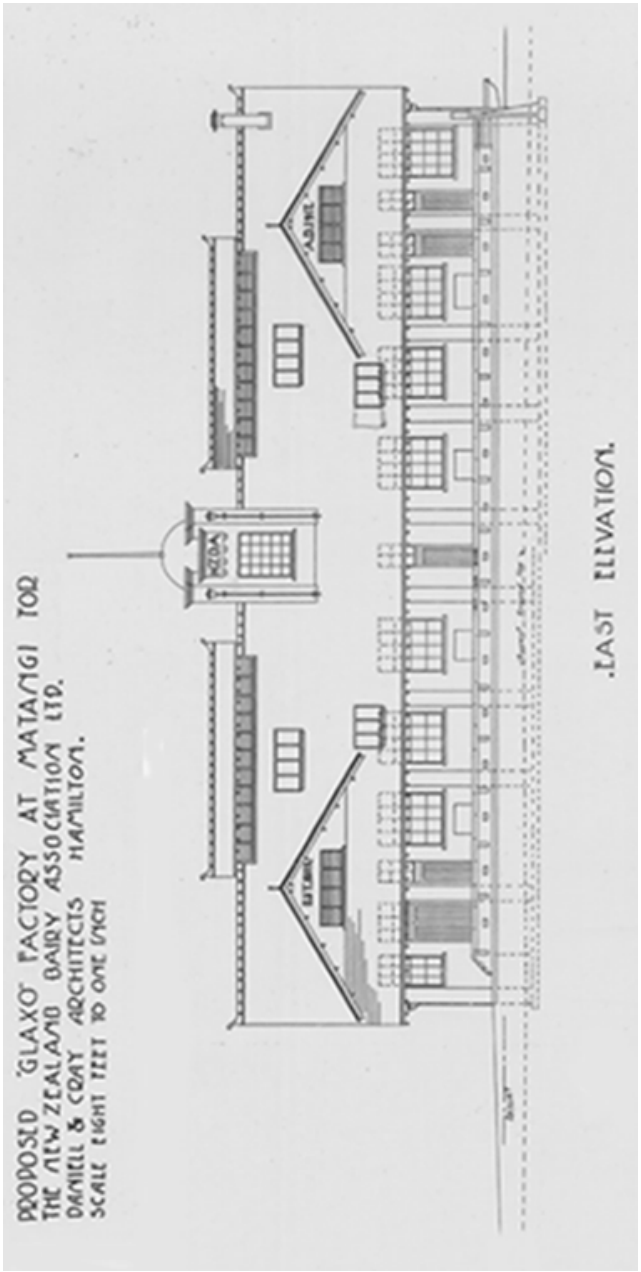
During this period most of the equipment has been stripped and numerous people have rented small spaces for storage or running small business'.

By any stretch of the imagination the history of Matangi and the Matangi dairy factory, has played an extraordinary role in New Zealand's dairying history.

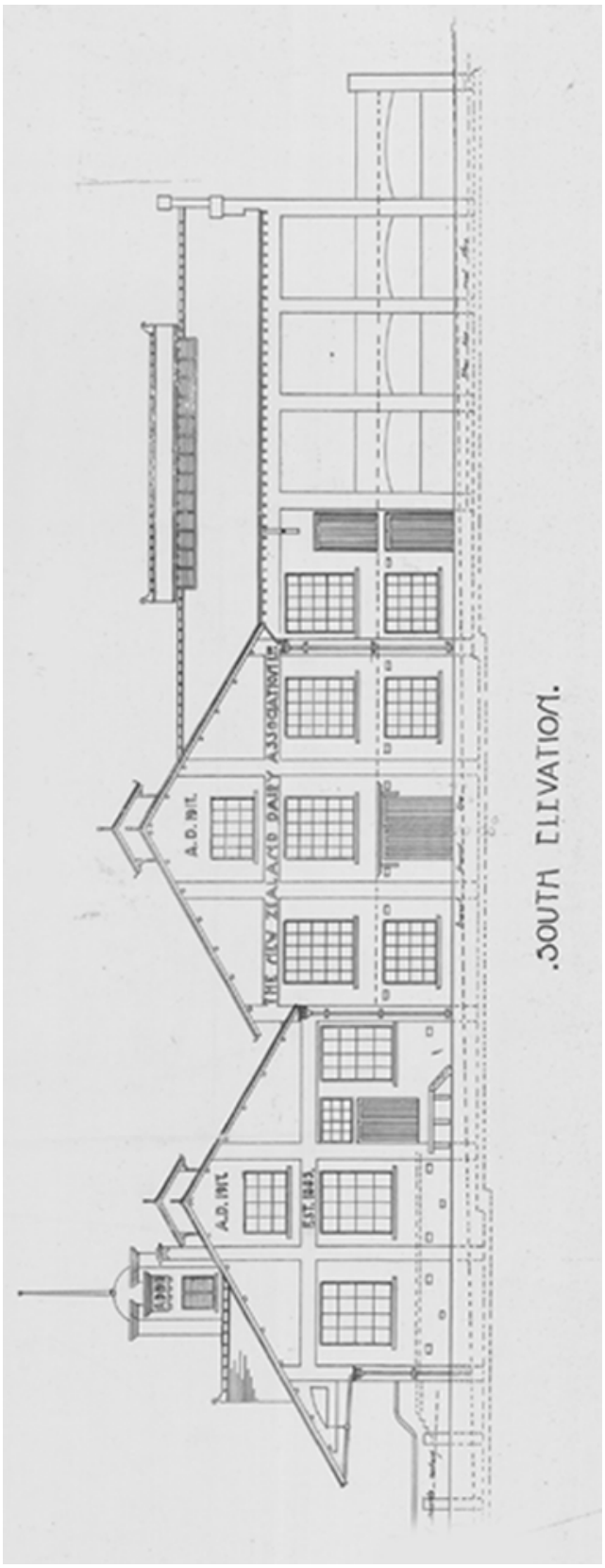
Bearing in mind that agriculture is the backbone of New Zealand's economy and that dairying is the backbone of agriculture in the Waikato, as well as many other regions of New Zealand, this is an important story for New Zealand as a whole.

## THE GLAXO BUILDING

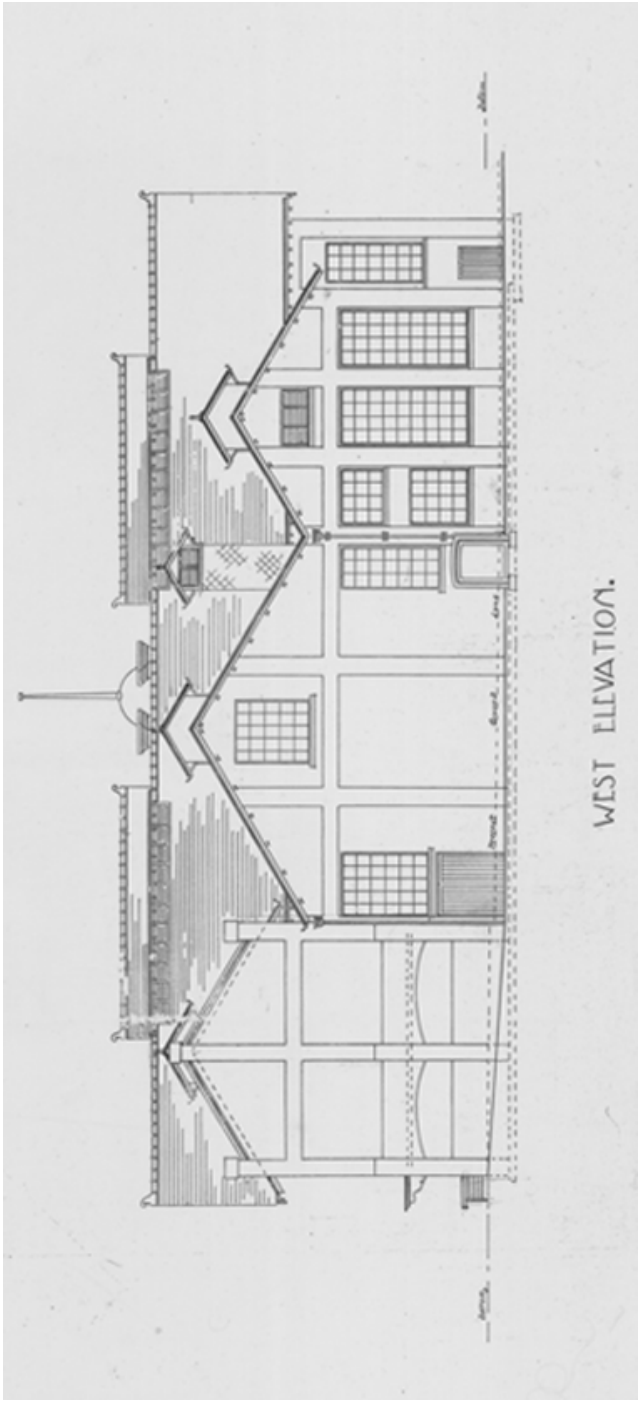
When we bought the factory we discovered 5 rubbish bags full of drawings of the factory. Amongst these were the original Indian ink on linen hand drawings of the "Glaxo" factory along with the hand drawn and water coloured structural drawings. The following pages show these sectional and elevation drawings as drawn by Frederick Daniell of Daniell and Clay Architects in Hamilton.



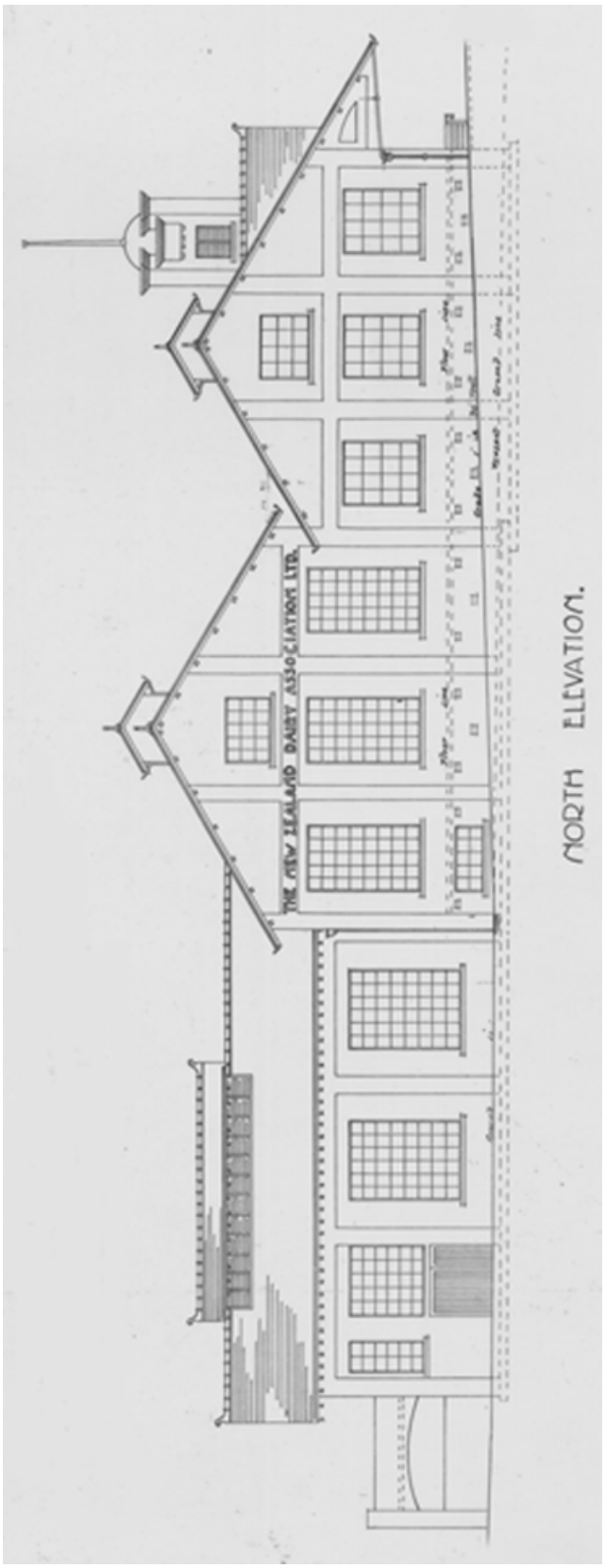

**East elevation, Matangi factory Glaxo building.**



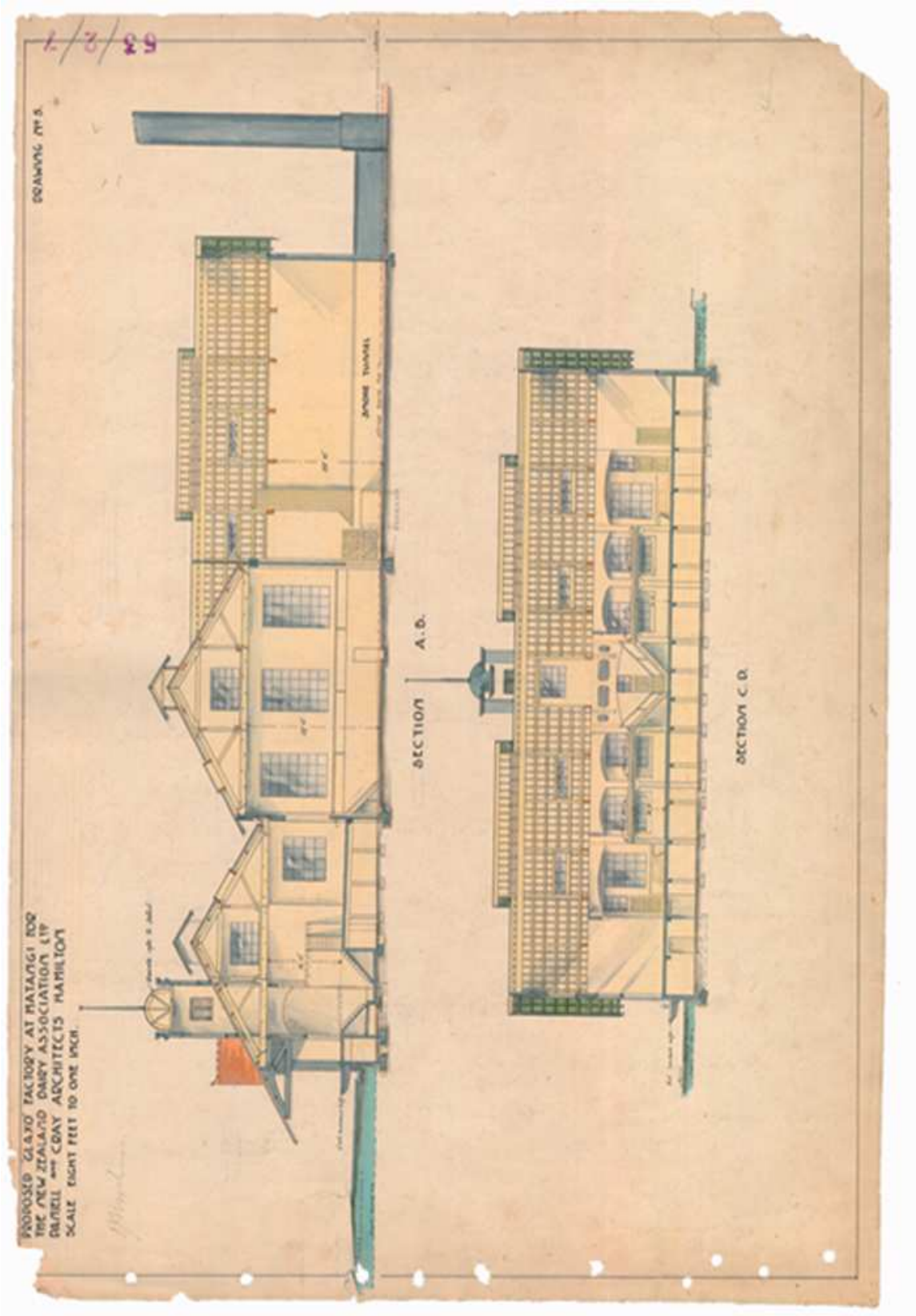

**South elevation, Matangi factory Glaxo building.**



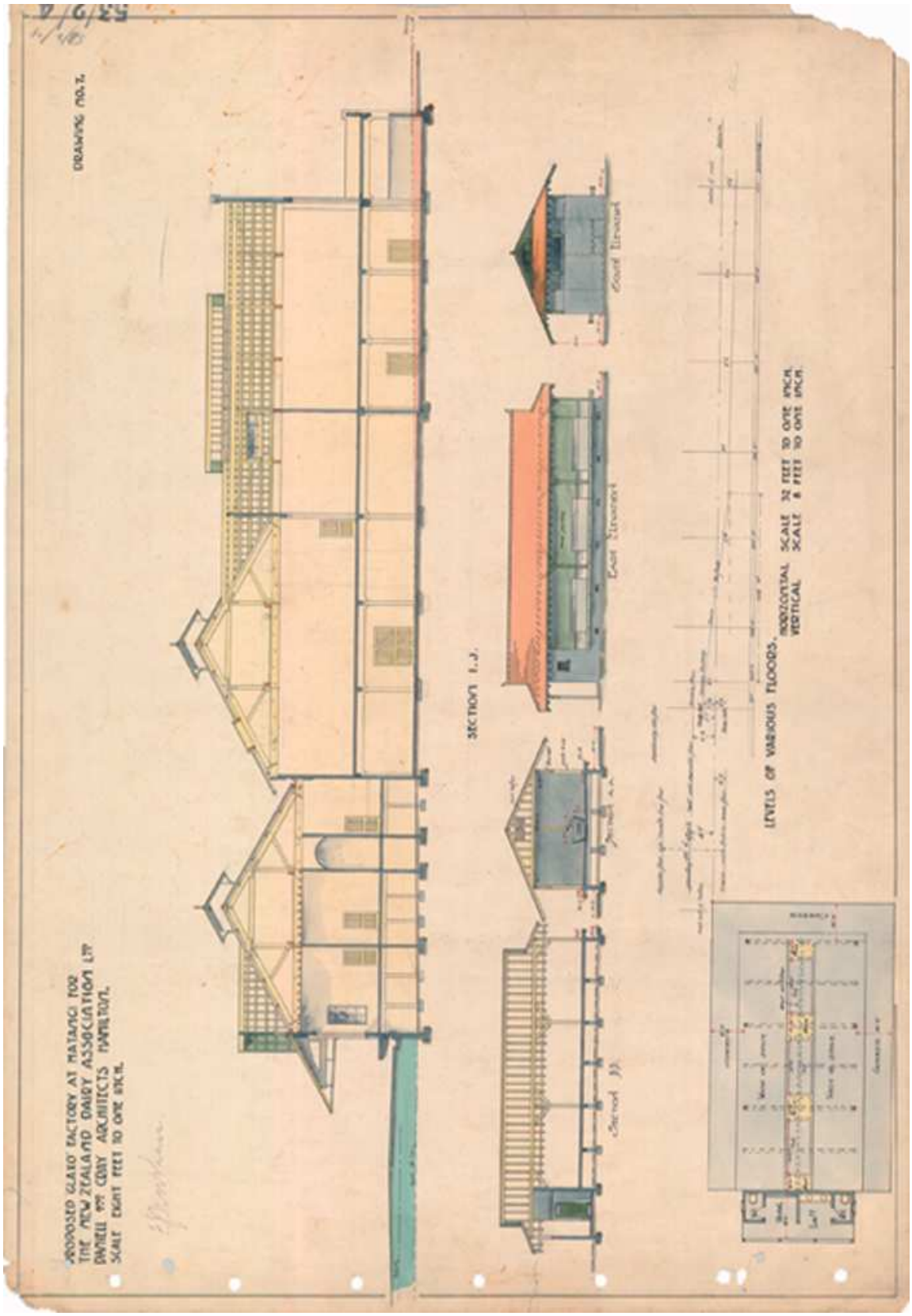

**West elevation, Matangi factory Glaxo building.**



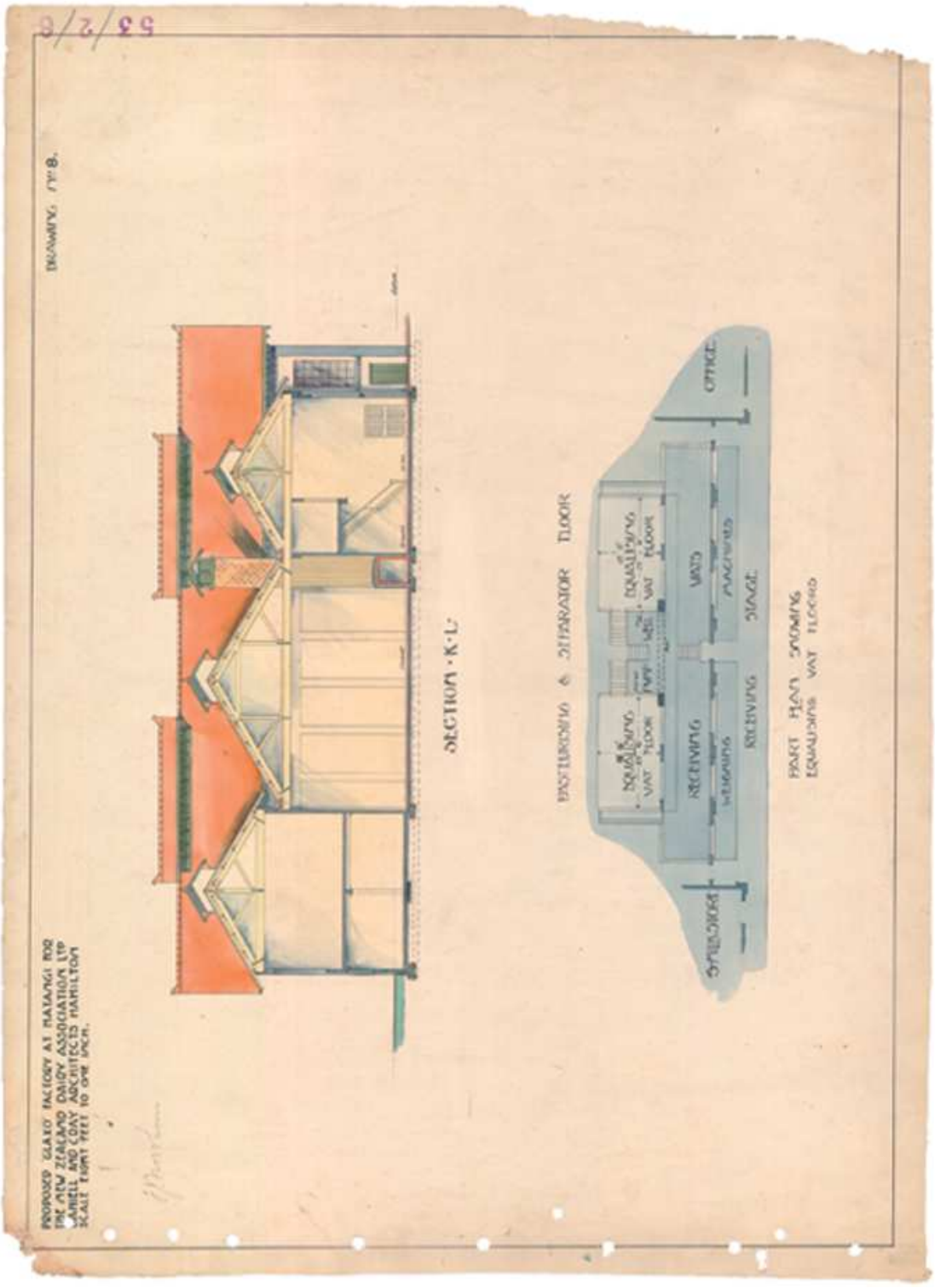

**North elevation, Matangi factory Glaxo building.**



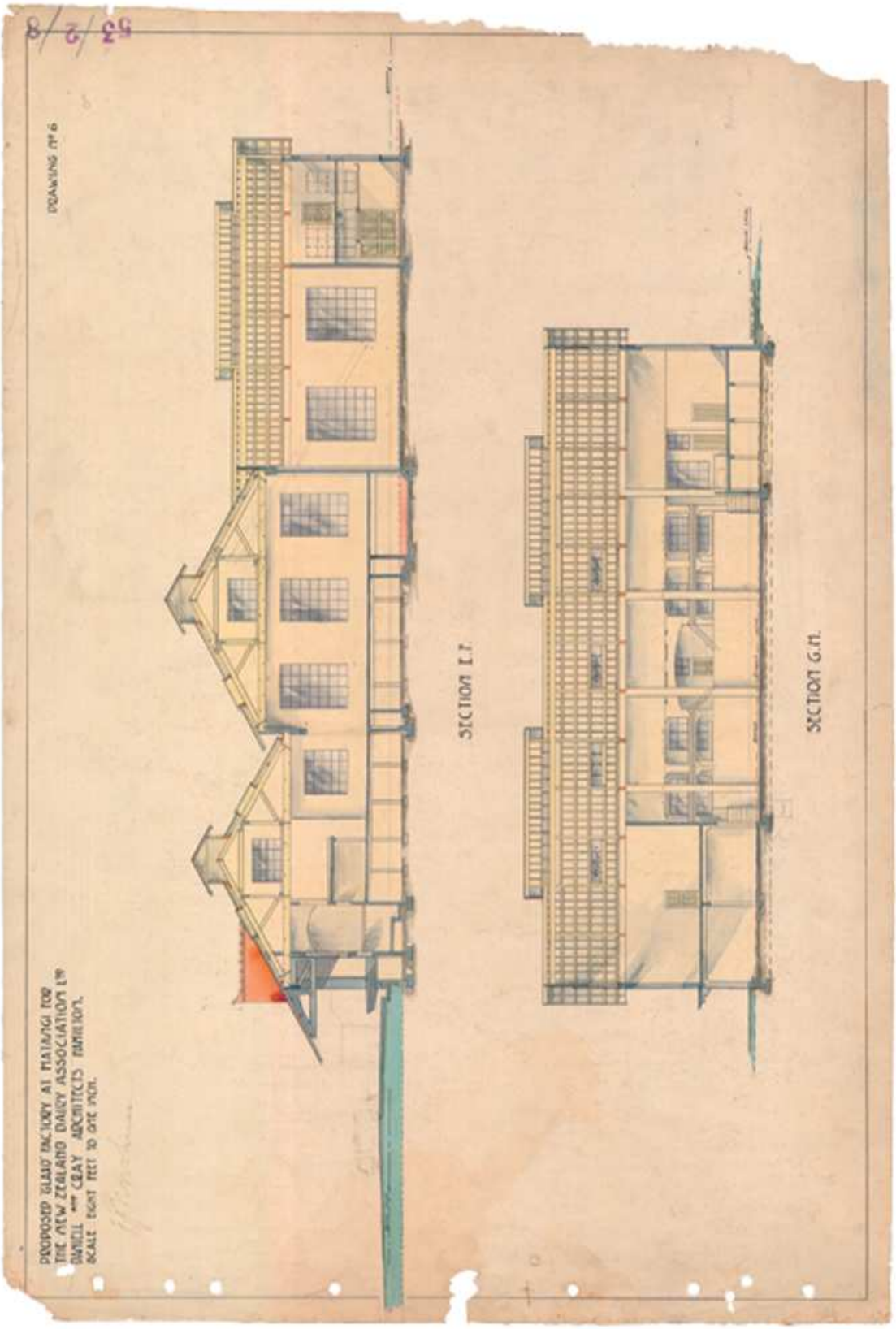

**Sectional drawing of Matangi factory, Glaxo building.**



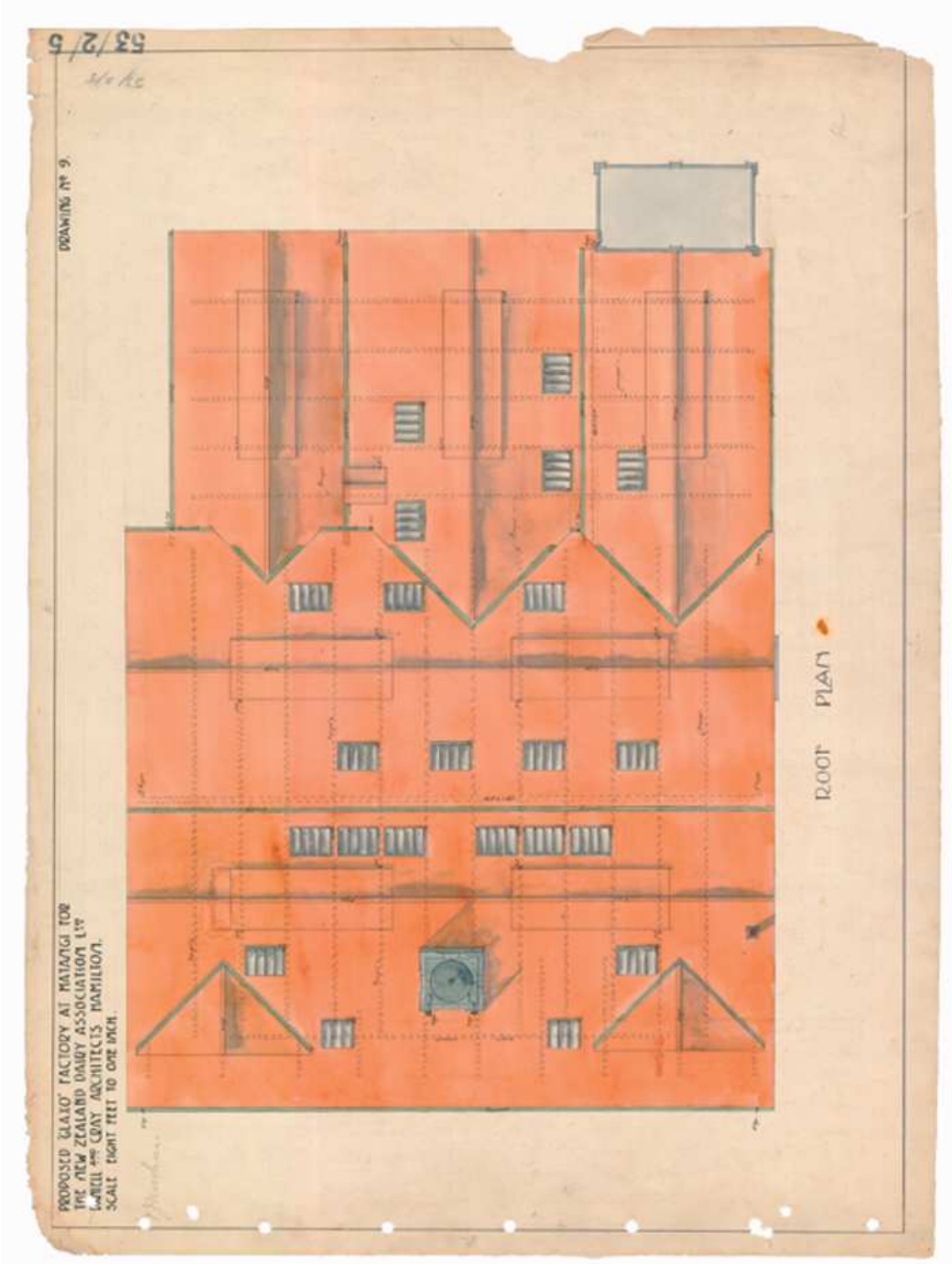

**Sectional drawing of Matangi factory, Glaxo building.**



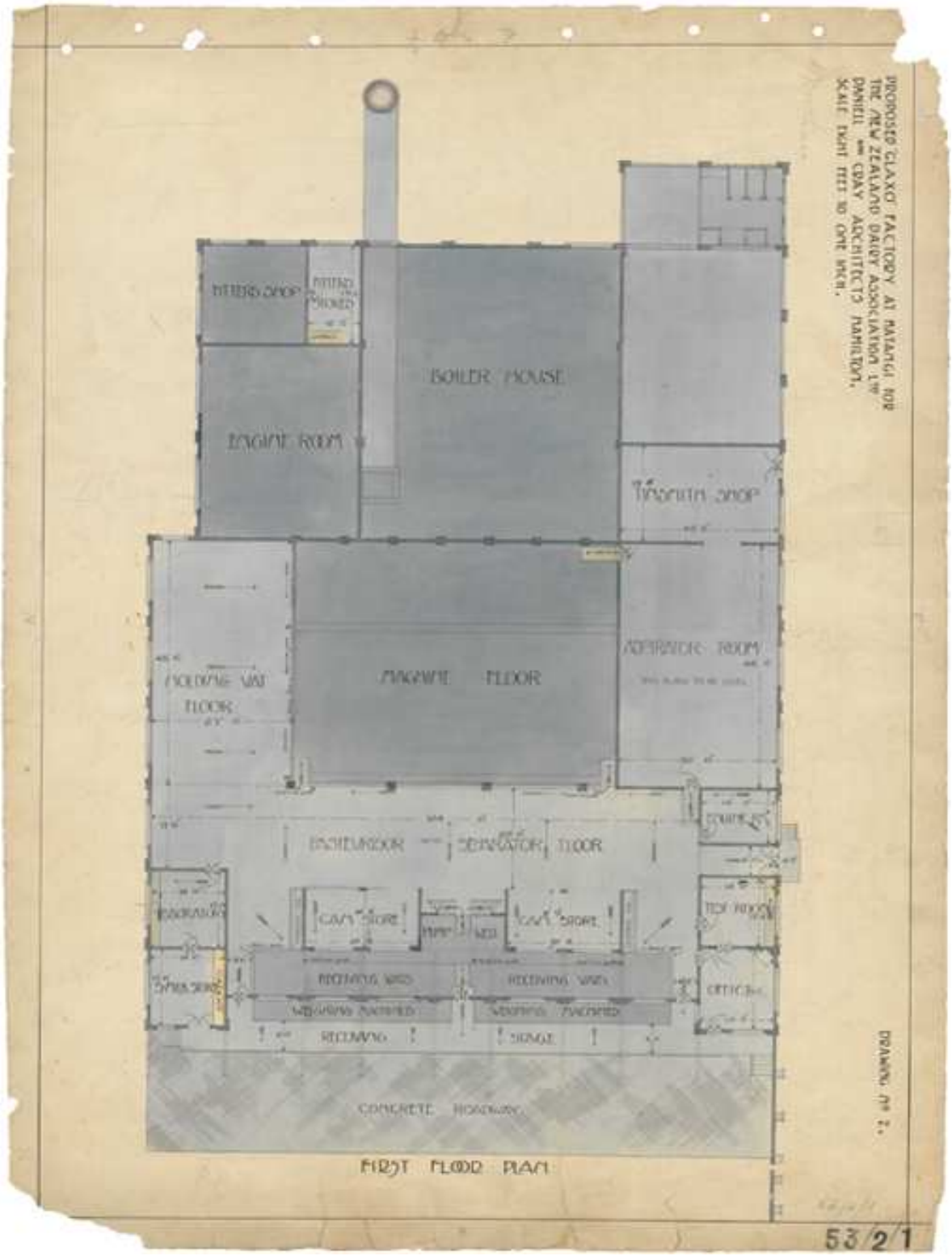

**Sectional drawing of Matangi factory, Glaxo building.**




**Sectional drawing of Matangi factory, Glaxo building.**




**Roof plan of Matangi factory Glaxo Building.**

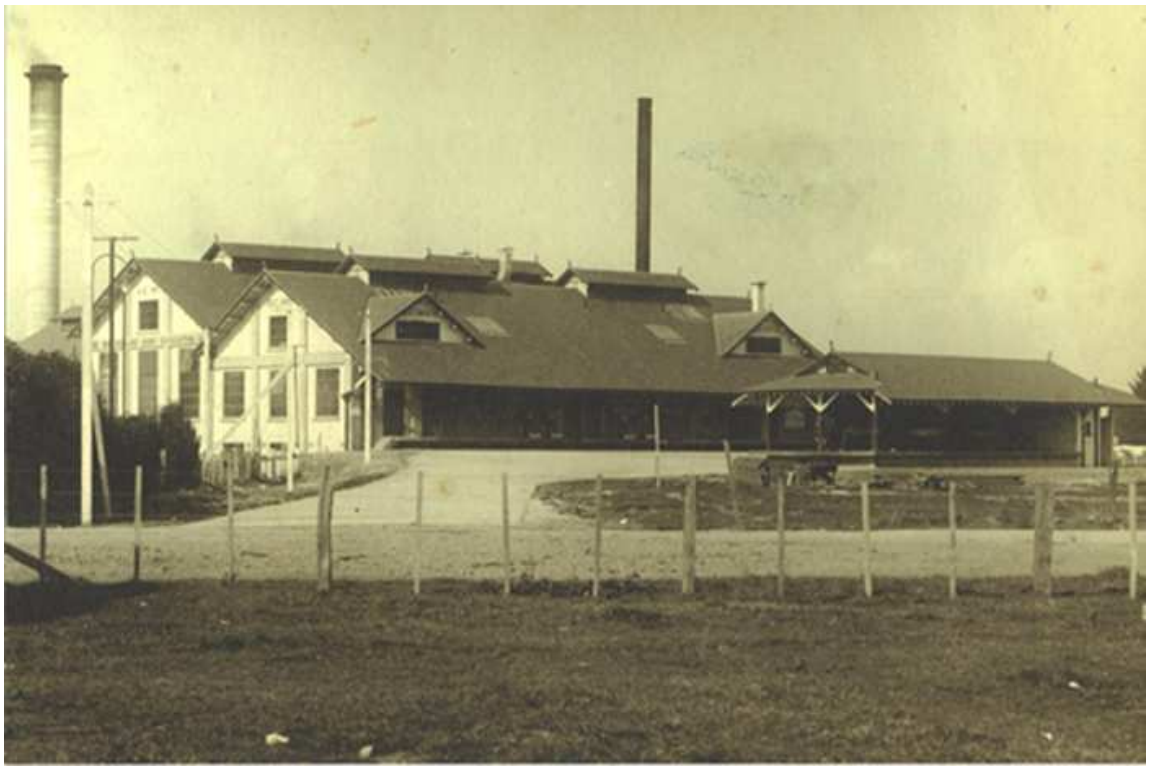



**Floor plan of the Matangi Factory Glaxo building**

These structural drawings show the huge structural beams and a sarked roof of solid Rimu. The walls are made of reinforced concrete while the roof shows tiled ridgelines with “Miha” shaped finials on the gable ends.

The centre of the building has an elegant tower block and a flagpole. Once we saw these drawings we had an overwhelming desire to re-create this building to generate the passion that was apparent in the original drawings. We had mixed feelings about this desire, as we could not seriously believe that anyone would build such a grandiose factory and we were having difficulty justifying how we could now go back and make it as the architect first conceived it and maintain the buildings historic integrity.

During this investigation, when we got the opportunity to look at the Fonterra archives for a couple of hours we discovered a series of photographs of the factory from the day it started through until the upgrade in 1942.



**The first smoke rising from the new Glaxo factory at Matangi. (The photo had “start up” written on the back so it is in 1919.)**

**Photo showing the factory in full swing with milk cans lined along the front of the building and the can washing building off to the right full of empty milk cans. The old trucks used for collecting the milk are in the foreground and the company Bowling Green is to the right of the drive. The photo is estimated to be early 1920's**

**New driveway put in to the main factory. Picture estimated to have been taken late 1920's early 1930's**

There in the early photographs is all the filigree. The only thing missing was the elegant tower block and the flagpole. Interestingly enough we have since realised that all the huge structure for this tower has been built right up to just below the roof so it is apparent that they intended completing this part of the building at some stage. It also means that the tower could be built to the original specification quite easily.

It is apparent from the early photos that the main body of the roof was some form of tile. The tiles appear flat and are very fine. As a boy Brew Robinson, who grew up in the area, could remember the roofing coming off the building. He could also remember the roofs coming off the F.C. Daniell designed houses in the village. He could remember they were flat small segments but they were not wooden shingles as they broke up like a clay tile. He then recalled that Tom Bryants house on the outskirts of Matangi, also designed by F.C. Daniell, had the same cladding on the roof until just recently.

The Douglas' who now own this extraordinary house still had a number of the original tiles.

I was incredulous to find that the tile was in fact, a flat kiln fired clay shingle design. Because the shingle design meant you had to have a triple layer of tiles at each of the joins, each tile has just over 1/3 of the tile exposed.

**Sample of the clay tiles used on the factory roof note that only about a third of each tile is ever actually exposed.**

We were later able to find a photograph of the Presbyterian/Methodist church, which shows these tiles in more detail although it is apparent they are damaged.

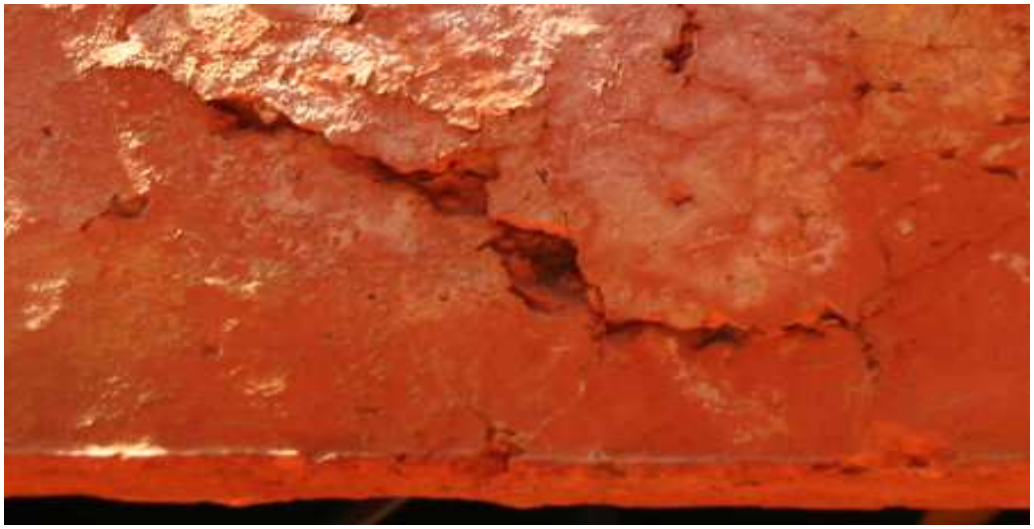
**Church roof with clay tiles on the roof.**

The Glaxo building with these tiles and the filigree would have made an extraordinary architectural statement.

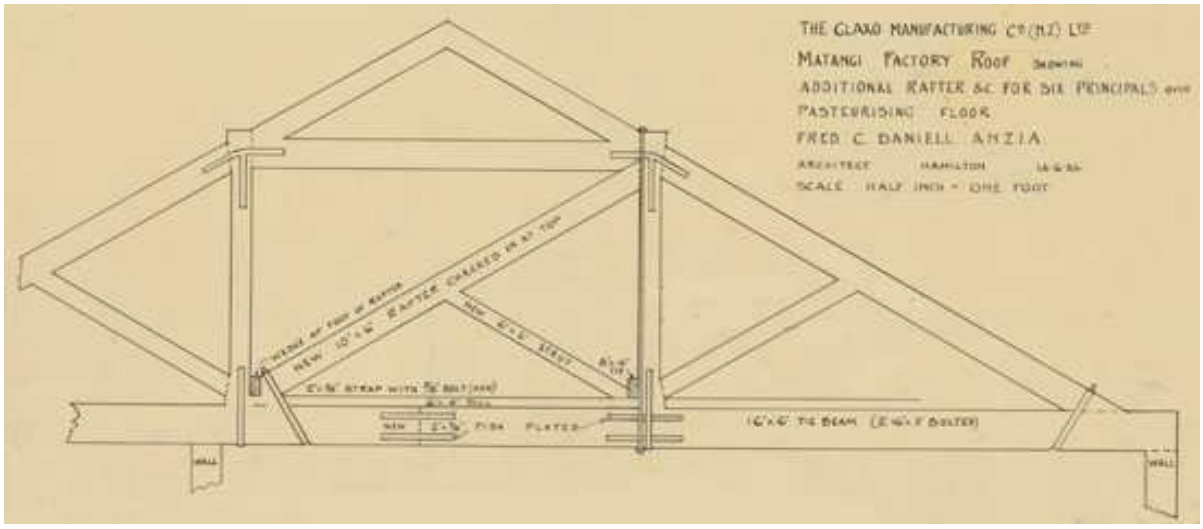
We calculated that in the dry state, there were over 120 tons of these tiles on the roof. This then explains the need for the huge Rimu trusses.

Besides the weight, the tiles had one other achilles heel. The mating flat surfaces and the non-sealing joint between the tiles meant water would get between the tile faces and would not dry out. The entrapped water would freeze during the winter frosts and the bottom part of the tile would blow apart. This sort of damage can be seen on the roof of the church and also on the tile supplied to us by the Douglas'

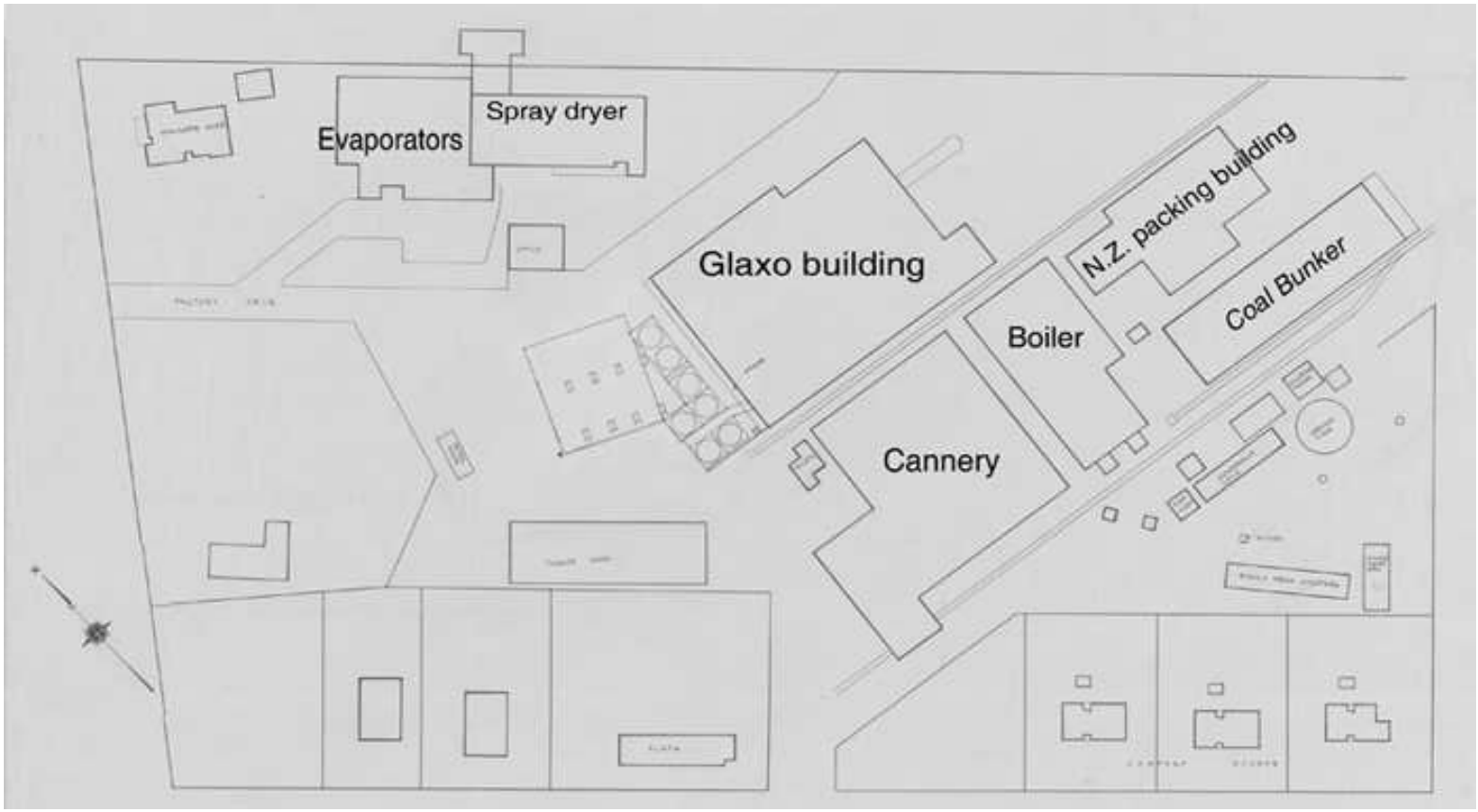
What makes the extravagance of the roof even more amazing is that all of this was built during the First World War at a time when labour and materials were at a premium. Further to this, the factory houses and the church had the same roof material. It would be interesting to know if these tiles had to be imported or whether they were actually made in New Zealand. Regardless, the cost of the roof would have been extraordinary.



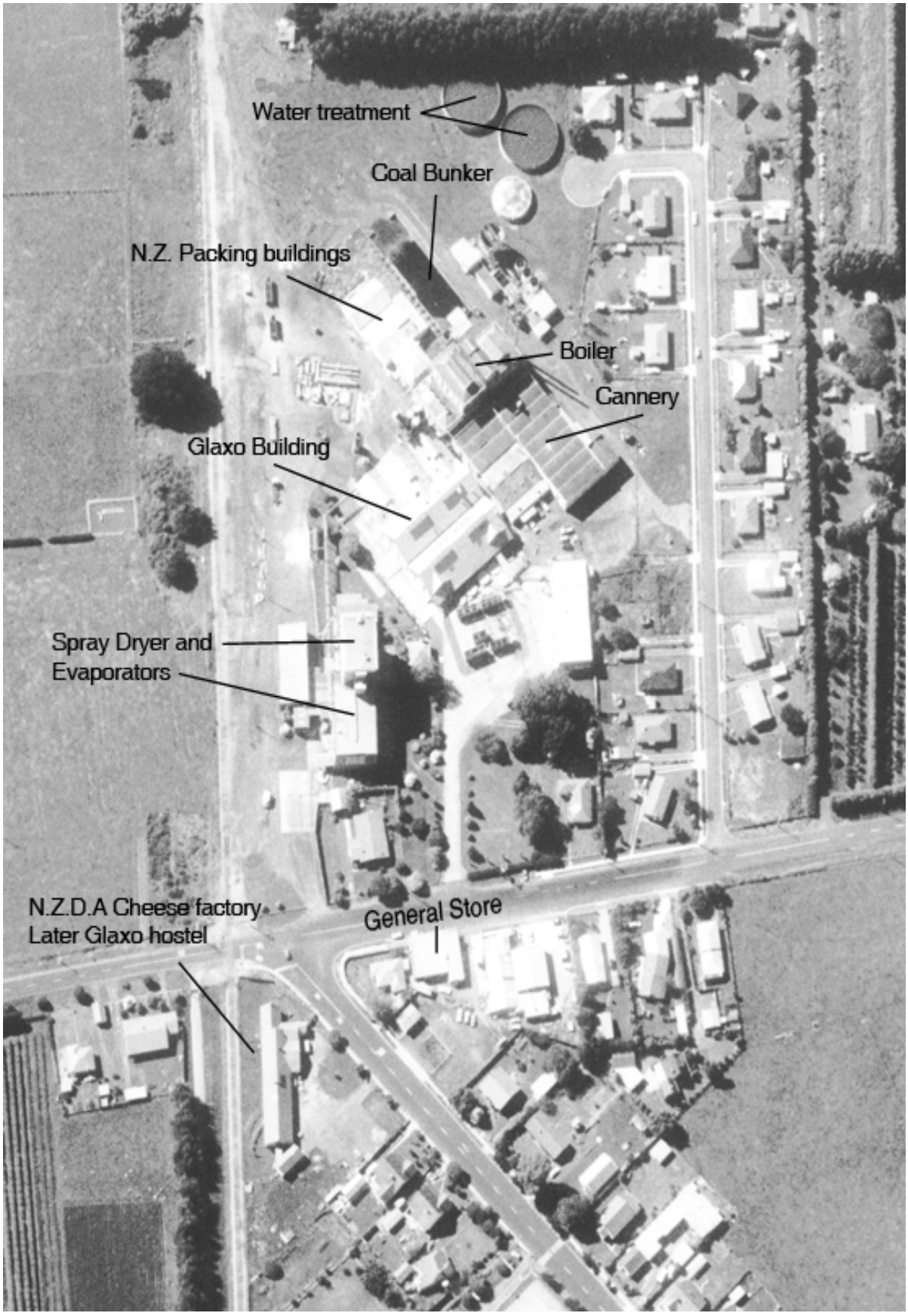
**Bottom face of tile blown from water freezing the inside of the tile and expanding.**




**Example of one of the trusses in the building.**


Evaporators
Spray dryer
Glaxo building
N.Z. packing building
Coal Bunker
Boiler
Cannery

**SITE PLAN**


Water treatment
Coal Bunker
N.Z. Packing buildings
Boiler
Cannery
Glaxo Building
Spray Dryer and
Evaporators
N.Z.D.A Cheese factory
Later Glaxo hostel
General Store

## FREDERICK CHARLES DANIELL

During this familiarisation with the building and its history we never appreciated the significance of Frederick C. Daniell the architect of this building. We have since been informed he was one of New Zealand's foremost architects in industrial and commercial buildings for this period. This perhaps goes someway to explaining the exceptional attention to detail that is the hallmark of this building.

PROPOSED "GLAXO" FACTORY AT MATANGI FOR
THE NEW ZEALAND DAIRY ASSOCIATION LIMITED.
DANIELL & CRAY. ARCHITECTS. HAMILTON.
SCALE EIGHT FEET TO ONE INCH.

Other F.C. Daniell's buildings in the Waikato such as Tom Bryants home and the Church on the corner of Te Aroha st. and River rd are also fine examples of his work. Notice all of the Daniell creations have an exceptional level of detail.

**The Douglas' home designed by F.C. Daniell in Matangi**

**F.C. Daniell designed church in Hamilton**

**F.C. Daniell's own house on O'Neil st. in Hamilton**

## MATANGI VILLAGE

Photographs from the Glaxo history book show the factory in 1920-21 along with the company houses and hostel. In those days you did not just build a factory, you had to build a large part of the village. F.C. Daniell's attention to detail is very apparent in all these associated buildings, particularly the Methodist/Presbyterian church which was unfortunately demolished by the church sometime before 1975. The church and the 9 employees houses, all designed by Daniell and all with the fine, clay fired tiles, finials and detailed concrete work. These are exceptional for a number of reasons; like the factory no expense has been spared and they were all built during the First World War, during a period of both labour and material shortages. Furthermore the buildings are all a concrete construction similar to the factory. This sort of construction, using expensive materials was not common for building houses, at the time these would have been considered to be exceptional employee homes.

The school which was first opened in 1910 was located south west of where the Glaxo factory was built. According to newspapers of the day "the increased traffic and noise made the school site, right next door, quite unsuitable." Another prime reason for the move was due to the fact that washing down water and sewage from the factory flowed down a drain, past the school and causing a health hazard. Brew Robinson recalls a friend of his falling into the drain. He was up to his neck in effluent, was unable to get out and was screaming. The teachers had to get into the drain to get him out. Brew recalls wryly that the school was shifted shortly after this. The shifting of the school is recorded as being "in association" with the building of the Glaxo factory.

The factory also had an area on the right hand side of the main drive that was used for numerous things. In the early photographs it is a croquet area, it was then changed to tennis courts and in another it is a bowling green.

Over the years many changes have occurred in the Village. The original stores have been demolished and a new block built.

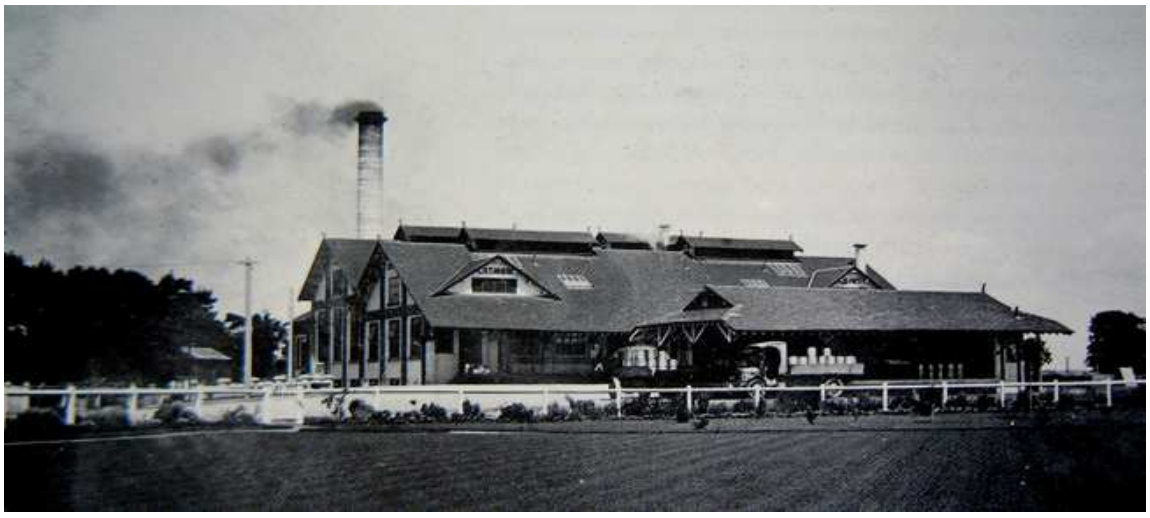
Whilst the factory was in its heyday a general store was situated between the railway and the Dairy Company. This store sold almost everything from hardware to groceries, drapery to grass seed and mash to petrol. When the Glaxo factory was built and the Dairy Company brought the land, the dwelling which had adjoined the store was renovated and became the factory manager's

residence. On the opposite side of the road was a billiard hall and in front of it a small store selling sweets and cigarettes alongside this was another small store then a butchery and beside that a saddlery.

In the 1920's a bakery was built in what was originally a boarding house for Glaxo workers. The front part was adapted and changed into a residence. The bakery stayed until 1954 at which point the buildings were used for weekly doctor's visits by Dr. Young from Hillcrest.

In 1914 a post office was built in the village and in the 1930's a single Europa petrol pump was added.

**North elevation of the newly constructed Glaxo building.**



**East elevation of the newly constructed Glaxo building.**

**These photographs were taken in 1920-21 by Harry Jephcott's wife, Doris. Harry Jephcott was at the time the chief chemist for Glaxo.**

## MATANGI VILLAGE 1920'S

**One of the workers houses**

**Working mens hostel**

**Chapel / town hall with the workers housing beyond**

**Glaxo sports day at Matangi 1920.**

## MATANGI VILLAGE TODAY

**Workers hostel**

**Chapel**

**Row of old workers houses**

**Matangi Hall**

**Old workers house**

**Matangi school**

| | | **TIMELINE FOR THE MATANGI DAIRY FACTORY SITE** |
|---|---|---|
| DATE | | |
| 1873 | | Joseph Nathan & Co Ltd founded in New Zealand |
| 1885 | | Matangi site was established, a creamery, or skimming station was built. |
| 1886 | | Henry Reynolds starts Anchor butter factory at Pukekura Matangi creamery becomes supplier. |
| 1894 | | N. Z. Packing company purchases site and builds cheese factory at Matangi. |
| 1899 | | Joseph Nathan & Co Ltd registered in London |
| 1900 | | New Zealand Dairy Association (N.Z.D.A.) Opens a butter factory at Matangi.. |
| 1901 | | W.T. Murray Ltd takes over N.Z. Packing company buildings, builds boiler and other buildings and begins production of Highlander condensed milk. |
| 1906 | | Glaxo name first registered |
| 1909-1911 | | William Sim invents canning machine. |
| 1910 | | Matangi School opens due to increased area demand. |
| 1912 | | N.Z.D.A. Creamery burns down, it is quickly replaced though. |
| 1914 | | N.Z.D.A. builds a cheese factory at Matangi. |
| 1916 | | W.T. Murray ltd goes into liquidation. |
| 1916 | | Matangi Cheese Company takes over New Zealand Packing Company buildings from W.T. Murray. |
| 1917 | | Negotiations concluded resulting in the amalgamation of the various companies at Matangi, into the N.Z.D.A. Group |
| 1917 | | Drawings for giant milk powder factory are completed, building commences. |
| 1919 | | N.Z.D.A. , W.V.D.A , W.C.D.C merge to form giant dairy company N.Z.C.D.C. |

| | | |
|---|---|---|
| 1919 | | Matangi “Glaxo Building” The largest dairy factory in the world opens amongst much fanfare, opened by the Prime Minister (Hon. W. F. Massey) to a very large appreciative crowd. Production of milk powder for Glaxo commences. |
| | | Factory also builds houses for workers, N.Z.D.A. cheese factory becomes workers hostel, NZ Packing Company becomes men’s smoko area. |
| 1920 | | N.Z.C.D.C moves school further away from Glaxo Factory due to noise and pollution issues. |
| 1936 | | Glaxo factory passed back into the hands of N.Z.D.A. |
| 1941 | | Strike during the war, means farmers have to run factory by night and farm by day. |
| 1946 | | Automatic can and box making facilities installed. |
| 1947 | | New Co-generative power station and boiler built at Matangi. |
| 1951 | | Matangi and Te Awamutu first factories in the world to introduce tanker transport. This revolutionizes the industry. |
| 1951 | | Casein manufacture begins. |
| 1962 | | Experimental skim milk dryer tested. |
| 1965 | | 5-effect evaporator set added to factory. |
| 1967 | | Spray tower dryer built. |
| 1967 | | Matangi dairy factory R&D department develop a manufacturing process for caseinates. Paerata and Reporoa Factories designed based on this work. |
| 1980 | | Speciality products produced such as canned milkshakes and puddings. |
| 1987 | | Matangi Factory closes its doors |
| 1990 | | Factory sold into private ownership, it is used for storage and small business’. |
| 2001 | | GlaxoSmithKlein become largest pharmaceutical company in the world. |
| 2001 | | New Zealands largest company Fonterra formed. The N.Z.C.D.C is the biggest partner. |
| 2003 | | Harry and Linda Mowbray purchase Matangi Dairy Factory |

## WHY THE PROPOSED WORK NEEDS DOING.

Sealing the building up and fixing the structural problems are the obvious first steps. However it would be unwise to do this work without doing the engineering that is required to revise the earthquake ratings for the building. Once the engineering is done then the structural repairs can be addressed to fit in with the final scope of improving the earthquake ratings.

Buildings like this are only going to survive in the long term if they have an economic use. This building which is out in the country has got limited use and limited potential already so to further limit its use by not being able to rent it for certain uses due to the earthquake ratings is not a sensible long term option. Better earthquake resistance is going to make the building better able to survive an earthquake and remain standing for future generations.

The windows that have been removed and blocked up, need to be rebuilt to original drawings and fitted back into the building. Access to the building needs to be organized as at present the building has not got sensible access to more than half of it and this means the building is not commercially viable. To do this the tank stands at the front of the building that were added after 1972 need to be removed. This will also make the building visually better balanced and allow for better public appreciation of the building.

Essentially we are looking at preventing further deterioration, repairing structural damage and making the building a rentable proposition.

Incidentally, when we bought the property this building had a tenant in one area and one room rented for storage. Most of the windows were boarded up and the building was inhabited by possums, rats and pigeons and many areas were soaking wet. We have already made significant improvements but we are not in a position to fund the big expensive items that will ensure its place as an operating building and part of New Zealand's history.

## PROPOSED WORK

The proposed work is to repair the roof in line with the long term view of bringing the building back to its original aesthetics. This will require structural wood work, replacement of rotted fascia, replacement of rusted spouting with the original profile, replacement of internal gutters and installation of structural steel where required for earthquake resistance, removal of blown concrete, coating of reinforcing steel to prevent further corrosion, replacing removed concrete and the installation of more steel if required to meet earthquake regulations, repair of structural columns that have been fractured and fixing of the areas where structural walls have been removed, removal of any asbestos, repairing and replacing windows as per the original design to make the building commercially viable, shifting electrical switch rooms which have been put in office areas at the latter stages of the factories use, installation of amenities, internal walls, doors and services. We need to make the building accessible by removing the old tank stands and associated access way, The reality is the list goes on forever if we wish to bring the building back to the point of being viable, however it can be done piece meal and this would be our suggestion.

## DAMAGE & RESTORATION

The internal gutters and areas of the roof are in poor condition. The water has got into the building and rotted structural beams and has wet the concrete to the point where the steel reinforcing has rusted, expanded and blown the concrete apart.

**Leaking internal gutter, rotting trusses.**

**Badly rotted external guttering**

**Corrugated iron on roof is in poor condition.**

**Broken clear corrugated panel needs to be replaced and resealed.**

**Internal gutter has been replaced with tin which has collapsed.**

**Collapsed tin gutter.**

**Water damage inside building from leaking internal gutters.**

**Rotting beam from water getting under corrugated roofing.**

**Structural steel rusting and blowing concrete.**

**Shot of roof showing rusted structural steel**

**Shot of roof showing rusted structural steel**

**Water damage through roof and onto switch gear.**

**Corner showing rusting structural steel and water damage**

The previous owners had used the building as a fertilizer store and had operated a bucket loader inside the building. The walls were used as backstops to load the bucket and the bucket has then been raised up the walls scraping the concrete down to the reinforcing steel. This sort of damage has occurred in up to twenty places around the building.

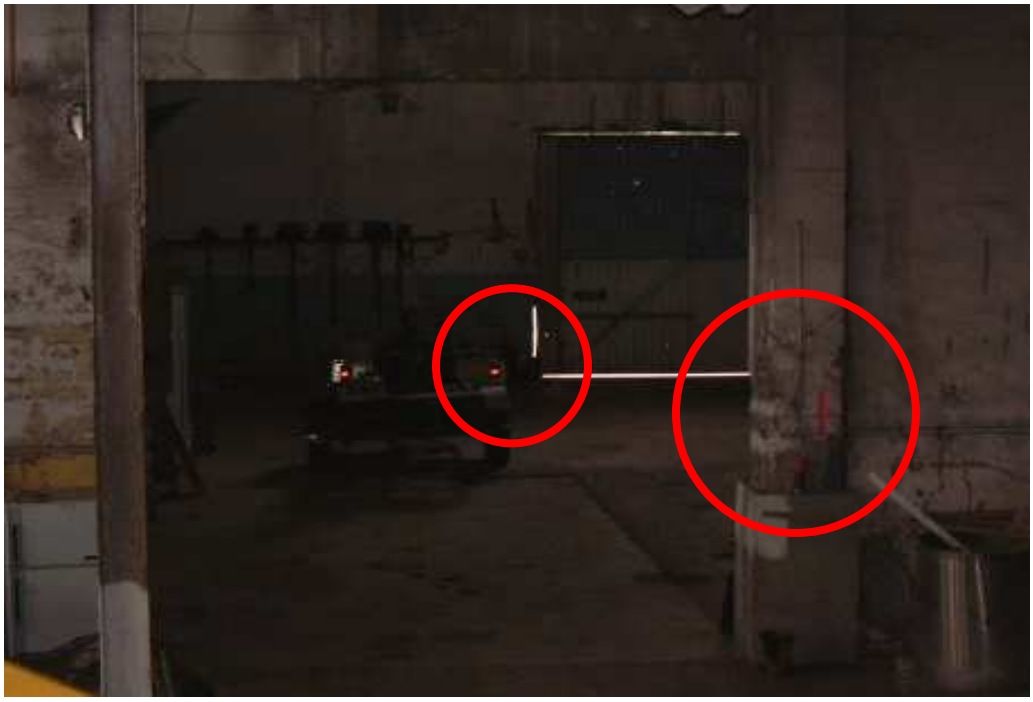
**Pillars scraped away by front end loader, exposing reinforcing.**

**Pillars scraped away by front end loader, exposing reinforcing.**

A hole has been cut in a structural wall to get access to the middle of the building. The structural column is now hanging down from the roof and will need bracing with a steel beam.

**Structural column cut out and now hanging.**

The front end loader has been driven into structural walls and fractured the huge columns; one of those damaged columns is adjacent to the structural column now hanging in the air. The other column is one of the main columns on the back wall.



**Hole in wall with structural column hanging. Damaged columns circled**

**Close up showing holes in wall and damage by front end loader.**

**Damage to the other side of the wall including holes in the wall and damage to the structural column beside the removed column.**

**Damage to the back wall where the front end loader has been driven into the structural column.**

**Holes in walls where front end loader has run into walls, holes have been simply boarded up from the other side of the wall to cover the holes.**

**Hole where front end loader has been driven into the wall**

Another hole has been cut in through a wall and it is obvious no engineering calculations were done - what's more it is adjacent to the structural column hanging in the air.

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**Hole cut in wall adjacent to hole with structural column hanging down.**

Fascia and barge boards are rotting and need to be replaced

**Rotting Fascia and barge boards.**

**Rotting barge board.**

**Rotting roof boards.**

**Tank stands in front of the building limiting access.**

At this stage, after an estimated $500,000 in expenses, we will have a structurally sound building and a rentable proposition. We will not have attended to any of the other, perhaps more aesthetic aspects of the building such as the original filigree that has been discarded, repairing or replacing windows that have been removed and blocked up, power supply, removal of asbestos.… The list goes on to the point where it becomes completely uneconomic.

This is an important part of New Zealands history, we have to work out a method of protecting it for future generations.

**This photograph shows the roof in need of repair. It also has the concrete plinths in the front and the access way (white building) added later, which we would like to remove**

With regard to what we see as the best approach for the re-roofing of the building, it would be a shame not to make every attempt to re-create the original roofing material as closely as possible. This may not be entirely practical as discussed in the history section of the report, as the original tiles were prone to blowing. It would make much more sense to use a more water resistant tile such as those on other restored F.C. Daniell buildings.

The following photographs of houses, from the same era as the Glaxo factory, in Balarat, Australia, and the re-roof of the Douglas' house show one of the types of tile we believe would look good on the roof. The other tile we believe would look good is also depicted below. These sorts of roofing tiles would enable the building to best fit the era and the architects attention to detail they would also enable the building to be restored with all the original filigree.

**This is the F. C. Daniell designed, Douglas' home just outside Matangi village. Currently it has the Marseille tile on the roof. This is one of the possibilities for the roof of the factory.**

**Marseille tile**

**House in Balarat with Marseilles tile and filigree.**

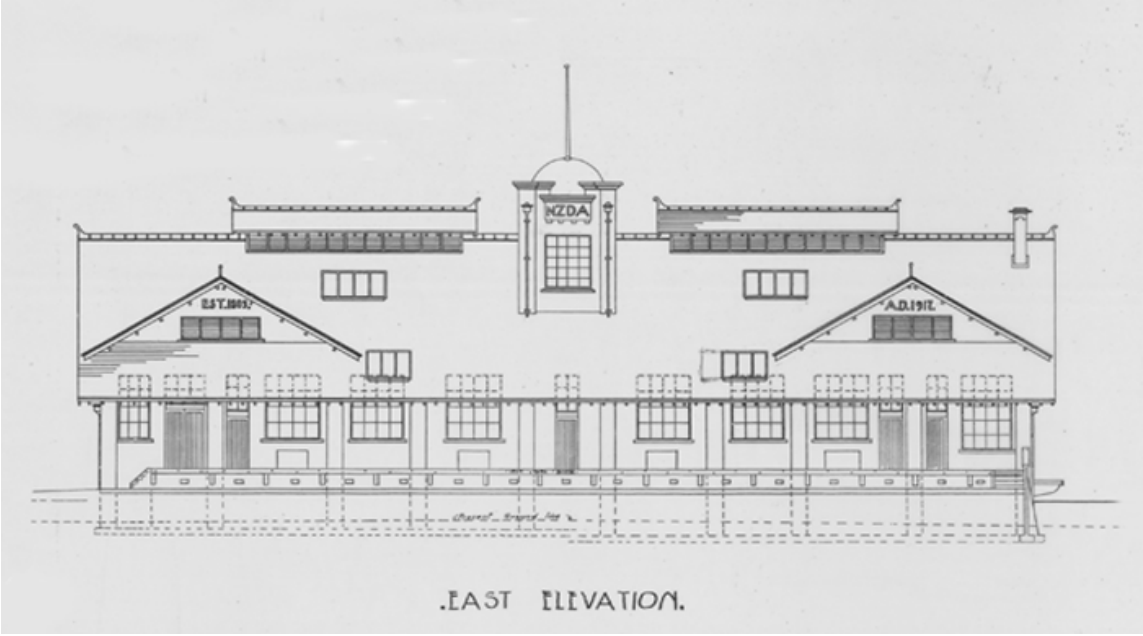
**Flatter style tile closer to the original look of building.**

**Flatter Nullarbor style tile**

**Flatter style tile with the capping and filigree attached**

## HOW THE BUILDING BENEFITS

The building will benefit as it will hopefully prevent it getting to the point where it is not sensible to salvage it. It will also make the building commercially viable so that it will have a long term future. If the building cannot be used it is doomed to failure unless it has an owner who is prepared to spend money with no commercial foundation.




**Edited photo**

## HOW THE PUBLIC BENEFIT

The public will benefit because the building will be around for future generations to appreciate. Aesthetically the building is an extraordinary example of an early 20th century factory built with more permanent materials than almost all of the factories in the various pictures in the historical books we have researched. This makes it a sensible building to invest in for the future. It is a big building and with careful thought it can have a commercial future while maintaining its original integrity.

If the building has a commercial use it will be lived in by the people operating the various businesses and the people visiting the building so in that sense the public will have access to the building in the course of their business.

We would display the history of the site in an appropriate area along with details on how the factory operated. This will need thinking through so that valuable material is not damaged. We would also need some sort of control over access as the site has a bad problem with vandalism. In one building alone we replaced over 100 window panes when we bought the property. Since this repair work 12 months ago around 15 have been willfully damaged by intruders again. I know what I would like to be able to offer the public but reality may have to be different.

The public will benefit by not having a derelict building in the community with all the associated problems. Meremere power station is an eyesore and not nice to live next door to. A rented aesthetically appealing building is a community asset and lifts the standards and property values as distinct to depressing them.

The dairy industry has played a major part in New Zealands commercial viability. This factory will remind the community of those early roots.

Matangi Factory is an excellent example of the work of Fredrick Daniell, an architect who has New Zealand wide recognition through this period of New Zealand history.

## SUMMARY

This is a huge building which requires a large sum of money to preserve and an even larger sum of money to get it to being a commercially viable proposition. If you look at the fixtures and fittings within the building it even blows it further into the red. The trick is going to be how we can walk this building ahead and make it viable at minimum cost but with an eye on the long term future and complete restoration. I am passionate about the building but it also needs dollars and to do it properly without getting to the point of commercial fittings it is going to be in excess of $900, 000 based on the estimates. I'm sure the right results can be achieved for less than this if we are clever.

Nevertheless it is going to be a very costly project and from a historical point of view it is clearly justified.

The reality is this factory building is highly significant to New Zealands history for aesthetic, architectural, cultural, scientific, technological and economic reasons. It needs to be preserved as does the old cheese factory we discovered during the process of our investigation.

We need to ensure National treasures such as this are not destroyed for short term gain.

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