Farm Buildings and Architecture

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Abstract

In New Zealand farm buildings represent for many a practicality of form that complements a relationship to the land. New Zealand architects of the twentieth century admired these buildings for their humbleness and their functionalism arising from the needs of the early farmers of New Zealand. For these reasons farm buildings are considered as part of the building tradition in New Zealand.

A desire for efficiency driven by technological innovation and economic motivation may be seen as a cause for change in agricultural practice. Farm buildings have developed alongside such imperatives. The nostalgia and relationship to the landscape that rural building previously had is being lost with this change. Another, more recent, cause for change in the agricultural industry is a growing public concern for farming standards in animal welfare and sustainability.

This project asks how an architectural involvement in the development of farm buildings might be approached? Or what an architectural approach might offer? The questions are researched and applied in a design project for the Tuakau Livestock.
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Introduction

This project started with an interest in construction methods and materiality. The corresponding theory in architecture is described by the term tectonics. Initially, the study of the theory was to be applied to the design project for long span building.

When trying to decide on a design project, the saleyards complex in Tuakau was noted as in need of development. Saleyards are used for the auction of livestock amongst farmers. In New Zealand, saleyards are part of the social and practical traditions of farming, but have never developed into a building type. Many examples of roofed saleyards are built at a similar latitude in Australia. The decision was made to use the Tuakau saleyards as my design project for the year. The site and program raised a series of questions. Why design a farm building? Why does a saleyard need a roof? And, how does an architect participate in designing it?

The following explanatory document attempts to address these questions. In the first chapter, the relationship between architecture and agriculture is established. The dependence of architecture upon agriculture is introduced and a relationship to the natural environment is seen as an idea that connects the two. New Zealanders’ nostalgic image of farming and farm buildings, in particular New Zealand architect’s admiration for the simplicity
of farm building is suggested as issues that this project is confronted by.

The chapter also suggests that the development of technology and machinery used in the agricultural industry is changing the rural shed. Such developments are suggested as causing a disconnection between farming and the natural environment. Imperatives of efficiency, mainly for economic reasons, have meant that farm buildings are becoming off-the-shelf standardized products. A specific relationship to the site is being lost.

There are few precedents of an architect being involved in the design of a farm building in New Zealand. The question then must be asked, what are the benefits of an architect being in the design? And, how they might approach it? Chapter 2 and 3 suggest ways in which an architect may be involved.

Chapter 2 includes the criticisms of agriculture, namely through sustainability and animal welfare issues. Climate change and global warming are cause for major change in architecture and agricultural practices.

Architects are taught sustainable design techniques to minimize a buildings energy use. Techniques such as natural ventilation, natural lighting and solar gain can be used to create comfortable spaces without the need for mechanical services. It is through this approach that an architect may address the criticism of agricultures involvement in climate change.

Farm buildings represent one tradition of building in New Zealand. One based on pragmatic agricultural needs and an availability of materials. Many of the materials used are considered to constitute the New Zealand vernacular. What was built derived from farmers’ needs and their knowledge of building techniques in timber construction. The Elegant Shed has become an aspiration of New Zealand architects. The character
of such buildings is not defined by ornament, rather form, functionality, construction method and materiality are considered as admirable aspects.

In chapter 3, an approach to design through an investigation into construction method is established. Such a method is suggested, as a way that an architect might approach the design of a farm building, with sensitivity to the traditions it is part of. In architecture, the term tectonics is used to refer to the expressive qualities of construction. The expressive potential of structure became popular with architects since the mid-nineteenth century as the use of ornament was disregarded. Gottfried Semper, Eduard Sekler, Kenneth Frampton and Marco Frascari have discussed the term tectonics.

A relationship between building and place is established through the writing of architectural theorist David Leatherbarrow. He says, 'all buildings have to be built somewhere.' Leatherbarrow suggests that there is a relationship between the construction and the context of a building. Through this research, my design attempts to reconstitute the connection farm buildings may have with the land.

The chapter also makes the comparison between different design methodologies. In architectural education, design projects are usually approached as a composition of space and form. Many times in design studio a form is created to which a construction method and hence materiality is applied.

In chapter 4 the design project for Tuakau Livestock Exchange is discussed. The design process used for the project for Tuakau Livestock Exchange, started with materiality. The use of timber

was considered important for the associations that could be made with it. The problem being, how to create a long span through timber construction? Reciprocal grillages were researched and used as a possible solution to such a problem. By approaching the design with a ‘top-down’ method, space and form is what is created through a process of construction.

A description of saleyards in New Zealand and the town of Tuakau are discussed in Chapter 4. A case is made for the roofing of the saleyards complex in Tuakau. The attempt is to apply the theory, generated through research, to the architectural design of the Tuakau Livestock Exchange. The result is not considered as the answer of how to design a farm building in New Zealand, nor is it suggesting that every saleyards should be covered, rather it is an example of how architecture may be used to address issues in agriculture and rural towns.
Agriculture and Architecture

The relationship between agriculture and architecture is an interesting one to make. This chapter looks at the associations that may be drawn between the two fields. Firstly it is noted that, agriculture formed a basis for architecture to develop. The relationship to the land and the natural environment is important for both disciplines. New Zealand architects admiration of farm buildings is discussed. It is noted that both have been subjected to change through technological advances. And both affect and are affected by cultural development.

Relationship of agriculture and architecture
It is debatable as to the origins and dates of the beginning of the agricultural revolution, but the association between the development of farming methods that allowed people to occupy the same area of land, and the production of permanent buildings can be made. The evolution of mankind from hunters and gatherers, to herdsmen, to agricultural farmers formed the basis for civilization to develop, villages developed into towns, and towns into cities, artisans and craftsmen were able to develop their trade, and eventually permanent architecture and architectural thought were applied to construction.²

The natural environment is important for agriculture and architecture. Architecture is interested with creating protection from the weather and utilizing environmental conditions, while agricultural production is at the whim of the climate. The sun is significant for architecture and agriculture, the former having been described as being shaped by light and using the sun's energy to heat spaces while the latter traditionally relied on the energy from the sun for production of food. Dale Pfeiffer recognizes this in his essay, ‘Eating Fossil Fuels’, he says, ‘Until

the last century, all of the food energy available on this planet was derived from the sun through photosynthesis. Either you ate plants or you ate animals that fed on plants, but the energy in your food was derived from the sun.

In agriculture the fertility of soil and lie of the land determine what type of crops or animals are raised. In architecture, the context is important for what and how something is built. Kenneth Frampton compares the two by saying, ‘Situated at the interface of culture and nature, building is as much about the ground as it is the built form. Close to agriculture, its task is to modify the earth’s surface to take care of it...’

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Farming Culture in New Zealand

Much of New Zealand’s development as a nation may be attributed to agricultural practice. The temperate climate of New Zealand made it ideal for farming for the early pioneers. Such historical roots have created a nostalgic image of farming for many New Zealanders. Geoffrey Thornton suggests that farm buildings have helped to create this image ...‘Because New Zealand was founded on agrarianism old farm buildings have become a memorial to the early colonial economy. They have their own characteristics and form an important element in the humanizing and transforming of the landscape. They are particularly significant for their economic importance in the development of the great pastoral and agricultural industries. Visually they remind us of our age-old dependence on farming for basic foodstuffs.’

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For many people living in urban situations, rural life is considered as a simple, ‘back to basics’ lifestyle. The country retreat is considered as a luxury to escape the complexities of urban life. This romanticized image of simplicity of rural life and building also brings with it negative connotations. The terms country bumpkin, peasant or hillbilly are terms used to describe a lack of sophistication in a person. A refinement in farm building will not change these negative conceptions, but may suggest that rural communities are not so much behind the times.

Despite this, products developed for farm use have become fashionable within popular culture in New Zealand. New Zealand fashion designer, Karen Walker, recently collaborated with Swanndri™ to produce refined versions of the iconic woolen coat, and the redesign of the Landrover™ to compete in the SUV car market are examples of farm culture being adopted into city life.

Beyond these consumer-based products, the ethos of farming is also being applied to the urban situation. Through isolation farmers were forced to become self-sustainable, methods include vegetable gardens and rainwater harvesting. The growing concern of society about the environment and a desire for good food has meant these techniques are becoming more popular.

Many New Zealand architects, since the 20th century, have admired farm building for its pragmatism and humbleness. The buildings constructed by early farmers were based on needs, function and availability of materials. Post-war architects have found the beauty of farm buildings in their usefulness.

In a 1973 interview with Ray Grover and fellow architect Ming Ching-Fan, John Scott describes the woolshed as a symbol of New Zealand-ness.

‘...It is the only building that we have all had a hand in – that’s grown out of our needs, our requirements, our kind of way of living. Everyone’s had a hand in it – Maori and European – especially on the East Coast. It has a particular kind of form and function and. Having grown out of the New Zealand farmers’ needs, it represents our total income, yours and mine, whether or
not we’re are involved in farming. It’s important because it was generated here. But I don’t say we go and build woolsheds.\(^6\)

John Scott’s admiration and description of the woolshed is shared with other New Zealand architects of the 20\(^{th}\) century. During the 20\(^{th}\) century, for many architects, Modernism represented architecture appropriate to the time; plain forms derived from the function of the building were characteristic of the era. The woolshed was conceived by New Zealand architects of the period to embody the Modernist mantra ‘Form Follows Function.’ The pragmatism of farming accorded with the importance Modernism gave to functionalism.

David Mitchell documented the 20\(^{th}\) century New Zealand architects attitude towards building in his book *The Elegant Shed*. The honesty that architects’ enjoyed arose from pragmatic approaches to simple problems and is suggested as the inspiration for some of New Zealand’s best buildings. The book sums up post-war New Zealand architects’ attitudes towards architecture in their country by saying,

‘There is scarcely a New Zealand architect who does not admire simple farm buildings, trampers’ huts and old style baches. Many will say they owe their best ideas to their experience of unpretentious buildings such as these.’\(^7\)


Peter Wood suggests that idea of *The Elegant Shed* has ‘achieved mythological status’\(^8\) amongst New Zealand architects. The popularity of the book benefited from the desire of post-war New Zealand to establish a identity for itself.\(^9\) The book and accompanying television series was criticized for complicating architecture and not actually providing a definition of what an elegant shed is.\(^10\) Despite this ‘The Elegant Shed’ has become a sought after addition to any architectural library in New Zealand.\(^11\) ‘The Elegant Shed’ discussed what might be labeled as the building tradition in New Zealand, a tradition of pragmatism and humbleness.

It is Mark Wigley who cites the building tradition as allowing New Zealand architects to participate in the world architectural debate.\(^12\) The point Wigley makes is that New Zealand has not been corrupted by the excesses of architecture and ‘New Zealand architects…found themselves practising what the world defined as architecture…’ when modernism attempted to turn architecture back into building.\(^13\) With the critique of modernism New Zealand architects withdrew from the architectural debate in order to preserve the regional tradition.\(^14\)

The tradition was preserved in architecture, but can the same be said of the baches, huts and farm buildings that inspire it?


\(^9\) Ibid.

\(^10\) Ibid.

\(^11\) Ibid. p 76.


\(^13\) Ibid. p 280.

\(^14\) Ibid.
Changes in farming practice have meant that farm buildings have not stayed the same. The aim is not to lose the myth of the elegant shed but to pursue it in the much-needed development of rural building, as Peter Wood has said, ‘A ‘shed’ is an architectural thing. An ‘elegant shed’ is not a thing but an aspiration.’

**Change through technology**

Like architecture, advancements in technology over the course of history have changed the way in which we farm. Machinery and tools used in farming have themselves been subject to design. Through technological advancements farming practice has become more efficient, but not without consequence. Kristin Duynisveld argues that a disconnection to the land and the environment is occurring through her the development of farming methods; much of her work is accredited to American scholar and farmer Wendell Berry. The work summarizes Berry by saying “…Farmers have lost control of their land and their commitment to the land through industrialization.”

Dale Pfeiffer writing on the changes of agricultural practice since the industrial revolution states that ‘the mechanization of agriculture hastened the clearing and the tilling of the land and augmented the amount of farmland that could be tended by one person.’ His writing is interested in the environmental impact industrial agricultural practice has had on the environment. While his writing looked specifically at America, it could be argued that the same is going on in New Zealand.

Much of the criticisms of change in agriculture has been found in American texts and is covered in the Chapter 2. Because of the importance of farming in New Zealand, changes have been


17 (Pfeiffer, 2003) p 2.
greeted as positive benefits to the economy. From a historical standpoint, Geoffrey Thornton writes about positive benefits that mechanization has had on the New Zealand farming industry. ‘Many pieces of farm equipment and machinery enabled the early run holder to become a more efficient farmer. Ploughs, harrows, reapers and binders and other such agricultural implements have been improved over the years, sometimes with developments made specifically by New Zealand manufacturers to meet local conditions. Shearing by blade shears gave way to mechanically operated handpieces and later became available as electrically driven machines. In dairying the invention of and improvements in the farm separator was a big step forward and this, together with the machine milker, enabled dairying to become a major export industry.’

The development of technology has enabled farmers to become more efficient in their practice, but at the cost of the tactile and experiential qualities of working with the land. ‘As the farmer steps into the closed cab of his air-conditioned tractor, they can lose touch with the soil of the field. It becomes too easy to forget what the soil feels, looks and smells like.’

The design of traditional farm buildings developed as ‘one off’ structures observing basic principles, such as ‘simplicity, forthrightness, honesty, commonsense and an understanding of the nature of various materials’. There was no mass production in a factory. However, there are now numerous prefabricated farm building companies in New Zealand, such as KiwiSpan™ who ‘build and supply steel frame…rural buildings and American...

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Barns to suit New Zealand’s extreme conditions.”\textsuperscript{22} Kristin Duynisveld suggests that contemporary farm buildings have lost a connection to farmland and culture because they are ‘not designed by farmers, but by engineers who understand functionality, instead of culture’\textsuperscript{23}. It may also be considered that the design of the buildings does not take into account the various contexts of a site; instead the emphasis is placed upon economic efficiency.

The architectural offspring of the industrial revolution, the International Style, has been criticized for its disregard for place specific factors in its implementation. Kenneth Frampton argues that the ‘\textit{tabula rasa} mentality of modernization…aspires to a condition of absolute placelessness.’\textsuperscript{24}

The development of contemporary agricultural buildings since the industrial revolution may be considered to have resulted in a disconnection to the land. Through engineering developments, technology and mechanization, the once, place responsive farm building is being lost. These methods may be considered as increasing the energy use in the practice of agriculture along with disregarding the beauty of the landscape.

Architects are taught passive design techniques to minimize energy use in their buildings, may be able to participate in farm building development. Through an architect’s involvement in the

\textsuperscript{23} (Duynisveld, 2008). p 28.
design of a building for the agricultural industry, issues of energy use may be acknowledged.

Through generating an understanding of the task required by the building and its environmental conditions required, the architect might be able to apply their skill in the construction of buildings. Australian architects, Stutchbury and Pape, applied the same thinking for their 2005 Deepwater Woolshed. The architects describe the design as part of the development of woolsheds in Australia.

'The Australian Shearing Shed has undergone marginal change throughout the history of its evolution. Sheep movement has been constantly refined; the shed was lifted to provide for undercover sheep storage and the shearing board was raised to ease the passage of wool to the classing table. In some areas technology has also contributed to the more efficient management of shed techniques. But fundamentally the shed as a building has become less decorative and more direct. Deepwater Shearing Shed has moved toward the integration and resolution of current concerns and functional requirements for such a building.25

Like the traditional shed, Stutchbury and Pape did not decorate the building, but rather the woolshed is generated through an understanding of materiality, and construction methods focusing upon functional and environmental requirements.

The technological advancements that have occurred in the agricultural industry have changed the way in which we farm. The developments have had a positive impact on economic efficiency and enabled farming in New Zealand to become one of the major industries. Perhaps the change through the industrialization of farming has brought to the forefront a new reason for change, one that addresses our impact on nature.

The development of stock trucks can be used as an example of the development of technology and design in the agricultural industry.

Image from http://timeframes1.natlib.govt.nz/
Sustainability

This century there has been a growing concern over climate change and global warming. The energy and waste produced by humans is causing change to the environment. Both construction and the agriculture are being affected by new initiatives to operate on a more sustainable level. Architecture has begun to address such concerns through various design techniques and technologies. The agricultural industry has been criticized for non-sustainable practices both environmentally, and ethically. The general public is becoming more concerned about where, and by what means their food, is farmed.

Society’s perception of agriculture is changing. The treatment of animals is becoming more important in the decisions the public makes about what they eat. The media in New Zealand has recently made the debate more public by publishing stories of animal neglect on farms. For example, New Zealand dairy business Fonterra’s largest milk supplier Crafar Farms in recent years has been convicted multiple times for environmental lapses and animal neglect.  

Animal rights groups criticize agriculture for the inhumane treatment of animals. Documentaries such as Earthlings directed by Shaun Monson graphically show the suffering of animals for food, fashion and medical research. The film has been nicknamed ‘the vegan-maker’ for the graphic portrayal of mankind’s mistreatment of animals. It is important now, for the agricultural industry to promote itself throughout the world as taking steps towards ensuring a humane treatment of animals.

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The New Zealand agricultural industry has suffered from the same criticisms; recently film footage showing poor living conditions of animals on cattle and pig farms have been made public. Society is becoming more conscious about the quality and the treatment of the food they eat, there is good reason for the agricultural industry to promote itself in New Zealand as encouraging ethical behavior.

Agriculture may also be criticized for its contribution to climate change and global warming. Criticisms include the cutting down of rain forests for farmland, the energy used and the greenhouse gases produced in agricultural production. The agricultural industry must address these problems in order to survive.

Dale Pfeiffer writes about the environmental crisis caused by agriculture. The major transformation of agriculture occurred during the 1950’s and 1960’s, what is commonly referred to as the green revolution. The green revolution saw the energy used in food production, shift from solar energy, a renewable resource, to fossil fuels, a non-renewable resource. The problem is that the agricultural industry is reliant on fossil fuels for food production, but fossil fuels cannot be replaced.  

Since the green revolution the energy input into agriculture has increased through the use of fossil fuels, but the food output has not increased at the same rate. Pfeiffer points out that the amount of energy we consume to produce food is becoming increasingly disproportionate to the energy the food gives us. To stop using fossil fuels in food production would mean the energy required is greater than the energy output. To operate on a sustainable level agriculture will need to find new ways for the energy used in food production to be generated or replaced.

Pfeiffer goes on to describe the affects that agriculture is having on the environment. Along with unsustainable energy

28 (Pfeiffer, 2003)
29 (Pfeiffer, 2003)
consumption, water use and pollution, land use for cropland and soil erosion in agriculture is causing an effect on the environment.30

The issue has been highlighted with the introduction of the Emissions Trading Scheme (ETS) in New Zealand. The scheme is ‘a price-based mechanism for greenhouse gases and part of an overall climate change policy’.31 (Forestry n.d.) Critics of the scheme suggest that the ETS still has some way in addressing the issue with the biggest greenhouse gas contributors, the agricultural sector. While other industries involvement in the scheme began in 2008, the agricultural industry, that contributes and estimated 40% of green house gases will not be implemented in the scheme until 2013 and will not bear full cost of emissions until 2030.

Agricultural energy inputs include fertilizers, irrigation, pesticides, machinery, transportation, electricity, and the construction and maintenance of farm buildings and infrastructures.32 Architects may be able to participate by applying sustainable building technologies to the construction of farm buildings and through the use of renewable energy technologies. Theories on constructing sustainable buildings consider the following aspects:

- Low energy use in the construction and use of buildings
- The use of replenishable sources in the materiality and the energy use of a building.
- The use of recycled materials and the ability for building components to be recycled if the building was to be demolished.
- The embodied energy in the extraction, manufacturing and transport of a building’s materials.

30 (Pfeiffer, 2003)
32 (Pfeiffer, 2003)
- The total life cycle costing of a building; the long-term effects of a building on the environment, society and economy.

- A relationship to place; consideration of local knowledge, building materials and traditions, environmental conditions of the site.

- Access and urban context.  

Farming in New Zealand is not as intensive as America. Two things may be learnt from the criticism of agriculture, firstly New Zealand can learn from other countries, so not to end up in the same situation, and secondly as country dependent on agriculture there is an opportunity for New Zealand to promote itself as a leader in addressing such issues.

Tectonics: The Art of Building

Farm buildings in New Zealand may be seen as part of the building tradition. Geoffrey Thornton describes the early years of building in New Zealand, suggesting the construction method and detailing were products of the availability of materials. ‘In New Zealand the plentiful supply of readily worked softwoods no doubt helped to achieve a greater degree of refinement in many of the early buildings.’ Mark Wigley suggests that New Zealand has a ‘tradition of building, rather than architecture, a tradition of the unadorned shed. Indeed, ‘New Zealand architecture’ is a contradiction in terms. What defines the regional condition is not a certain architecture but a certain resistance to architecture. This resistance preserves the category of building on which architectural theory has always been based.’ Wigley goes on to suggest that ‘architecture...[in New Zealand]...can be found inhabiting building rather than simply added to it.’

A way of architecture ‘inhabiting’ building can be considered through the theory of tectonics. Tectonics in architecture refers to the expressive qualities of construction, materiality and detail. The term tectonics used in architecture finds its etymology in the Greek word tekton – meaning builder. Through its linguistic origins the term tectonics is interested in building and can be related to the title architect, that shares its linguistic roots; archi – meaning master, and tekton – meaning builder. An architect therefore can be defined through etymology, as a master builder.

The term tectonics in architecture has come to be defined as the expression of the play of forces in a building, the material


35 (Wigley, 1986) p 280.

36 Ibid. p 282.
qualities and the arrangement of parts in construction. It may be seen as a celebration of the art of building. Since the 19th century architectural theorists, such as Karl Bötticher, Gottfried Semper, Eduard Sekler, and Kenneth Frampton, have discussed the theory of tectonics.

Up until the mid-nineteenth century architecture was defined, through the writing of Vitruvius, as firmitas, utilitas and venustas, or firmness, commodity and delight. Architect and theorist, Gottfried Semper broke from this tradition with his analysis of the Caribbean hut exhibited in the, 1851, Great Exhibition. Semper was able to theorize a historical origin of architecture drawing on the examples of built work of the world cultures on display. He argued that architecture existed of four elements, which he labeled as either stereotomic or as tectonic. The term stereotomic, described the hearth and the foundation; and tectonic, the roof and the screenwall. In doing so, Semper, was able to make a division between the technical and the symbolic components of a building.

At the time of Semper’s thesis, architecture was in a state of change. The Industrial Revolution was introducing new building materials and construction techniques, which in turn introduced a shift from traditional craft techniques. With new materials and techniques questions of representation in architecture were being raised.

Eduard Sekler clarifies a distinction between construction, structure and tectonics. Defining tectonics, Sekler, states that ‘...once structural concept has found its implementation through construction, the visual result will affect us through certain expressive qualities...which cannot be described by construction or structure alone. For these qualities.... The term tectonics should be reserved.’

For many, the issue of tectonics begins in the joint. Marco Frascari has described the joint as a meeting place of the ‘constructing and construing’ of architecture in ‘The Tell-The-Tale Detail’\(^{38}\). Kenneth Frampton, too, puts an importance on the joint, for him it is vital in telling the logic of construction.\(^{39}\)

David Leatherbarrow describes architecture and landscape architecture as the ‘topographical arts’, and that a single framework exists in both disciplines, that of topography. In doing so Leatherbarrow attempts to repair the breakdown of traditional craft that occurred after the industrialization of construction. Leatherbarrow suggests that all construction is influenced by the topography and technology of a building.

The relationship between a building and place has recently been given further meaning through contemporary sustainable thinking. “A green building cannot be designed in the abstract and imposed on a place. Instead of being conceived as a self-contained object, design focuses on elaborating a dense web of complex symbiotic relationships with all aspects of the building’s settings.”\(^{40}\)

**Construction in the design process**

Design education at schools of architecture place an importance of the spatial, formal and conceptual aspects of a building. In the theory of tectonics, space may be seen as the result of construction method. The idea of construction as the basis of architectural design is not a new idea, but rather one that predates the spatial discourse. Kenneth Frampton notes that,

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\(^{39}\) (Frampton, 1995).

\(^{40}\) (Buchanan, 2005). p 34.
“The great French architectural theorist Eugene Emmanuel Viollet-le-Duc would compile his magnum opus of 1872, his Entriens sur l’architecture, without once mentioning space in the modern sense.”

Sekler reinforces the importance of construction in architecture by suggesting that ‘...in architectural criticism tectonics would seem to deserve as much consideration as some of the other elements which have been singled out for special discussion, chief among them space.”

In an interview with Sam Ridgeway, Marco Frascari talks about a lack of emphasis on materiality and construction and a higher emphasis placed upon form and space in design studio at architecture school. Frascari says that students in design studio were producing “a beautiful design with a lot of space...but there was no construction”, adding, that “spaces change completely with the system of construction. The same...envelope, if you build it in brick or if you build it in wood, is a different space” Frascari was talking about his experiences during his time at the University of Pennsylvania, but the same idea could be applied to most schools of architecture throughout the world. There is an attempt in this project to apply a method of top down design, starting with a construction method informed by materiality from which a space is created.

Renzo Piano is an Italian architect who applies a similar theory to his practice. Of his design projects and research Piano says ‘research nearly always concentrates on two areas in particular:

41 (Frampton, 1995). p 1.
42 (Sekler, 1965).
44 Ibid. p 71.
on material and on the piece." Piano goes on to describe that his awareness of ‘space, expression and form’ started with “doing’: with the building site, with research into materials, with the knowledge of construction techniques, conventional and otherwise."

A design process emphasizing materiality and construction describes an approach placing an emphasis on the tactile nature of building. Such a response is in accordance with the unadorned sheds of farm buildings. Through approaching the design of a farm building from a construction perspective an architectural response to farm building may be able to continue to be part of the building tradition.

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Project for Tuakau Livestock Exchange

The design project for the Tuakau Livestock Exchange introduced some of the issues discussed in the previous sections. The relationship to the agricultural industry placed it within the context of the farm buildings in New Zealand and forced it to address the criticisms of the industry. The design approach reflects the building tradition with an emphasis placed on materiality and construction. Issues of sustainability and animal welfare are addressed in the design.

Sustainability can be considered to include environmental, social and economical contexts. Economic efficiency has been a major influence in agricultural production. The design of a farm building by an architect will cost more than the current pre-fabricated buildings. Firstly, justification for the redevelopment of the Tuakau Livestock Exchange needs to be described in economic terms.

When putting an emphasis upon economic efficiency, it hard to argue against prefabricated sheds for low construction costs. Through an architectural response, high initial costs of construction can be offset by considerations for the social and environmental contexts and the future of the site.
The design of the Tuakau Livestock Exchange hopes to:

- Create a more efficient procedure during auctions.
- Be seen as an investment by the agricultural industry to show a concern for the environment and animal welfare.
- Provide better facilities to ensure a higher attendance raising sale prices.
- Generate community support within Tuakau through becoming a public building and an image for the town.
- Become part of the infrastructure of Tuakau, by generating electricity through solar collection and collecting rainwater.
- Allow for future development of the site through a more efficient use of land.
- Create a more comfortable and less stressful environment for animals - research suggests that the meat from animals brought for slaughter will be of a higher quality.

These aspirations can be seen as having financial benefits for the Livestock Exchange over the lifetime of the building.
Site

The design responds to the various contexts of the site. The natural environment, and the dynamics of Tuakau were understood before beginning the design project.

Tuakau is a small rural town in the Franklin District of the Waikato Region. The town is situated 45km south of Auckland, and 7km from its larger neighbor, Pukekohe. Tuakau may be considered as the gateway to Port Waikato, most visitors to Port Waikato travel through the township. The fertility of the soil in the region and low frost levels make the area ideal for growing crops and grazing livestock. Sheep and dairy farms are also scattered throughout the surrounding area.

The Waikato River is to the south of the town, and the area has a history of occupation by Tainui tribes and was involved in the New Zealand land wars of the 1860’s. To the north the Hunua Ranges rise 688m above sea level.

Sketch of the Franklin area showing Tuakau to the south of the Hunua Ranges and to the north of the Waikato River.
Tuakau is the third largest town in the Franklin District. As of the 2006 census the population of Tuakau was 3,504 people, representing a rise of 22.8% from 2001. The growth suggests that there are development possibilities for the town. The rural lifestyle Tuakau has to offer and the affordability of land may be seen as reasons for such growth.

The description by David Mitchell of a New Zealand small town can be used to describe Tuakau, 'The recurring form is of the main-street town, signaled by a scatter of light industrial sheds on the highway. Houses start at the 50 k.p.h. speed zone, and move out to flank the strip of shops that runs through the town

centre, gap-toothed with paring lots and petrol stations. There are false fronts above the older shop verandahs, and occasionally a second floor to house the dentist or lawyer. The street is punctuated by key buildings that break its prevailing pattern: the once-dignified Post Office, the grand corner pub, the new supermarket. On the grassed corner is a roughcast Plunket Room and Women’s Rest Room... 48 Perhaps the difference between Tuakau and Mitchell’s description is that Tuakau did not develop along a major arterial route, perhaps the reason for slow growth in the town. The slow growth has allowed Tuakau to keep its rural town lifestyle. Included along the main street are two well-known secondhand shops. Bookending the south end of the main street is the saleyards site. Town plans for Tuakau, from 2002 and 2005, suggest the importance of the saleyards in the future development of the town, the current site is considered in need of redesign to create a better connection to the main street.

The edges of the site were considered important for a better understanding of how the saleyards would interact with the town. The main road, George Street, runs across the left boundary of the site, on this road, opposite the saleyards the residential zone begins. George Street is the road into and out of town, suggesting that the site frontage is important. To the southern boundary are the local sports fields. There are light industrial buildings to the eastern end of the site, which slowly give way to farmland.

On the northern boundary of the site is the local Marae established in 1914. The Tuakau town plan suggests a “desire to develop the profile of the Marae”, the Marae is hoped to become a ‘focal point for local and wider communities.”

also states the opposition of the Iwi to the current saleyards and that both the current uses are not compatible. 50

This opinion is not shared with a majority of the town who see the saleyards as a positive image for Tuakau. The Tuakau Town Plan of 2002 suggests a future development of the yards that by 2011 “the Saleyards have been developed as focus of tourist activity and rural Market theme. Previous detrimental effects have been managed through mitigation measures, and there is a whole level of environmental protection associated with the saleyards activity.” 51 It is noted in the same document that the current saleyards are not compatible with future development.

Like many towns in New Zealand, a major part of Tuakau’s employment relies on the agricultural industry. The saleyard complex in the town highlights the importance of the agricultural industry, and it is important that it stays. My design for the Tuakau Livestock Exchange will endeavor to generate community involvement on the site and allow for future development of the town.

The climatic conditions of Tuakau are as follows:
- Tuakau sits at -37.2667 latitude and 174.95 longitude.
- The annual rainfall is 1350mm.
- Mean summer temperatures range from 14°C – 24°C.
- Mean winter temperatures range from 6°C – 14°C.
- 80% humidity is experienced.
- The predominant wind direction is from the Southwest.

50 Ibid.
51 Ibid
Program: Saleyards and Marketplaces

A saleyard is a complex that is used for the auction and sale of livestock. At Tuakau these auctions are held three times a week. Animals are brought to site via stock truck and unloaded down ramps into a large holding pen. The animals are sorted depending on age, sex, breed and home farm into a network of pens and runs, where they are held before auction. This process is generally used for most species of farm animals, with the pen heights and area determined by the species of animal. At Tuakau the animals sold are cattle and sheep.

The auction process is different for sheep and cattle. Sheep auctioned as the auctioneer walks along a raised walkway above their pens. The bidders move from pen to pen in a run at ground level. Cattle are herded, one pen at a time, into an auction auditorium, with the one exception being calves, who are auctioned from their pens.
Saleyards provide an opportunity for the identification and tracking of livestock in case of disease outbreak. Like other aspects of the agricultural industry, technology has developed in this area. An electronic system such as the National Livestock Identification System (NLIS) used in Australia can be applied to keep track of livestock movement between farms throughout their lifetime. Electronic ear tags on livestock are scanned, by portable wand, when animals enter the yards. Advantages of the NLIS system include the traceability of any animal, and all the animals they may have come into contact with, in turn enhancing the ability of disease to be tracked.

Saleyards in New Zealand have a historical and social significance to the development of rural towns. Jock Phillips describes sale days as important social occasions in rural communities when he discusses the history of saleyards in New Zealand

‘The saleyards were usually close to the railway station. Sales of lambs or dairy cows were important social occasions attracting carriers and stock and station agents as well as farmers. Sometimes they were just local markets, held weekly or fortnightly; sometimes they were larger annual or bi-annual fairs. Kaponga’s weekly market was held on Friday, when farmers and their livestock came to town, along with a banker and a doctor. It was also the main shopping day. The Farmer noted that many stayed on at the sales ‘until their horses went lame and their saddles became worn.’52 ‘Farmers and their families sometimes treat the event as a picnic day out, and stock firms provide refreshments for clients at the end of the day.’53 The social atmosphere of the yards still exists and it could still be said that the dynamic of Tuakau has the ability to change when the sales are in operation.

53 Ibid.
Saleyards in New Zealand provide an important part of the historical, economical and social contexts of rural towns. It will be a loss to farming culture in New Zealand if this institution was to be gone. But, issues that are plaguing the agricultural industry may be seen as reasons for fostering the continuation of such practices and places. The next section investigates the ways in which the redevelopment of the saleyards complex may address these problems.

Stockyard, The Hunters Hills by Peter McIntyre represents the social atmosphere at the saleyards. Image from http://timeframes1.natlib.govt.nz/
Architectural Elements
The design of the Tuakau Livestock Exchange was approached as comprising of two architectural elements, the plan, consisting of the public spaces and buildings of the complex and the roof.

Master planning
The movement on and around the site was informative of the planning. Truck access, public access, wind direction and solar movement determined the master planning of the site.
The buildings and spaces required for the operations of the saleyards are as follows:
- Different pen spaces for cattle and sheep, with adjoining loading ramps for trucks
- An auditorium space is required for the auction of cattle, this is the largest building of the complex and is used as a focal point of the site.
- Administration space is needed, including four private offices and a reception area for bidders to register.

The site was divided up according to different activities and the relationship to the boundaries.
- A café.
- A classroom space is included in the design to accommodate for, school/tourist visits and community events.
- An allowance for the development of the town through proposed retail spaces.
- The inclusion of a market place to generate activity in town and on site.

Community space
An important aspect of the design was to include community spaces. The idea was to create community interaction with the site and the industry. And is in accordance with planning for the future growth of the town. The positioning of the site on the main street of Tuakau suggested the importance of this decision and where to place the public space.
A café, a classroom space and proposed areas for retail development are organized around the public space and road frontage to generate activity. The public space is also designed overlooking the array of pens, creating a connection between the public and the activities of the site.
The saleyards are currently in use for three days a week, by providing public facilities the site is used more intensively. The covered public space was designed as a weekend market place. The decision for the market was to get further use on the site, and for the rural community ideal not to be lost. The region surrounding Tuakau grows a high amount of New Zealand’s produce, the farms will have the opportunity to sell their crops at the market.
Relationship to the ground

‘The gravitational opposites, the immateriality of the frame and the materiality of the mass, may be said to symbolize the two cosmological opposites to which they aspire: the sky and the earth.

Despite our highly secularized technoscientific age, these polarities still constitute the experiential limits of our lives. It is arguable that the practice of architecture is impoverished to the extent that we fail to recognize these transcultural values and the way that they are intrinsically latent in all structural form.54

The major part of the Tuakau Livestock Exchange is the roof; the buildings and decking beneath the roof owe their design as a ground response to the aerial nature above. By doing so Semper’s definition of tectonics and stereotomics is explored in the project. The buildings beneath the roof are to be constructed from timber. In the design the tensile nature of timber is

54 (Frampton, 2002). p 95.
contrasted to the solid characteristics it might embody through different construction methods.

**Functionality**

The fences and pens of the saleyards are used to control the movement of animals. Currently the shape of the pens determines the movement of animals. In the design for Tuakau Livestock Exchange the movement of animals helped to determine the layout and shape of the pens. This thinking is in accordance with the aspiration to make animal welfare a priority at the Tuakau saleyards. Much of this design can be attributed to the research of Dr Temple Grandin, who has published numerous papers on animal psychology.

Cattle are taking from their pens to an auction auditorium; the layout of the cattle pen area is representative of that and designed along the following parameters:

”Long, narrow pens are recommended in holding facilities where livestock are held for a relatively short period of time (Kilgour,
A major advantage of long, narrow pens is efficient animal movement. Animals enter through one end and leave through the other. To eliminate 90° corners, the pens can be laid out on a 60°-80° angle (Figs. 1 and 2). Each pen gate should be longer than the width of the alley, so that it opens on an angle to eliminate the sharp corner.55

Sheep are auctioned from their pens, therefore their movement is one directional; they enter and leave the pen from one direction. A herringbone type layout of pens was designed for the auctioning of sheep with pens laid out back-to-back.

The work of Dr Temple Grandin also influenced the design of the facility’s loading ramps. The curved run leading up to a ramp is recommended by Grandin as it takes advantage of cattle and sheep’s natural instincts, ‘...First, it prevents the animal from seeing the truck ... or people until it is almost in the truck or squeeze chute. A curved chute also takes advantage of the animal’s natural tendency to circle around the handler (Grandin, 1987; Barber and Freeman, 2000). When you enter a pen of cattle or sheep, you have probably noticed that the animals will turn and face you but maintain a safe distance. As you move through the pen, the animals will keep looking at you and circle around you as you move. A curved chute also takes advantage of the natural behavior of cattle to go back to where they came from.56

Through the design of loading ramps and holding facilities, the Tuakau Livestock Exchange will help to reduce the stress and


56 Ibid. p 150.
injuries to livestock. The facility will operate more efficient by incorporating principles of livestock behavior. Through applying such principles in my design the issues of animal welfare are addressed.

The plan was a result of an analysis of the site and program.
A roof over the yards

Central to this project is the roof and I argue for it in both functional and symbolic terms as follows. The possibility of the roof in architecture suggests that, meaningful identity can create a relationship to place, and protection from the elements can help foster a sheltered community place. The roof may act as town infrastructure through energy generation and water collection. And by doing so, the design of the Tuakau Livestock Exchange is an opportunity for the agricultural industry to promote animal welfare and a positive attitude towards the environment and the community. As a result, Tuakau achieves a significant work of architecture that refers through materiality and construction to the history of farm buildings, and creates a strong expression to local identity.
Function of the roof
Research into the natural behavior of animals suggests that a roof over the saleyards may reduce stresses on animals. In doing so the yards will function more efficiently and the wellbeing of the livestock will be improved.

The design of the roof is to firstly provide shelter from the elements for the occupants, both animal and human. The concept of providing shelter fits with current research on the welfare of animals on farms. Fisher, in his thesis entitled ‘Shelter and Welfare of Pastoral Animals in New Zealand’, suggests the natural physiological and behavioral attributes of livestock is in part influenced by the animals desire for protection from the environment and it is the farmers responsibility to provide adequate shelter for their animals. In his thesis Fisher describes the natural reactions of sheep and cattle to different environmental conditions ‘...in hot conditions sheep stand side by side reducing the area facing the sun, while in cold conditions cattle stand with their hindquarters to the wind. It may also be noted when travelling through the countryside, during hot days the shade of trees is used by sheep and cattle. The Ministry of Agriculture and Forestry are currently researching into ‘...shade and shelter in New Zealand conditions in order to make practical recommendations in new codes of welfare for farmed animals’.

58 (Fisher, 2007). p 351.
In particular to the Tuakau Livestock Exchange which is to the northern tip of the Waikato region, Fisher outlines benefits of stress relief upon cattle ‘...In the Waikato region, shade use by dairy cows began when ambient temperature reached 25°C and increased exponentially with increasing ambient temperature...(Roberts et al. 2002)....Cows with access to shade produced more milk, spent more time eating in the late evening, had lower respiration rates, and had lower body temperatures in the middle of the day. Providing relief from heat with sprinklers also reduce respiration rate and body temperature after locomotion (Verkerk et al. 2006).’

While it may be argued that 25°C is higher than the mean summer temperature in Tuakau of 24°C, (freebase 2009) ‘...some of the main environmental factors affecting thermal stress are ambient temperature, solar radiation, wind speed, humidity, precipitation, and ground surface conditions...[and]

60 (Fisher, 2007). p 352.

61 Ibid. p 350.
62 Ibid. p 352.
63 Ibid. p 352.
Wet conditions are not so influential on the thermal comfort of livestock, but during visits to livestock auctions I was able to witness the slipping of the animals on wet surfaces. The safety of the animal seems to be compromised through slipping and one would presume the animal would experience higher stress. The chances of the development and the spread of disease is assisted through a wet floor.\textsuperscript{64} Temple Grandin suggests that the ‘...Provision of soft floor and weather protection, reduces animal stress, ensuring optimum stock condition.’\textsuperscript{65}

Grandin goes on to say that direct sunlight causing shadows or reflections may effect animal movement within a yard.\textsuperscript{66} At the saleyards shadows are often cast over the ground through the railings of fences, or glare is created from the sun reflecting on wet concrete. Grandin understands that animals experience the world in a very different way to human beings...Reflections on wet floors often cause animals to refuse to move. A reflection that is visible at an animal’s eye height may not be visible to a person.\textsuperscript{67}

\textsuperscript{64} (Grandin, 2004).
\textsuperscript{65} Ibid.
\textsuperscript{66} Ibid.
\textsuperscript{67} Ibid.
The Roof being Infrastructure
The agricultural industry needs to use energy from renewable resources and reduce energy use.\textsuperscript{68} My design for the Tuakau Livestock Exchange addresses energy use issues through the use of sustainable design principles and technologies. Furthermore the roof aims to generate a positive public perception towards sustainability in agriculture. The roof is conceived of as a farmed landscape, solar collection is achieved through photovoltaic cells, rainwater is harvested and natural ventilation is achieved. By doing so, the form of the roof was partly determined by the environmental functions it was designed to perform. The Tuakau Livestock Exchange not only services the agricultural industry but also provides infrastructure for the town.

\textsuperscript{68} (Pfeiffer, 2003).

Rainwater harvesting
Rainwater harvesting is a traditional technique used on farms, and is implemented in the design of the roof for the Tuakau Livestock Exchange. Rainwater is caught on the roof and drained to water tanks along the south of the building. The collected rainwater is to be used to cater for the water requirements of the complex.

Alternatively, the Tuakau town plan suggests that the town’s population growth will require the current water supply to be updated to meet future needs. The water collection at the Tuakau Livestock Exchange may be able to be incorporated into the development.

Photovoltaic cells
Photovoltaic cells convert the sun’s energy into electricity. Parts of the roof are given a northern aspect for sun exposure for photovoltaic cells. The energy generated is used to power the building with excess fed back into the grid.
The use of a renewable resource of energy the sun is used and in doing so, a relationship to the reliance of traditional farming practice on the sun’s energy is commented on through technology.

**Passive design**

Natural ventilation and natural lighting is important for the use of the Tuakau Livestock Exchange. By designing the roof to naturally perform these functions the energy use of the building will be reduced. The form of the roof and the cladding were determined by trying to achieve a passive system of operation.

Studies into the organization of the roof for natural ventilation and lighting, water collection and photovoltaic cells.
Structure of the Roof

The Materiality of the Roof

The design of the roof was approached as an investigation into timber as a construction material. Timber is used for its relationship to rural building, sustainable construction and local industry. Early research was into methods of timber construction that will create a long span. As an alternative to a traditional post-and-lintel structural system, the book ‘Reciprocal Frame Architecture’ was brought to my attention.

‘The reciprocal frame is a three-dimensional grillage structure mainly used as a roof structure, consisting of mutually supporting sloping beams placed in a closed circuit…[The] variation of the reciprocal frame…[is when]…the beams are connected in the same plane forming a planar grillage.’

Japanese architect Shigeru Ban has experimented with such systems in projects for the Pompidou Center in Metz (under construction) and the Forest Park Pavilion (not yet realized), and Alvaro Siza in his London Sepentine Gallery of 2005 used a reciprocal grillage the use of timber relating to the trees of the park. Both architects worked with Ove Arup engineers, one of the major engineering practices in the world, during their respective projects.

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With each member supporting the next there is no piece in the structure that is unnecessary for its integrity; much like the efficiency of structure used in farm building. Whereas the efficiency in agricultural buildings is generally due to economic benefit, the efficiency of the reciprocal grill is in the timber being used to its maximum potential. Small timber members are used in the system, which can be milled from younger trees. Younger trees are replaced at a quicker rate, reducing the lifecycle costs of the building on the environment. By doing so the building is efficient in its use of natural resources.

A lattice type structure such as a reciprocal grill illustrates both the compressive and tensile characteristics of timber. The tectonic nature of farm construction may also be appreciated for an understanding of the construction method and a use of materials that reflects their characteristic. The Taranaki Gate exemplifies a built object on the farm that is intriguing as to understand how it works. The Taranaki gate also manifests the

A 1:10 scale model of a reciprocal grillage. The model shows the use of plywood within some squares of the grid to brace the structure.
nature of the materials used; solid timber posts do a different job to the tension of the wire. The aesthetic of reciprocal grillages also creates an intrigue into the working nature of the system.

“A building, but also part of a building, explains itself by showing how it works and what it’s for. We try to make each element clearly legible both independently and in its relation with others and thus to make it not only part of a larger structure, but also a self contained whole...by showing how things work, and letting each element speak for itself as far as its function in the larger whole is concerned, the architecture of a building can intensify our awareness of the phenomena that make up our environment. If it is clear how things work, that is because it looks as if it can be taking apart.”

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A repetition in the agricultural landscape was noticed during site analysis. Lines of crops and animals are repeated in nature, while in the built environment includes fences. The repetitive nature of the reciprocal grill reflects the repeating bays and yards formed in stockyards.

**Structural Approach to the Roof**

Through making a series of reciprocal grillages further knowledge of the system was generated. A reciprocal grill uses a repeated part to construct a geometric grid. In order to design with a reciprocal grillage it is important to understand the geometry of the structure and the parameters that define it.\(^{73}\)

Experimentation with different shaped members on various scales lead to an understanding of the geometries of the grill in

three dimensions. By changing different variables in the connection of each piece, different geometries can be created. The different places where each piece connects to the next determines the size and shape of the grid. A square grid was desired to reinforce the repetition of pens below and the nature of the system (and tectonic curiosity through expression of how it works) was to be exploited through the distinction made between each piece. By using these criteria a grill was designed, the size of each square determined by the width of the cladding material.

The rotation of the overlap determines the curvature of the system. The changes in the members not only create different geometries on the horizontal plane, but also determine the curvature of the vertical plane. By changing the depth of the notch and the distance between, shallower or deeper curves can

Model studies into the different geometries created through different shaped members.
be generated. Furthermore by changing the direction of the overlap sequence formed either a convex or concave curve.

Because each member is subjected to the same loads, they are the same dimension; as a result what is called a field condition of construction is created. A field condition is opposed to a hierarchical structure, where members grow in size depending on the load it is transferring.

With such a large roof over the saleyards, the decision was made to break the roof up into smaller canopies for structural, functional and visual reasons. Part of the design process included a meeting with Holmes Consulting Engineers, it was realized during the meeting that the reciprocal grill was not going to span as far as was anticipated. The notching of the members and the number of joints create a weakness in the system.

Either a convex or concave curve is created with the rotation of the overlap
The breaking up of the roof meant that natural ventilation could be achieved through the overlapping of different roofs.

The field condition of the reciprocal grill would become visually static over the whole span. The decision to create the roof as a repetition of frames of reciprocal grill meant that edge beams would break up the visual effect of the field condition.

The decision to break the roof up allowed for a repeated structural bay across the site. The break in roof surfaces also allowed for ventilation to occur between the spaces provided. Each bay was then designed to make use of the natural elements of the site. This is the application of the idea of the roof being infrastructure.
Firstly the frames of reciprocal grills had to be held up. The design was explored through hand drawing and model making. Rather than having a column on every corner of the frame, the structural bays were designed as a cluster of columns from which the frames cantilever. The cluster of columns is tied together at the top by a steel collar, which trusses are connected to. The trusses form edges for the reciprocal grill to span between.

The design for the Tuakau Livestock Exchange has been developed through an iterative process concentrating on construction method and materiality. By doing so, it is hoped that sustainability can be addressed through creating a connection to local traditions and community. The energy use of the building has been addressed but not proven as sustainable through technical data or computer modeling. The focus of the project has been to experiment how architecture and saleyards might interact.
The design of the structural bays were investigated through an iterative process.
Conclusion

What started as an interest in construction and materiality led to a focus on an agricultural activity that has not previously received architectural attention – the saleyard complex. This attention is timely as changes in the agricultural industry are occurring for reasons of environmental sustainability and animal welfare.

The practice of agriculture has changed over centuries, with major developments occurring since the industrial revolution. The shift from the use of the sun as the main source of energy of food production to the use of fossil fuels allowed agriculture to become more productive. But the change has come at a cost to the environment. Architectural involvement in the design of saleyards is able to address issues of energy use through the appropriation of sustainable design techniques.

Saleyards are an important part of the New Zealand’s history of farming and rural towns. Not only were they important for the economical progress of the country but also the social and cultural development in rural towns. The design project for the Tuakau Livestock Exchange illustrates how architecture can be involved in the design of such facilities. The design of saleyards is capable of creating better conditions for animals, reinvigorating town identity and promoting and fostering a market for good food. Issues of energy use in the agricultural industry can be addressed through the application of sustainable design techniques and renewable resources.

Through approaching the design with the intention of construction and materiality being expressed, the saleyards building is able to keep its connection to the building tradition in New Zealand. This project is not trying to reinvent farm buildings but rather is suggesting a way in which architects may participate in the development of contemporary farm architecture.

74 (Pfeiffer, 2003)
The design of farm buildings is not going to solve all the problems of energy use and animal mistreatment in the agricultural industry; these decisions are ultimately up to individuals. What the building can do is promote an attitude to farmers and the public that there is a different way of doing things.
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