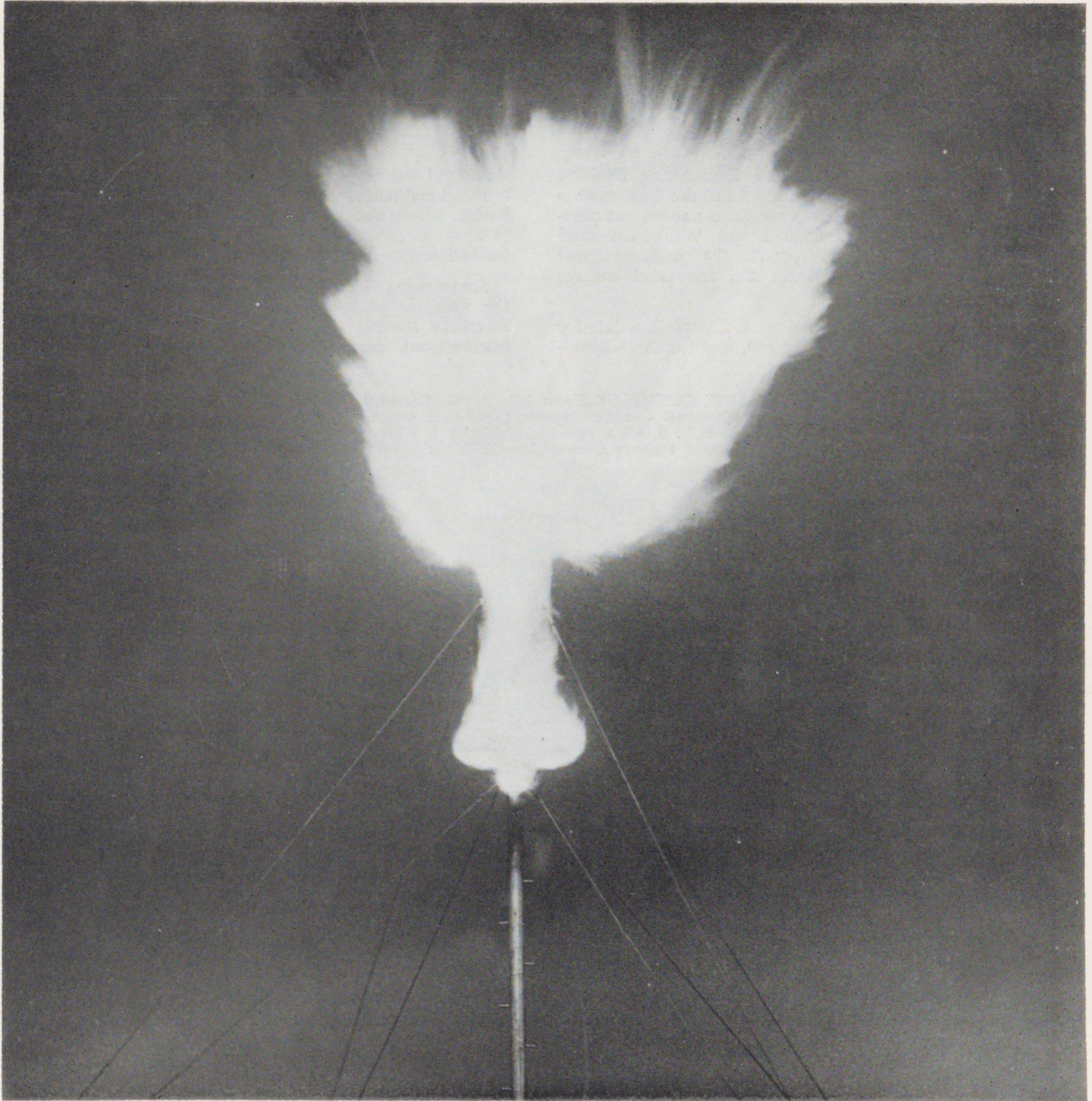
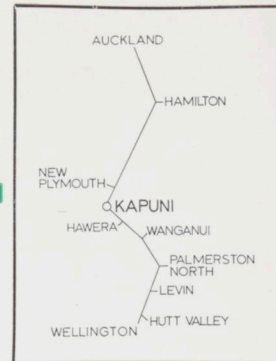
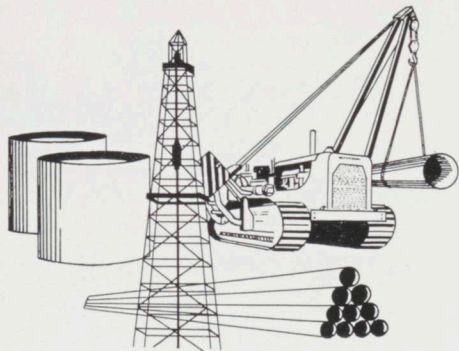


Spring 1968

arrowhead



FLETCHER CONSTRUCTION AWARDED MAJOR KAPUNI CONTRACTS



FLETCHER Construction Civil Engineering Division has gained the major contracts for the \$18 million Kapuni project. The contracts are for a natural gas pipeline from Kapuni to Auckland and Wellington (\$7½ million) and the main contract for the condensate line from Kapuni to New Plymouth and associated tannage (\$2 million).

Work on both projects has begun. Completion date for the condensate line is 1 July, 1969, and for the Kapuni-

Auckland and Kapuni-Wellington lines is 1 October, 1969.

Fletcher's tender for the Government contract was the lowest. There was one other wholly New Zealand tender, three from New Zealand firms associated with United States interests, one United States tender and two Italian.

Announcing the acceptance of the \$7,770,629 tender, the Minister of Works (Hon. P. B. Allen) said that Fletcher's success against strong competition, local and international, demonstrated the ability of New Zealand

SIGNING OF KAPUNI GAS PIPELINE CONTRACT. From left: A. G. Summers, Chief Executive Officer, National Gas Corporation; A. R. Wright, Director, National Gas Corporation; J. P. Lewin, Director, National Gas Corporation; S. C. Parker, Chairman, National Gas Corporation; Hon. P. B. Allen, Minister of Works; J. Espie, Managing Director, Fletcher Construction; J. G. Smith, General Manager, Fletcher Construction; F. R. Askin, Acting Commissioner of Works.



contractors to hold their own with any others. This pleased him personally, because his portfolio brought him into close touch with the contracting industry, and it also pleased the Government.

Weather will be the greatest problem the contractors have to contend with during the building of the Kapuni Pipeline. Therefore the Paekakariki-Wellington sector has been chosen for the first portion of the pipeline to be got under way. The reason for this is that the sector is through hilly country and because of the wind in this area earthworks dry out quicker, so that this sector can be more easily worked than others during the winter. The contract calls for the laying of the pipeline from city gates to city gates Auckland to Wellington plus the line feeding into Kapuni and also certain lines at various stations on the way, such as Hamilton, Palmerston North, Levin, the Hutt Valley. The line ends under this contract at Takapuni on the Auckland end of the line and at Tawa on the Wellington end.

How is the Line Constructed

First a roadway has to be made alongside the section of country where the pipe will run. Alongside this the trench to carry the pipe is dug. The pipe is laid along this roadway, is welded together in sections, in most instances of about $\frac{1}{4}$ of a mile, and then placed in the ditches and each of these $\frac{1}{4}$ -mile sections welded together.

The pipeline will certainly be long but neither horizontally nor vertically will it be straight. The curves in the line either horizontally or vertically will be a result of the terrain through which the line has to pass. In hilly country there will be more earthworks needed than in flat country. The idea is to keep the pipeline as close to the horizontal as possible and preferably not to vary more than 30 degrees to meet operational requirements.

Curving through as against curving up, in certain terrain, has to be taken at gentle limits because of constructional problems. The bending of the pipes is done by cold steel methods and must be in gentle curves in order that there is no damage to the pipe. Although a simple route map of the pipeline shows a series of straight lines this is in fact not the case. The pipeline must follow a route to suit the topography of the ground. Generally this moves along the top of ridges. But in the course of the pipeline some 26 major river crossings have to be made. The pipe has to be buried under the bed of the river and these crossings are important engineering tasks for the construction company.

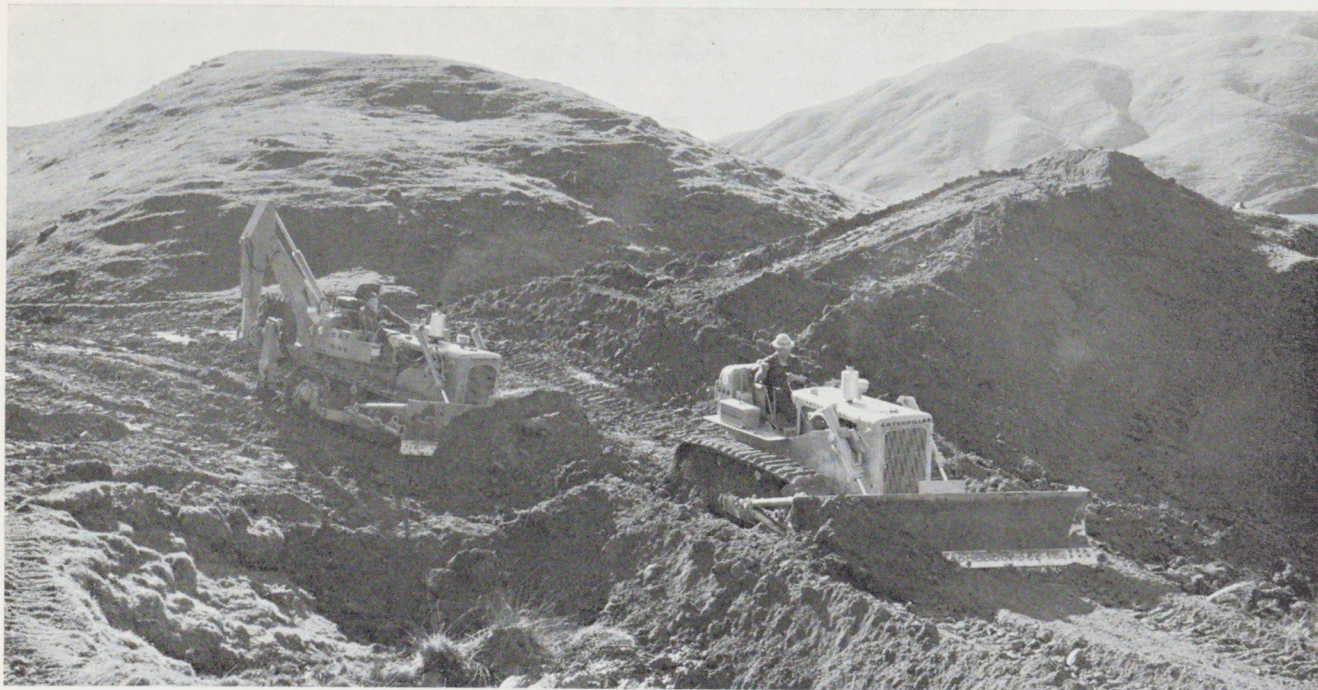
For digging the ditch for the pipeline a special wheel type ditcher will be used. This equipment has had to be imported from overseas. It can only be used in country where the work is carried out on a reasonably level piece of territory and which is not rocky. Elsewhere in hilly country or rocky country the conventional back-hoe type of excavator is being used.

A steep stretch of country on the Tawa - Plimmerton section of the pipeline which was the first to be started.





Another view of the rugged country being worked near Porirua. The pipeline route is indicated by the earthworks in the centre of the photograph. The fence in the foreground is a temporary one erected to contain stock when the permanent fence was taken down to allow the work to be carried out.



Bulldozers preparing the first section of the roadway along the pipeline route. The machine at the rear will be used later for trenching.

The pipes will be laid with a side-boom tractor. This is a specially adapted tractor with a crane attachment on the side and it can go anywhere a tractor can go. It runs parallel to the pipeline. A hydraulic bending machine will be imported from overseas to pre-bend the pipes to fit the country through which they have run. The pipes are welded on the ground above the trench. This welding work calls for men who are not only highly skilled welders but who also can work at high speed. The success of the operation depends upon team work and the skill of the individual welders. A number of welders with many years of experience in this type of work will be brought from overseas and New Zealand welders will also be trained to become a part of the welding team. The pipes are pre-wrapped in a bitumen-coated fibreglass matt. This wrapping will become damaged in the welding of the sections and has to be re-coated at joints. The pipes are being supplied under separate contracts from India and the protective coating of the pipes will be done also as a separate contract in New Plymouth.

Over much of the line the pipes will simply be laid into the bed which is prepared for them. But in rocky country sand has to be laid before the pipes are placed so that the rock surface does not do damage to the protective coating. Electrodes will be placed in the pipes at intervals in order to check for corrosion.

While most of the pipes will be laid in $\frac{1}{4}$ -mile sections there will be a variation on this where there are obstructions to be considered. For instance, where a road has to be crossed the pipes will be laid at either side of the road until a deviation can be put in and then the road pulled up and the small sector under the road will then be laid.

After the pipes are laid, the filling is placed over them and then the pipes are hydraulically tested.

Most of the men engaged on this Kapuni Pipeline will be local people, but in addition to the specialised welders, previously mentioned, there will also be some dozen overseas specialists who will act as supervisors.

In general the laying of the pipeline will start at Wellington and end at Auckland. However, when more equipment is available and the weather is right a start will be made with the pipeline from South Taranaki. Wherever necessary construction camps will be erected near the site of the works to obviate long travel by work teams.

The Condensate Line

The separate \$2 million contract, which was also secured by Fletchers for the condensate line from Kapuni to New Plymouth, involves installing equipment at well heads and the installation of gathering lines to collect gas at the wells and bring it to the Government's CO₂ removal plant. The CO₂ content amounts to 45% of the raw gas.

This contract is to Shell-BP Pipeline Line Services Limited. The condensate line is to bring the petroleum, which is produced in the production of the gas, by pipeline 32 miles to New Plymouth in a 6in. main where this petroleum will be stored in storage tanks and piped to the wharf to be discharged into tankers for Marsden Oil Refinery. The tanks are being built under subcontract by Fletcher-Bernard Smith. **The petroleum is of high quality and will supply approximately 10% of New Zealand's petrol requirements.**

BIG FLETCHER TIMBER EXPORTS



Squares and logs loading at Napier for Japan.

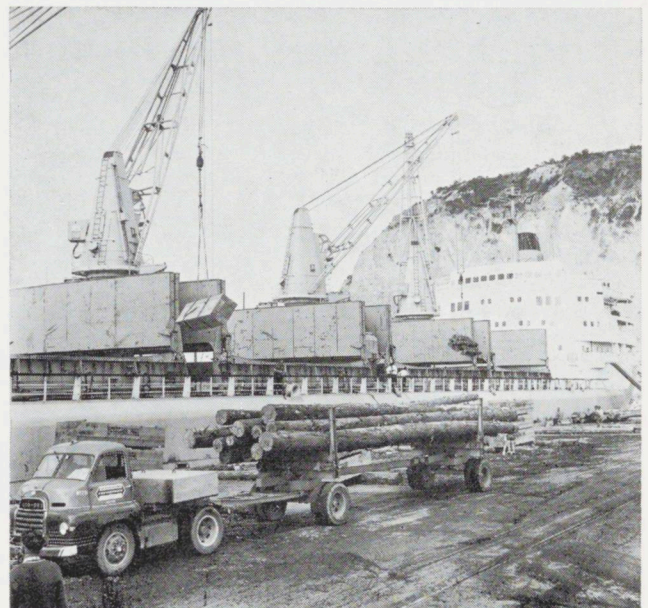
IN the financial year ending March, 1969, Fletchers expect exports to reach \$4 million. This statement was made in the Annual Report 1968.

It is significant that the company's exports have risen from a few thousand dollars spread over many items to nearly 5% of Group turnover — and are expected to increase.

While other exports have risen — quite impressively in terms of percentages, it is timber which has brought the big export earnings — the dramatic rise from a few thousands to millions.

We are selling logs, sawn and dressed timber and some plywood. Japan, Australia, Great Britain and the Pacific Islands are the buyers.

The exports are of both native timbers and pine. So far as indigenous varieties are concerned, demand and availability have just about equalised. In pine there is still room for increased sales. The other opportunity for increased export earnings lies in switching sales from logs to sawn timber and plywood.



Logs, sawn timber, pulp and paper have been for some years an important part of the trade of the port of Tauranga, but although Fletcher Timber does export through Tauranga, its contracts with Japan for the export of logs and sawn timber have brought a boom to the port of Napier. In a year Fletcher Timber exported more than 28 million feet of logs through that port. More recently in conjunction with Waipari Timber (a Fletcher company) log exports have also been sent through New Plymouth.

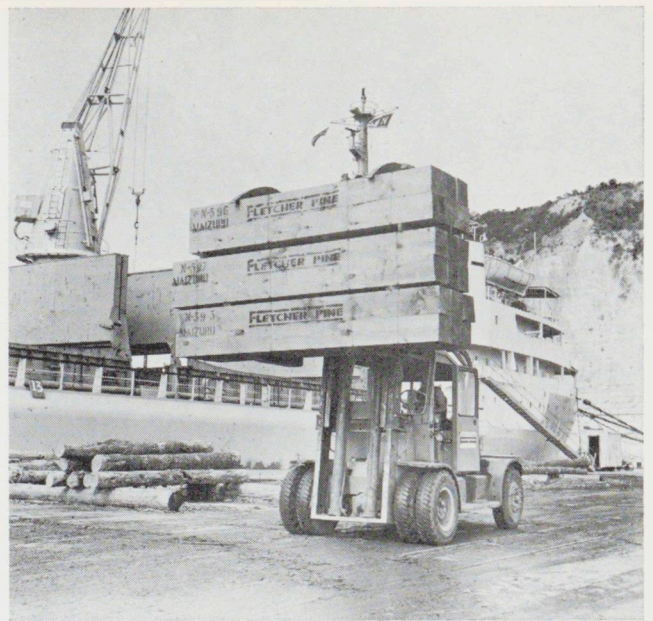
At the beginning of this financial year orders had been obtained for 80 million feet of logs and 10 million board feet of timber for export to Japan over a 12 months' period.

Subsequent orders from Japan included half a million feet of tawa logs a month for six months, and an order for 300,000 ft. of beech logs. Tawa flooring has also been exported to Britain.

Exports to Australia include both exotic and indigenous timber, and plywood. Sales have been made in most States.

Plywood sales to Fiji have also proved encouraging and efforts are being made to extend the trade to other Pacific Islands.

Agents have been appointed throughout Australia and in London and Fletcher Timber have an Export Marketing Manager (C. E. McCleary) resident in Melbourne and a Timber Adviser (until recently M. G. McGregor and now A. N. Carter) in Sydney. In addition, directors and executives of the company make frequent visits abroad to further the export drive.



Squares loading for Japan (above) and a shipment of sawn timber for Australia (below).



JAPAN . . . The Risen Sun

NEW ZEALAND'S patterns of trade are changing rapidly and today (June 1967 statistics) Japan in the export trade of New Zealand rates as No. 3 and in the import trade as No. 4. Ahead on exports are U.K. and U.S.A. and these countries and Australia on imports.

Fletchers' two-way trade has expanded rapidly over the year, first with the import of steel and machinery and followed by substantial exports of logs and sawn timber.

To improve their own understanding of the new Japan and to meet leading representatives of customers and suppliers, J. C. Fletcher, Managing Director of Fletcher Holdings, accompanied by K. G. Fraser, Managing Director of Fletcher Group Services, spent the first week of July in Tokyo.

They were fortunate in being able to meet leaders of such companies as Mitsubishi, Mitsui, Sumitomo, the '4 companies' — Toya Menka, Ataka, Nisso, Marubeni iida — as well as Nichimen and Furukawa.

J. C. Fletcher writes: "Although our week in Tokyo

was a demanding one on our time, it was full of interest and promise of expanding trade between our two countries and, in particular, between Fletchers and Japanese companies.

"We came away convinced that Japan would have a growing need for raw materials and essential foodstuffs, was determined to diversify her sources of supply and was looking to us here in New Zealand to participate.

"We were treated with the utmost of kindness and hospitality and it would be unfair of me to single out the names of organisations or individuals involved. We have thanked them all on a number of occasions and in various ways.

"We were particularly honoured to be given a special reception by our Ambassador, the Hon. John Scott, who was ably supported by our Trade Commissioner of that time, J. L. Fenaughty.

"It was a great experience and we both look forward to returning and renewing many friendly associations."

At a tempura house restaurant in Tokyo where as well as enjoying the meal the guests were treated to Tokyo's heaviest earthquake for 12 years (6.4 on the Richter scale). From left to right Messrs. Saigo, Fraser, Yamaguchi, Fletcher and Sakurai





Visiting Mitsubishi Exhibition Centre (above) and at a cocktail party given by Mitsubishi (below). In the photograph above are Messrs. Fletcher, Fenaughty, Saigo, Fraser and Sakurai.



Messrs. Sakurai (centre) and Fraser talking with another guest.



Messrs. Fletcher and Fusino with the Hon. John Scott (centre).

"To Initiate Action"

FORESTRY DEVELOPMENT CONFERENCE



Four members of the Steering Committee. From left: H. G. Lang, Deputy Secretary, the Treasury; F. W. Homes, Economics Manager, Tasman Pulp and Paper; K. G. Fraser, Managing Director, Fletcher Group Services; A. P. Thomson, Assistant Director-General of Forests (deputy chairman of the committee). On opposite page, the Director-General of Forests (A. L. Poole), Chairman; and R. K. Usmar, Secretary of the Conference.

IN the year ending June of this year, New Zealand exported about 85 million cu. ft. of wood in the form of pulp and paper, sawn timber and logs, and earned the country about 42 million dollars in overseas funds. By 1973 New Zealand will possibly have 135 million cu. ft. available for export and six years later 150 million cu. ft.

With forest product exports earning the country so much in overseas funds, the welfare and future of New Zealand's forest industries are of national importance and concern. Hence a national Forestry Development Conference has been planned from February 18 to 20, 1969, in Wellington.

The aims of the conference are to assess and broadly define the desirable place of forestry and the forest industries in the future economy of New Zealand. It is hoped the conference will recommend what development should take place and how that development should be encouraged. It is to be "a conference to initiate action."

Some of the questions which the conference will try to answer are:

- How long can we maintain the present rapid growth in forest products export earnings?

- What land is best suited to forestry?
- How much wood can our forests produce?
- What industry will be needed in five years, in 10 years?
- What markets will there be for wood products?
- What sort of products should we make for export?

The conference will consider also where forests should be established to stop flooding, and how forests could be used as a tourist attraction. It will examine how much money the recommended development might cost, ways and means of financing the development, and what manpower would be needed. It will study the requirements for education, training and research.

The Steering Committee of the conference was set up to direct and co-ordinate the work required. In turn, the Steering Committee has set seven working parties to investigate, innovate and recommend.

The Minister of Forests, the Hon. Duncan MacIntyre, has called the conference "potentially the most significant event for forestry since the 1913 Royal Commission on Forestry recommended that the N.Z. Forest Service should

be established as a separate department of Government."

But, the Minister added, the climate for a study in depth of forestry was very different today from that in 1913, when, for the past 100 years, our native timber resources had been squandered. New Zealand's forests now supplied industries with a combined output worth \$230 million a year. Forestry, logging and the forest industries employed some 37,000 people. Today, the industrial users of wood were at least as anxious as the Government to ensure that our forests are maintained and increased.

Forest planting rates should be increased to 60,000 acres a year within a few years, he considered, for only by increasing planting programmes now will rapid expansion be possible in the 1990's.

The conference is an integral part of the National Development Conference but its timing in February, 1969, will also coincide with the 50th anniversary of the establishment of an independent Forestry Department now known as the New Zealand Forest Service.



The findings of the Forestry Development Conference will be put before the second session of the National Development Conference in April, 1969.

Interim recommendations by the marketing, production forestry and forest industries working parties was presented to the first session of the National Development Conference in August this year. These working parties were to advise on action which could be taken immediately to exploit opportunities which have arisen since devaluation.

Other working parties are concerned with multiple-use forestry, finance, manpower and education training and research.

K. G. Fraser, Managing Director of Fletcher Group Services, is a member of the Steering Committee whose Chairman is A. L. Poole, Director-General of Forests, and other members are F. W. Holmes, Economics Manager, Tasman Pulp and Paper Company Limited; H. G. Lang, Deputy Secretary, the Treasury; M. J. Moriarty, Secretary of Industries and Commerce; G. J. Schmitt, Senior Lecturer in Economics, Victoria University of Wellington; A. P. Thomson (deputy chairman), Assistant Director-General of Forests; D. O. Walker, Marketing Director, N.Z. Forest Products Limited.

Other Fletcher people involved in Working Parties are Dr. J. S. Watt, W. A. Bourke, K. A. P. Civil and A. T. Jewell. P. A. Matthews is on the Public Relations Subcommittee.

FOREST SERVICE PHOTO CONTEST

IN its fiftieth anniversary year the New Zealand Forest Service is offering prizes for photographs of subjects related to forestry or the forest industries. Photographers are invited to enter their pictures in a competition, from the results of which the Forest Service hopes to obtain pictures it can use for displays, for illustrating its calendar and its publications, and for other purposes. There is a possibility that some entries may find a place at Expo 70 in Japan.

Rules for the competition are:

1. Entries must depict an aspect of forests, forestry, forest industry, or wood use. This gives a very wide field of choice in view of the multitude of forest uses, forestry operations, and methods of processing wood which lend themselves to photography.
 2. The photographs must not previously have been published.
 3. There will be two classes:
 - (a) Black and white prints, which must be 10 in. x 8 in., glossy or matt, and unmounted;
 - (b) Colour prints, 8½ in. x 6½ in., unmounted, or colour transparencies, 35 mm, 2¼ in. x 2¼ in., 3¼ in. x 2¼ in., or 5 in. x 4 in.
 4. Prizes for each class: First \$100, second \$50, third \$25. Up to thirty consolation prizes of \$5 book token may also be awarded at the discretion of the judges and not necessarily equally divided between the two classes.
 5. Entry in the competition will constitute a contract to assign and release to the Minister of Forests all copyright and publication claims in respect of pictures which win prizes.
 6. Up to three prints or three transparencies may be submitted by each competitor accompanied by a signed entry form, which must record name and address of the sender, titles of pictures, dates and places of photographing, camera and film.
 7. Photographs will be judged by Professor J. T. Salmon; P. W. Walker, Manager of National Publicity Studios; and J. H. Johns, Senior Photographer, New Zealand Forest Service; whose decisions will be final. No entrant will be eligible for more than one prize. No correspondence on the judging will be entered into.
 8. Entries must reach the New Zealand Forest Service (Publicity Section), Private Bag, Wellington, not later than 31 March, 1969.
 9. Persons employed in photographic work by the New Zealand Government are ineligible to enter this competition.
 10. The results of the competition will be published in the N.Z. Weekly News, N.Z. Listener, N.Z. Camera and N.Z. Timber Journal.
- These rules have been slightly abbreviated. Further information and entry forms may be obtained from N.Z. Forest Service.

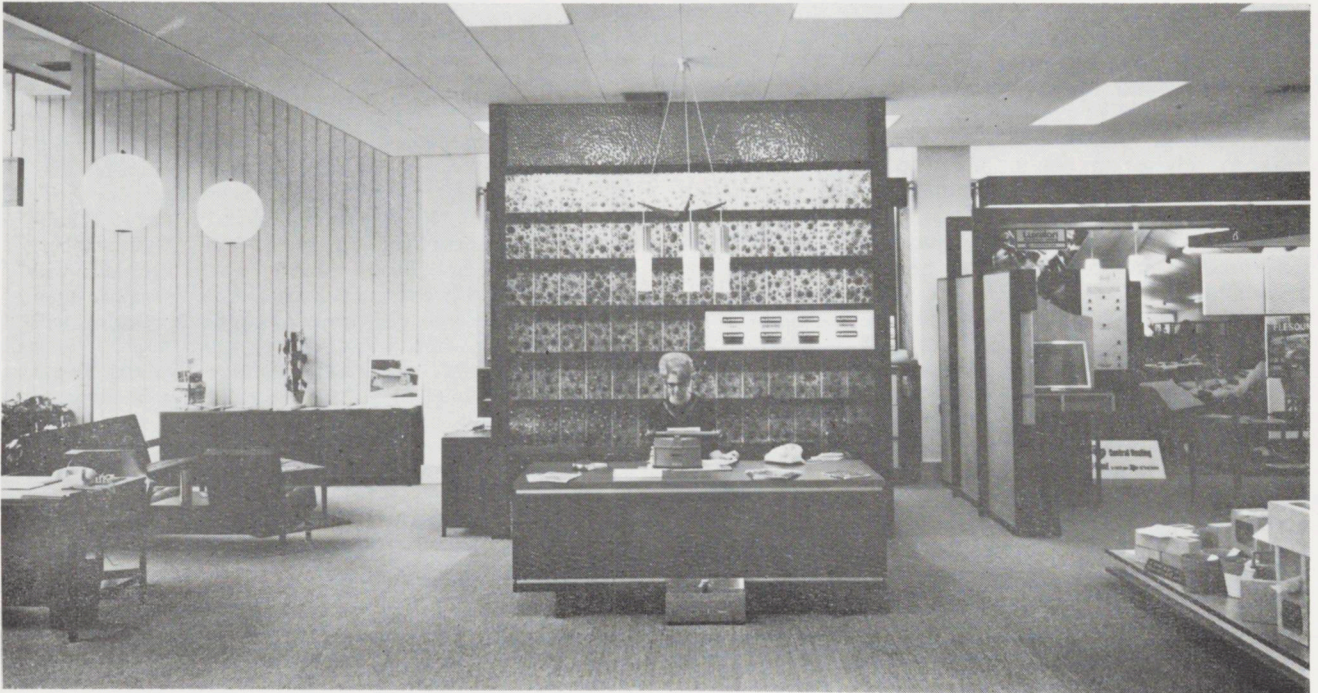


FLETCHER SALES AND INFORMATION CENTRE OPENS IN AUCKLAND

A CENTRAL city location where you can order anything from a panel pin to a penthouse, from steel for manufacturing refrigerators to the refrigerator itself; a place where you can buy a section, have a house designed, choose and order your materials, organise construction; a place where you can order industrial chemicals or a carpet for the house; where you can arrange the designing, building and financing of a factory; where you can order an air-conditioning plant for a multi-storey office block or a low-cost central heating unit for a home — this describes in part the function of the Fletcher Sales & Information Centre which opened in Auckland in mid-July. It occupies the ground floor of Finance House in Albert Street, Auckland — strategically placed opposite the city car park.



Below: The reception area with the interviewing lounge on the left. Above: The Centre theatrette.

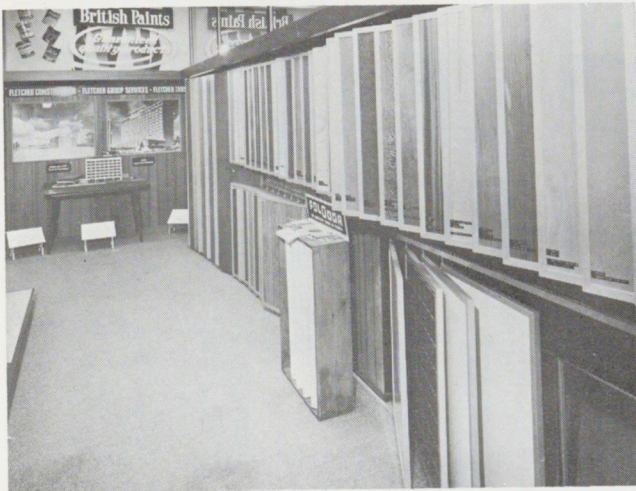




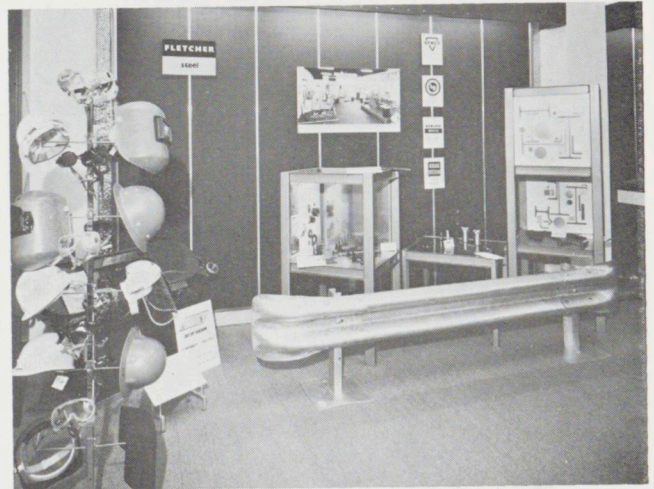
In the foreground a display of door handles and, in the stand behind, building papers.



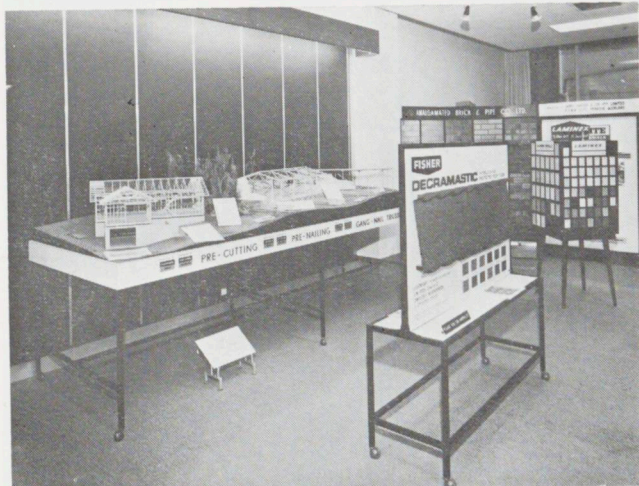
A stand devoted to environment control — insulation, acoustics, central heating, planned music.



This wall stand shows the extensive range of plywoods manufactured and marketed by Fletchers.



A display of steels and agency lines sold by Fletcher Steel. In the foreground is safety equipment.



Fletcher Timber's display showing house construction and demonstrating its pre-cutting, pre-nailing and gang-nailing services.



The flooring stand, which highlights the new range of Nairnflor vinyl tiles and sheeting and also carpets.

How does the centre work. As a starting point — it's an information centre. Anybody visiting it can see displays of various building materials and other products marketed by Fletchers. Some — but by no means all — are manufactured by Fletchers since Fletcher Merchants sell a wide variety of builders' materials made by manufacturers outside the Group. Literature on products displayed and other products and services of the Group can be obtained.

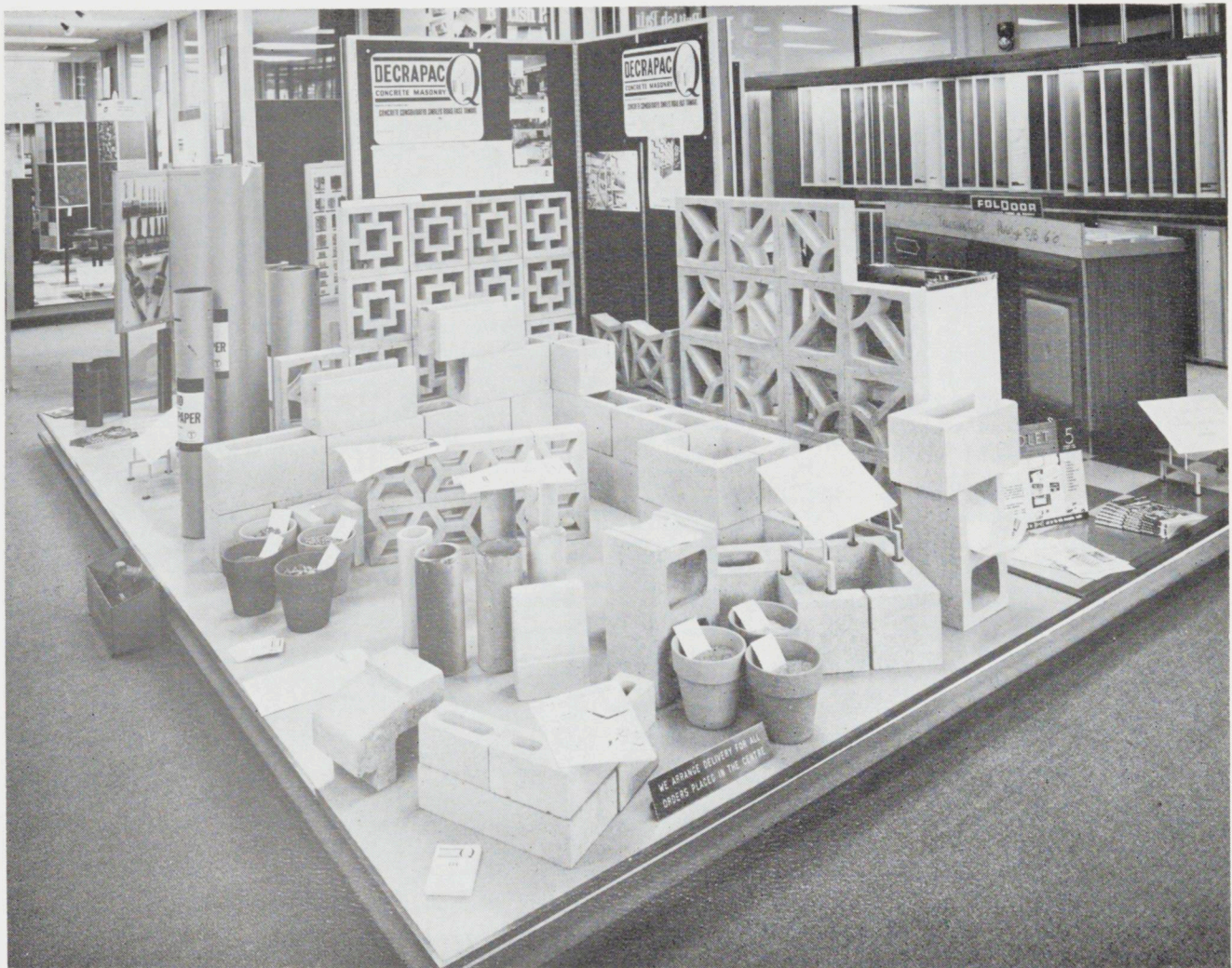
But knowledgeable and helpful though the Centre Manager (M. Payne) and his team may be, neither they nor anyone else can know all the answers to questions potential Fletcher clients may pose. What they do know, however, is which company or division in the Group can provide a specific answer. They have therefore set up a

system whereby any questions outside their capabilities to answer are referred to the appropriate person who contacts the inquirer.

And so the Centre provides a service for a very wide section of the community — the handyman, the home builder, the re-decorator, builder, architect, engineer; the manufacturer who wants steel or timber, plywood or particle board or die-cast parts, the businessman who wants advice on designs, building and lease-back finance for a factory.

Whether it's home building, re-decorating, manufacturing, major construction, property investment — Fletcher Sales & Information Centre can help provide the answers.

Concrete Consolidated's display of Decrapac concrete masonry shows some of its wide range of building blocks and decorative screen blocks.



HIGH PRAISE FROM CLIENT FOR DESIGN OFFICE INGENUITY

A VERY warm tribute to the ingenuity of the Architectural and Engineering Division of Fletcher Group Services was recently paid by a client — Cookes New Zealand Wire Rope Company Limited — for the designing of a pre-tensioning bed, now in operation at Cookes' Mt. Wellington plant.

All types of construction ropes — guys or stays, boom suspension ropes, suspension bridge ropes, ropes for supporting roofs, are more effective for pre-tensioning. In simple lay terms this means stretching them before they are used so that the amount of movement possible when they are placed in position is reduced.

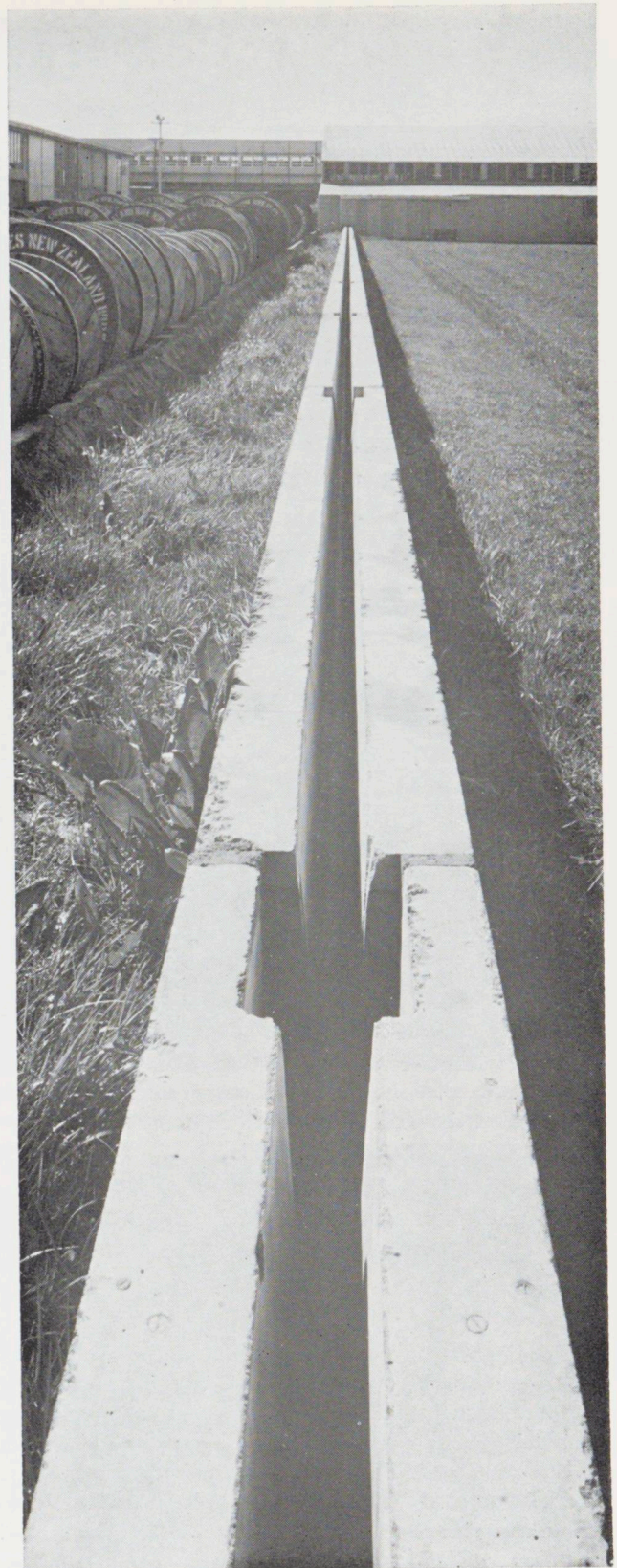
The normal method of pre-stressing is to use concrete anchors which hold one end of the rope while the other end is pulled by hydraulic winch. But the ground at Mt. Wellington was totally unsuitable for this type of construction.

The Chief Design Engineer of Fletcher Group Services, C. W. Hall, produced a solution by using a continuous horizontal column of pre-stressed concrete. These columns, each 15ft. long, have a U-shaped slot in the centre with a steel bearing plate at one end and an enlarged trough at the other which takes the concrete ferrule holding the rope at that end. The rope then passes along the trough. The number of the columns used is determined by the length of the rope. The present plant has 18 columns giving a test bed length of 270ft. So long as the rope can bear against the sides of the slot the whole structure cannot buckle.

This addition to Cookes' plant was made to pre-tension the stays for N.Z.B.C. transmitter masts, but it can be used for other work.

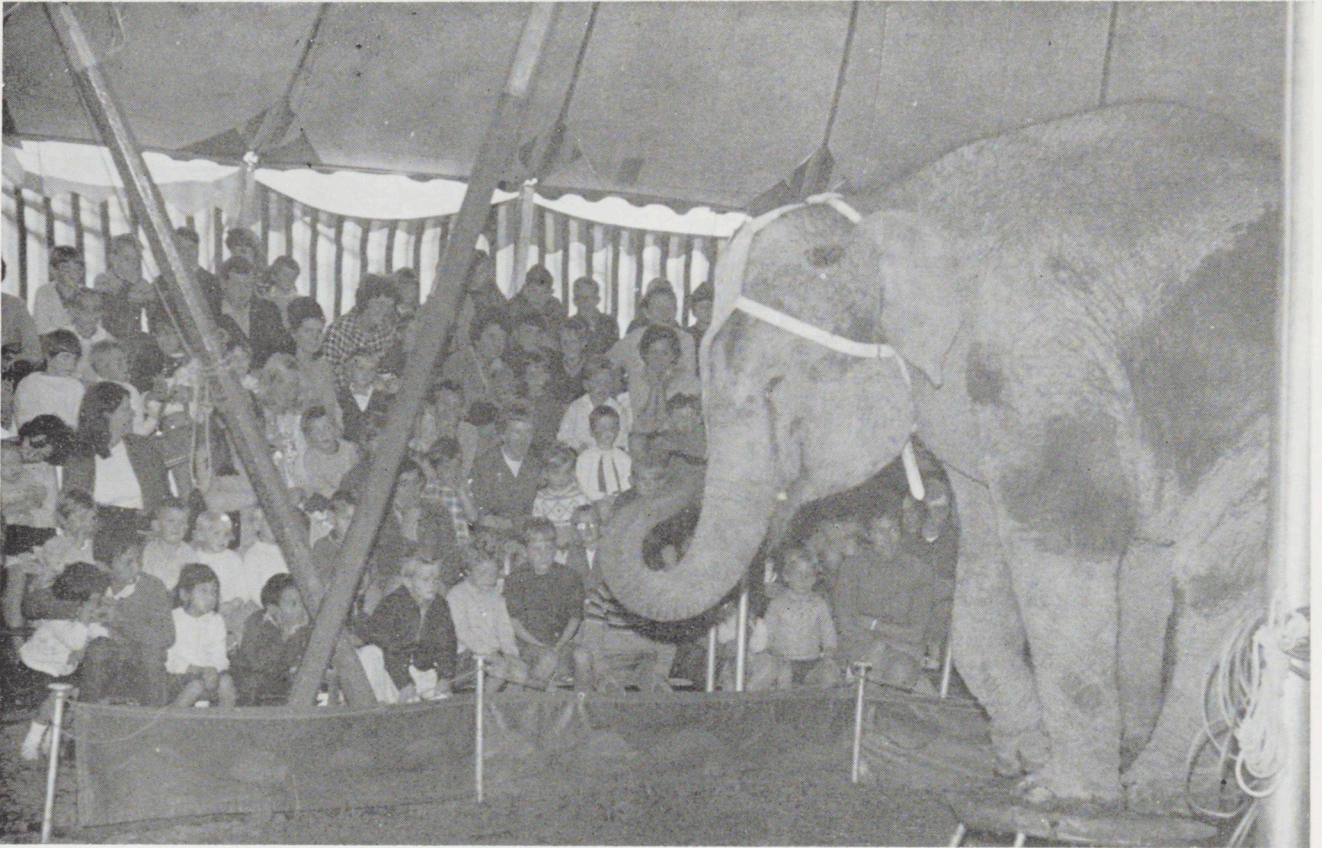
In an article on the new plant, Cookes' house magazine said:

"The complex problem of design and installation of this specialised equipment involved novel problems and Cookes wish particularly to acknowledge the contribution of the Chief Design Engineer of Fletcher Group Services. His concept of a method of providing this pre-tensioning bed is believed to be completely new."



SHOPPING CENTRES . . .

THE CONTINUING STORY



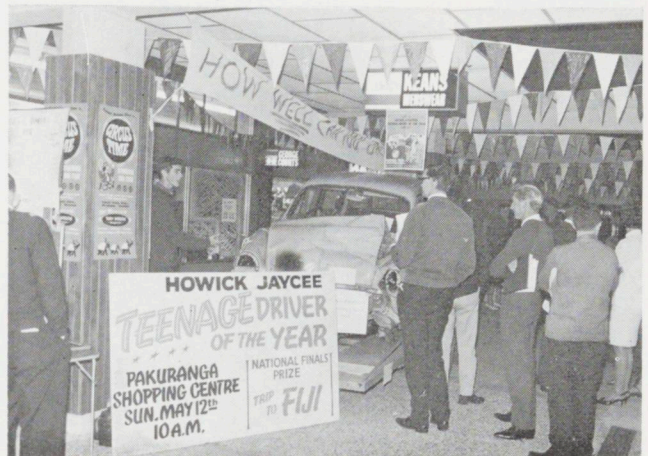
In school holidays many attractions are provided. Shown (above) is the circus at Pakuranga. The Centre also co-operates with local clubs in civic interest projects (below).

WHEN Fletcher Trust promote a major shopping centre they begin a continuing story which will outlive even the T.V. version of "Peyton Place."

First comes the feasibility study, the land procurement, the designing, the building, the letting of the shops; then the big fanfare of trumpets and the official opening.

But vitally important though all this is, it is but the conception, gestation and birth. The baby has got to be nourished to live.

Feeding the lusty child is the job of Fletcher Trust's shopping centre managers. Theirs is a job of co-ordinating the promotional activities of the tenants, of originating ideas, of planning activities and interests in conjunction with local groups. Photographically on these pages, are shown some of the attractions which keep Fletchers' two biggest shopping centres — Pakuranga (Auckland) and Northlands (Christchurch) continuing centres of interest.





One of the biggest draw-cards of the year at Pakuranga is the annual motor show, with the latest models displayed throughout the malls for a fortnight.

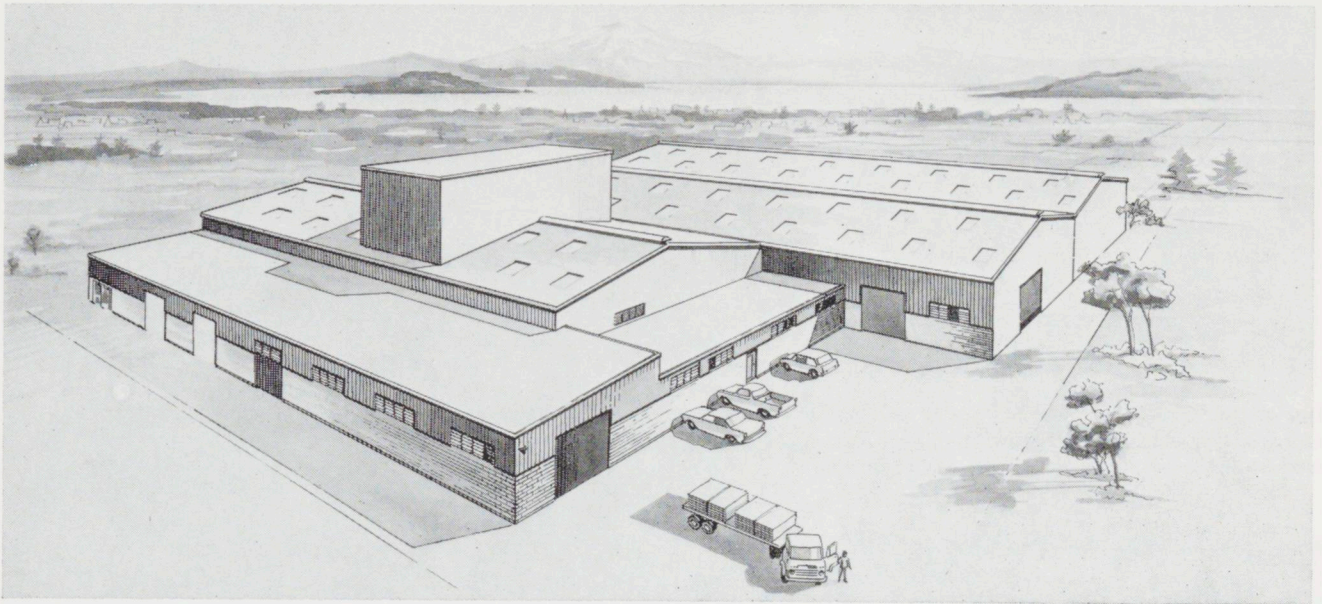


In Northlands, Christchurch, wool week, not only had special shop displays, but shearing and knitting demonstrations and fashion parades.



NOW BUILDING IN TAUPO

New \$2 million Plycopyne Factory



An artist's sketch of the new Plycopyne factory at Taupo being built for Fletcher Timber, who will be producing from it by the middle of next year.

FEW — if any of the newer building materials can match the fantastic growth of particle board.

In Europe in the five-year period 1956 to 1961, production rose from 265,000 metric tons to 1,520,000 metric tons. Demand in New Zealand has been growing similarly at a phenomenal rate. The manufacture of particle board was pioneered in New Zealand by Fletchers, who, before building the highly successful Christchurch plant in 1957, had been experimenting with this product for several years.

This initial work has paid off. Plycopyne — Fletchers' particle board — has been so well accepted that the Christchurch plant is working on a three-shift, seven day basis.

Now construction is well under way on a second, bigger plant at Taupo. The plant will adjoin Fletcher's exotic timber mill. The building has been designed by Fletcher Group Services (Design Engineer, A. Falconer) and is being built by the Civil Engineering Division of Fletcher Construction (Contract Engineer, J. Reeves; Project Manager, R. McQuinn). Fletcher Timber's Site Engineer is R. Tindall. It will be completed by the end of the year. At this stage the installation and commissioning of the machinery will be started and it is expected that the plant will be operational by the middle of next year. The plant has been designed by a recognised world authority on particle board installations. He is H. F. Schwiertz

of West Germany. Most of the machinery is from West Germany, which has had a long history in particle board manufacture, and has been a leader in this industry for some time.

The Taupo plant will be the biggest such plant in the country and will be almost twice the size of Fletchers' plant in Christchurch. It will incorporate the latest overseas developments in particle board manufacturing. It will be highly automated and will contain a number of complex control systems which will ensure a uniform standard of production of very high quality.

The plant will take up an area of 50,000 sq. ft. It will employ approximately 50 staff. The initial capacity of the plant will be 10 million sq. ft. per year (on a $\frac{3}{4}$ " thickness basis) and will be ultimately capable of at least 50% in excess of this capacity.

One of the remarkable features of the new plant is the size of board that it will produce — 12ft. x 6ft. or 72 sq. ft. in area, as against the present 8 x 4 sheets or 32 sq. ft. in area. Thicknesses of the boards will be from $\frac{1}{4}$ inch to 1 $\frac{1}{4}$ inches. All boards in the new plant will be produced in the 12ft. x 6ft. size but some of the production will be cut to other lengths and widths to suit trade demands.

The factory will draw its raw material from the pine forests in the Taupo area and will utilise thinnings from these forests or recovered round wood — in other words

the tops of trees which are unable to be used in log production for timber or plywood.

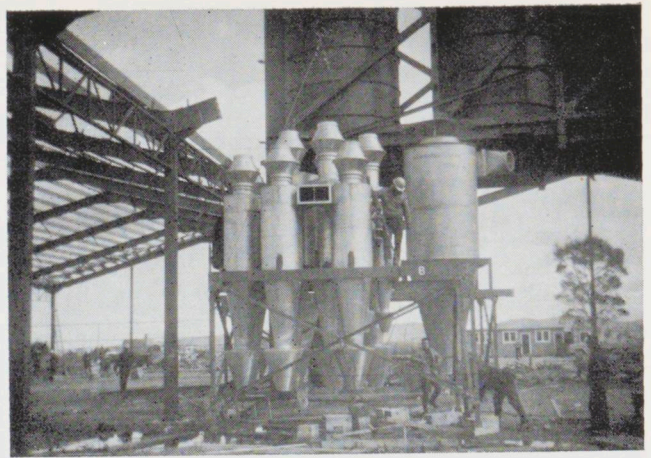
Waste from the Taupo sawmill will be used for fuel to heat the high pressure hot water boiler. This heat is required to dry the flakes used in the manufacture of particle board and to heat the press. The actual flaking of the timber will be part of the operation of the particle board plant. This process is different from the chipping process carried out at the Taupo timber mill, where material unsuitable for timber production is used for pulp and paper. The flakes required for particle board are much thinner and more evenly sized than the chips used for pulp and paper manufacture.

Particle board's great advantage over solid timber is its stability and its production in widths which cannot be attained in solid timber. Its principle use is in the furniture and cabinet-making industries but it is also increasingly being used for flooring and for partitions and panelling. The new Plycopyne factory is very much a computer project. First an appraisal of the investment proposed was made by the Fletcher Computer Bureau. The computer was also used to plan construction and siting. All matters relevant to the project such as finance, town planning requirements, plant selection, site investigation, fuel and power supply, building design, ancillary plant design, and negotiation for the basis of contract were incorporated.

These were in addition to the more usual problems of actual building construction, and provisions of materials and services such as structural steel, sub-contractors and installation of plant.

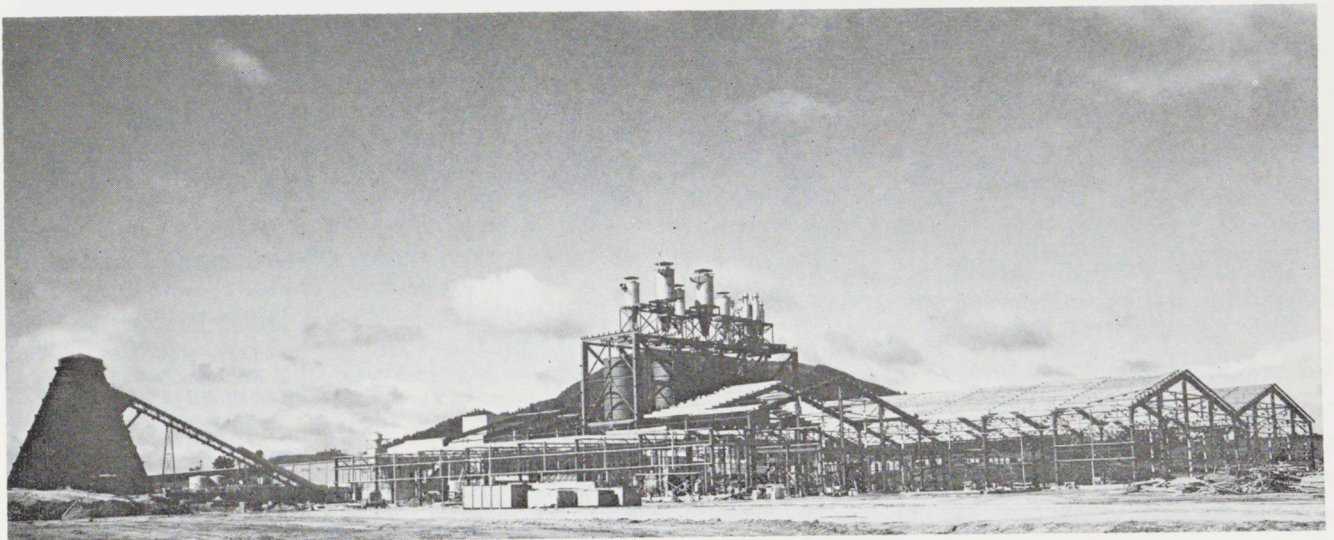
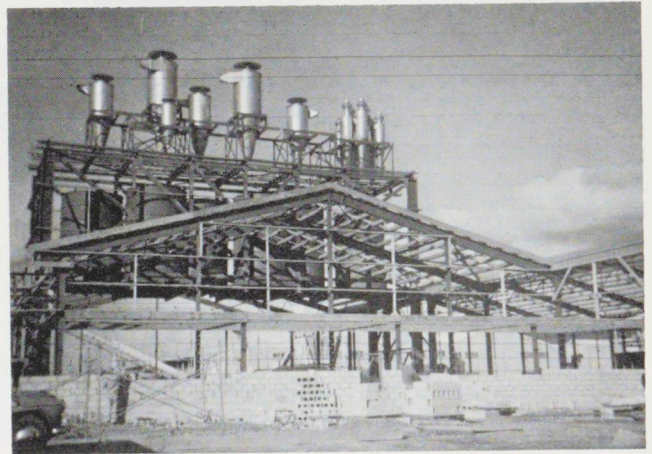
Initial computer analysis indicated February, 1970, as the earliest possible date for completion. Subsequent re-planning, re-networking and re-analysis brought this date back six months.

In the future the computer can be used to determine the most economical sizes of board to be cut from the standard 12 ft. x 6 ft. sheet.

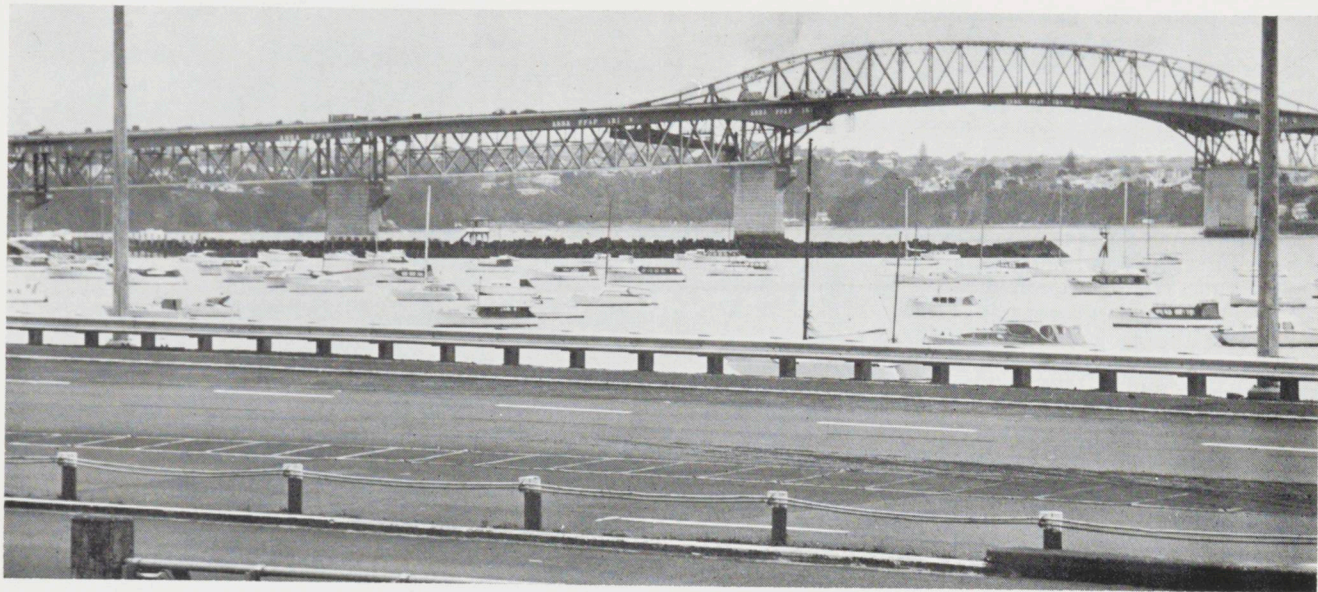


Above: the cyclones being placed in support stand prior to lifting into position and (below) in position on top of the silo tower.

At bottom is a general view of the factory as it appeared in September.



A Fletcher Contribution to Road Safety



Flexrail guard rail is being installed on the approach roads on both sides of the Auckland Harbour Bridge.

STEEL guardrail is an important feature of modern highway construction and road safety. A familiar sight overseas, it is now manufactured in New Zealand by Fletchers to the engineering standards laid down by the American Association of State Highway Officials (A.A.S.H.O.) and is being increasingly used on the more hazardous areas of New Zealand highways. The guardrail is marketed by Fletcher Steel under the trade name "Flexrail" and is manufactured by Fletcher Industries' Brownbuilt factory. This rail has been scientifically developed to restrain and guide out of control vehicles in a manner that will cause the least damage and the least hazard to other vehicles. Designed to resist a thrust of 80,000 lbs., its flexible beam strength enables adjoining sections to absorb heavy impacts beyond the beam strength of individual rail units. It also provides early warning of danger areas and its good visibility maintains this characteristic under adverse weather conditions and night driving, thus creating more driver confidence and reducing the tendency towards centre line crowding.

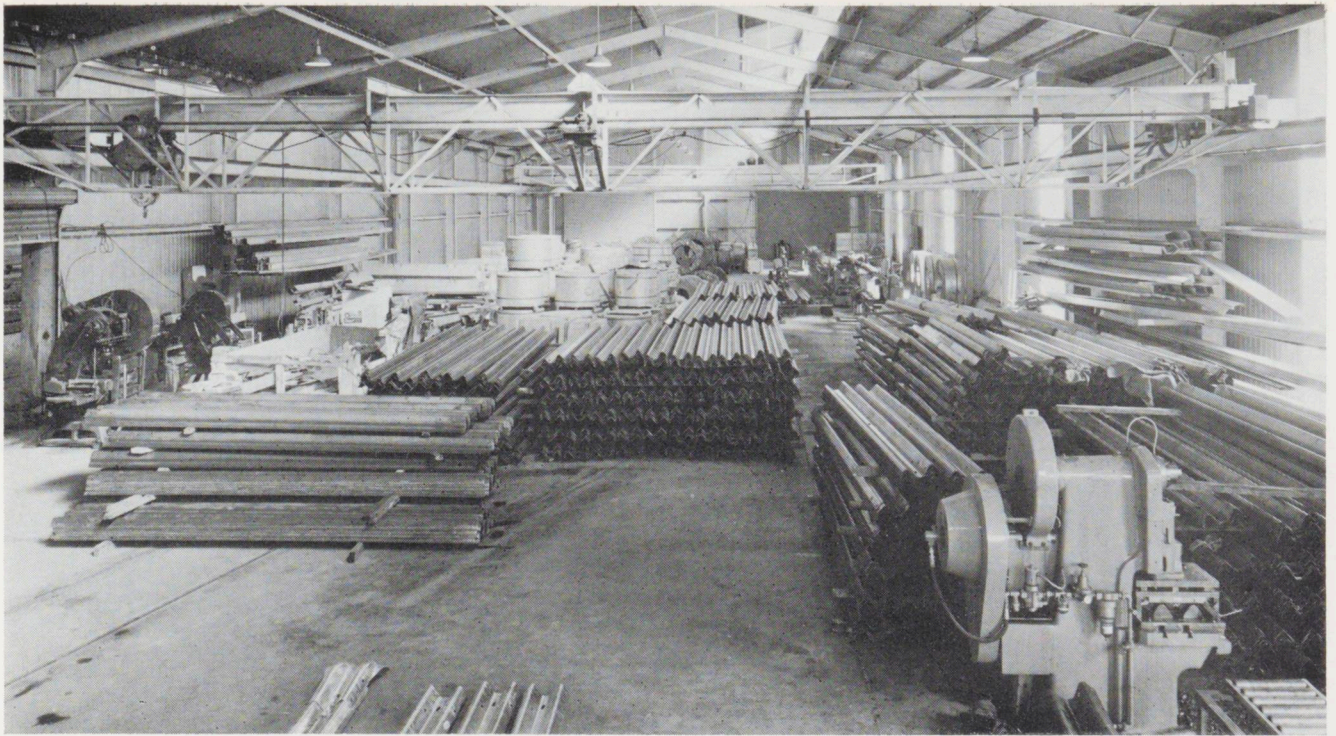


Showing the truck in the accident described on these pages . . .

Technical Details - Standard Section

Net length	12' 6" erected
Post spacings	12' 6" or 6' 3"
Metal gauge	12G U.S. (O.1046")
Bolts and nuts	$\frac{3}{8}$ " diameter Button Head
	Galvanised, 8 per splice
Joint strength	80,000 lbs. min.
Finish	Hot dip galvanised
Curved sections	To order from 15' to 150' radius.

Terminal sections Available from stock



Fletcher Industries' Brownbuilt factory at Penrose where Flexrail is manufactured for Fletcher Steel. The general purpose roll forming mill also manufactures special sections for companies outside the Group.

The New Zealand Ministry of Works have set out their requirements based on the same criteria as A.A.S.H.O. and the steel beam-type guard rail produced for Fletcher Steel meets or exceeds the Ministry of Works' requirements in every aspect.

The basic section of the rail is cold rolled on a general purpose roll forming mill which was designed and built in New Zealand by Fletchers. Every length of guard rail comes off true to profile and completely interchangeable.

After the initial section is formed the rail is cut into standard lengths which provide a net laid length of 12ft. 6in. plus a 12½in. lap for a splice joint on each adjoining section. The rail is then punched at each end to take special splice bolts and provision is made for single post mounting bolts at 6ft. 3in. centres.

The final stage of production is to heavily galvanise the rail by the hot dip process which ensures a long, corrosion-free life under all circumstances.

So that the full ribbon strength of the rail can be developed through a continuous length, 8 splice bolts are used on every joint. The specification calls for this bolted joint of a standard rail section to withstand a tensile force of 80,000lbs.

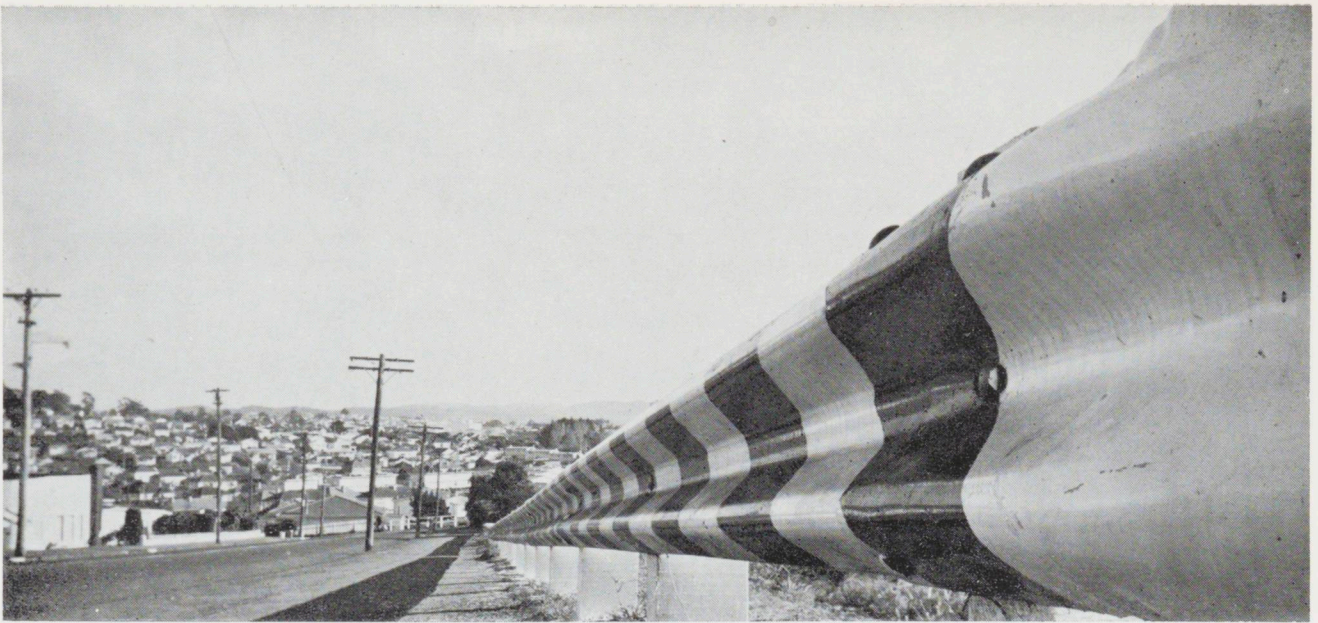
The strength of steel plus the sectional properties gives a high modulus of elasticity and moment strength which enables Flexrail to resist high impacts without failure and

to limit pocketing. This is of major importance in re-directing out-of-control vehicles parallel to the rail.

The wide corrugations, in addition to providing sectional strength, also combine to reflect light from all angles and provide a high degree of visibility both day and night. The deep central valley occurs at bumper height on most cars and assists in guiding out-of-control vehicles along a path parallel with the guard rail installation.

Guard rail has proved itself in New Zealand. Just how effective it is, was seen last September on the Hutt road between Petone and Wellington, when an unladen truck became involved in an accident while attempting to pass a car. The driver lost control of his truck, swerved off the road at 40 miles an hour and hit the guard rail almost head on. The truck almost stopped as the rail flexed with the impact but the posts, embedded in new fill, were pushed over. The front wheels passed over the guard rail and the truck came to rest with its nose at the foot of the embankment and a rear wheel still behind the guard rail just as a north bound electric train was passing. Had it not been for the guard rail this would almost certainly have been a fatal accident. The truck driver received only a bump on the head and a rather severe shaking.

This was a very severe test of a guard rail installation and the manner in which the guard rail prevented a major accident created a strong impression and confirmed the designers' confidence in specifying it for this open limits heavy traffic motorway.



Flexrail safeguarding a stretch of an Auckland city road.

STORM DAMAGE TO ROOFS

SEVERE storms this winter, particularly in Christchurch and Wellington, did serious and widespread damage. Trees were blown down, fences were destroyed and much structural damage was done to houses and other buildings. Roofs particularly suffered and one roofing firm had 1,400 tiled roofs to be repaired while another reported he would not be clear of storm repairs for 18 months.

Although in Wellington a top speed of 160 miles an hour was recorded, records in the city area showed gusts of about 80 m.p.h. — a velocity we can expect in many parts of the country from time to time.

Investigations by Fletcher Industries' technical staff showed not only that what happened in Wellington and Christchurch this year could happen over much of the country but why it happened.

The fault was firmly placed on a lack of attention to construction details and an inadequate understanding of wind stresses. In other cases breakdown was due to contractors' failure to follow manufacturers instructions.

Fletcher Industries arranged a series of lectures on roofing construction methods and these were given to highly appreciative and interested audiences of architects, engineers, building inspectors, Ministry of Works staff and roofing contractors in the four main centres by the company's Technical Officer, D. Scofield. One consequence of these lectures was that he was invited by the Wellington City Engineer to advise in the revision of the Wellington City Council by-laws covering long-run roofing membranes, and by the Chief Engineer of the Manukau City Council to address a meeting of Auckland local body engineers and building inspectors.

In the course of his lectures he pointed out that no matter how firmly a roof was put on, the fixing of roof framing to wall members was equally important.

The technical literature produced by Fletcher Industries for their long-run roofing, Brownbuilt, has for some years now urged specifying authorities and roof fixers to consider certain special recommendations for applications of Brownbuilt in specified areas of known high wind velocity.

The Auckland lectures were held in the theatre of the Fletcher Sales and Information Centre, featured on page 12.

FLETCHER INDUSTRIES IN THE AUCKLAND FESTIVAL

ONE of the 1968 Auckland Festival activities which created considerable interest was an outdoor painting contest in Bledisloe Street. Entrants were 20 students from the Elam School of Fine Arts.

Each student had a Plyco-plywood panel 6ft. x 6ft. on which to execute a painting on the theme "Festival." Contestants had a time limit of from 10 a.m. on a Monday until 4 p.m. the following Wednesday to complete their entry. Fletchers gave each contestant a grant of \$20 to cover the cost of paints and there was a first prize of \$100 and two consolation prizes of \$50. In addition a grant of \$100 was given to the School's library fund.

The contest was organised by Fletcher Industries who have been invited to make it an annual event. Next year the paintings will be executed on Flexboard.



Winner of the Fletcher Industries painting competition, Angela Meeson, with her entry (left) and above another view of the painted boardings.

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