

State's First Terminal Wheat Silos

BUNBURY'S VAST GRAIN STOREHOUSE

TWO outstanding features are associated with the Bunbury harbor silos.

Firstly, they represent the first terminal bulk handling silos to be constructed in Western Australia.

In the second place, they have been built in time which constitutes an Australian record for this type of construction.

Stretching well over a 100ft. into the sky, the silos have given Bunbury a new landmark—and a highly useful landmark.

Bunbury can pride itself on being the first port in this State to see this new era of industrialism. Bins will ultimately be constructed at Fremantle and Geraldton, but the claims of Bunbury were primarily considered by the Government.

Since the work was taken in hand by Messrs. A. T. Brine and Sons, the construction of the silos has been followed with the keenest interest by Bunbury people and visitors.

The initial steps in connection with the building were undertaken by the Harbor and Rivers Department under the supervision of the Chief Engineer (Mr. Stevenson-Young) towards the latter part of the first half of 1937. After surveys the pile were driven in as foundations of the bins which were to soar over a 100ft. into the air above them.

Messrs. A. T. Brine and Sons commenced the actual work of laying the concrete early in July.

NO LOCAL PRECEDENT

It is a tribute to the firm that they were able to accomplish such an efficient job with no precedent in this State to guide them and a time limit on the contract.

As long as five years ago Messrs. Brine and Sons placed in a responsible quarter a comprehensive scheme of construction in connection with a bulk handling system, while a little over a year ago their construction superintendent (Mr. A. H. Willmott) travelled to Sydney, where he acquired first-hand data from the construction works New South Wales.

Mr. Willmott returned to this State armed with new ideas, and a building plan which would mean a speedy, efficient and economical construction job. The whole was submitted to the Government as a concrete installation embodying the provision of the country bins with terminal facilities at the ports.

EARLY PROBLEMS

Right from the start of operations at Bunbury, Messrs. A. T. Brine and Sons were beset with difficulties.

The elevator pit had to rest on rock, and excavations had to be made to the basalt foundation, and this was accomplished by interlocking sheeting.

Having gone down beyond sea level the water problem necessitated pressing attention, and two boilers were commissioned to supply the necessary power to operate the six pumps, and these kept working continuously for some weeks.

Excavations were carried out 13ft. below low tide level, which indicates the damp nature of the underground operations.

When work was commenced above the ground, the job raced ahead. The actual construction of the bins from the bottom to the top, a height of 35ft., took a little over four weeks, or 20

actual working days and this, it is claimed, represents an

AUSTRALIAN RECORD for the building.

Into the huge walls of the bins went 2500 tons of concrete, and work was carried on throughout the 24 hours of each day, numerous lights guiding the workmen at night and sometimes causing some concern to ships at sea.

The captain of the s.s. Dalla, for one, mistook the light high on the silo for those of a ship which had run aground and he was quite worried until he arrived at the port and found out the cause of the electrical display.

The construction of the silos was carried out on the moving form principle, which has only once before been employed in this State, when an 180ft. chimney was built at Rivervale.

Building a high structure such as the silos is not such an easy task in winter, and there were many disadvantages caused by the weather. But the plant was actually running on the day specified in the terms of the agreement.

EFFICIENT WORKING

The final arrangements were carried out by the Railway Department, and the transport contractors for the company, by the delivery of machinery. The vital equipment arrived on December 14, and the machines were installed by noon the following day.

Trials proved the efficiency of the silos. They were conducted with new season's grain from the Lake Grace district, and some 150 tons of the wheat were transferred into the bins and later loaded into the special trucks which are to be utilized in conveying the grain a couple of hundred yards or so along to the elevators on the jetty.

The wheat is handled in a whirl of wheel and cogs. Several trucks can be relieved of their burdens of grain in a matter of a minute or so.

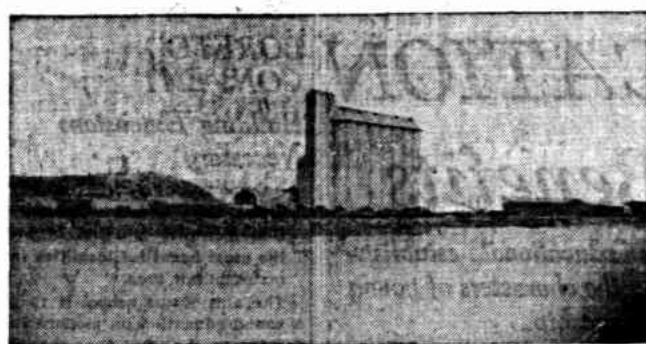
Intricate machinery deals almost magically with the incoming supplies. After the bulk grain has been brought alongside the silo, the delivery truck is placed over the grills directly above the hopper bin.

Gravitating into the hopper the wheat is elevated and passed through a 15 ton scale, which automatically prints and records the capacity of each lode.

After this operation the wheat continues on its way to the top conveyor, which deposits the grain in any bin required.

The silo contains four large bins of 35ft. in diameter, and 95ft. high, while there are also six interspace bins. Altogether the silo can hold the enormous quantity of 8000 tons.

When a boat comes in and wheat has to be taken out, one-third of the total capacity will gravitate through the large spouts that are situated above the railway trucks. The remaining two-thirds are taken from beneath the bins by means of a horizontal conveyor and thence to No. 1



A South-West Skyscraper—Looking at the silos from across the Estuary

elevator to the shipping bins where it gravitates into the trucks.

A conveyor spout, enables the men loading the trucks to direct the stream of wheat on to any portion of the trucks and keep it evenly distributed. Wheat can be loaded and reloaded at the rate of 250 tons an hour.

The overall height of the silos is 120 ft., and the walls are comprised of reinforced concrete on timber piles driven into the rock. There were 6000 tons of concrete used in the construction, 150 tons of re-inforcement and 1500 yards of sand.

The number of men employed on the work fluctuated as various

JAMES HARDIE AND CO.'S PART

Tremendous structure that it is, it follows that a large amount of the best roofing, gutters, down piping, asbestos sheeting etc., was necessary for the Bunbury silos and these requirements were met by the well known firm of James Hardie and Co., Pty., Ltd., of Rivervale.

Material supplied by the firm has been used largely in numerous important building projects which indicates its staunch quality.

sections were complete or held in abeyance while other parts were developed, but at times there were as many as 120 men employed.

Like ants, they swung alongside the walls at perilous heights, but fortunately there was no serious accident, a few minor injuries being the only setbacks in this respect.

Almost all the workmen were Bunbury men, and so efficient did they prove that Messrs. A. T. Brine and Sons found it necessary to employ only a few experienced key men.

INTRICATE MACHINERY

Installed by Thos. Robinson and Son

The vital machinery part of the silo construction was carried out by Thos. Robinson and Son (Aust.), Ltd., which is the outstanding firm supplying silo equipment in Australia.

Under the supervision of Mr. R. Goode, of Thos. Robinson and Son Pty. Ltd., the machinery was erected in quick time.

Describing the functions of the machinery, Mr. Goode said:

"The wheat is unloaded from the trucks into a hopper, underneath which is placed a drag chain conveyor 62ft. long, the capacity of which is 300 tons per hour, and is composed of mild steel links running on sprockets. This draws a solid stream of wheat 14in. high into a second cross drag chain conveyor, 28ft. long. Both of these drag chains are driven through gear-boxes from electric motors fitted with flexible couplings. This cross conveyor feeds the wheat into No. 2 elevator, which elevates the grain into garner and scale bins. This elevator is approximately 80ft. high.

"After weighing, the operator lets the wheat go into No. 1 elevator—approximately 125ft. high. Both of these elevators have 22in. 6-ply rubber canvas belts fitted with Wade cups and are driven through gears from electric motors fitted with rubber and canvas vee driving belts.

"One of the very unusual features of these elevators is that they have a weighted elevator boot pulley in place of the usual take-up for tightening the belt, thus enabling the belts to stretch or tighten owing to atmospheric conditions and still keep the belt taut.

"The No. 1 elevator discharges on to a band conveyor on top of the silo, which conveys the wheat along to various bins. This band conveyor has a semi-automatic take-off carriage for the purpose of discharging at these different points. Installed in this take-off carriage is a friction clutch for the purpose of moving the carriage each way.

"The band conveyor is a 26in. wide 6-ply endless rubber canvas belt, and is driven by rubber and canvas vee belts from an electric motor. When discharging wheat for loading, the grain is drawn off the bottom through the valve on to a band similar to the top band and discharges into either elevator so that the operator can weigh off if needed. If weighed, the grain would go from No. 2 elevator into the garner and scale bins up No. 1 elevator, or if not weighed would go direct into No. 1 elevator and along the top band conveyor into the shipping bins. From there it is loaded into bulk trucks for the jetty.

"The plant is so designed that, if necessary, when unsound wheat has been received, it can be discharged in reject bins. Also, when wheat has been stored for a lengthy period it can be turned by running through the plant back to the main bin."

The machinery was supplied by Thos. Robinson and Son Pty. Ltd., Sydney, and A. T. Brine and Son, Perth; belting and vee ropes by Dunlop Perdurax; scale by A.S. C.O., and has been installed by A. T. Brine and Son, Perth, under the supervision of Mr. Willmott, of Brine and Son, Perth, and Mr. B. Goode, of Thos. Robinson and Son Pty. Ltd., Sydney.

A LEADING BUILDER

Mr. W. L. Brine's Accomplishments

AN EMPIRE BUILDING FAMILY

SCORES of magnificent buildings in Perth, the suburbs and the country stand as testimony to the notable constructional achievements of A. T. Brine and Sons Ltd.

The firm was founded by the late Mr. A. T. Brine and is now headed by his son, Mr. W. L. Brine.

As an individual builder the late Mr. A. T. Brine constructed numerous utilities which to-day are a credit to his building abilities. They include the Narrogin State School, additions to the Hospital for the Insane, Claremont, Fremantle wheat sheds and other buildings.

In later years such outstanding edifices as the University of Western Australia, St. Mary's Cathedral, Royal Insurance Building, Shell House, Anzac House, the State War Memorial in King's Park, additions to Boana Ltd., St. Anne's Hospital, Mt. Lawley, St. John's Hospital, Belmont, Gladden Buildings and now the silos at Bunbury stand as lasting tributes to the building prowess of A. T. Brine and Sons.

Since he took over entire control several years ago, Mr. W. L. Brine has added to the firm's reputation as builders of the highest class.

Mr. W. L. Brine has a commanding personality and a keen business sense and is thus perfectly equipped as head of such a prominent building firm.

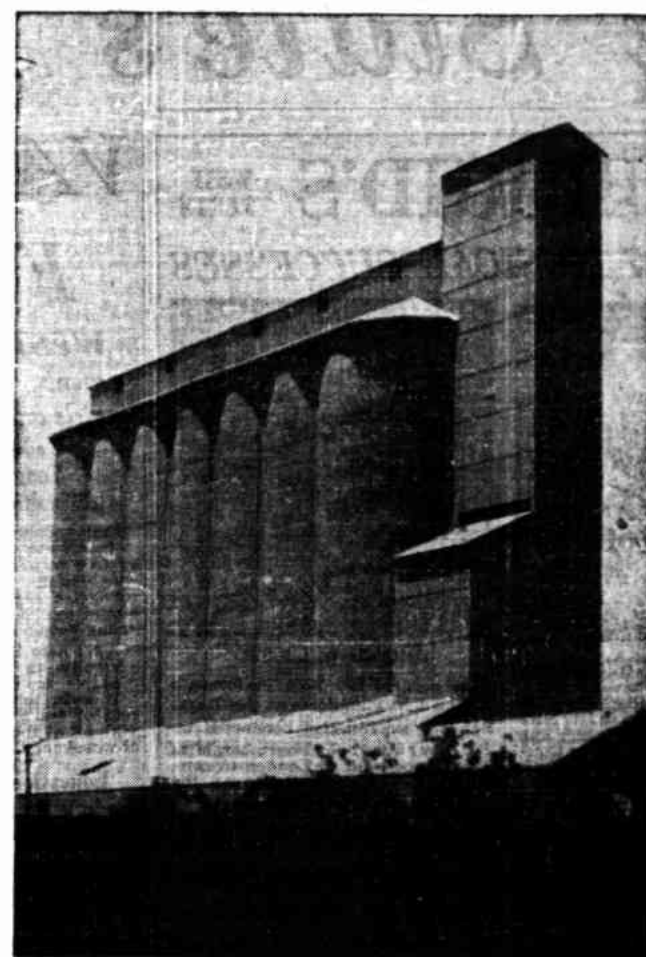
He was born at Stawell, Victoria, in 1888 and he came West at the age of nine. After education at a State school and Hale School he spent two years at the Teachers' Training College, Claremont, and then took up a teaching appointment at the Perth Modern School.

Travelling to England in 1914 Mr. Brine received theoretical training in architectural engineering at the Manchester University, and during the war, after being rejected for war service, he filled positions at the National Physical Laboratory, Teddington, and the British War Office.

Mr. Brine's association with building construction in Western Australia dates from 1919 when he joined his father and brother in business as the firm of A. T. Brine and Sons.

Mr. A. T. Brine, senior, died in 1927 and in 1931 Mr. A. T. Brine, junior, severed his association with the company, which has been carried on since by Mr. W. L. Brine.

In the opinion of Mr. Brine there is every reason for a feeling of optimism in regard to the building trade. It has been booming for several years now and prospects would remain bright even without the proposed Government building programme, which is sure to further stimulate the trade.



Achievement

THE CONTRACT FOR THE BUILDING OF THE NEW SILOS AT BUNBURY WAS ENTRUSTED TO

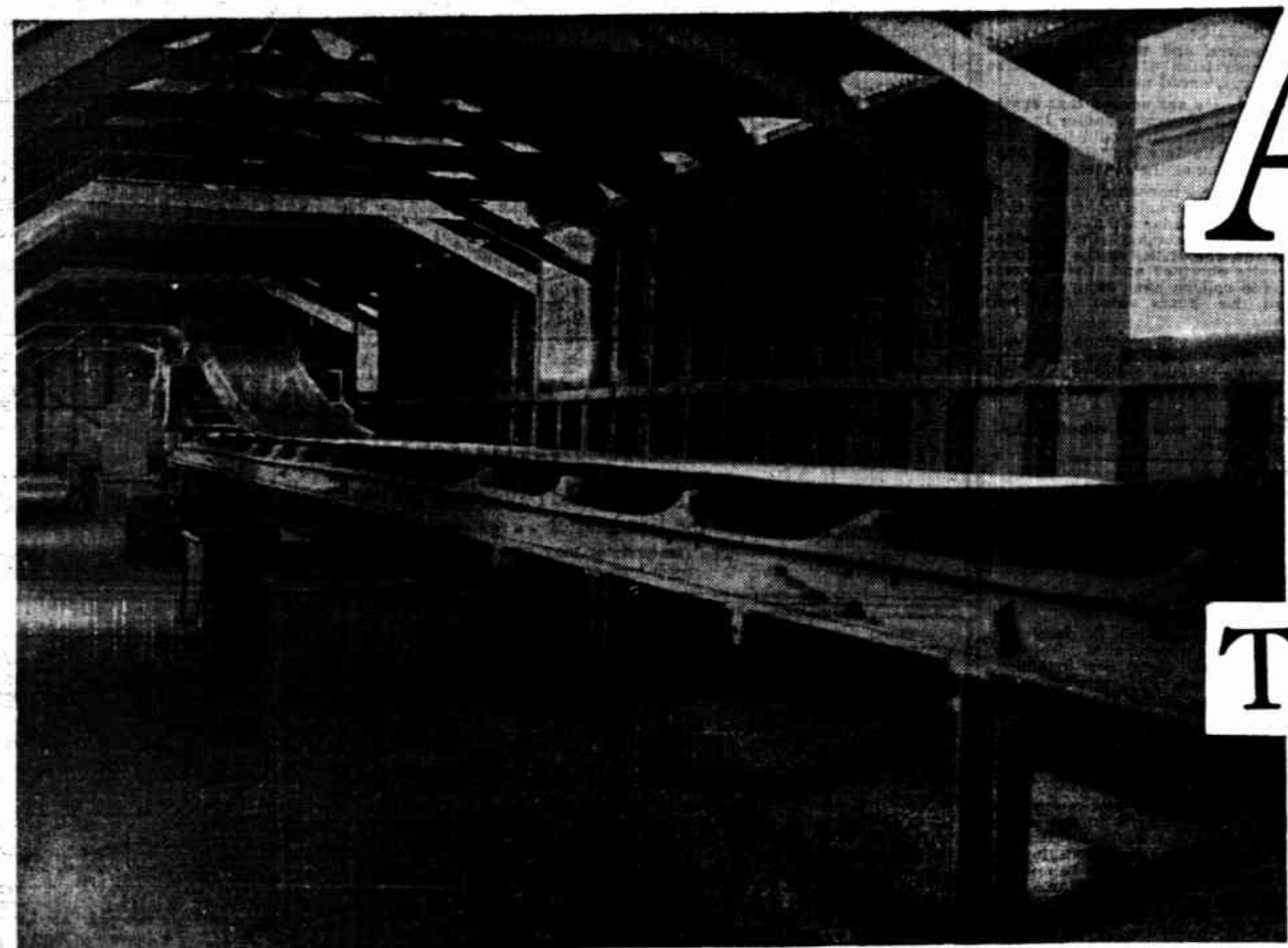
A. T. BRINE & SONS LTD.
295 James Street, Perth

OTHER IMPORTANT CONTRACTS CARRIED OUT BY THIS FIRM ARE:—

W.A. Trustee Building, Alliance Assurance Building, Padbury Building, St. Mary's Cathedral, State War Memorial, Metropolitan Markets, Hackett Memorial Buildings, Shell House, St. Mary's Church of England, South Perth, Commonwealth Bank, Midland Junction, National Bank, Fremantle, Anzac House, Boana extensions, St. Anne's Hospital, Mt. Lawley, St. John's Hospital, Belmont.

IN THE COURSE OF CONSTRUCTION:—

Gladden Building and new Fremantle theatre.



A VIEW OF THE CONVEYOR AT THE TOP OF THE BUNBURY SILO, TYPICAL OF A "ROBINSON" INSTALLATION

A MODERN SILO

The new state Silo at Bunbury has been erected on modern lines, and the whole of the machinery and running gear was designed and manufactured in Australia by

Thomas Robinson & Son, Pty. Ltd., Sydney,
in collaboration with **A. T. Brine & Son, Perth**

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