THE FYANSFORD CEMENT LINE

by John McNeill

The author was employed by Australian Cement Ltd from 1938 to 1986, rising to the position of works manager at Fyansford.The following account is based on his research in the company files and on his personal knowledge of operations at Fyansford.

This account is mostly concerned with the rail transport aspect of the plant and quarry.

Introduction

When the Australian Portland Cement Company was established in 1890 raw materials from the quarry were carted four km by horse-drawn wagons. There were no proper roads and serious transport problems were soon manifest. The company went into liquidation during 1902 but was reconstituted in 1905 and production recommenced.

At this stage a tramway was laid from the edge of the quarry south-east for three km across a paddock to meet the nearest road reserve where road cartage took over. This system remained in service until 1911 when an aerial ropeway was installed direct from the quarry to the works.

The aerial ropeway was fed by a narrow gauge system of portable lines worked by horse, with the trucks being loaded by scoops and shovels.

Broad Gauge Siding

Connection of the cement-making plant to the wider world was initially by horse drawn wagons until a branch of the Victorian Railways broad gauge line was built. During 1915-16 the company approached the State Government, requesting a railway line between North Geelong and the works. The company said this would remove the problem of damaged roads in Geelong, link the works directly to a state wide transport system and cope with anticipated increases in output.

Interstate movements of cement, coal and gypsum were also being considered at the time.The government finally passed the North Geelong to Fyansford Railway Construction Act 1916, and the line was declared open on September 9, 1918.

An alternative consultant's proposal for a line from South Geelong station through Chilwell and Newtown, then down the hillside, now carrying the Deviation Road, and to the works site, was considered impractical.

The company had to purchase any private land involved, and transfer title to the Victorian Railways at no cost, for as long as the line remained in use. Its length is nearly five km and the easement width at least 30 metres. The construction cost was only 5404 pounds ($10,808) but the company had to agree to pay 2354 pounds ($4708) a year in freight for 15 years, and the line was also to be available for use by the paper mill at Buckley's Falls.

Railway estimates of freight tonnage were 45,000 tpa (tonnes per annum) cement, 25,000 tpa coal, 750 tpa stores and 300 tpa paper.Paper freight never eventuated as output of the nearby paper mill decreased until its shut down in 1923.

To make proper use of the rail siding, a despatch department was constructed on the land purchased at the junction of Hyland Street and Asylum Road, and that section given to the railways. The company had to agree that all cement capable of delivery by rail to any place further than 16 km from the works would go by rail. This would at least guarantee revenue on the basis that nine pence (eight cents) a tonne was added to normal freight rates for the separate five km haul to North Geelong.

The Railway Act was amended in 1954 to allow widening of bends along the line, and in 1934 and 1975 to extend license agreements. Under these, the company is allowed to store material and goods, and carry out activities on the lease property.

Production levels rose with an improving market at the end of the 1920 coal strike, and the maximum degree of expansion possible on the south side of Hyland Street was put in motion.

To match the kiln fuel requirements and make best use of the new rail siding a complete coal handling and milling system was constructed between 1921 and 1925. A rail mounted steam shovel (RH No. 6) with a 7/8 cyd (about one tonne) bucket, and a grab and dragline, unloaded incoming rail wagons, either into a 1500 tonne storage yard, or to an 18,000 tonne open dump.

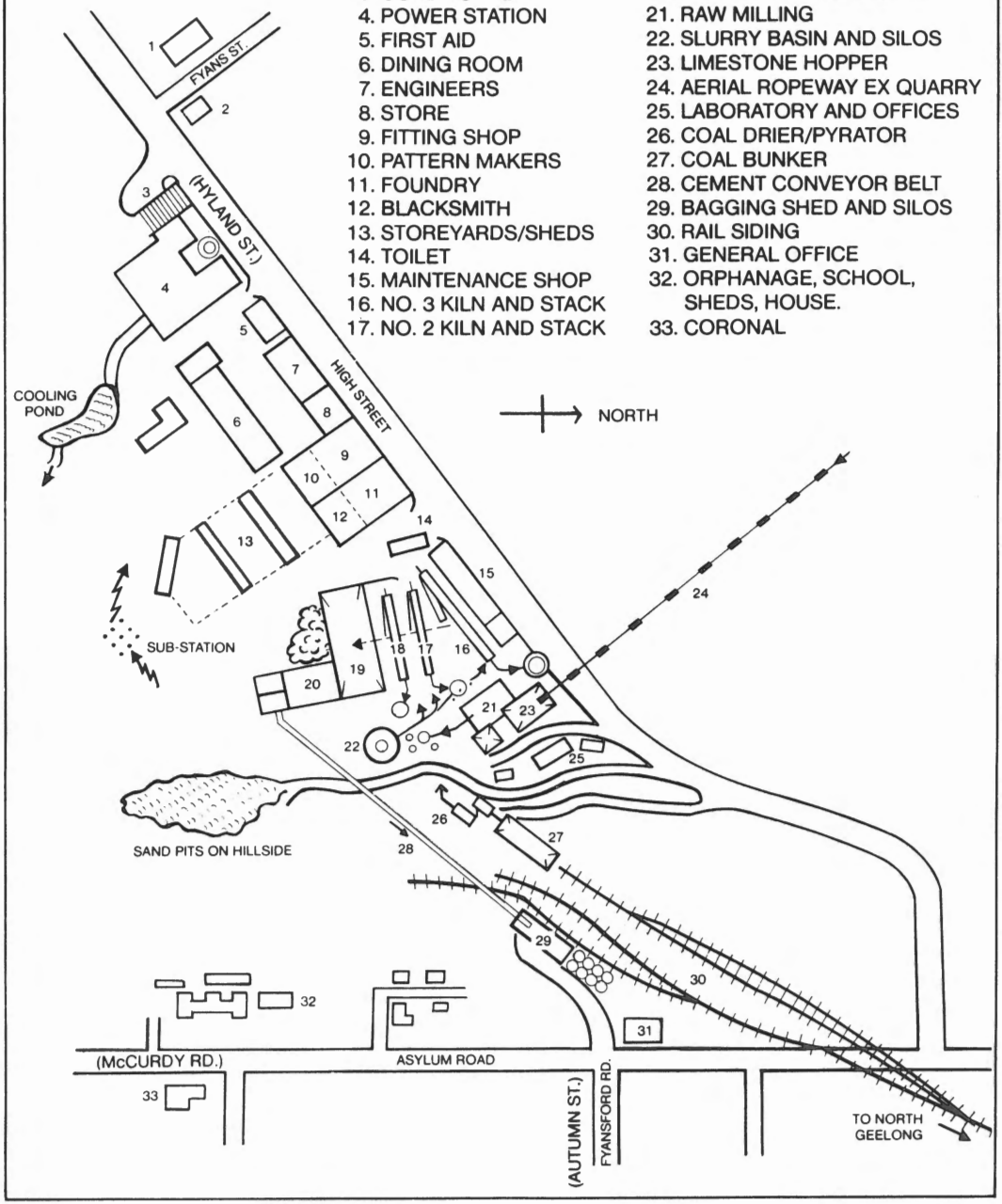
With the first cement silos and bagged and bulk despatch departments being constructed beside the rail siding, a 20 inch (500 mm) belt conveyor system was laid up the hill to the silos.

These first silos were of 1200 tonnes capacity. The first four in 1922 were given numbers 31 to 34, the next four in 1924 are numbered 41 to 44 and together they supply No 1 bagging shed.

The earliest two Bates Baggers of 1919 vintage, were simple two spout models. In 1924 they were replaced by three three-spout machines and these

WORKS LAYOUT 1922

1. ST. LUKES CHURCH
2. POST OFFICE
3. COAL HOPPER
4. POWER STATION
5. FIRST AID
6. DINING ROOM
7. ENGINEERS
8. STORE
9. FITTING SHOP
10. PATTERN MAKERS
11. FOUNDRY
12. BLACKSMITH
13. STOREYARDS/SHEDS
14. TOILET
15. MAINTENANCE SHOP
16. NO. 3 KILN AND STACK
17. NO. 2 KILN AND STACK
18. NO. 1 KILN AND STACK
19. CLINKER STORAGE
20. CEMENT MILL AND SILOS
21. RAW MILLING
22. SLURRY BASIN AND SILOS
23. LIMESTONE HOPPER
24. AERIAL ROPEWAY EX QUARRY
25. LABORATORY AND OFFICES
26. COAL DRIER/PYRATOR
27. COAL BUNKER
28. CEMENT CONVEYOR BELT
29. BAGGING SHED AND SILOS
30. RAIL SIDING
31. GENERAL OFFICE
32. ORPHANAGE, SCHOOL, SHEDS, HOUSE.
33. CORONAL



ACL loco No 9 on the overburden tramway at the top of the quarry.
Photo: R. Reilly ex Ellis Collection

remained in continuous use until the late 1970s. Road cartage of cement up Hyland Street hill was no longer necessary, and in 1922 despatches were 50,000 tonnes over the rail.

The Quarry

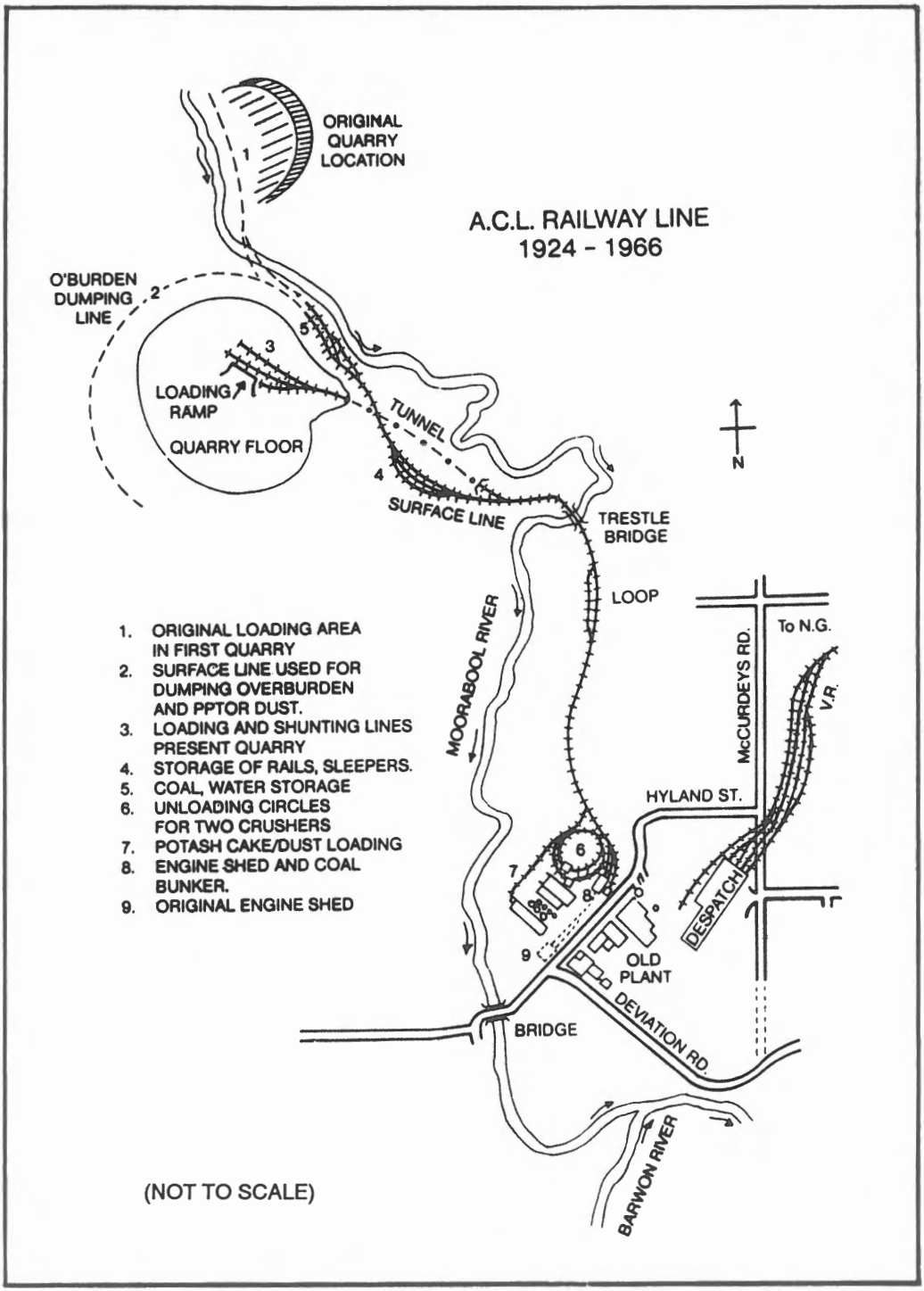
To keep up with increasing demand at the works for limestone, major changes were made at the old quarry. Steam shovels were introduced with larger wagons and crushers at the ropeway loading bin. The programme started in 1921 and continued through to 1926, making the quarry an extremely busy operation in a rapidly enlarging area. The rail system was laid down only in the quarry floor and was not connected to the works as the ropeway did this job.

Throughout its history the company has been involved in the long-term usage of large machines in one of Australia's most efficient stone excavations. A new limestone delivery and storage system was introduced during 1924-25. The existing ropeway system continued delivery to both the new and old plants until 1924 when the company purchased four Hudswell Clark 0-4-2 STs from Wallaroo (S.A.) and in 1926 bought two 0-6-0 STs from the Henderson Naval Base (W.A.). The ropeway had limited capacity and so a three feet six inches (1066 mm) gauge railway was constructed from the floor of the old quarry, across the Moorabool River on a wooden trestle bridge, about half way to the works, and to a shunting loop where new equipment was installed to crush and store the limestone.

The quarry was working deeper into the Batesford hillside and with the limestone deposit tilting down to the south, the overburden ratio was becoming a problem. Stone was excavated from the floor as close to the river as possible, and some of the harder stone across the river approaching the Dog Rocks was also obtained. Rail tracks were moved across the floor to approach the faces where track-mounted steam shovels directly loaded the rail wagons and the first group of locomotives shared the new work load.

The smaller Hudswell Clarkes shunted the 10 cyd (20 tonne) wagons on the quarry floor, while the two Vulcans ran on the new line to the works. To assist blending and quality control at the works, each train load was sampled before leaving the quarry. The sample was analysed for calcium carbonate content, the result telephoned to the crusher attendant, who posted figures on a board visible to the crane driver. That driver deposited the stone in sections of the storage allocated to high, low and medium grades.

The open storage yard had a capacity of 30,000 tonnes of limestone and 500 tonnes of iron oxide, and the covered end could hold 13,000 tonnes of gypsum. The newly installed crusher (No 1) was a Williams Hammermill-Mammoth No 7, with a 220 kw motor, and built to reduce feed down to three-quarters of an inch (20 mm). Rated at 300 tph, it could achieve only 200 tph with a stone which was relatively wet, and an uneven blend of soft and hard material.


A.C.L. RAILWAY LINE
1924 - 1966
ORIGINAL QUARRY LOCATION
O'BURDEN DUMPING LINE
LOADING RAMP
QUARRY FLOOR
TUNNEL
SURFACE LINE
TRESTLE BRIDGE
LOOP
MOORABOOL RIVER
McCURDEYS RD.
To N.G.
V.R.
HYLAND ST.
DESPATCH
OLD PLANT
DEVIATION RD.
BRIDGE
BARWON RIVER
N
1. ORIGINAL LOADING AREA IN FIRST QUARRY
2. SURFACE LINE USED FOR DUMPING OVERBURDEN AND PPTOR DUST.
3. LOADING AND SHUNTING LINES PRESENT QUARRY
4. STORAGE OF RAILS, SLEEPERS.
5. COAL, WATER STORAGE
6. UNLOADING CIRCLES FOR TWO CRUSHERS
7. POTASH CAKE/DUST LOADING
8. ENGINE SHED AND COAL BUNKER.
9. ORIGINAL ENGINE SHED
(NOT TO SCALE)

ACL No 1 Garratt emerging from the tunnel into the bed of the limestone quarry. 1951. Photo: R. Reilly ex Ellis Collection.

Haulage ropes, 260 metres in length, pulled the wagons to the crusher hopper and a hoist tipped the side-opening wagons. The first crane, operating length-wise above the entire yard, was of 5 cyd (10 tonne) capacity, and worked from 1926 to 1938 before being joined by No 2 of 8 cyd (16 tonne) capacity.

The existing Batesford quarry's production was limited, with a rapidly increasing overburden ratio, and a decrease in the width of property available for quarrying. Borehole testing of the flatter country downstream, basically the McCann family-owned estate of Dryden, indicated a massive deposit of limestone ranging from a high grade of 90 per cent CaCO3 (calcium carbonate) below the overburden to a much lower grade as depth increased. The overburden was mainly clay and easily removed, except in the western area where basalt layers covered the stone.

The course of the Moorabool River crossed the deposit area and was the boundary between Dryden and other properties. To the north, the Dog Rocks granite outcrop gradually cut off the limestone. It was in this area that overburden was to be dumped when quarrying started.

The plan for this operation had several stages.

Open-cut quarrying was used to remove overburden from an area large enough to allow sinking down a working floor for some 37 metres. This opened up a working face with 30 metres of limestone, averaging a usable mix quality and six metres of overburden. With the floor about 21 metres below sea level, a drainage pump system collected water for pumping up into the river.

The limestone from this 'glory hole' type of quarry was loaded on rail wagons used in the first quarry.

A tunnel 1.3 km in length was driven from a convenient point nearer the works down to the accepted floor level in the quarry, and a rail track laid in that tunnel. The gradient was 1 in 37 against the load.

Loading rail hoppers in the limestone quarry. Loco No 5 or 6 (number indistinct) in attendance. 1951. *Photo: R. Reilly ex Ellis Collection.*

Finally, the limestone was transported to the works, via the tunnel. The total length of main line was 5.6 km.

The underground drainage system installed across the floor of the new quarry was copied from the one which was successful in the original workings. There, the excavation of the usable limestone blend required a working floor level 4.6 metres below the nearby river level, and to collect and remove seepage from that perforated river bed and nearby land, tunnels were driven underground at right angles to the working face, leading back to a sump for pumping into the river.

That quarry was completely flooded only once in its 40 years, and out of action for four weeks.

At the old quarry, the Moorabool was diverted back to the unused workings during the late 1920s to take its course further away from the sensitive section of the new quarry face.

Second Quarry Opened

The work was completed in 1931, and the first quarry was vacated. Four of the five steam locomotive shovels, one rail and three track mounted, were now fully occupied in the new quarry. The original crushers were sold, the loading station demolished and the ropeway system dismantled over a few years. Buildings were transferred if usable, or demolished, and the quarry faces left untouched. Some stone was quarried there when floods covered the new quarry years later.

The original surface rail line was kept in use for cartage of stores, particularly coal for steam shovels on overburden, and transport of workers. An extended section of this line was taken in a circle round the top of the limestone body to take overburden from shovels, and tip it on the dumps. On the quarry floor a team of track-layers regularly shifted the rail lines close enough to the working faces to accept direct loading of limestone from steam shovels.

In the 1950s, the line was lowered into a cutting in the floor and a fleet of AEC Matador rear tipping 18-cubic yard (14 cubic metres) capacity trucks

Above: Passing ACL Nos 1 & 2 Garratts at the crossing loop between quarry and works. 1951.

Below: ACL No 10 by Perry, ex Hume Weir, at the Fyansford loco shed. Original print undated but probably 1951. Photo: R. Reilly ex Ellis Collection.

took the stone from the shovels and tipped it in rail trucks.

To cope with smoke accumulation problems in the tunnel there were originally four ventilation shafts reaching up to ground level, and the locomotives travelled according to a pattern aimed at minimising nuisance to the crew. In hauling loaded wagons from the quarry on an upward slope, the engine was in reverse, with the cabin-end leading. On the downward return, the engine led in normal position, being able to coast, and emit little smoke from its stack.

In 1948, to assist clearing smoke from the large Australian Standard Garratt, a reversible exhaust fan was installed in the vent shaft halfway along the tunnel. The fan blasted air in as the engine approached, and sucked it out after the engine had passed.

The six small locomotives, four Hudswell Clarkes shunting wagons, and two Vulcans taking wagons to the works, continued their duties in this new quarry. The original wagons had wooden bodies of about 16 tonne capacity on a four wheel chassis, and were later replaced by steel wagons of 18 tonne capacity. All were side tipping for delivery into the crusher hopper at the works.

Increasing demand for limestone to match works expansion led to purchase of two Beyer Peacock Garratt locomotives (2-6-0.0-6-2 wheel arrangements) models, weighing 71 tonnes in 1936 and 1938 for mainline haulage, with two of the smaller locos engaged in shunting and four on overburden duties. In 1945, handling capacity was further increased with purchase of an unused, surplus Australian Standard Garratt (4-8-2.2-8-4, weighing 120 tonnes) from the Victorian Railways. One of the Beyer Peacock Garratts then took over shunting at the crusher circles.

In 1946, two small, old Perry side tank engines of the 0-4-0 style were added to the fleet for shunting at the quarry, and in 1957, the last locomotive was bought, a General Motors diesel electric weighing 67 tonnes, and fitted with dynamic braking with a greater tractive effort. With haulage up the tunnel as the main limiting factor on capacity, a comparison of the different engines' performance is indicated below.

1931	Vulcan loco	Three wagons up tunnel each trip, then a total of six to the works once per hour equalling 100 tph (tonnes per hour).
1936	Beyer Peacock	Six wagons up tunnel and direct to the works, with round trip of 30 minutes, equalling 200 tph.
1946	Australian Standard Garratt	Nine wagons with round trip of 30 minutes, equalling 300 tph.
1947	Australian Standard Garratt	Using two Garratts and auto matic signalling system, equalling 480 tph.
1957	Diesel Electric	15 Wagons with round trip of 26 minutes, equalling 550 tph or 4700 tonnes per day.

Rail Closure

At the Batesford quarry, there had been a logical development, with changes of equipment and methods during the years from work in the old quarry through to present days.

The first introduction of Bucyrus steam shovels came in 1921, and the direct loading of rail wagons by shovels at the quarry face, during the first years of the new quarry.

In 1952, AEC Matador motor trucks were introduced, and carted the stone from shovels to wagons which had been shunted into the loading ramp, centrally located on the floor.

Marion three-cubic-metre capacity diesel shovels first appeared in 1958 and stayed in service until 1988 when replaced by modern, faster and more manoeuvrable front end loaders and shovels. In recent years there has been a phased-in transfer of overburden removal operations to contractors. This policy, together with closure of the railway, use of larger equipment and greatly increased productivity of all personnel at the quarry, has markedly reduced the manning level.

The next major step was the erection of the limestone conveyor system from quarry to works in 1966, involving the installation of the larger No 3 crusher at the quarry, seven sections of belt conveyor in a concrete support and protective structure across country for 3.67 kilometres, a rail mounted stacker with a slewing boom, and two rotary plough reclaimers to feed limestone to either the storage yard for the old mills, or to the feed bin for the new raw mill (R22) being installed. The existing crushers at the works, Nos 1 and 2 were taken out of service.

The ACL railway ceased operating in April 1966 and the company disposed of all the rolling stock.