ORBOST & DISTRICT HISTORICAL SOCIETY Inc.
P.O. BOX 284 ORBOST VIC 3888

NEWSLETTER

No. 130 August 2016

Building the 1970s bridges over the Snowy River and Newmerella floodplain

In October 2015, David Jellie was guest speaker at the Historical Society meeting in Orbost. This Newsletter is based on David's talk with particular emphasis on the photos which he showed.

In early 1974, as an Engineer with the Country Roads Board, David came to Orbost as the Supervising Engineer for the construction of the new bridges which were part of an 8.4km Orbost-bypass road design. This was a major project involving not only a new bridge over the Snowy River (including Lochiel Lagoon), but other bridges over Ashby's Gulch and Watt's Gulch. These new bridges were opened in November 1976 with the unveiling of a plaque on the eastern end of the $2.4M Snowy River Bridge.

In the 1960s, the Country Roads Board started investigations into creating a new crossing of the Snowy River at Orbost. The existing bridge needed constant maintenance and it was estimated that its lifespan was about a further ten years. The approach alignment at both ends was very poor and fatalities had occurred at the Marlo end. Also, it was common for large vehicles to get stuck under the transverse bracing between the two trusses on the old bridge. Height (and weight) restrictions were imposed. There were strong doubts that the bridge could survive another severe flood.

As it happened, the devastation caused by the

ABOVE: Orbost says good-by to their old bridge, November 1976.

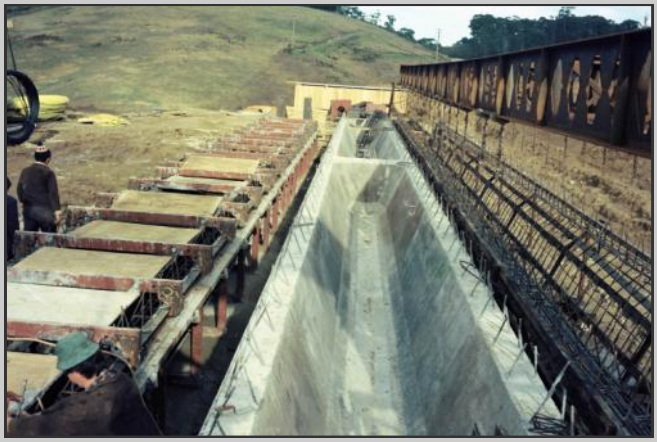
huge 1971 flood forced the CRB to decide that a complete redesign of the approaches to Orbost was needed.

This involved a new freeway style bypass route 2kms. long downstream of the existing railway viaduct bridges and across the flats at the narrowest point of the flood plain.

The new Snowy River Bridge was to be located 45 metres downstream from the old bridge. It was designed to have a 1.83 metre clearance (under the bridge) above the record 1971 flood level.

Construction started in January 1974 and was completed 2½ years later.

ABOVE: The old bridge after the 1971 flood.



CASTING YARD. A pre-casting yard was set up within the road reserve at the Melbourne end of Ashby's Gulch at Newmerella, together with two gantries, steam curing, prestressing bed, storage shed and office. Tension piles were located at each end of the casting bed capable of carrying a maximum prestress force of 1000 tons through the wires. After a beam was cast and cured, the wires were cut and the pressure remained in the concrete beam. Steam curing was done overnight with a steam cover over the top. In all, 212 prestressed concrete U beams were made (each 21-30 metres long and weighing up to 50 tons each). Three to four beams per week were produced with a maximum of one per day. Workforce at the casting yard was one foreman, six labourers, and one boiler attendant. After the job was finished, the casting yard was buried. Pearson Bridge P/L was the contractor for this part of the project.

David Jellie said "*This was the first time that precast U beams had been used by the CRB. The Orbost bridges had a lot of "used first" features that we tried out for the first time. We had a testing laboratory just across from the footie ground (Noel Goldfield was in charge) to test the concrete every morning. The concrete is constantly under compression. No water can get in and there is no cracking so it is maintenance free. We had to produce and store the beams to match what we were doing at the time."*

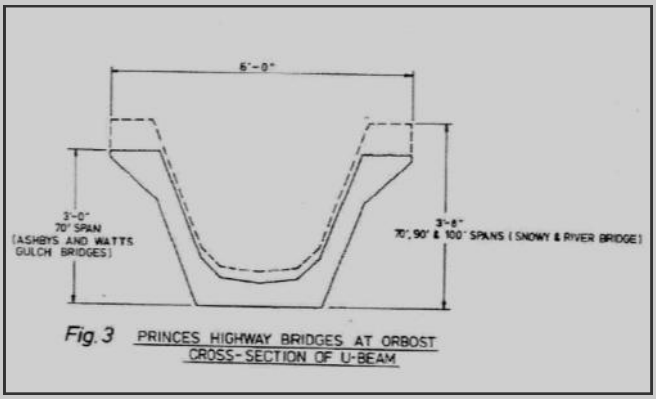


Fig. 3 PRINCES HIGHWAY BRIDGES AT ORBOST
CROSS-SECTION OF U-BEAM

PHOTOS show the construction process for the pre-stressed concrete beams used on all bridge.

FOUNDATIONS

SNOWY RIVER BRIDGE. David Jellie: "*Each pier is supported by two 1.5 metre reinforced concrete cylinders sealed 3 metres into bedrock. The maximum length of cylinders is 21 metres. The very hard metamorphosed sandstone constantly damaged the 1.5 tonne rock chisels used to break the rock so mining and blasting methods were used. For about half of the piers in the river, we had to send miners down. The deepest pile is over10 metres below normal water level. I had to go down and inspect every pile before it was concreted. I went down inside the piles. I had a whistle to guide the man at the top, a series of 5 whistle calls.* ***This was in the 1970s and is not allowed now because it is too dangerous****. I sat in a chair to be lowered down inside the casing to inspect the rock. The piles were sealed into the rock inside a steel casing.*

"There was an arbitration dispute with a sub-contractor (Frankiepile P/L) who said that he was losing a lot of money due to damaged equipment because of the hard rock. The CRB called it metamorphosed siltstone when it should have been called metamorphosed sandstone commonly called "greywackie" which is very hard. The CRB lost $188,000 on this case (a lot of money in those days)."

ABOVE: David Jellie about to be lowered inside a steel casing to inspect the rock below. He had to inspect the foundations for each pile.

RIGHT: Photograph of the very hard metamorphosed sandstone into which the piles were cast.

MATERIALS

David Jellie: "*CRB geologists explored the area and found suitable rock at Young's Creek, and sand deposits at Reed Bed Creek near Cann River. Quarries were established at these sites. A Pioneer Concrete batching plant was sited on the river flats near the Railway Station at Newmerella. A high percentage of the 60 -90 men working on the bridge at any time were locals, many of them farmers who were multi-skilled and industrious men. This extra employment was very welcome in the Orbost area and I noticed many new cars."*

To help in construction of the new bridge across the Snowy River, a low level temporary bridge was built adjacent to the new bridge alignment.

LEFT: In this photo, the new bridge which is under construction can be seen in the foreground. The temporary bridge which was built at a lower level can be seen behind, and further behind is the old bridge.

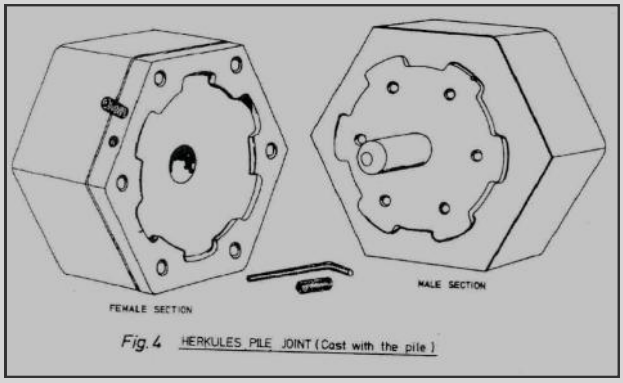
RIGHT: Trucks carrying the massive concrete beams drove on to the temporary low level bridge and the beams were then craned into their correct positions.

WATTS GULCH and ASHBY'S GULCH BRIDGES over the Snowy River floodplain

Foundations for the gulch bridges also posed problems. H -piles were driven down through alluvial silts to the dense gravels at an average depth of about 21 metres. A 5-ton drop hammer was used. (See photo at right).

H-piles were suitable for Ashby's Gulch and for all abutments where they were bitumen coated to reduce the effects of down drag caused by settlement of the road embankment.

However, at Watt's Gulch, precast concrete Herkules piles were used. Herkules piles come in hexagonal precast sections which are joined together by a locking joint. (See below). The patented mechanical joint is made from steel. The first pile is driven into the ground leaving about 1 metre above ground so that the next section can be fitted and locked in place by turning.



ABOVE: An H-pile being driven into the floodplain silts and gravels. **LEFT**: Herkules pile joint detail.