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Reading through the report of the November 1977 meeting I note correspondence was exchanged between the S.R.S.V. and Mr.D.W.Edwards of Merseyside, UK., regarding various types of mechanical interlocking used on the Victorian Railways. The letter resulted in a short discussion following which, one of our interlocking 'experts' was asked to reply in detail.

The Group Leader suggested that a short article be prepared for publication in the S.R.S.U.K. Newsletter. The suggestion was also made that a short section on safeworking be a regular feature of another societies magazine.

Now that the S.R.S.V. has its own Newsletter, I feel that both the above ideas would be right at home in *Somersault*, the interlocking article becoming a 'Data Sheet' type article for the information of new and old members alike.

#### ARCHIVES NEWS

Unfortunately, the move to the new room has not yet taken place but it is hoped that by the time you read this, the Archives Committee will have commenced the conversion of the room to our requirements. When the Archives have been established there, the diagram service will be resumed together with the reproduction of diagrams in *Somersault*. Diagrams covering articles already printed will also be reproduced.

Peter Stoneham has kindly donated some diagrams to the Society which include the Cheltenham signal box diagram complete with frame and glass.

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#### SIGNALLING ALTERATIONS

- 12. 8.1978 GARFIELD. The connection from the up line to the goods siding has been removed.
- 20. 8.1978 VIADUCT JUNCTION-FRANKLIN STREET. The up through suburban line has been slued to a new alignment. Signals E 62 and E 68 have been relocated to ground masts.
- 20. 8.1978 MACLEOD. A turnout has been provided at the down end of the up platform road and will be used to enable ballast trains to reach the future up line now under construction between Macleod and Greensborough.

- WN 35/1978 FLINDERS STREET B BOX. No 2 St. Kilda stabling siding has been placed out of use due to the reconstruction of the adjacent swimming pool.
21. 8.1978 NORTH CRESWICK. The goods siding and connections were abolished including the staff/annett key exchange apparatus. This work follows the closure of the station to goods traffic.
- WN 35/1978 WODONGA COAL SIDINGS. New signalling diagram No 6'78 became effective and diagram No 25'71 is cancelled.
27. 8.1978 UPPER FERNTREE GULLY. Former Council Siding and signalling equipment including the low speed signals on posts 16 and 18 were removed.
27. 8.1978 BALLARAT A BOX. Post 12, six arms, has been replaced by a new post with six discs.
29. 8.1978 MITIAMO. No 2 and 3 roads have been removed.
- WN 36/1978 KOONDROOK, CARPOLAC and PATCHEWOLLOCK are now Guard in Charge of safeworking unless trains are to cross.
- WN 36/1978 NEWPORT. A telephone has been provided to enable the Altona Petrochemical Company to alert the V.R. during any emergency that requires the halting of trains between Newport and Laverton or Werribee.
5. 9.1978 VIADUCT JUNCTION. Route indicators have been provided on post 32 home signal from the South Viaduct line. The LH arrow indicates the road set for the Goods Lines and the RH arrow for the Down Through Suburban line.
- WN 37/1978 YANAC and YAAPEET are now Guard in Charge of safeworking unless trains are to cross.
6. 9.1978 BAYSWATER. The auxiliary frame at the up end of the yard was relocated to the down side of the line.
- WN 38/1978 STRATFORD, FERNBANK and LINDENOW. Composite staff exchange boxes were provided to enable an economy of rostered hours of station staff. The Weekly Notice also published details of the trains running on the SEB and Compo SEB.
- WN 39/1978 TERANG. A Staff exchange box has been provided.
- WN 40/1978 BOWSER. Now only switched in as required. The train service on the Bright line runs only as required following the opening of the Freight Centre at Wangaratta earlier this year. The service to Peechelba East has been as required for many years.

24. 9.1978 FLINDERS STREET A BOX. Post 18, down home signal from Z to the South Viaduct line, was relocated to a ground mast seven metres in the up direction.
- WN 40/1978 NATHALIA, PICOLA, RUSHWORTH and COLBINABBIN are now Guard in Charge of safeworking unless trains are to cross.
24. 9.1978 KEON PARK-THOMASTOWN. Co-ordinated traffic lights were provided at Settlement Road level crossing. A new down advance starting (light) signal, lever 4 at Keon Park, was provided on the upside of the crossing. This signal and the up departure signals at Lalor are controlled via stopping or express push buttons. The down home signal for Thomastown was replaced by a light signal and is worked from push buttons on the platform or at the up end points. The staff locks at Thomastown were replaced by annett locks, the key to which is secured in a staff/annett key exchanger.
25. 9.1978 LANGI LOGAN. The staff instruments and associated equipment have been transferred to a new station building.
- 3.10.1978 PIANGIL. The plunger locks and home signals have been abolished and staff locks provided on the main line points. Hand locking bars were provided on the points leading from No 2 to No 3 road.
- 3.10.1978 CROYDON. The Cool Store Siding has been removed.
- 3.10.1978 NINDA. Staff locks and WSa levers have replaced the hand locking bars and CCW levers on the main line points.
- 4.10.1978 NYARRIN. Staff locks provided inlieu of hand locking bars.
- 5.10.1978 VIADUCT JUNCTION. The up home signal No 306 was relocated to a signal bridge.
- 12.10.1978 THOMASTOWN. The up home signal E was converted to automatic signal TS580.
- 12.10.1978 CLAYTON. Pedestrian boom barriers have been provided and operate in conjunction with the boom barriers. A sonalert is provided to warn pedestrians prior to the lowering of the booms.
- 18.10.1978 STAWELL B BOX. The home signals on post 11 are now fitted with Reid's patented signal replacers.

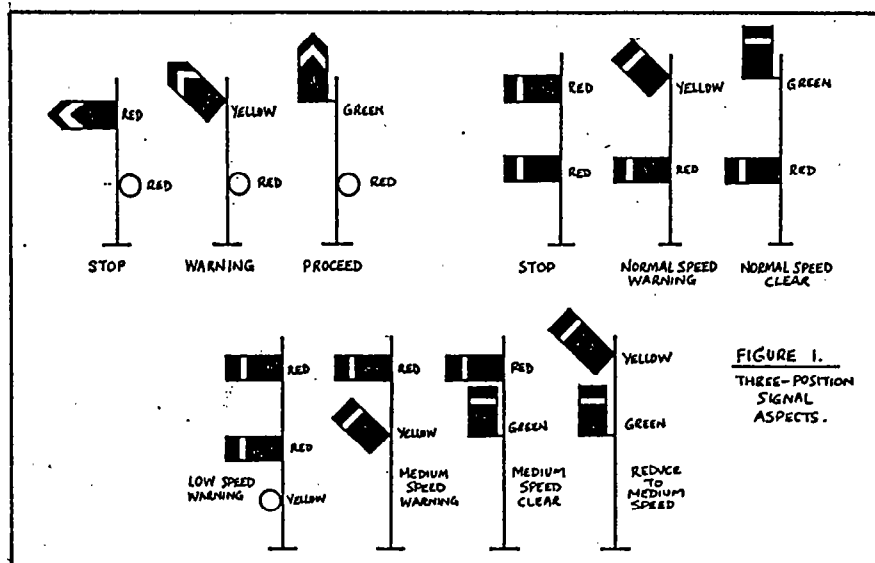
### SIGNALLING ON MELBOURNE'S ELECTRIFIED RAILWAYS

*This article was originally published in The Railway Signal Engineer, an American publication, and is an abstract of an article by Mr. F.M. Calcutt, Engineer of Signals. It was originally published in the 28 August 1919 issue of the Industrial Australian and Mining Standard.*

In order to fully realise the benefits from the electrification of its suburban lines, the Victorian State Railways (Australia) made a very careful review of the signalling of the electrified portion and after a visit by the Engineer of Signals to America, Great Britain and the Continent, it was decided to adopt the three position automatic signalling system that is used extensively in America. That the decision was a correct one has since been borne out by the favourable comments of the operating staff and the results achieved.

#### THE SIGNAL SYSTEM

The automatic signalling system adopted is what is known as the upper quadrant, three position type, with red, yellow and green coloured lights designated Stop, Warning and Proceed.



In the three aspects of the automatic signals, a second light, always red, is shown. This is known as the "marker light" and serves as a precaution in the event of the main signal light being extinguished, for the marker light is always shows the Stop indication. It brings the night aspect of automatic signalling into uniformity with interlocking signals which in the general scheme are all two-light signals. The typical aspects are shown in Figure 1.

The end of the automatic arm is pointed indicating that, after having stopped at such a signal for a specified time, the

driver is authorised to proceed cautiously into the next section. The night equivalent for the points arm is two staggered lights, that is, the lights are not arranged vertically, as is in the case of interlocked signals, the "marker light" being located on the opposite side of the signal mast from the semaphore signal.

From a train running points of view, three-position signalling has a great advantage over the mechanical system, comprising home and distant signals, in that it enables trains to follow each other more closely and, further, defers the "caution" signal to the latest moment compatible with practicable braking. Figure 2 attempts to illustrate this latter advantage. In the mechanical system, distant signal (1) is not permitted to be lowered to the "Clear" position unless home signal (2), starter (3) and advanced starter (4) have been lowered, say, on account of a previous train in the section, a train passing the distant signal travels at reduced speed to signal (4).

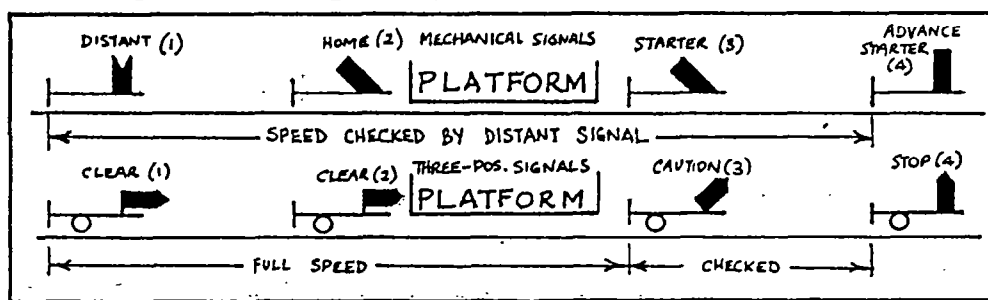


Figure 2. Home and Distant, and 3-Position Signals compared.

Comparing this with the three-position signalling shown immediately above, clear signals are shown on signals (1) and (2), and the train does not reduce speed until signal (3) is reached; that is, the speed check between signals (1) and (3) is saved. It may happen that after the train has passed automatic signals (1) and (2), signal (3) may operate to the "Clear" position, and so eliminate the check altogether. This is different from the action of the mechanical distant signal, which, when passed at danger, always continues to exercise its speed check throughout the limits of its control, whether the home signals are clear or not.

### THREE POSITION INTERLOCKED SIGNALS

The three position interlocked signal is a two-armed signal, the top arm being called a "Normal Speed Arm" and no restriction is involved in its use other than the maximum speed for which the line is suitable. The indication given by the lower arm is restrictive and is known as the "Medium Speed Arm". It is used for diverging movements over switches or other sections of the line where only a moderate speed is permissible. On the Victoria Railways this arm limits speed to 25 mph. Each arm works in the three positions as in the case of the one arm automatic signal. The only aspect for which both arms are brought into commission is in the "Reduce to Medium Speed" indication, which is used for cautioning the engineman that he is approaching a medium speed signal. The arms on the interlocked signals have square ends and at night the two lights - one for each arm - appear in the verti-

cal line. This denotes an absolute stop signal which, unlike the automatic signal, cannot be passed after waiting a given time. In addition to this, there is located below these two arms and on the same side of the signal mast, a hooded electric lamp so it may be seen both day and night, known as a low speed signal. It indicates to the engineman to proceed at low speed not exceeding 10 mph and be prepared to stop short of any obstruction. In America this third indication is given by a short arm and the present installation is a Victorian innovation, the electric lamp being very simple and cheap in comparison with the more complex motor mechanism for working the arms. The colour of this low speed signal is yellow.

It will now be gathered that the two-arm signal is really a speed indicating signal - the top arm for high speed, the second arm for medium speed and the yellow light, lowest of all, for low speed, thus the higher the position of the indication the higher the speed permitted. Usually there can only be one high speed route, though the second arm and low speed light frequently govern two or more routes.

In the mechanical system of route signalling, a separate arm is provided for each route, consequently, where there is a multiplicity of routes, the meaning of the groups of arms becomes increasingly difficult to interpret. The permissible speed of the train for each route has to be remembered and regulated accordingly. A noteworthy instance of the complication involved in route signalling exists at the west end of Flinders Street station, where one group of signals from one of the viaduct lines comprises 12 arms leading to as many routes, and another group on the same bridge leads from the second viaduct line to seven routes. In the new system this will be greatly simplified by the substitution of the two-arm signal for each group. The speed signalling system then, tells the engineman not where he is going but at what speed he may safely proceed.

The application of the three position signalling system involved many engineering problems, the drafting of new rules and regulations, and the thorough education of all concerned in its operation. The smooth working of the system up-to-date is, however, sufficient testimony to the manner in which the men have intelligently studied and quickly adapted themselves to the new method of operation.

Dwarf signals are provided for switching movements, which consist of a small white disc placed between the tracks slightly above ground level and on which is painted the representation of a signal arm. This signal is similar to that use at the Chicago terminal of the Chicago & North Western. By rotation of the disc the painted arm simulates the movement of the actual arms on mast signals, the rotation being imparted by an electric motor mechanism at the back of the disc. In order to minimise the number of red lights which a locomotive engineman would see at night in congested areas, the "Stop" indication of the dwarf signal is purple instead of red. The "Caution" and "Clear" indications are, however, yellow and green respectively.

(to be continued)

V.R. SIGNALLING HISTORYNo 6. LOCKSLEY

by Jack McLean.

When the line was extended from Seymour to Longwood on 20 November 1872, there was only one intermediate station - Avenel. Mangalore was opened as a staff station during the construction of the Goulburn Valley line in 1880. Monea, never a staff station, was opened on 27 August 1882 and closed on 13 June 1960.

Locksley was opened as Burnt Creek Siding on 18 October 1882 for goods traffic, passengers being catered for from 3 September 1883. It was renamed Locksley on 5 December 1904.

The goods siding was a loop on the down side of the line and in the early stages the platform was on the opposite side of the level crossing at the Melbourne end. Staff and Annett Locks did not appear in Victoria until the 1890's and so, on an important line like the North-East, something more reliable than hand locking bars and padlocks were required to ensure that points at outlying sidings were in their correct position. Interlocking was the only method available.

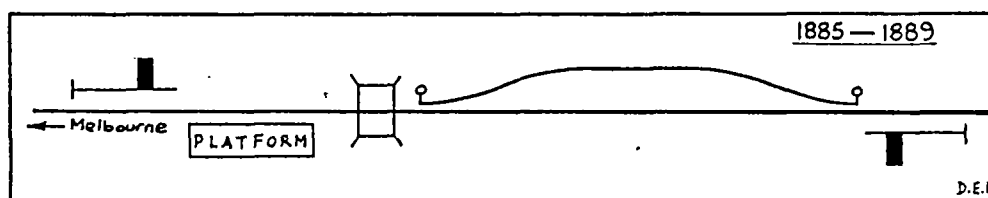


Diagram 1. Original layout.

On 6 May 1885, a six lever frame was installed and this probably provided for the points, a lock-bar and a home signal at each end of the station. On 22 August 1889, this was increased to ten levers indicating that there were now distant signals and two-armed home signals in each direction. What purpose they served is not clear as Burnt Creek is not shown as a staff station in either the 1890 or 1892 Working Timetables and there seems to be no evidence of it becoming a crossing station until 1905.

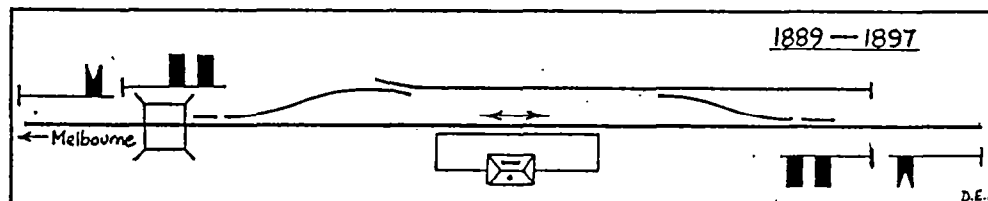


Diagram 2. Interlocking - 10 levers frame.

From 20 May 1891, the interlocking was altered so that the main line signals could be lowered in both directions; up until this time it would appear that the Station-master was on duty for all trains.

With the coming of tablet working on 22 February 1897 on the section Avenel-Longwood (among others) tablet locks (first used in 1896) were installed on the Burnt Creek loop siding on 3 December 1897 and the ten lever interlocking frame removed.

The name of the station was changed from Burnt Creek to Locksley on 5 December 1904, probably while they were working on increasing the facilities there. On 1 January 1905, a 20 lever interlocking frame was installed indicating that there was a distant signal, two-armed home signal (arrival to No 1 and No 2 road), two points (main to No 2 and No 2 to No 3 road) and two lockbars - at each end. This was shown in signalling diagram No 882'1904 from which our third diagram has been deduced.

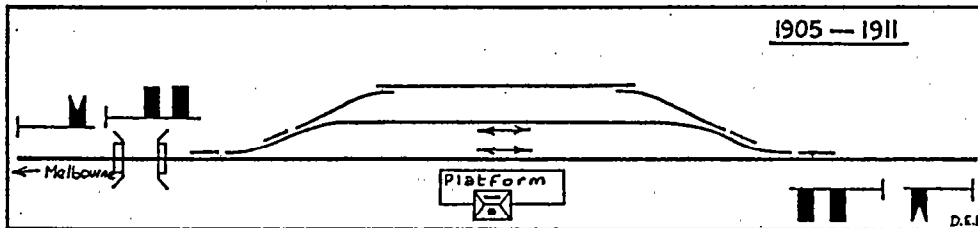


Diagram 3. Interlocking - 20 lever frame.

In Weekly Notice No 45 of 1911, alterations were shown which included sluing the main line twice near the up and down distant signals so that No 2 road became the main (straight) line through the station. Shortly after this the tablet working was replaced by miniature electric staff on 12 October 1913.

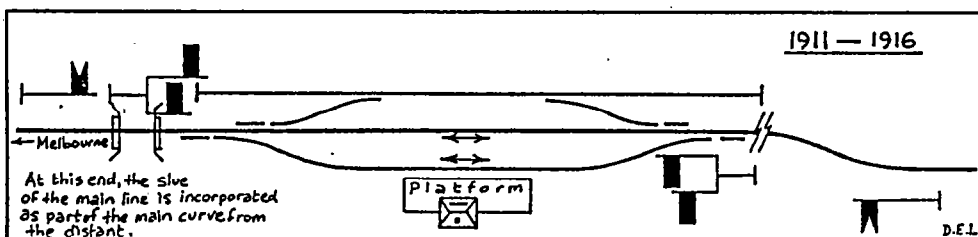


Diagram 4. Alterations a/c platform on loop.

In 1916, the station was again enlarged. A new No 3 road was constructed, extending to dead ends at both ends and discs were provided to signal entrance to and exit from this road. In addition, departure home signals were provided on bracket posts to signal trains from No 1 and 2 roads at either end. A new interlocking frame of 30 levers was now required to work the yard and this was provided on 6 June 1916.

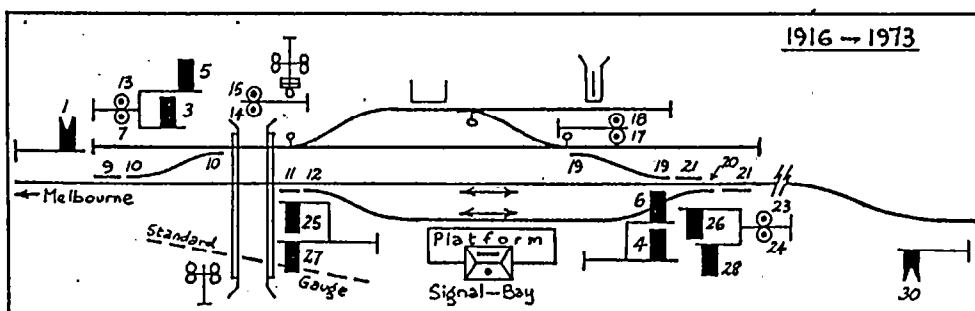


Figure 5. Yard accommodation increased.



Apart from the provision of automatic staff exchangers in 1926, very little further alteration took place at Locksley until April 1960 when some of the signals were relocated in connection with the standard gauge line then under construction. Two extra disc signals along with the flashing lights were provided on 6 June 1962.

The standard gauge line in the ensuing eleven years took away a large percentage of the traffic from the broad gauge line which now largely became just a rural Victorian line rather than an interstate line. The remaining lines, now diesel hauled, were longer and faster. Thus the need for frequent crossing stations was reduced and where a signaller is still required for train operations, he often has little to do between trains.

The V.R. attempted to close the station to passengers late in 1972 but because of local opposition, this was not proceeded with until further investigations were made. However, as shown above I did not take long to reach the obvious conclusion, and the station closed to all traffic, except for goods in wagon loads, on 1 April 1973.

A loop goods siding was retained and the up end main line points were secured by annett lock (provided 22 May 1973), with staff/annett key exchange apparatus located near the up end of the siding, whilst the down end were staff locked (provided 1 April 1973). The staff/annett key exchanger enabled the flashing lights to be switched to manual operation when the siding was being shunted.

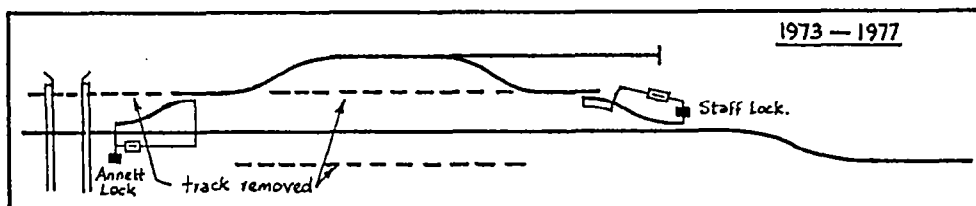


Figure 6. Goods siding retained.

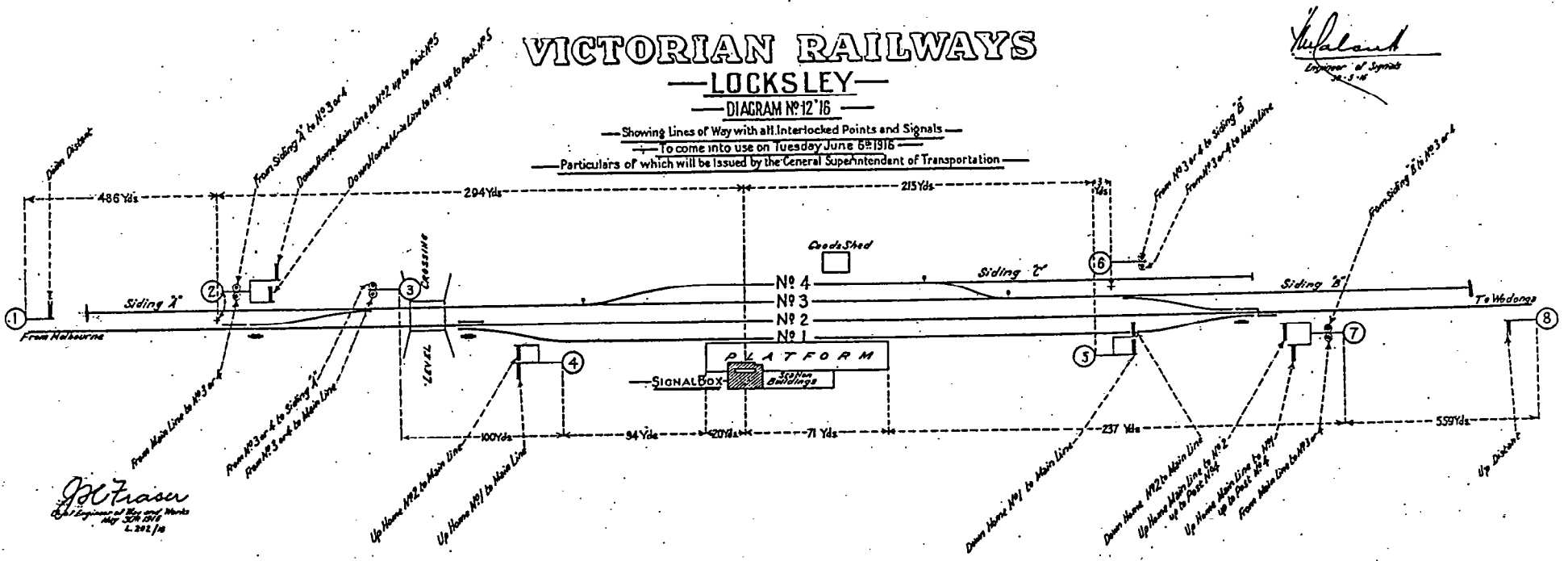
The loop goods siding remained in service seeing little use until 30 September 1977 when Locksley was closed to all traffic and the siding removed. All that now remains now is the mound of earth that was previously the passenger platform and the flashing lights standing guard at the adjacent level crossing.

# VICTORIAN RAILWAYS

## — LOCKSLEY —

### — DIAGRAM NO 12 '16 —

— Showing Lines of Way with all Interlocked Points and Signals —  
 — To come into use on Tuesday June 6<sup>th</sup> 1916 —  
 — Particulars of which will be issued by the General Superintendent of Transportation —



*H. Lalant*  
 Engineer of Signals  
 24.3.16

*J. C. Fraser*  
 Chief Engineer of Signaling Works  
 24.3.16