MODELLING THE RAILWAYS OF QUEENSLAND

CONVENTION 2008

Authentic Queensland Trackwork and Lineside

by Russell Bianchi

Introduction:

As a long time modeller of Queensland Railways in both HoN3.5 and Sn3.5 scales it has been pleasing to see the growth and development of the modelling of Queensland railways over the past two decades. While as a group we are still a fair way off being spoilt by having access to large ranges of ready to run models, as are our counterparts in the southern states. We are however lucky in having a small group of dedicated manufacturers who do a wonderful job in ensuring that we the average modellers have access to a wide range of locomotive and rolling stock kits in the two main scales.

From my own point of view I have always attempted to create models of a reasonably high standard (or as high as my abilities allow!) and therefore I have always tried to stay a close a possible to the details of the real railway within reason. One area that I have paid particular attention to in my modelling has been the constantly overlooked aspect of trackwork.

Over the years many excellent layouts have done a lot to advance the cause of Queensland Modelling. Unfortunately, I have always found my eyes drawn to the non-prototypical commercial track that has been used.

One point that brought this point starkly to my mind was when I started to take close up photos of my first Sn3.5 layout 'Iredale'. While I appreciate that such photography always tends to be cruel, there is also the other often-heard comment that cameras never lie!

Please do not take my comment about these other layouts as a criticism, it has just been one of those things that I have always been conscious of and it has always been in the back of my mind to see if a more prototypical approach could be adopted.

The major problem is that most commercial trackwork is designed to replicate 'chaired' rail. In the United Kingdom (the home of Peco) a large percentage of their permanent ways were built using chaired rail. In layman's terms chaired rail means that the rail is not affixed directly to the sleeper as in Queensland but sits in a cast holder commonly referred to as a 'chair'. (Refer photo below) From a Queensland Railways modelling point therein lays the problem. As the rail sits proud of the sleeper there is daylight be-

The photo below clearly shows 'chaired' trackwork. This is the type of trackwork that most commercial model railway track work is based on.
Photo: Authors collection.

The above photo is a great example of construction of the early branch lines. Other than minimal civil engineering the track was laid virtually directly onto the ground. Other points to note include the line side fencing and minimal ballast.
Photo: Russell Bianchi

tween the sleeper and the bottom of the rail, as well as the moulded chair itself. Both are extremely unprototypical. I appreciate that the manufacturers need the moulded chair to secure the rail. Without appearing even more pedantic there is also some minor scale issues with the length of the sleepers. I also acknowledge that I have had very little experience with Shinohara and Tiling trackwork.

Hence this presentation is really a bit of a snap shot of the research and approach I have taken with the construction of my second Sn3.5 layout, 'Helidon Spa'. At the end of the day I am the first to admit that this approach is labour intensive and time consuming and therefore I can clearly understand why people would take the easy approach by using commercial track.

All I can suggest is to give it a go and see if you think the visual difference is worth the extra effort.

Firstly I will look briefly at a bit of the history and theory of permanent way construction followed by a look at how this was recreated in miniature. This research generally only pertains to the era up until the end of steam.

Please note that the following details are based on my own research and observations and are very general in nature. I am sure that like most items on Queensland Railways you could write a book on the subject. My aim at the end of the day has always been to strive to improve my modelling of the prototype to the best of my abilities and I hope that the following may inspire some of you to have a go at replicating this unique component of the total picture of early Queensland railways.

Prototype:

History

Some sources will have us believe that early Queensland Railways were no more that rough tramways built to extremely poor standards. While it is clear that most of the early lines were built to a budget so to speak, the detail and engineering that went into their construction and maintenance was generally on a par with most colonial narrow gauge railways of the time.

The Queensland Railways Engineering Department had developed a very specific set of guidelines for use by the various commercial contractors to follow with the civil engineering and construction associated with building of new lines.

Queensland Railways developed a number of track related standards that were designed to deal with the types and sizes of locomotives that would be used on a particular line. In general terms the main difference between the standards was the size of rail used. Other aspect that came into play was the number of sleepers and tons of ballast per mile, etc all of which not only impacted on the route availability of locomotives, it also played a significant part in the maximum speeds allowed on the line. While we should not generalise it

A nice example of early mainline trackwork. The main point to note is the general construction in line with the engineering standards approved at the time.
Photo: Courtesy of the John Oxley Library.

would appear that most branch lines were constructed to much lower standards that the more heavily used lines. In an endeavour to reduce cost on these lighter lines maintenance was kept to a minimum. A number of local Downs drivers with experience on the many branch lines in the area have stated that a very lively ride would result if the speed limits were not adhered to. In later years Queensland Railways was able to reduce maintenance cost by simply reducing the maximum speed allowed on the line.

General Standards

In a constant endeavour to reduce construction costs, Queensland Railways adopted standards that saw the use of light rails, minimum rail fixings and little ballast. In addition to this they also avoided earth works as much as possible, which resulted in sharp curves, steep gradients and frequent changes in gradient. Most bridges were also low level.

To allow the early lines to surmount the many range crossings many curves were constructed as tight a 5 chains, and on the odd occasion down to 4 chains. Gradients were also daunting in places. When both of these factors were combined the physical impact was magnified, which created operational issues for the early locomotive engineers. However, generally the adoption of this approach did allow Queensland Railways to access the areas to the west of the great divide without extremely steep gradients and minimal civil engineering such as embankments, bridges and tunnels.

From a modelling perspective the prototypical use of tight curves (generally a necessitiaty) is a godsend as it allows the modeller to incorporate some reasonably sharp curves and still claim some form of prototypical accuracy!

Civil Engineering

As stated above, Queensland Railways along with most narrow gauge colonial railways avoided wherever possible the need for significant civil engineering. It was only when there was a need to maintain a workable gradient that significant earthworks and bridges were contemplated. Even where a bridge could not be avoided it was not unusual to see the line drop down on either side of the creek/river rather than spend the additional cost to build a higher and longer trestle bridge to maintain the line at the prevailing level of the area on either side of the obstacle.

We also need to remember that any substantial civil engineering was a very labour intensive process using the primitive resources available at the time of construction. Such works obviously caused time delays and more importantly increased the overall cost of the line.

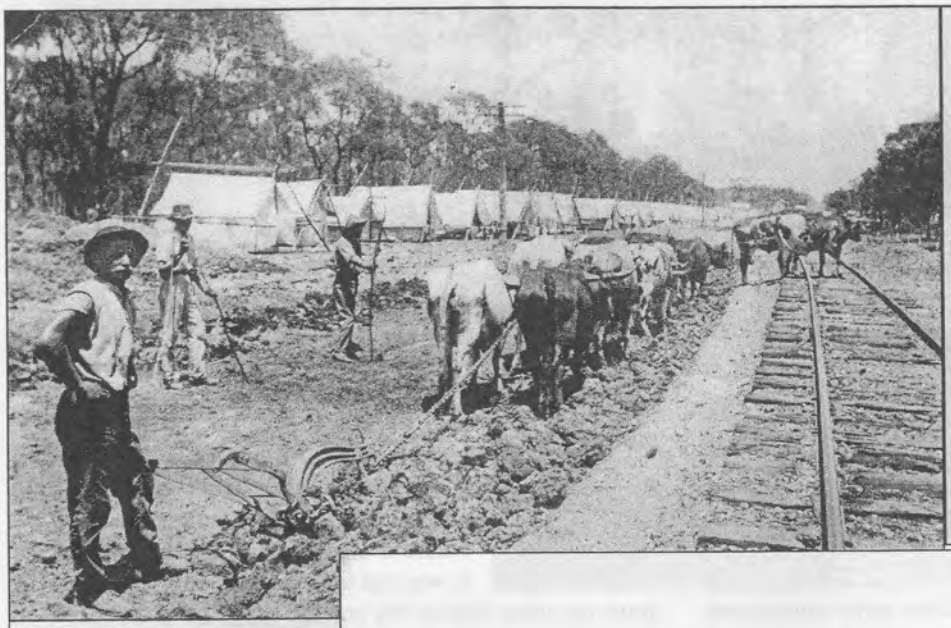
If you refer to the engineering drawings that accompany this presentation they will clearly show that Queensland Railways had developed very specific standards for the construction of road bed, drainage channels and various types of cuttings, etc. All of these points should be of interest to the modeller with the preparation of the track bed and any associated landscape modelling.

One aspect of modelling the railways of Queensland that is seldom modelled is the general undulating nature of prototypical track work. Except on very flat ground it is unusual to see long stretches of flat track as the line generally followed the contours of the land. I appreciate that there would be some limitations from our model motive power in dealing with such changes in gradients. This aspect might be my next great challenge!!

Rail

The rails used were flat bottomed and was spiked directly to the sleeper. In the early years most rail was of 42lbs per yard construction, but from the 1890's the rail size was generally increased to 60lbs per yard on the more important lines. From 1903 all new lines constructed were built with 60lbs rails.

Rail lengths were generally 30', but 24' and 40'



Civil engineering 1900's style.
Photo: Courtesy John Oxely Library

Freshly laid track on the Pittsworth to Millmerran branch line. Note the rounded sleepers adzed to accept the 42 lb rail. The trackwork is yet to be ballasted. You can also see that the joints for the rails are staggered.
Photo: Courtesy John Oxely Library.

A good example of standard track construction in the early 1900's. Once again note the staggered rail joints.
Photo: Courtesy John Oxely Library.

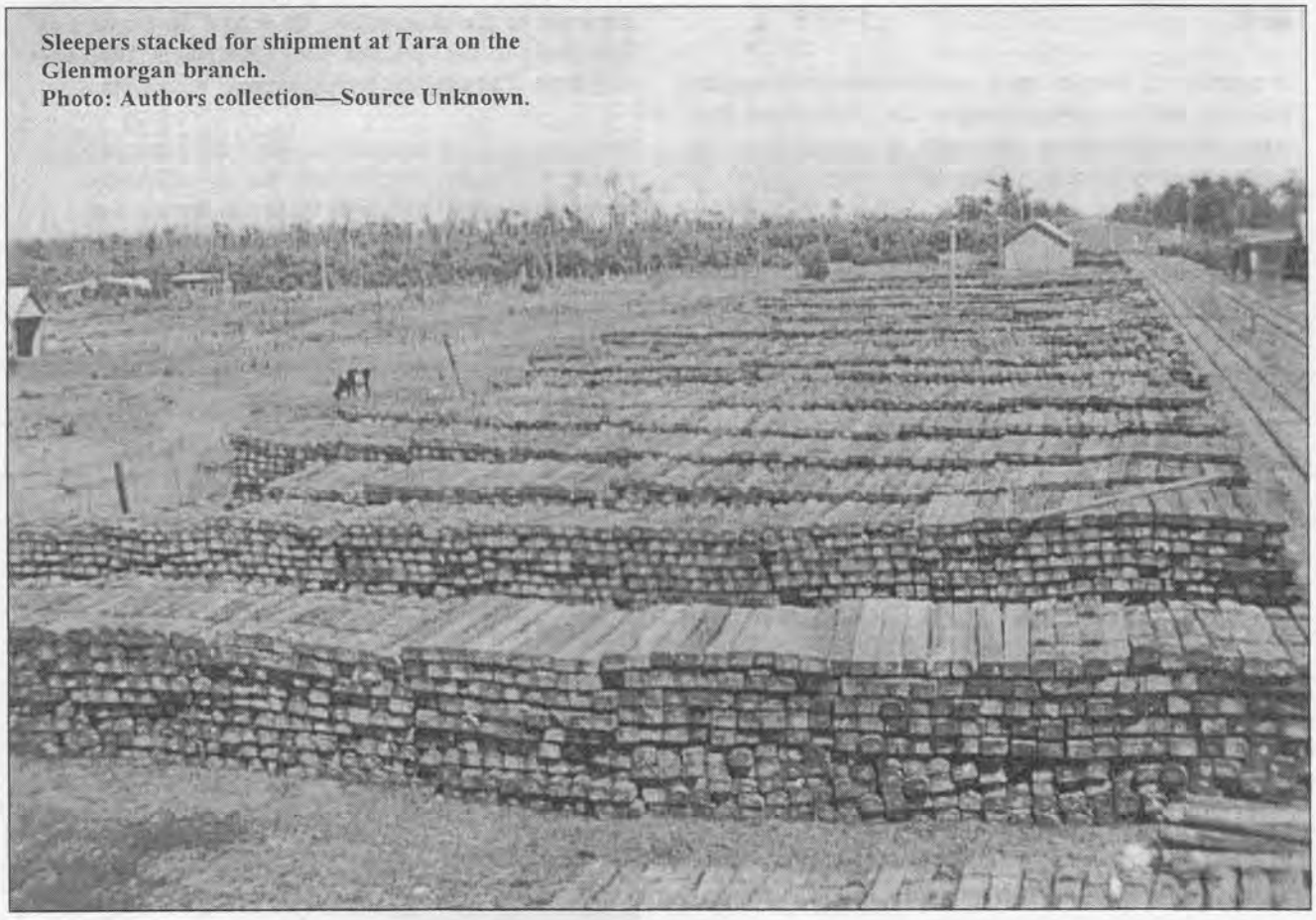
A example of early 60lb rail showing the more common 6 bolt fishplate, common with that size of rail. Note the absence of any 'chairs'
Photo: Anthony Veness

lengths were also used.

From an operational point of view the general guide for acceptable axles loads on a given line was that axle loads to the value of one fifth of the weight of the rail per yard were allowed.

While there certainly appears to have been many exceptions to the rule, rails were generally laid in a staggered manner so that rail joints were half way along the opposite rail. It was however not uncommon to see joint directly opposite on bridges, etc. Period photographic evidence appears to suggest that in the earlier days that rails were laid opposed. It was also very common to see running lines laid with one type of rail and sidings laid with the lighter rail.

Once again for the modeller seeking a more prototypical approach, there are numerous points from the above, which should be of interest. But please make sure that if you model a lightly laid branch line that you don't run a 90 ton diesel down the line. The fettlers will come chasing you!!



Sleepers stacked for shipment at Tara on the Glenmorgan branch.
Photo: Authors collection—Source Unknown.

A track construction gang laying standard hardwood sleepers onto an already prepared road bed.
Photo: Author collection– Source unknown.

Sleepers

Generally most sleepers were cut from local hardwoods (although steel sleepers were used in the north of the state). In the very early day sleepers were supplied with rounded tops, which were adzed to provide a flat section for the rail to sit on. Subsequent to this, a move was made to the more standard timber sleeper that most people would be familiar with. Theses sleepers were approximately 7' long by 9" wide by 4.5" deep.

A number of sleeper mills where situated throughout the state just to provide sleepers for Queensland Railways. A large number were also at various times exported to other colonial railways.

In S scale the length of the sleeper scales roughly to 32mm. Compare this to the length of the Peco sleepers of (29mm) and you can see that there is a significant variation from a scale perspective.

Rail fixings included dog spikes, which were used to secure the rail directly to the sleeper. Many standard gauge railways employed sleeper plates between the rail and the sleeper to help spread the load as trains passed. On QR the load was carried totally by the sleeper and therefore impacted on the axle loadings that a particular line could handle.

A number of different types of fish plates were used by QR. It would appear that most 42lds rail was secured by 4 bolt fish plates while 60lbs rail employed 6 bolt fish plates.

The drawings accompanying this presentation which were associated with the construction of the Drayton Deviation in 1914/15 clearly show the preferred layout for sleepers. Note the difference in spacing's from the running line and passing loops to those used in sidings. If you want to get that pedantic in a model form please don't let me stop you!

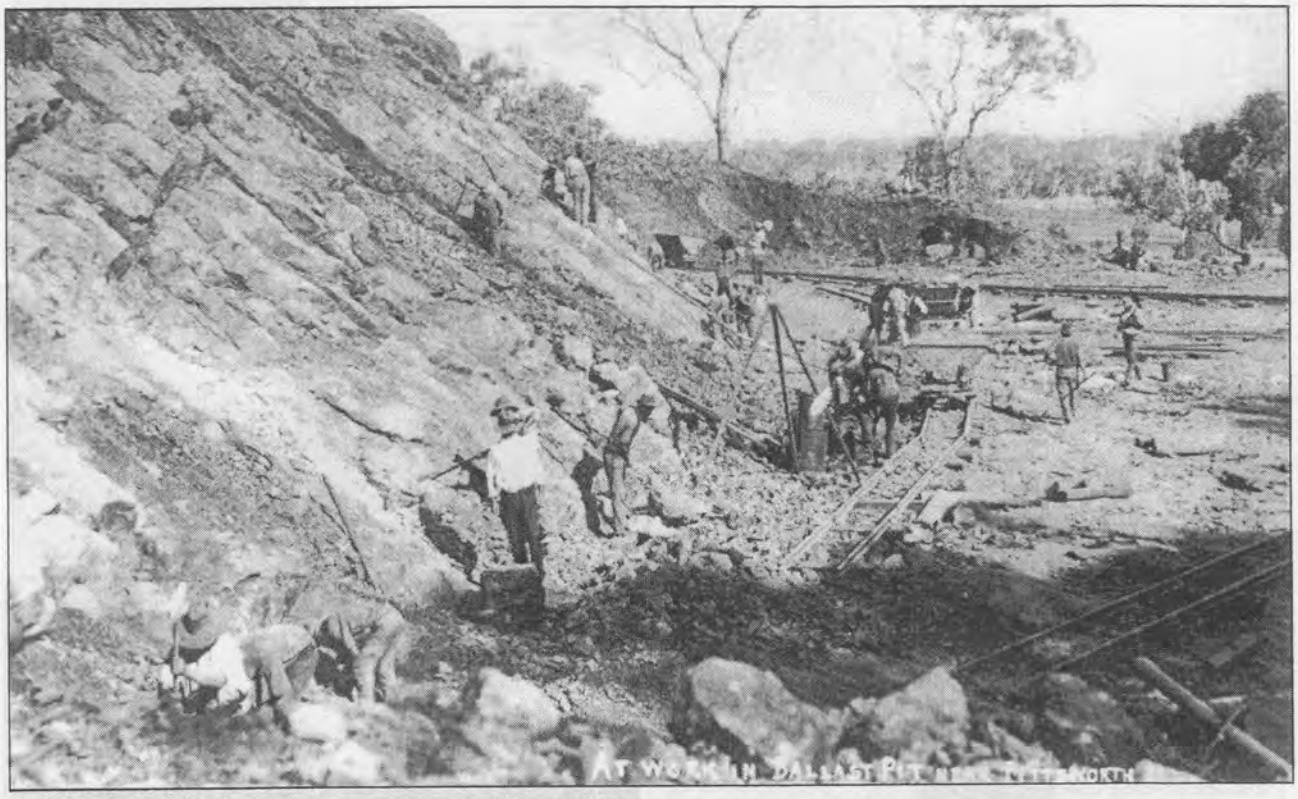
Ballast

One of the factors facing the early contractors was the cost associated in the provision of ballast. The mining and crushing of rock and the subsequent transportation of rock ballast was an expensive exercise and therefore it was generally only found on the more important lines. It was also not unusual for this type of ballast to be supplemented with river gravel.

On less important lines it was therefore not unusual to see other types of ballast such as earth, sand, ashes or river gravel. Most of the ballast for these lines was sourced much closer to the head of works. It was not unusual to see a number of quarries opened to supply materials to the contractors. Of course in the case of lines built to the 'packed earth' standards there was very little if any ballast provided other than earth.

From a modelling perspective, there are a couple of points to consider, they include; the use of crushed rock or blue metal ballast as we see today was not widespread. Generally most ballast was sourced close to home and therefore your ballast in general terms should represent the general material available in the

While not widely spread steel sleeper where used in the north of the state in an endeavour to reduce the damage done by white ants.
Photo: Author collection– Source unknown.



A local ballast pit opened to supply ballast for the construction of the Pittsworth to Millmerran branchline. The use of local ballast was always a preferred option during the construction of early lines.
Photo: Courtesy of the John Oxley Library

area of your chosen prototype. As an example on both of my fictious branch line layouts which we set somewhere in the granite county to the south of Toowoomba I used a combination of crushed granite and sandstone as my ballast. Also be conscious that when ballast on mainlines was upgraded sidings and loops may not have been so lucky, so for that point of difference try using a different type of ballast in your sidings..

Points

Unlike a lot of English railways the timber layout for points was very simple. There were no intertwined sleepers for each route but rather just longer sleepers that supported both routes of the point. Good reference photos will show that there were generally two longer sleepers near the front of the point blade so that the throw lever could be mounted.

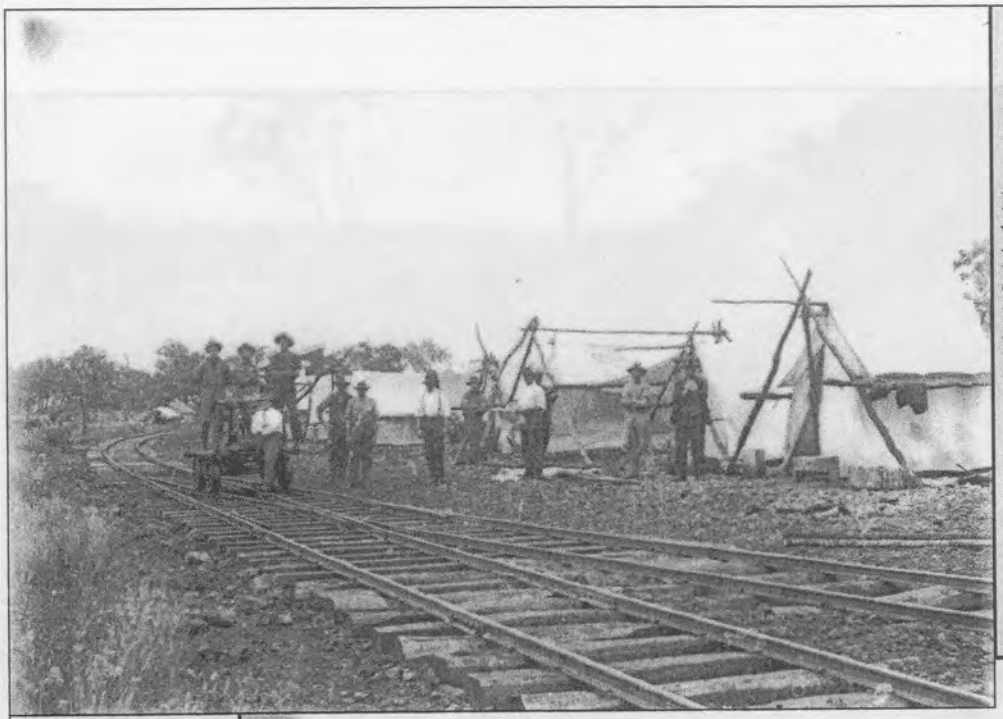
Research has indicated that Queensland Railways used a number of different throw levers over the years. Once again check period photos of your chosen location to ascertain which types were in use.

A more modern Queensland Railway's engineering diagram for a standard #8 point accompanies this presentation.

General

While I won't go into great detail in this section, it is fair to say that Queensland Railways developed a whole range of general line side related infrastructure, which

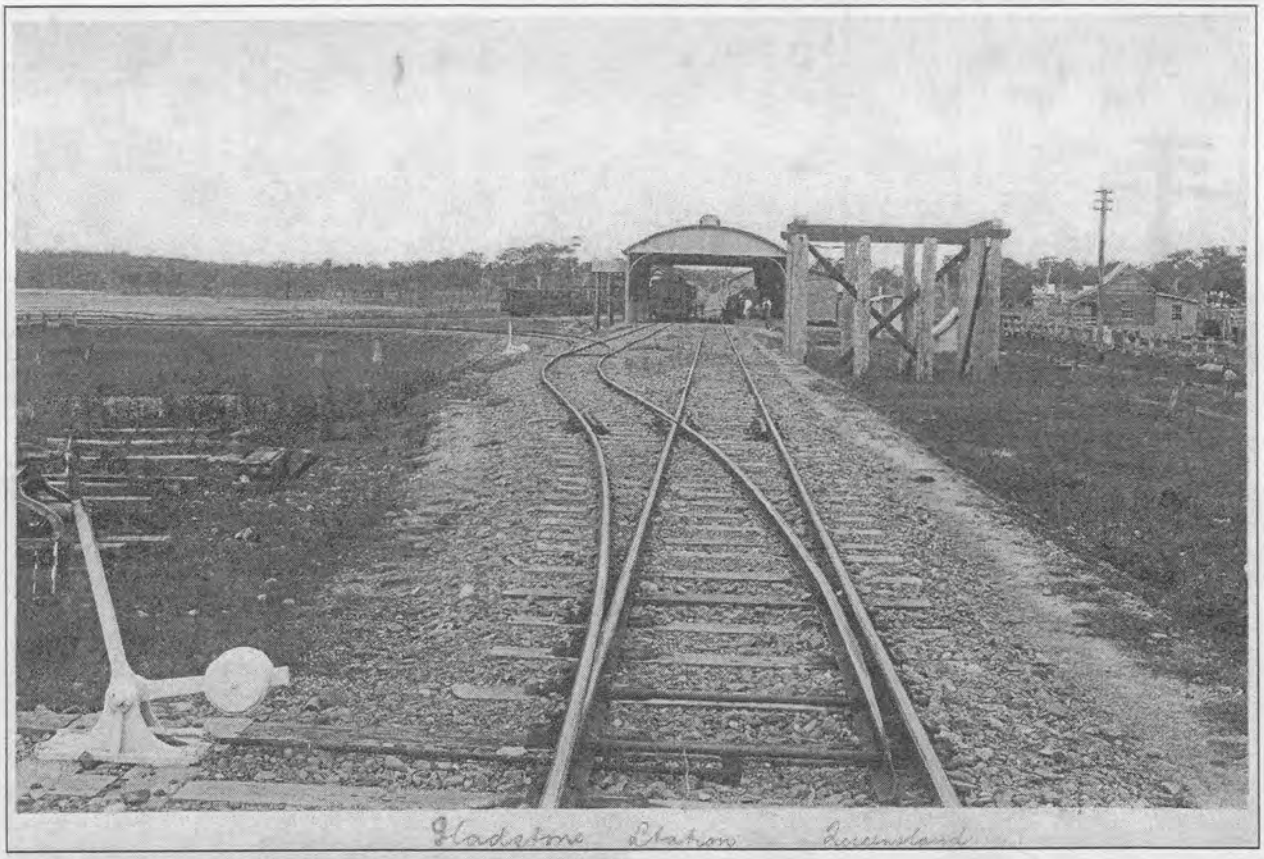
A ballast train collecting ballast for the construction of the Pittsworth to Millmerran Branchline.
Photo: Courtesy of the John Oxley Library



Recently completed point work on the Pittsworth to Millmerran branch line. Once again awaiting ballasting.
Photo: Courtesy John Oxley Library.

A ballast train being unloded on the Pittsworth to Millmerran branchline. Note the irregular nature of the ballast, clearly not blue metal or crushed rock.
Photo: Courtesy John Oxley Library.

Construction of pointwork underway on the Pittsworth to Millmerran branch line.
Photo: Courtesy John Oxley Library.



Another early example of track construction. Points to note include the basic civil engineering of the track formation as well as the basic construction of a point. Also note the two extended point timbers to support the point throw.
Photo: Courtesy of the John Oxley Library.

was uniquely 'QR'. In addition to the above, there are many other line side details that can be considered when developing an overall scene for a layout. Some of the obvious ones to consider include:

Signs

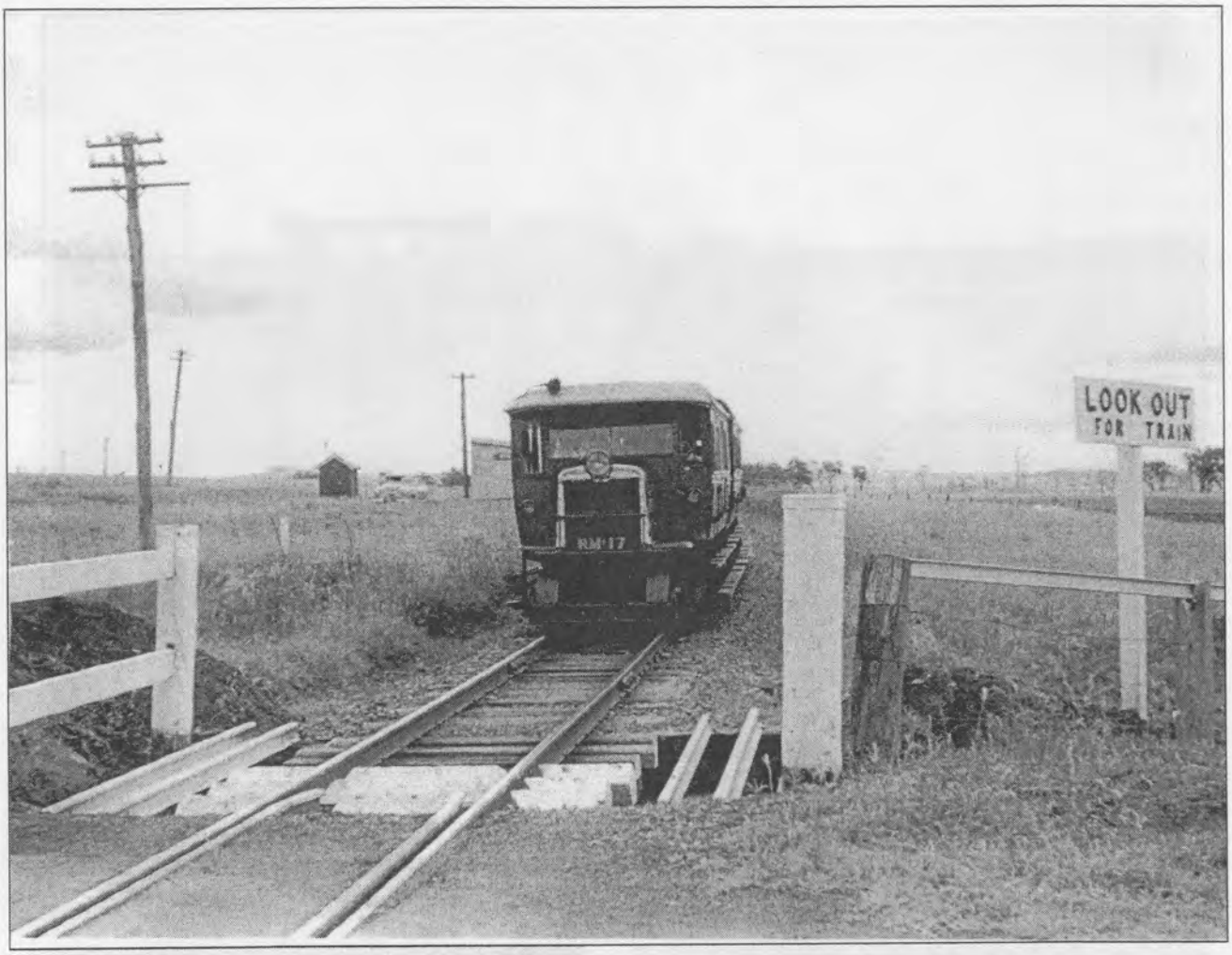
No real explanation required here other than suggesting that there are many little detail cameos that could be considered to add prototypical detail to a scene. There were a whole range of signs used along the lines including speed signs, gradient sign, miles posts and permanent way restrictions, etc, etc.

In relation to milepost signs, Queensland railways could tell you almost down to the yard (as it was then) exactly where any piece of infrastructure was located, and this was 140 years prior to GPS technology! Even today you can still see examples of this simple yet effective asset management system.

Fencing

Once again no rocket science here! In steam days a lot of lines were fenced to stop stock from straying onto the line. Unlike today's modern halogen lamps the old steam loco lamps were not well renowned for casting

In steam days the need to tender to locomotives on a regular basis produced its own range of line side infrastructure. In the photo to the right you can clearly see a number of examples including a water column and a service pit and associated pile of ash. What would WPH&S say about such pits today?
Photo: Authors collection – Source unknown.



Above is a clear example of Queensland Railways simple but effective method of keeping stray stock from access the running line where the line crossed a road. Also note the primitive warning sign for traffic.
Photo: Courtesy John Armstrong.

light any useful distance in front of a loco. Hence the need for fences!

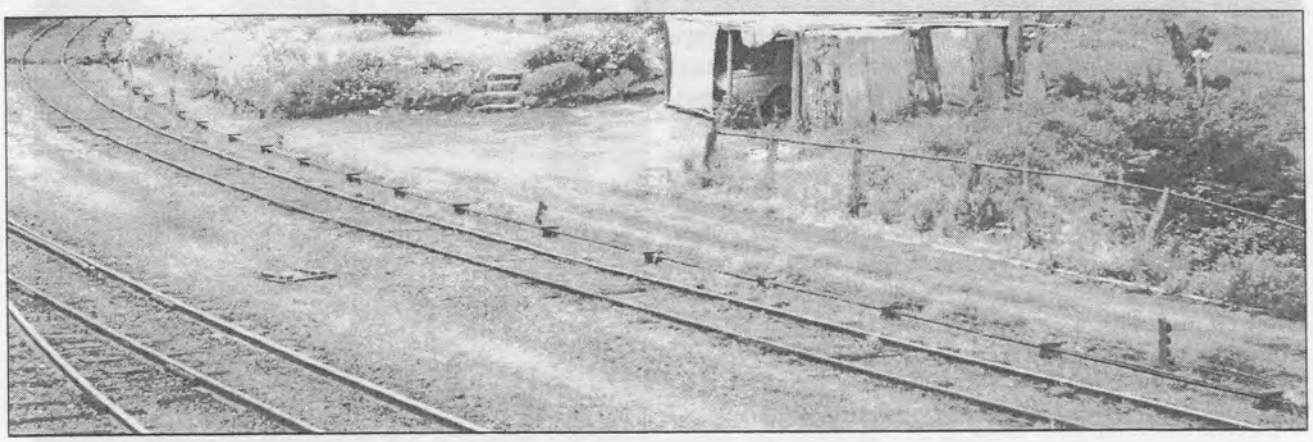
Cattle grates

Following on from the above, Queensland Railways developed a fairly standard cattle grate system to stop stock from accessing the running line where a road crossed a line. Many examples of this simple system are still in use today.

Level crossings

To this day the open level crossing is still one of the major safety issues in operating a railway. As could be imagined there were literally thousands of road crossings over railway lines in the state. Once again there were a number of

While not overly clear the photo below shows mechanical point rodding running along side of the line, also visible just to the right of the rodding are upright stands which guided the signal cables.
Photo: Authors collection—Source unknown.



The above photo is a good example of looking past the main reason for the photo being taken in the first instance for other details. Note to the left of the picture a number of small tanks which would have been used by the local fettlers. The need to fill these tanks would have dictated the need for water gins to run periodically on this line.
Photo: John Armstrong.

different approaches to the signing of such crossings depending on the type of line, location and traffic density. Once again many period photo exist to use a reference sources.

Point rodding and signal wires

Most controls for points that weren't controlled by localised point throws and signals by wires were located either in a separate signal box, or housed in or adjacent to the station. (i.e Spring Bluff and Clifton) While point rodding usage was not widespread it was certainly in use in a number of high traffic areas.

Locomotive needs

While most would be familiar with the general infrastructure most commonly associated with the operation of steam locomotives. There are however a significant number of details outside of the normal loco sheds and water towers, etc that were required to keep locomotives operational while they where on the line and away from their home shed.

Some possible candidates for inclusion in a model would include loco servicing pits. In a number of locations including Spring Bluff and Oakey a service pit was provided on the main line to assist fireman with the cleaning of their fires. From a modelling point of view there would also be the associated pile of ash around such points. While not a common as the water tanks, photographic research shows that a number of locations had water columns adjacent to the running line that were obviously feed from other sources.

If you are modelling a branch line, then it was not uncommon to see a wagon loaded with coal lurking around the station to enable locomotives that may have been required to stable at the terminus overnight to replenish prior to the return journey.

One final line side group of feature that is commonly observed in photos of the era are the humble sand box and coupling rack.

Maintenance infrastructure

The detail provided by these hardy soles is virtually endless. Some of the more common aspects of their trade included rail racks (where spare rails were stored off the ground), piles of sleepers, lineside tanks for drinking water for the fettlers, fettlers camps (usually a tarp over a rough frame), etc, etc.

The above are just a few examples of details that could easily be incorporated into any layout.

The best bit of advice I can give in relation to hunting down line side detail is to revisit all of your railway books and photo collections. Take the time to look past the main reason for the photo (usually a locomotive or the like) and you will be amazed what wonderful undiscovered detail is lurking in the background.

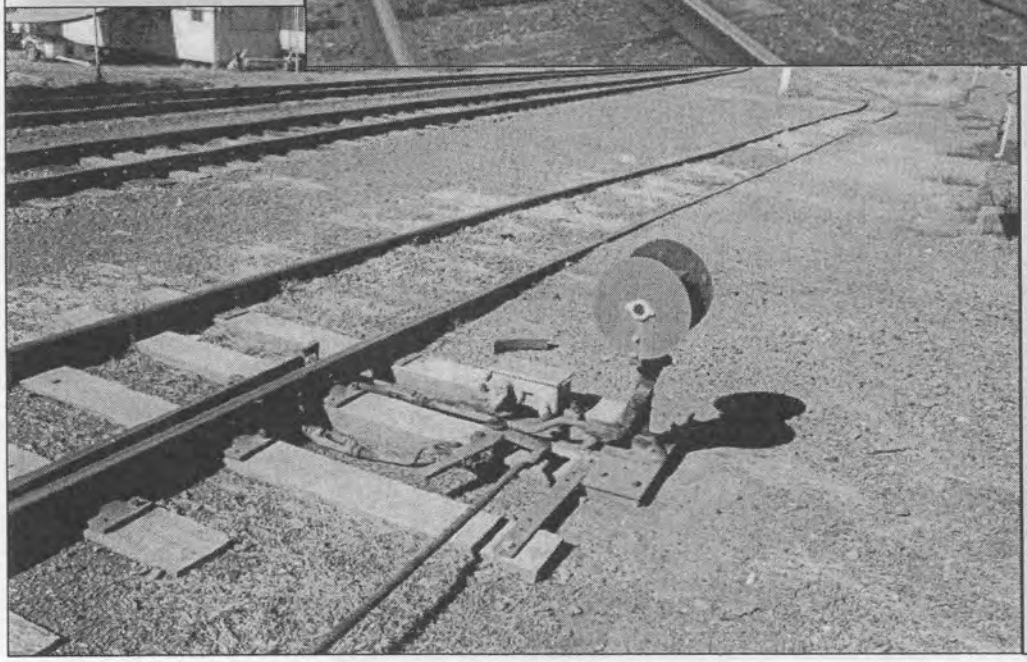
Another early example of Queensland Railways track work using rounded sleepers and 42 lb rail. Note how the surface of the sleeper for the rail has been adzed flat.
Photo: Courtesy of the John Oxley Library.

An example of a fairly common type of point throw, Note the mounting of the throw on the two extended sleepers.

Photo: Russell Bianchi.

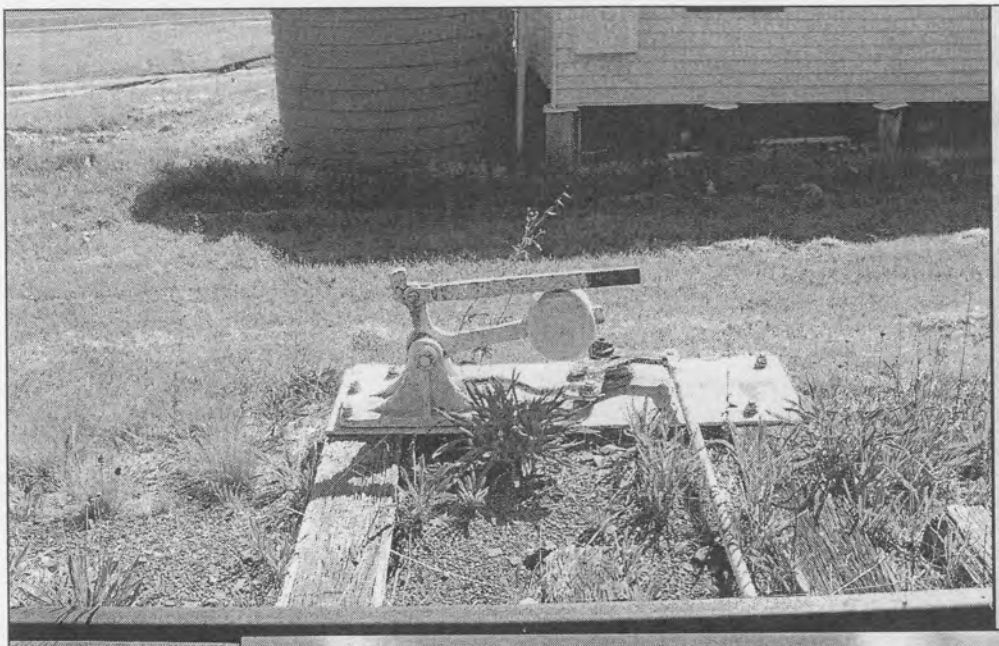
An example of a 'stop block' or de-railer. These devices were used to protect the main line from runaways. Not the mechanical linkage to operate the devices as well as the shunters lamp operated signal.

This example was located at Grandchester. Also note the base plates under the rail which is a more modern approach to laying track.



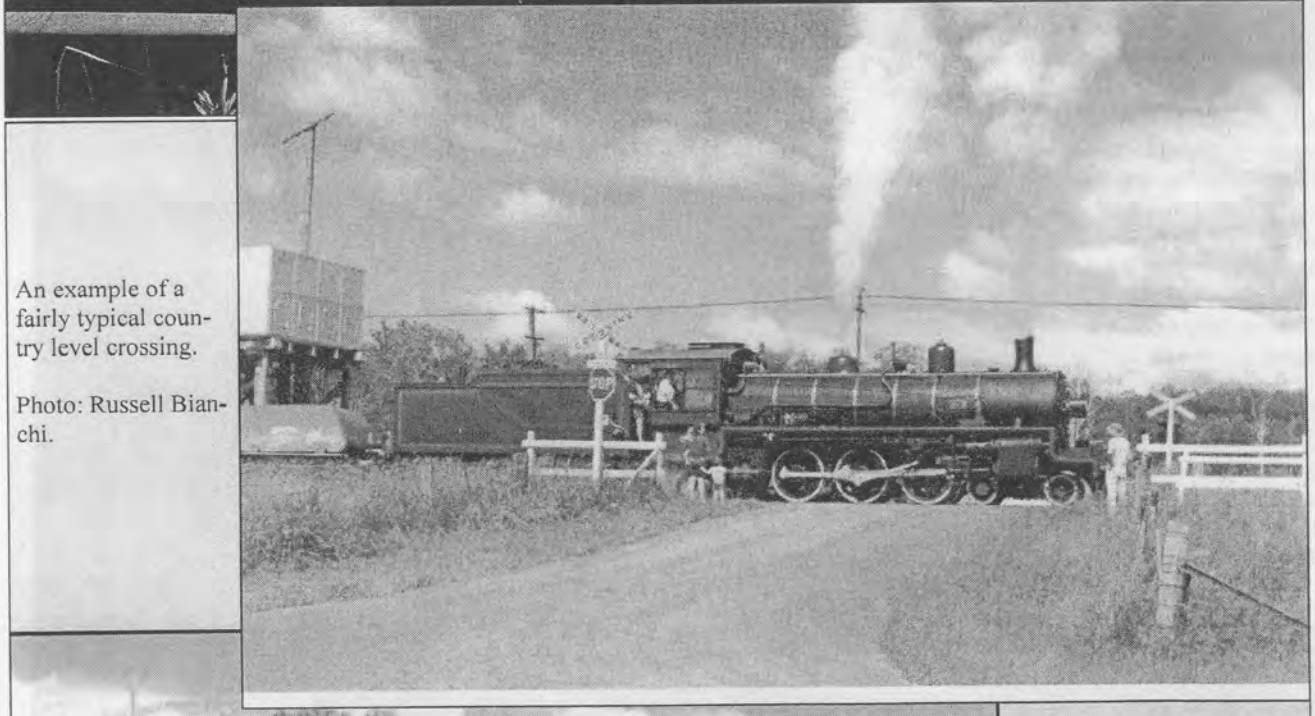
An example of a illuminated shunting signal which enabled railway men to identify which way a point was set. Once again note the mechanical linkages operating the signal and point.

Photo: Russell Bianchi.



Another type of point throw lever for the control of a point. Note that this type uses a crank system to throw the point rather than the more common direct method shown of the previous page. To accommodate this type note that the extended point sleepers have been moved further apart.

Photo: Anthony Veness.

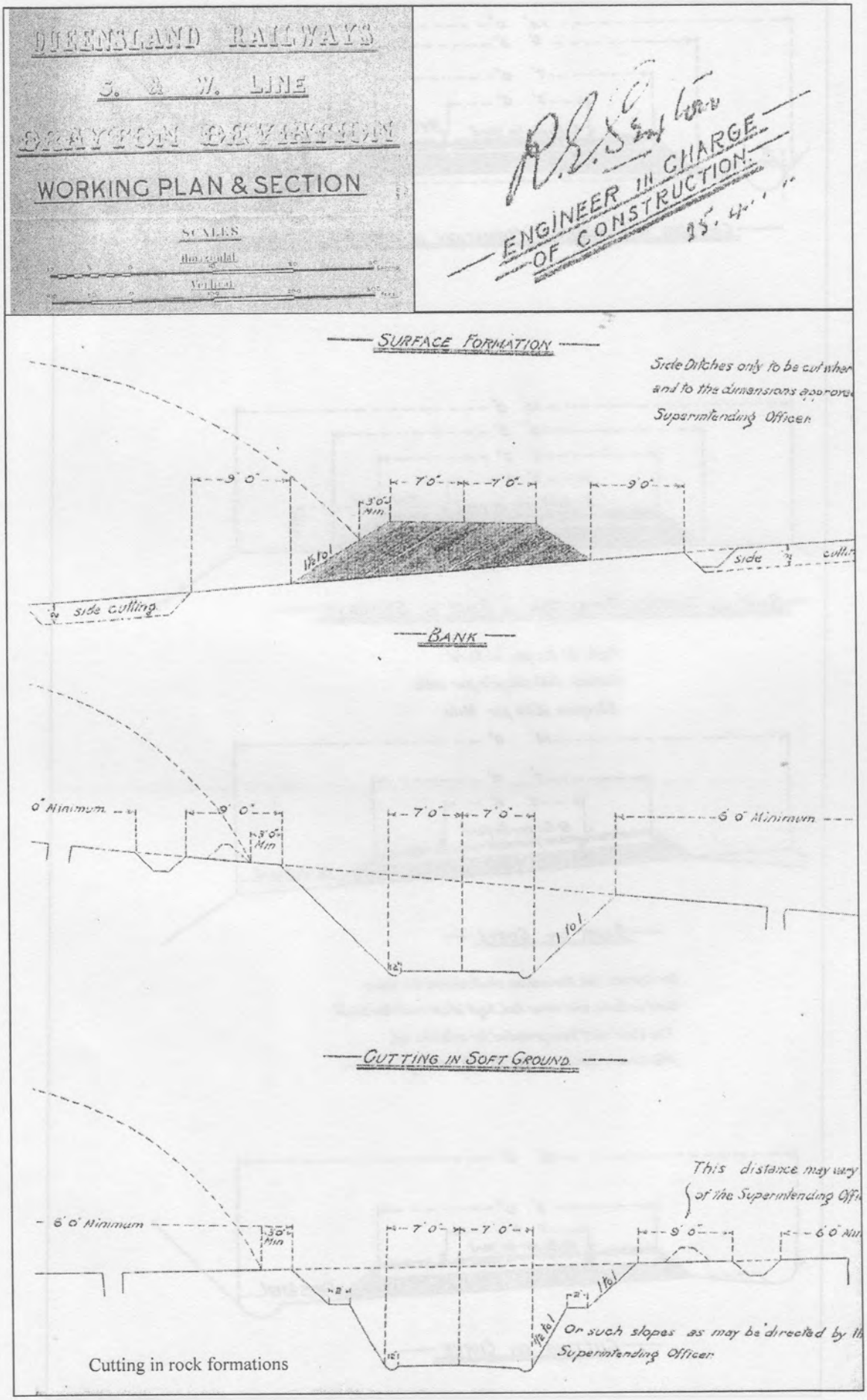


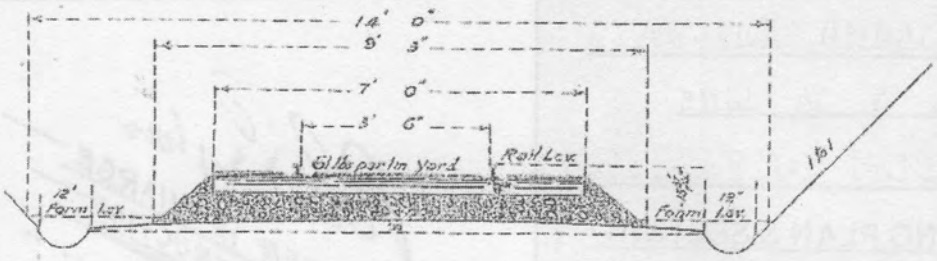
An example of a fairly typical country level crossing.

Photo: Russell Bianchi.

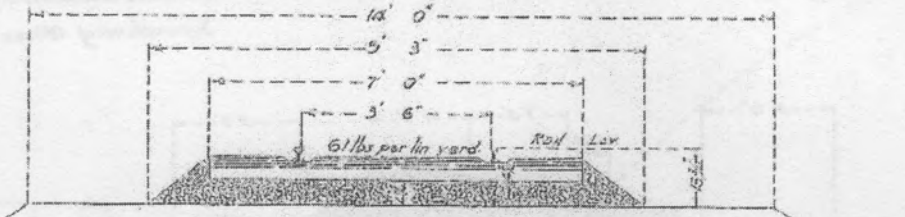
An example of a small signal sheltered located at Clifton. In earlier days the levers in this shelter would have controlled the points and signals in and around the station. Not the gap in the left hand end of the platform timbers to allow access for the mechanical linkage and signal wires.

Photo: Russell Bianchi.


QUEENSLAND RAILWAYS
S. & W. LINE
STATION EXTENSION
WORKING PLAN & SECTION
SCALES
Horizontal
Vertical
ENGINEER IN CHARGE
OF CONSTRUCTION.
SURFACE FORMATION
Side Ditches only to be cut wher
and to the dimensions approve
Superintending Officer
9' 0"
7' 0"
7' 0"
9' 0"
3' 0" Min
1½ to 1
side
side cutting
BANK
0" Minimum
9' 0"
3' 0" Min
7' 0"
7' 0"
6' 0" Minimum
1 to 1
CUTTING IN SOFT GROUND
This distance may vary
of the Superintending Offi
6' 0" Minimum
3' 0" Min
7' 0"
7' 0"
9' 0"
6' 0" Min
1½ to 1
1 to 1
Or such slopes as may be directed by th
Superintending Officer
Cutting in rock formations

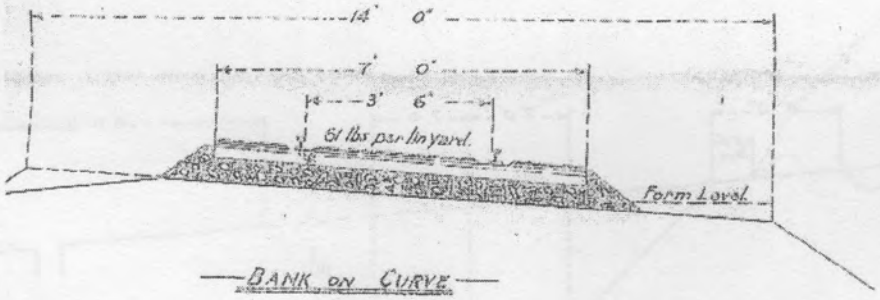


CUTTING AND SURFACE FORMATION IN CUTTING ON STRAIGHT



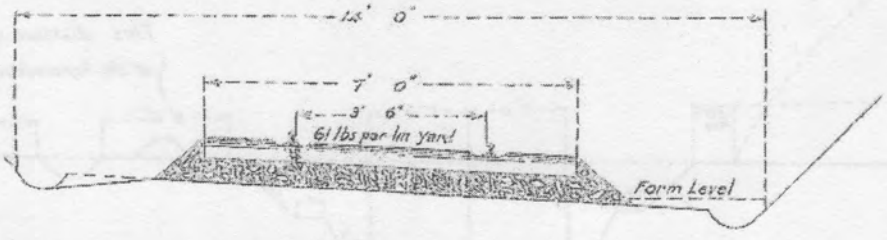
BANK AND SURFACE FORMATION IN BANK ON STRAIGHT

Rails 61 lbs per lin Yard
Ballast 1100 cubyds per mile.
Sleepers 2640 per Mile

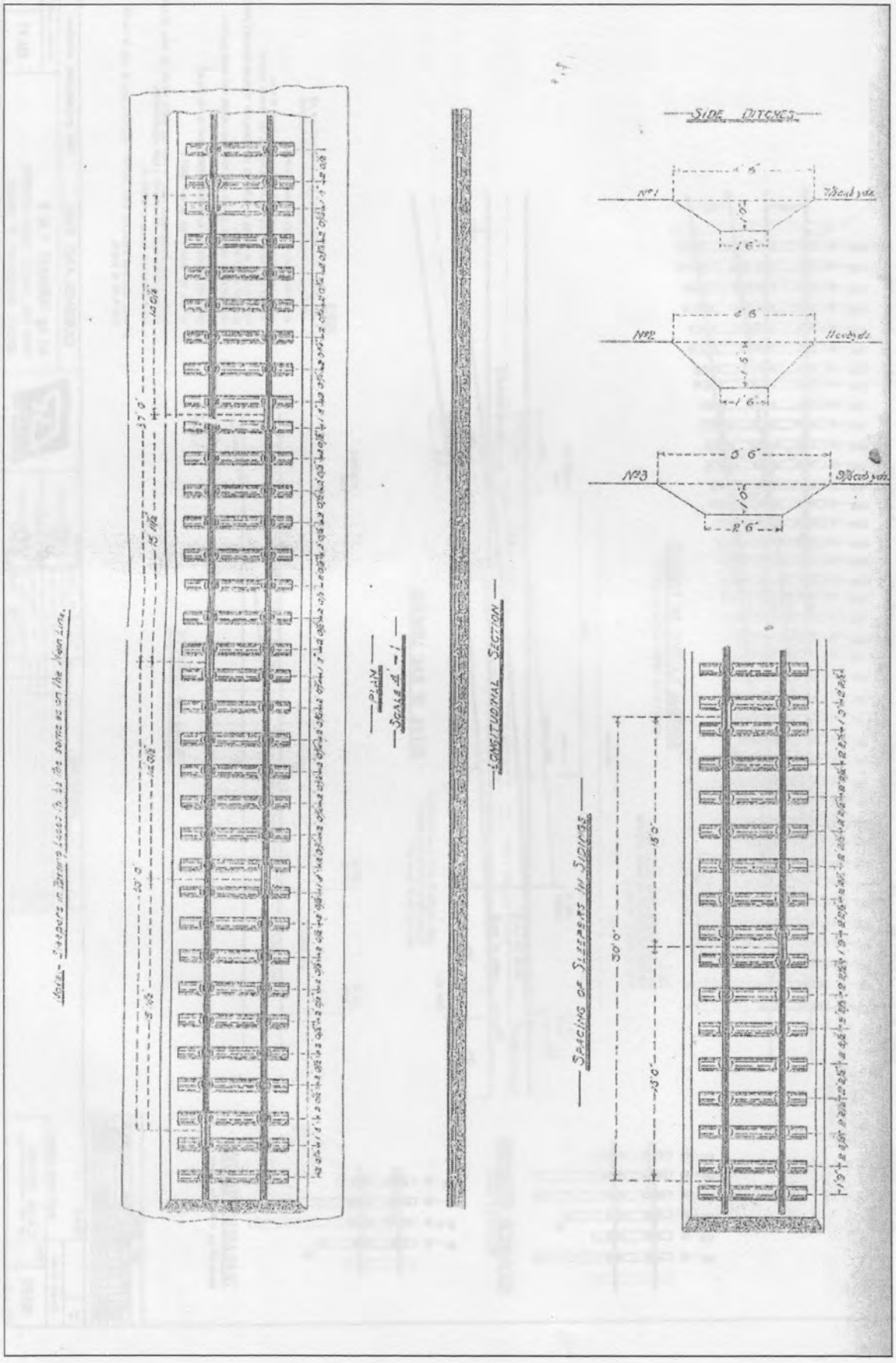


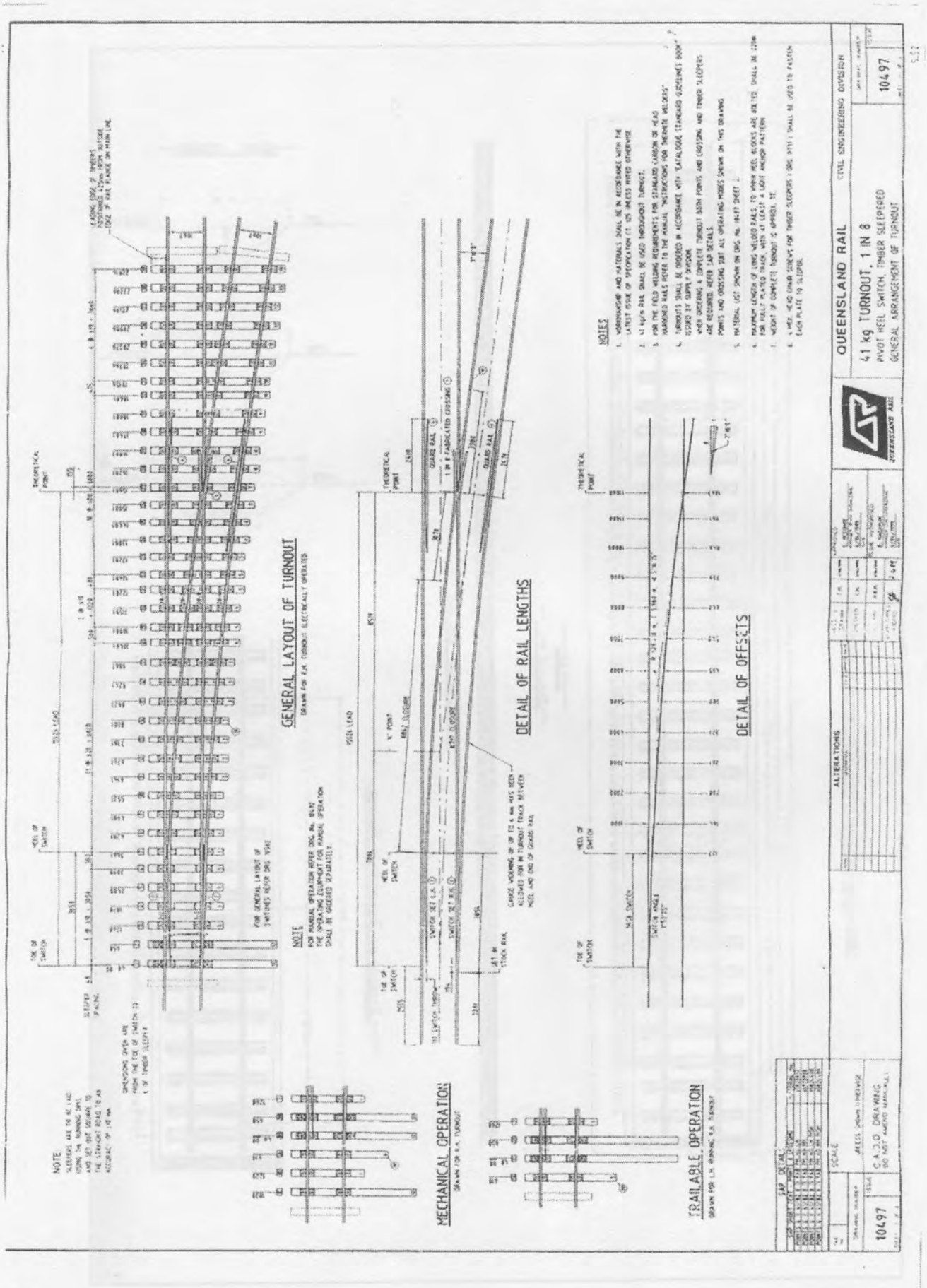
BANK ON CURVE

On Curves the Formation shall receive the same Cant as Rails, and inner Rail, kept at correct Rail Level
The Cant shall be as provided for in Tables of, Maximum speed of 30 to 40 miles per hour.



CUTTING ON CURVE


SIDE DITCHES
No 1
No 2
No 3
PLAN
SCALE 4' = 1"
LONGITUDINAL SECTION
SPACING OF SLEEPERS IN SLEWERS


QUEENSLAND RAIL
CIVIL ENGINEERING DIVISION
41 kg TURNOUT, 1 IN 8
PIVOT HEEL SWITCH, TIMBER SLEEPERED
GENERAL ARRANGEMENT OF TURNOUT
10497
GENERAL LAYOUT OF TURNOUT
DETAIL OF RAIL LENGTHS
DETAIL OF OFFSETS
MECHANICAL OPERATION
TRAILABLE OPERATION
NOTES
ALTERATIONS

Modeling Queensland Railways Track and Lineside

Now armed with some very basic knowledge of Queensland Railways track construction principles, it is time to have a brief look at how this information can be adapted to try and improve our modeling.

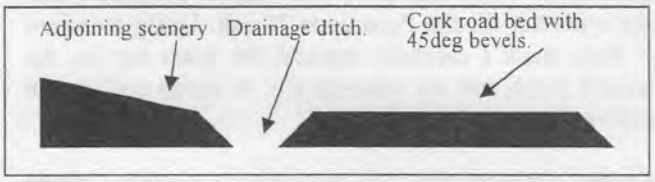
For the purpose of this exercise I will share with you the various techniques I developed during the construction of my SN3.5 layout 'Helidon Spa'. The techniques are scale irrelevant.

Road Bed Preparation

My main aim here was to replicate two main features. The first was the shouldered ballast look as detailed in the Drayton Deviation engineering drawings and the second was the flat terrain frequently seen around most stations and sidings where there is generally little variation in terrain.

The first step was to mark out the proposed location of the track work. I then identified just where the station limits would commence, thus giving me a demarcation point between the two techniques.

In the general station are I laid 3mm sheet cork to cover the entire area. For the rest of the approach tracks I reverted to the normal cork strips under the rail. Once secured, the corners of the strip cork where beveled with a craft knife at 45 degrees to help define the shouldered ballast look. I then laid a second row of small cork strips adjacent to the first strip and repeated the beveling process (Refer Diagram below). The end result was that I was left with the foundations of a drainage ditch which I was subsequently able to detail. The station area was



however due to the use of sheet cork nice and flat as required. That is not to say that the cork can't be distressed in some manner to remove the ironing board look.

Trackwork

The construction of prototypical track work was the whole aim of this project and therefore a number of various approaches were considered and trialed before settling on my preferred approach.

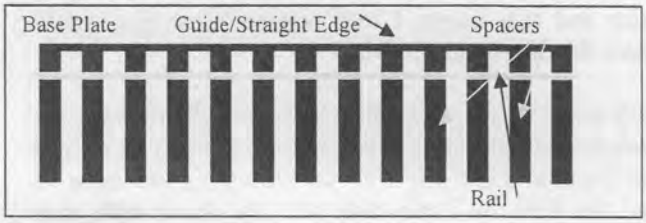
I will look at the construction of normal track work and points separately.

As I had been lucky enough to purchase a sizable bundle of well used of Peco code 75 rail at a swap meet I had a ready source of very cheap rail. Some years ago I had had come across a small supply of English copper clad 00 sleepers from a company call SMP (Scaleway). A quick measure showed that they were absolutely spot on scale wise for Sn3.5 track. A look at Mainlytrains web site in the UK showed that they were still available. So an order for 1000 precut sleepers was dispatched at an approximate cost of 12 pounds plus postage.

Jig

The next and most import aspect of the whole project was to construct a jig to allow for the quick and accurate construction of track.

As all of my track work was to be soldered I chose to build my jig from timber rather than plastic. Having found a suitable piece of timber for the base I then went through my collection of scale lumber to identify a size



that matched the scale difference between the sleepers. The diagram above shows the basic construction of the jig.

A suitable piece of scale lumber was glued in position to provide a straight edge from which to work. The scale lumber chosen to match the gap between the sleeper was then glued in place using one of the copper clad sleepers for every alternate space. When the glue had dried the copper clad sleepers where removed and I was left with a very simple jig. The only tip is to ensure that whatever copper clad you use that it is higher than the spacers otherwise you may have problems during the soldering process.

The final step in this process was then to mark where one of the rails would sit prototypically and add another strip of timber parallel to the first guide but sitting on top of the sleepers. In the construction process the rail would be held against this guide while being soldered.

Rail

While on the subject of rail, I have deliberately avoided any sort of scale comparisons between the various manufacturers as this has been done many times in the main stream modeling magazines. I also acknowledge that by using Peco rail I am technically using non prototypical bullhead rail and non flat bottom rail. My main excuse for this is that my supply of rail was the right

Scale	N	2 mm	TT (3 mm)	HO	4 mm/ft	S	O	7 mm
Ratio	160	148	101.6	87	76.2	64	48	43.5
45 lb/yd	23	25	37	43	49	59	78	86
60 /b/yd	28	30	44	52	59	70	94	103
75 lb/yd	32	34	50	58	66	79	105	116
80 lb/yd	33	35	52	60	69	82	109	121
95 lb/yd	36	39	57	67	76	91	121	134
95 lb/yd BH	36	39	56	66	75	89	119	131
50 kg/m	37	40	58	68	78	92	123	136
60 kg/m	42	46	67	78	89	106	141	156
136 lb/yd	46	49	72	84	96	114	152	168

price and that unless I told anyone know one would know the difference anyway.

In S scale I have adopted a fairly straight forward approach to which rail to use. For more modern all welded rail I would use Code 100, for 60lb rail I use code 75 and for 42lb rail I use code 55. (the above table may help with other scales) While Helidon Spa has been constructed with code 75 rail, I have experimented with code 55 n gauge rail for older sidings and the spindly look is just magnificent. I have had no issues with any of my rolling stock on this track.

For those who model HoN3.5 it would just be a matter of identify various suitable rail sizes appropriate for the scale.

Track Construction

With you favourite soldering iron nice and hot it is now time to make your first piece of scratch built track work.

The first step in the process is to select a suitable piece of rail and to tin the bottom of the rail with solder. Now load up the jig with your suitable copper clad sleepers, position the rail against the second guide mentioned above and start soldering each sleeper to the rail. When all the sleepers have been soldered remove the completed section from the jig and then solder the rail on the outside to ensure a strong joint. It is then just a process of moving the completed section along the jig soldering more sleepers as you go.

In the early stages of the development of my track laying process I tried to build individual pieces of track in the jig (i.e both rails soldered to the sleepers) but found that this approach was not very flexible or user friendly.

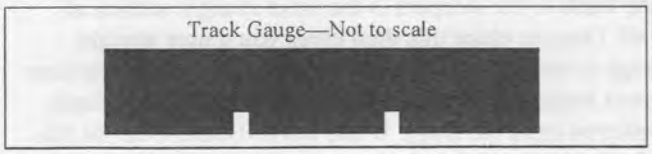
My preferred option was to take the completed section of track with only one rail attached and treat it like a bit of flex track, In this state you can easily position the track anyway you like. Once you are happy with the final position of the trackwork you can secure it to the baseboards. Once secured, the second rail is then added using your track gauge to position the rail while it is soldered in position

There are many sources of gauges (refer useful contacts) for track construction but being a fairly impatient type of person I decided to make my own rather than take the time to import one.

I choose a small section of flat brass bar and cut one small notch with a hacksaw. The width of a hacksaw was just a perfect for the Peco code 75 rail. Using a section of Peco track I carefully marked the brass bar for the second notch and cut accordingly. A cheap and simple track gauge.

Another approach that may be useful for modelers would be to save time with the soldering iron and only solder every 4th or 5th sleeper to the rail. The missing sleepers could then be provided from a supply of scale timber. I wouldn't think that you would want to go any more than 4 or 5 timber sleepers as the less soldered sleepers you have the less strength there will be in the finished product.

Well there you go you have your first piece of prototypical track work. All you need to do now is repeat the process literally thousand of times until you are sick of the sight of your soldering iron! But it is all worth it. Trust me!!



Scale Rail Lengths

If you wish to take your approach to fine scale modeling to a higher level you could consider the prospect of using scale lengths of rail. (Don't forget to off set the joints)

But for those of us who are not that pedantic, a simpler approach would be to take a small file and file a grove in the rail every scale 30' to give a visual and audible representation.

To visually finish off you could also use etched fishplates which are now available from a number of sources in both scales.

Cutting the insulation gap.

Funny enough, a fairly important step when using copper clad sleepers! The only bits of wisdom I can give you here is to make 2 cuts on each sleeper between the rails. This reduces the possibility of a cut not severing the copper clad properly and causing shorts.

Also test frequently to make sure there are no shorts. If you have laid hundreds of sleepers and you have a short it can be a pain in the butt to find. You have been warned!

Points.

It is when it comes time to tackle the construction of scratch built points that most people get the jitters. Like most things in life it is not has hard as it looks if you take a simple logical approach to it.

When it comes to point construction there are a number of benefits for the average modeller. The first and most obvious one is that of cost. As a rough guide the cost of constructing your own point work is apx 20% of the cost of a comparable commercial point. Secondly once built they are almost indestructible, and if in the event of some damage being inflicted it is easily repaired.

However the real benefit from scratch building points is that you are only limited by your imagination. You suddenly don't have to compromise your modelling by us-

A photo of Helidon Spa which show cases all of the aspects of the modeling of Queensland Railways track work and lineside detail. Photo: Russell Bianchi

ing only commercially available points. If the prototype you wish to model has a peculiar track formation, no problem. Build it yourself!

When it comes to the construction process there are two approaches you can take, we will have a brief look at both.

Option 1

The first step to building a point is to find a good template. There are numerous sources for such templates, but a good place to start looking is on the web site of the English finescale model railway component specialist, 'Exactoscale'. (www.exactoscale.co.uk) This company has available a range of down loadable templates of 00 gauge for a large range of points, single and double slips, etc. For the HoN3.5 modeller it will just be a case of using a photocopier to reduce the template down to the appropriate size.

The next step is to pin the template to a flat surface. Appropriate strips of your preferred supplier of copper clad can then be cut to length and glued directly to the template. Just make sure that the gap between the sleepers is the correct scale distance. This may vary slightly from the sleepers actually shown on your template.

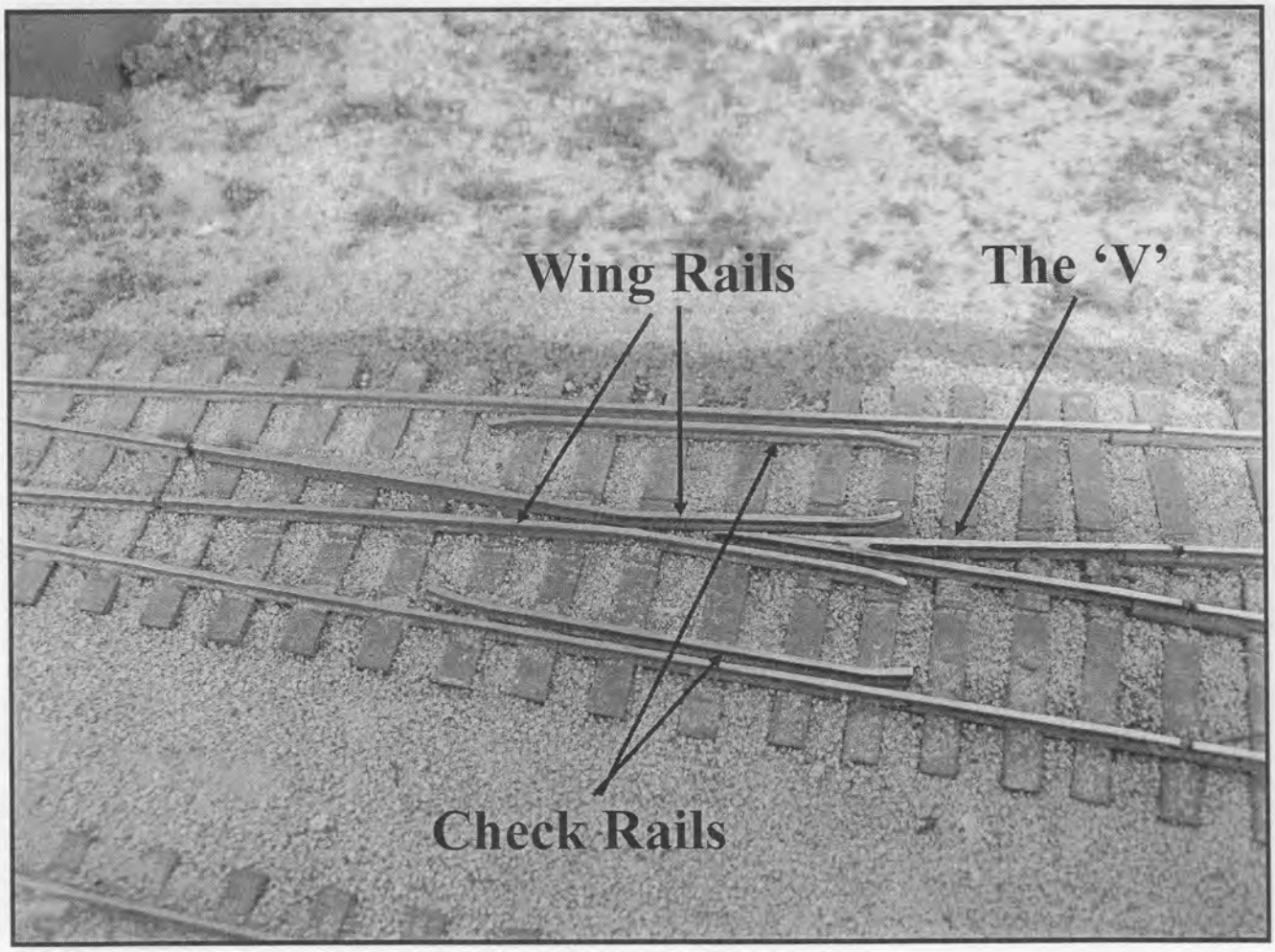
I found that the best place to start with the soldering of the track to the sleepers is the main straight section of rail. Once in place this then gives you a nice straight edge to work from in positioning all other rails. The next most important step is to construct the "V" (sometimes referred to as the frog). While not difficult, it can be fiddly. It is just a case of using a bench grinder and/or a good set of files to produce the appropriate angles on the two rails that when soldered together will form the "V". If you want to cheat it is possible to buy a range of prebuilt "V" for #'s 5, 6, 7 & 8 points. (refer useful contacts list)

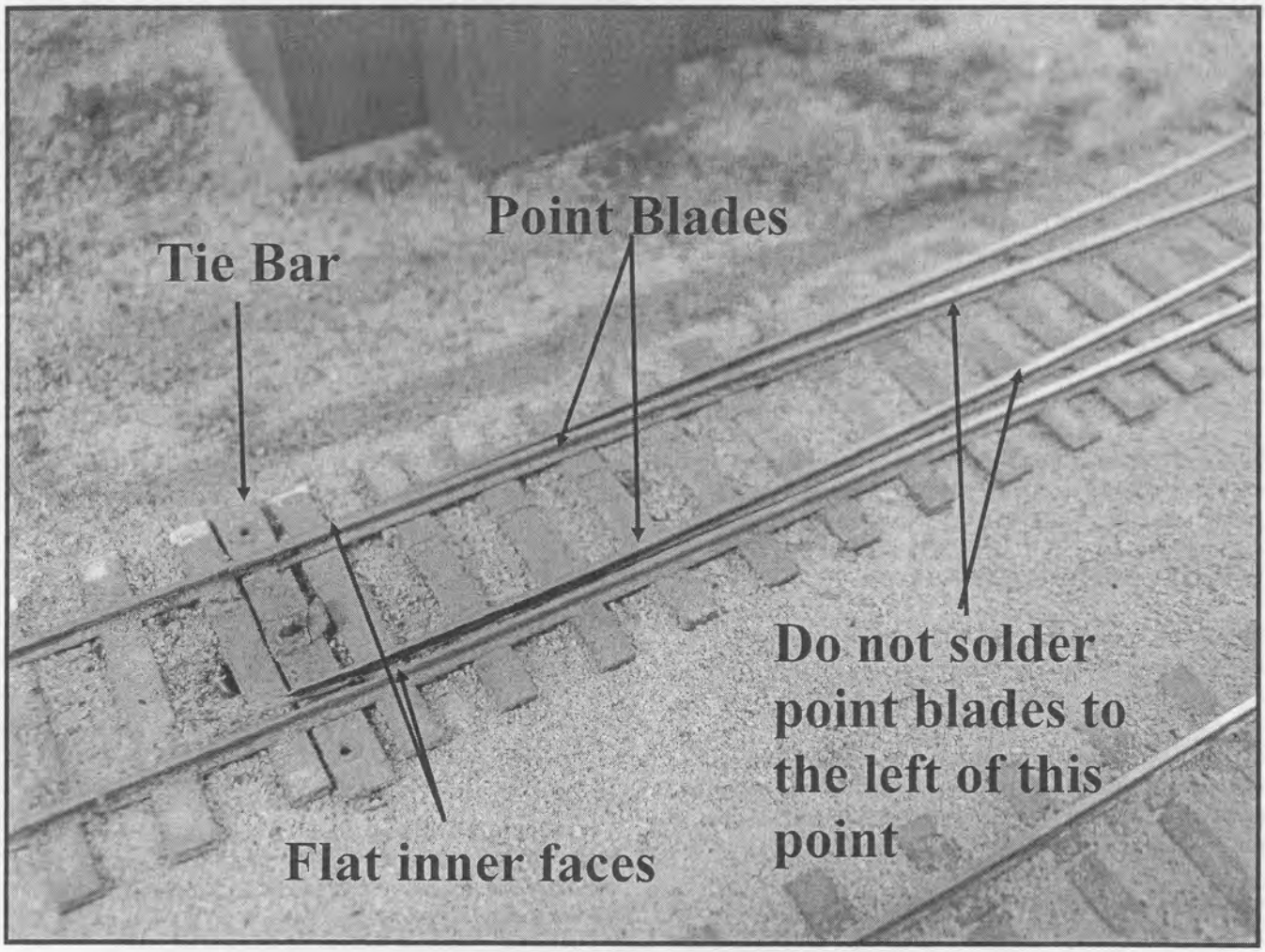
Once you are happy with the "V" that you have created tack solder it into place. I say tack solder only at this stage as it does allow you to make very minor adjustments further down the track.

The golden rule of point construction is to keep your track gauge handy at all times and check everything you do frequently.

The main curved rail can now be installed as it can be gauged off the "V". But should generally follow the curve of your template.

The next step is to produce the wing rails that guide the wheels onto the "V". It is important to note that the rails that extend towards the blades of the points should only go about 4/6 sleepers before being cut. The purpose of





the break in the rails is to avoid an electrical short circuit when power is supplied.

The next step is to produce the point 'blades'. This is a step that can be done with a good file and a vice, but is certainly a lot easier with a bench grinder. A tip here is to cut rails a number of centre meters longer than required. Once you are happy with the blade then cut it to suit the required length. Before securing the blades to the sub base mark with a felt pen where the blade will contact the main rails. Now remove the point from the backing board and gently file a flat spot on the inside of the main rails where the point blades will strike. You may need to remove a sleeper between the marks made previously to enable a nice flat surface to be established. The obvious aim with the finished product is to try and ensure that when the blade of the rail is against the main rail that the width of the two rails is approximately the same as one rail. To understand how this should look have a look at a commercial point.

Once you are happy with the way the point blades strike the main rail then they can be fixed in place. Make sure that they do not touch the wing rails when securing. Also only secure the blade rail to the first 4/6 sleepers at the 'V' end. This will then allow the blades to easily swing back and forward.

The next step is to fit the checkrails. Once again only lightly tack solder in place until you are happy that a number of items of rolling stock will negotiate both roads of the point without catching on anything.

The final step is to install a tie bar to the point blades to control their operation. In my case I chose to use a unit produced by SMP Scaleway, which is designed for this purpose. You will note that the tie bar has been designed with two areas on which to solder the blades as well as a hole for the easy installation of point motors. Another more simple option is to use a strip of copper clad sleepering. File the strip down both on the sides and the base to ensure that it move easily between the sleepers. Solder the blades to this copper clad tie bar so that when one switchblade is hard up against a rail there is a gap of apx 2/3mm between the other switch blade and rail.

The next step is to install some additional track to the various roads of the point and undertake some serious testing. Adjust if necessary. Once you are happy with the performance of the point you can then return and solder all those areas that had only been tacked with solder.

The one final task is to gap the rails so as to ensure that there are no electrical short circuits.

Option 2

If the above does seem a bit daunting for you don't be concerned. There is a cheat's method, albeit a bit more expensive.

Basically this approach involves taking a commercial point (I have used a Peco point of this exercise) and substituting the copper clad sleepers for the plastic ones.

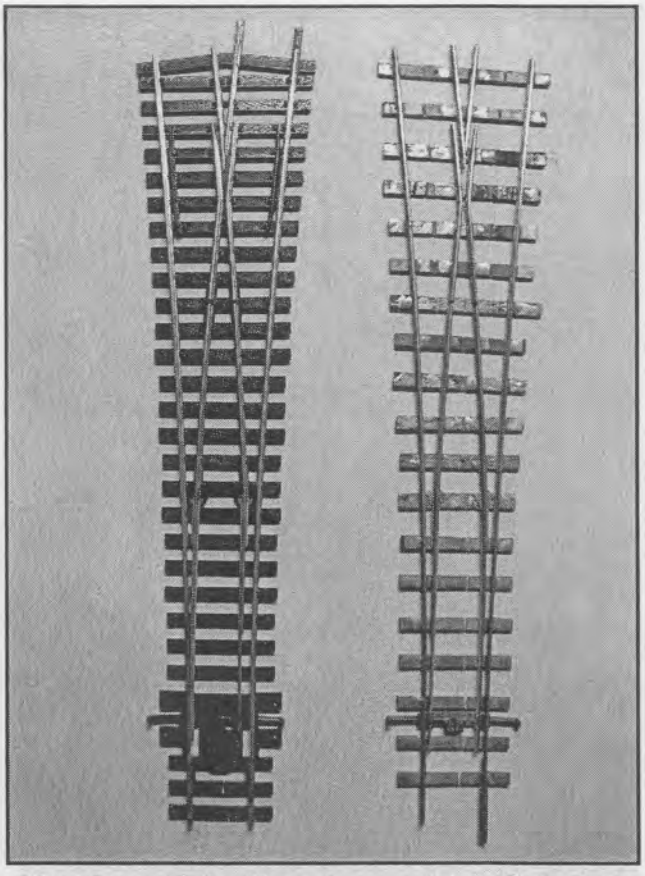
Start by photo copying the back of the point to give you a rough template, mark on the template where the scale sleeper spacings should be and then cut the sleepers to the required length.

Next start working you way along the point by cutting out every second plastic sleeper and replace it with a copper clad one. Once you have finished this you can then remove the rest of the plastic sleepers and finishing installing the copper clad replacements.

A good tip is to be very careful not to damage the tie bar on the Peco points. With this remaining in place you don't have to worry about a tie bar.

So as you can see this approach is very quick and easy and the end result leaves you with the look we are trying to achieve. The approach is very handy if you are able to obtain a supply of broken commercial points

Obviously with both of the above you will need to install a self-latching point motor to control the operation of the point.



The above photo illustrates a point built to basic early QR standards using the Option 2 method of construction. Not the Peco tie bar still in place. Photo: Russell Bianchi

Detailing Your Track

Once your track and points have been completed it is then time to detail them. The first step is to use and old toothbrush with some standard laundry strain remover to remove the residue of the flux. Once dry a very light mist of a commercial primer can then be sprayed over the track.

I then use a variety of artist oil paints to paint the sleepers. I generally use a brown base coat with a number of subsequent greys and whites. The later are dry brushed on.

Trial and error is the only way to come up with a process that suits you. Be aware however that the ballast application process will also have a significant effect on the final look.

The final step is to paint the side of your rail with your preferred colour and then give everything a good clean.

Ballast

While I'm sure that I don't need to tell people how to lay and secure ballast there are a few tips that I believe are important if trying to achieve a prototypical QR look.

First of all unless you are modelling a more modern main line try to avoid large chunky ballast. A good tip here is to use N gauge ballast. If you are modelling a specific location try and obtain some of the natural material from the area and make your own. In my own case as I was modelling a fictitious location in the sandstone country along the bottom of the main range I sourced some sandstone rock which I pulverised to make my own ballast.

It is also worth trying to mix a number of different grades of ballast together to resemble the less uniform ballast found on a lot of early lines. Once laid it is also recommended that you weather your ballast to take the new and uniform look off it.

General Line Side Detailing

Rather than bore you senseless with a blow by blow description of how to construct the literally millions of additional line side details you could add to your model railway I will finish with a series of model photos which I hope will give you some inspiration and ideas to add a little bit of prototypical QR atmosphere to your layout.

I have also included a range of useful contacts which

Useful Contacts

Company	Web Address	Items of Interest
C & L Finescale	www.finescale.org.uk	Track components including ready made 'V's' and switchblades.
New Zealand Finescale	www.nzfinescale.com	Etched S scale fish plates, signaling equipment and point throws.
Model Etch Australia	www.modeletch.com	A range of useful etched items, including HO scale fishplates.
Mainlytrains	www.mainlytrains.co.uk	General stockist of a large range of general railway related items including SMP Scaleway track components.
Exactoscale	www.exactoscale.co.uk	A wide range of scale track building components. A range of downloadable templates for point, etc. Be careful as the templates are to P4 scale 00.
Railway Engineering	www.railwayeng.com	Offer a range of part built copperclad points in various scales. Also have a nice range of track gauges.
Proto 87	www.proto87.com	Wide range of track building components, tools and jigs, etc.
Brass Master	www.brassmaster.co.uk	
Blacksmith Models	www.blacksmithmodels.com	General stockist of a large range of general railway related items including SMP Scaleway track components and other useful lineside detail parts.
Alan Gibson	www.scalefour.org/ag/	Track gauges
Fast Tracks	www.handlaidtrack.com	The true one stop shop for track scratch building suppliers.. Large range of tools, jigs and various other aids. Suppliers of a wide range of copperclad sleepers and strips. They also stock a large range of Mt Albert Scale Lumber wooden sleepers.

hopefully will allow you to source a range of finescale modeling components which will help you to add some serious detail to your models and help lift the standard of your modeling.

While I am the first to admit that building prototypical track work does take a lot of time, especially when you consider the general size of most layouts. From experience all I can tell you is that all the work is worth it, as it just adds another dimension to your layout.

In relation to line side detailing, prototypically you don't need a lot of items because in reality there wasn't a lot of infrastructure on most lines. In my humble opinion the best approach is to make sure that the detail that is included is well modeled and resist the temptation to overcrowd your model with one of everything.

As stated previously, if you are looking for ideas for this type of detail the best approach is to look at as many old photos as you can lay your hands on.

One final point to ponder is that prototypically the railway was made to fit the environment in which it was located and not the other way round. So when you are visualizing a modeling scene keep this point in mind.

Best of luck.

References

John Knowles Queensland Railways Steam Locomotives 1900 –1969 Design and Operation.

John Kerr Triumph of a Narrow Gauge.

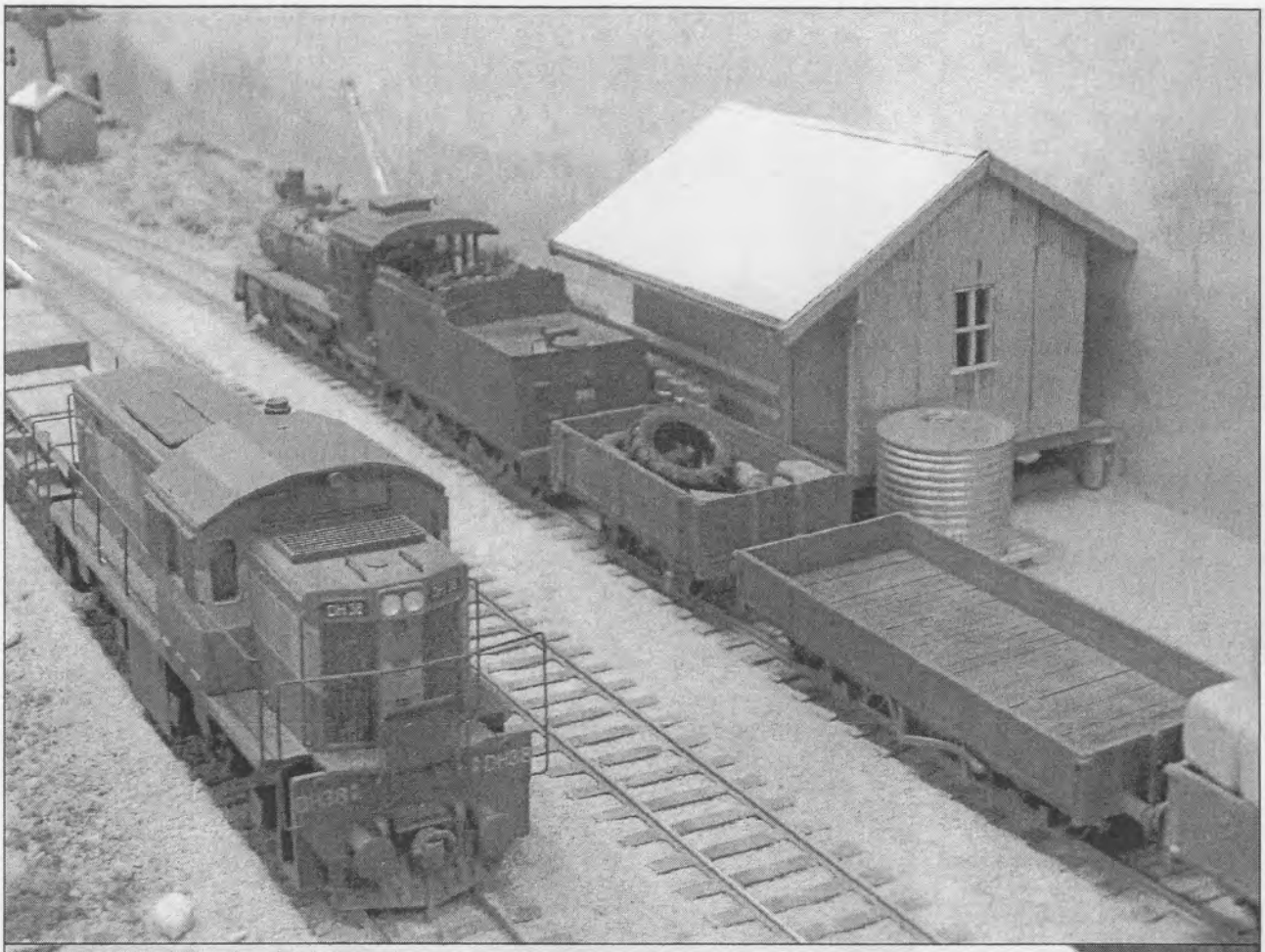
Various Queensland Railways engineering drawings.

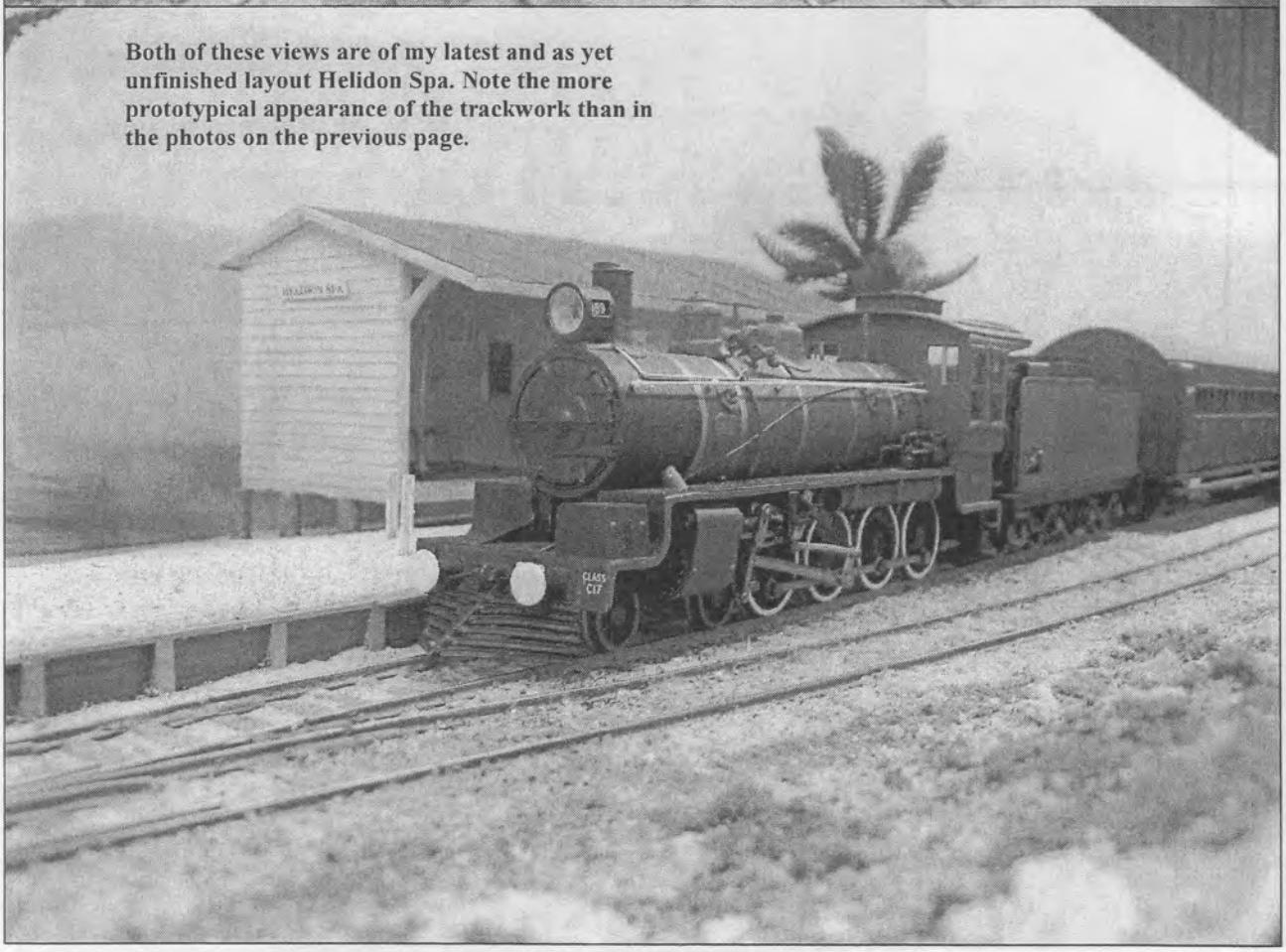
Personal discussions with past and present QR Employees.

C17 #991 wait its next turn of duty at Iredale. Iredale was constructed using Peco code 75 rail and points.

Another view of Iredale with a DH shunting the goods shed siding. The use of chaired rail is very noticeable in this birds eye view.

Another view of Iredale which clearly shows the chaired rail. Note the lack of shouldered ballast in the sidings, this was not an unusual feature. In the foreground is the fettlers rail rack.

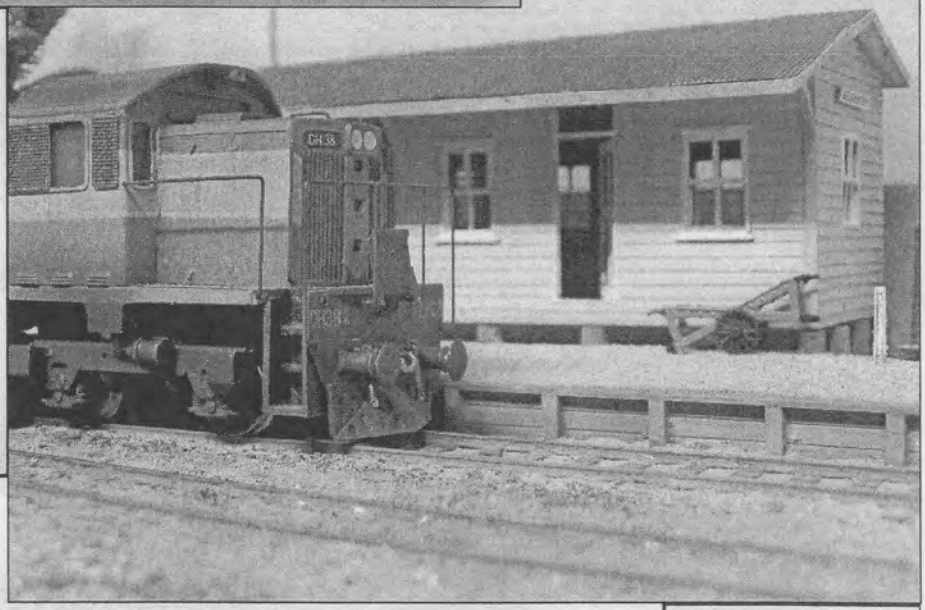


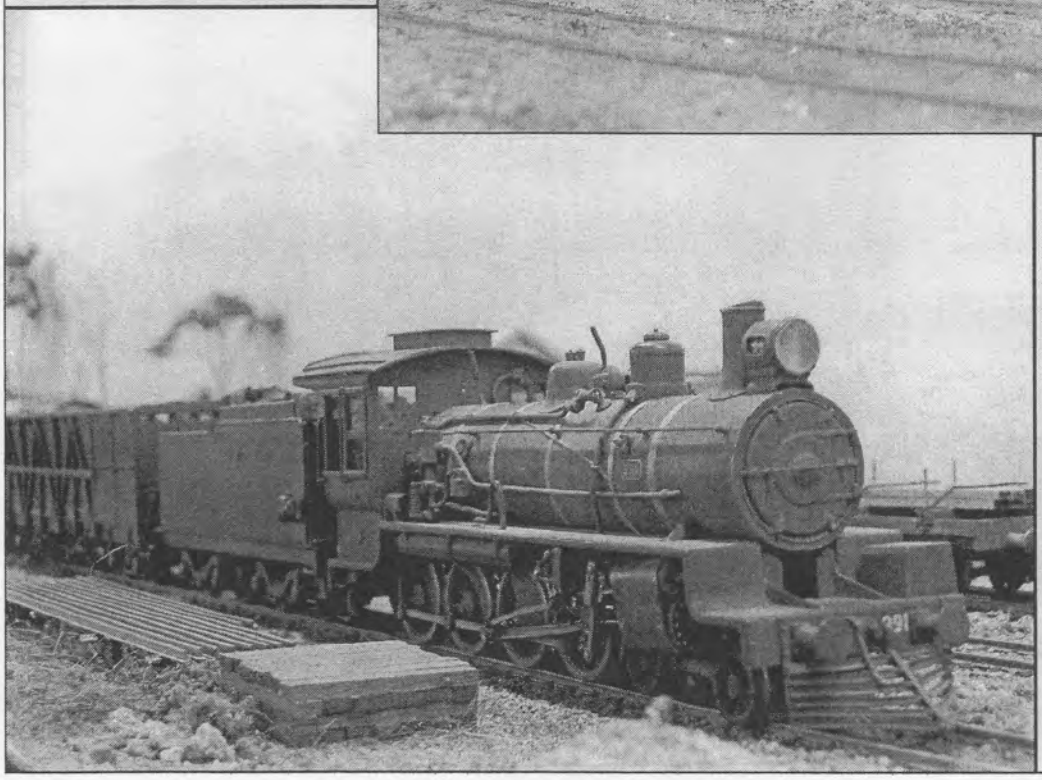


Both of these views are of my latest and as yet unfinished layout Helidon Spa. Note the more prototypical appearance of the trackwork than in the photos on the previous page.

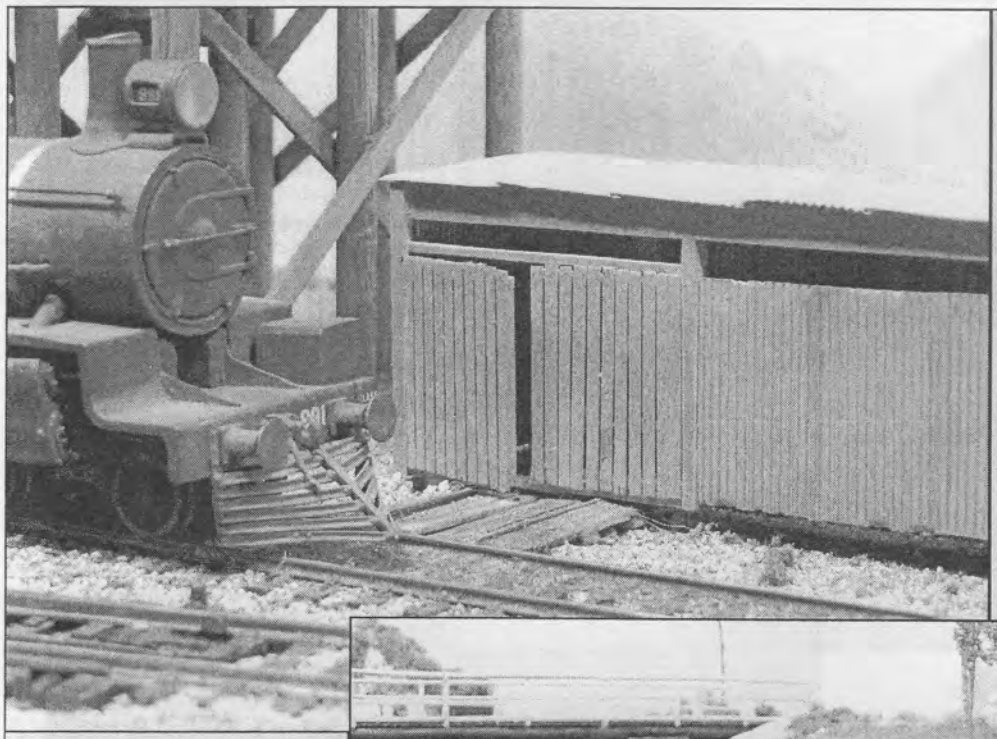
1404 approaches the road crossing just to the south of Iredale with a freight train. Note the prototypical cattle grate and lineside fencing.

A DH stands at Helidon Spa station. Note the standard QR platform facing. The station still needs ant caps on the stumps and a step to the office.





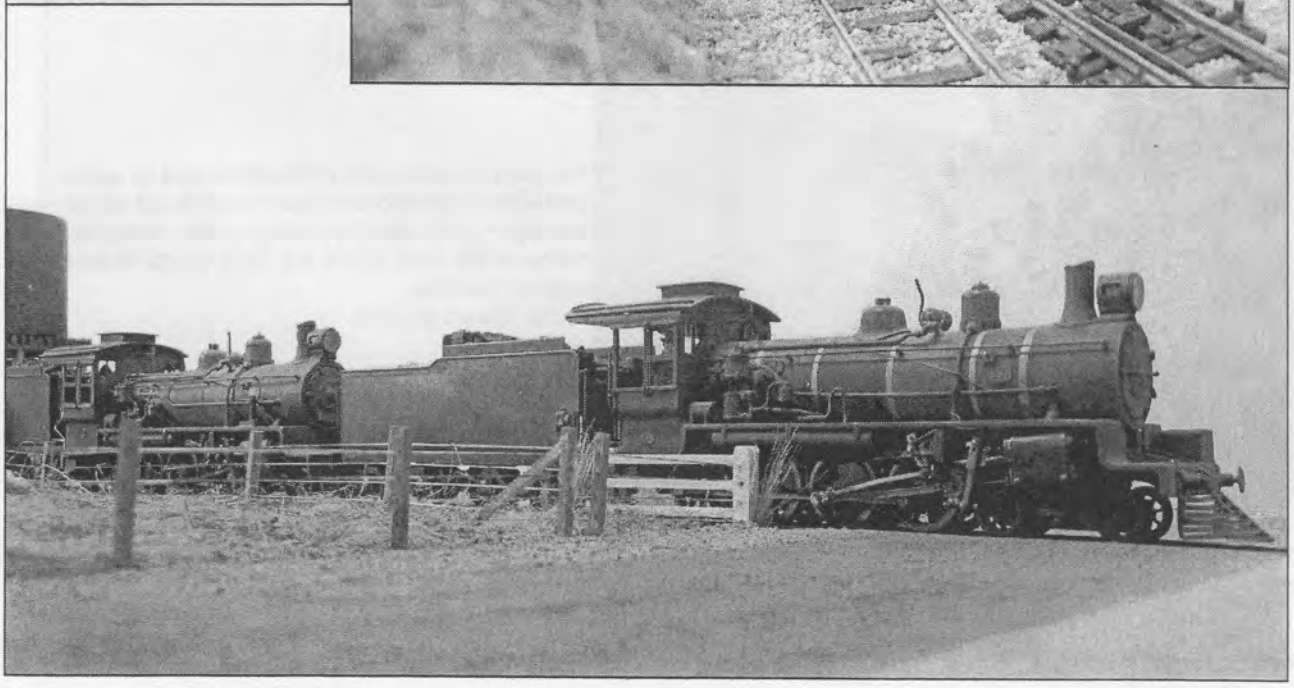
The photo to the left shows a simple line-side scene which includes a rail rack and a supply of new sleepers for use by the local fettling gang.

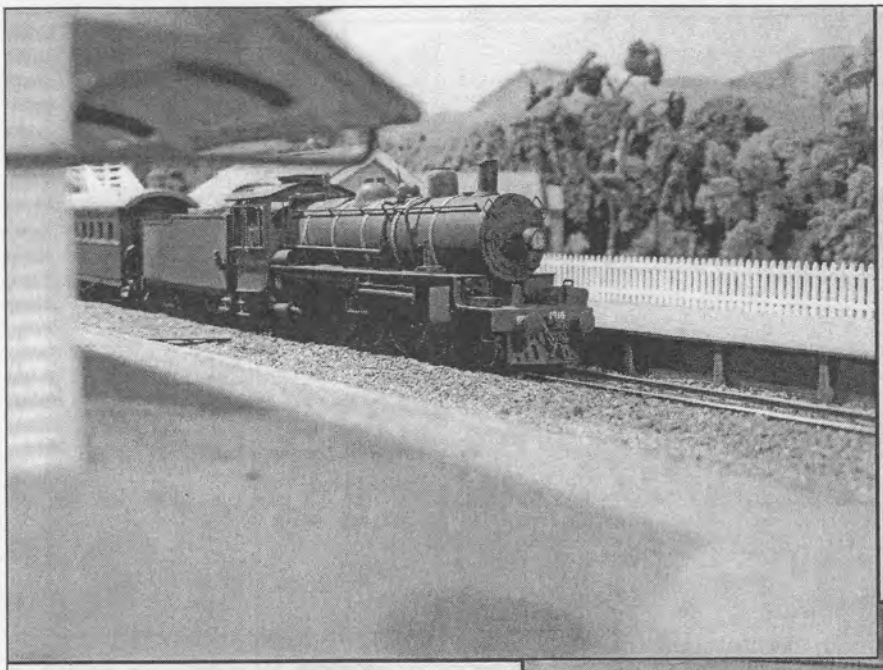


A simple lineside fettlers shed. Easy to build and extremely common in days gone by.
Photo: Russell Bianchi

In my mind the scene to the right is spoiled by the business end of a Peco point when everything else is generally in line with the prototype.

The photo below is at the end of the day what makes all the extra effort worthwhile!!





With the Queensland S Scale groups layout Rosevale being modeled loosely on a prototypical main line station the group have used a nice mix of crushed rock ballast to represent what was in use in such locations in the 1960's.
Photo: Russell Bianchi

Once again on Rosevale we see a small diorama of a very common linside feature of many Queensland Railways lines.
Photo: Russell Bianchi

The end of the line with a DH parked hard up against the buffers. Note the prototypical cutting and linside fencing. It is also worth pointing out the uncrowded nature of this scene which was fairly typical of most country locations.
Photo: Russell Bianchi