

# Education Program Basic Skills Series



## Module Five

# Track laying

The following pages introduce the essential elements of track laying

- Tools
- Fundamentals of track laying
- Sectional track
- Flexible track
- Point work, Turnouts (Switches)
- Ballast and road bed

# Track laying tools

The following tools are adequate for laying sectional and flexible track work in N scale, HO scale, OO scale and On30.

## Tack hammer

Driving track securing pins



## Fine nose pliers

Fitting rail joiners onto the end of rails. Bending rails to the required curvature.



## 300 mm steel ruler

Aligning track at joints



## Diagonal cutters

Cutting rail to length and removing track securing pins.



## Fine files

Dressing rail ends prior to installing rail joiners .



## Fine tooth saw

Cutting rail to length



## Small hand drill

Drilling additional track securing pins in sleepers



## Tape measure

Laying out and checking track alignment



## Hobby knife

Trimming sleepers to clear rail joiners



# Fundamentals of track laying

Like the foundations of a building, track work is the foundation of a good layout. Bad track work will only result in a problematic and frustrating layout. So pay special attention to this module and the laying of track and turnouts (switches/points).

The fundamentals of track laying for reliable operation are

- Track held down securely
- Smooth rail joints
- Smooth curves
- Track is in gauge

## Track held down securely

Track can be readily secured with twelve mm 20 gauge panel pins

## Smooth rail joints

Smooth rail joints provide a bump free path for the wheels of your rolling stock. Smooth rail joints require the rail ends at a rail joint to be in line both vertically and horizontally. You can achieve smooth rail joints by ensuring

- Rail ends are in, not on top of the rail joiner.
- Rail joiners are straight and grip the rail ends firmly
- Rail ends are filed smooth before track laying
- Sleepers are parallel either side of the track joint

The upper photo shows the near side rail is on top of not in the rail joiner.

The middle photo shows a well aligned track joint.

The lower photo shows a misaligned track joint.

## Smooth curves

Smooth curves contribute to reliable train operation. Smooth curves through rail joints are essential. Sectional track is accurately curved. Flexible track needs the end of each piece bent to match the curve prior to track laying.

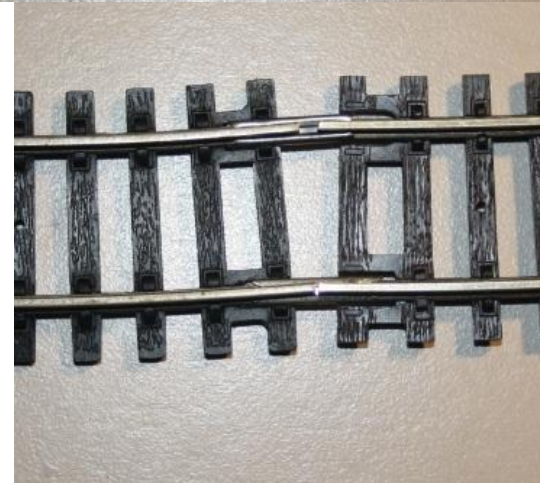
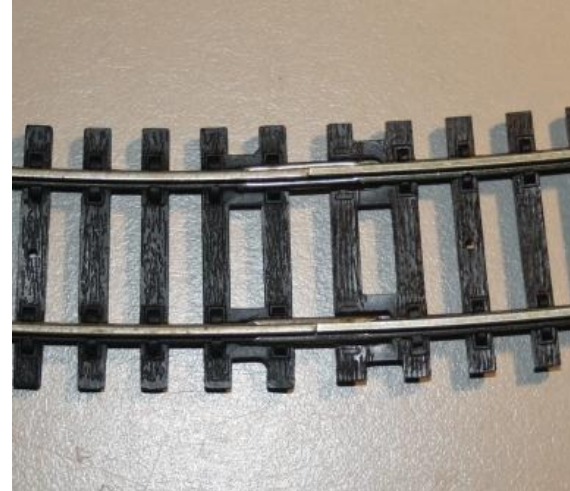
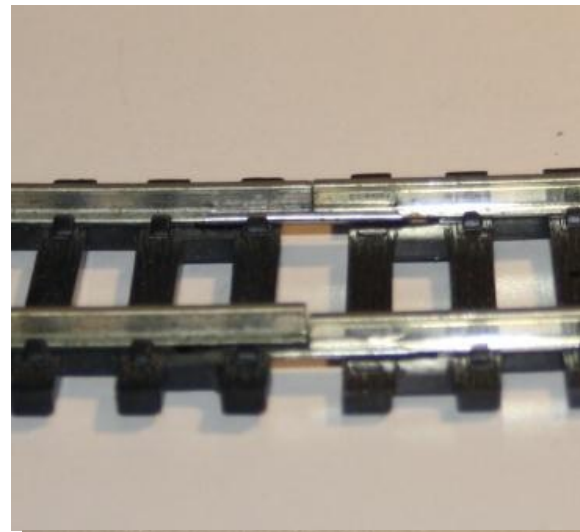
## Kink free track joints

Track through rail joints needs to be straight or smoothly curved. A good visual guide is the sleepers are parallel either side of the rail joint, not splayed like the track in the lower photo.

## Track is in gauge

Your wheels will stay on the track provided the track gauge is within tolerance. NMRA S 3 .2 details the track gauge tolerances for each gauge. You can measure the track gauge using a calliper or use an NMRA standards gauge. Use of the NMRA standards gauge is explained in NMRA Recommended Practice RP 2. Details of the track standard and RP 2 are available from the NMRA web site <http://www.nmra.org/standards/sandrp/consist.html>

Out of gauge track is usually due to broken track securing clips on the sleepers. This problem can be corrected by driving a track fixing pin alongside the offending rail and bending the pin to push the rail into the correct position.



## Sectional track

Sectional track is available from a variety of manufacturers. If you started out with a train set, it came with an oval of sectional track. Sectional track has its place on a model railway. Laid it is has the same appearance as flexible track that comes in 900 mm lengths .

Curves of manufacturers recommended minimum radius can be laid more precisely in sectional track than in flexible track. Fitted with snug fitting rail joiners sectional track will operate mechanically and electrically for many years.

Sectional track is easy to lay provided you follow the fundamentals of track laying. The pieces come with fixing holes in the sleepers. A track fixing pin every 200 mm is adequate for securing 16.5 mm gauge sectional track. 12 mm panel pins are ideal for securing sectional track to your layout. The pins only need to hold the track snugly in place. A common cause of under gauge track is the pins securing the track being driven in too tightly.

Sectional track can be cut to obtain non standard sections. The rail can be cut with a fine tooth hack saw, abrasive disc in a high speed motor tool or diagonal cutters. Regardless of the cutting method the cut rail end needs to be filed to shape to provide a smooth rail joint. The clips securing the rails to the sleepers at the end of a cut down section of track need to be cut back with a hobby knife to allow the rail joiners to be installed.

## Flexible track

Flexible track as the name implies can be laid to any required geometry. That being said laying curves of less than 600 mm radius in 16.5 mm gauge flexible track is not easy.

Some experienced modellers glue their track into place. This technique makes relocating track difficult. Most of us pin our track in place, at least until we are satisfied with the arrangement and performance of the track work.

Depending on the brand the track may or may not have fixing holes in the sleepers. A fixing hole every 100 mm is sufficient to hold flexible track in place. Again it is important not to drive the track fixing pins in too tightly as this will pull the track out of gauge.

When bent into a curve one rail ends up longer than the other. Connecting flexible track to other track requires cutting the longer rail. The rail can be cut with a fine tooth hack saw, abrasive disc in a high speed motor tool or diagonal cutters. Regardless of the cutting method the cut rail end needs to be filed to shape to provide a smooth rail joint. The clips securing the rails to the sleepers at the end of a section of flexible track need to be cut back with a hobby knife to allow the rail joiners to be installed.

## Point work, Turnouts (Switches)

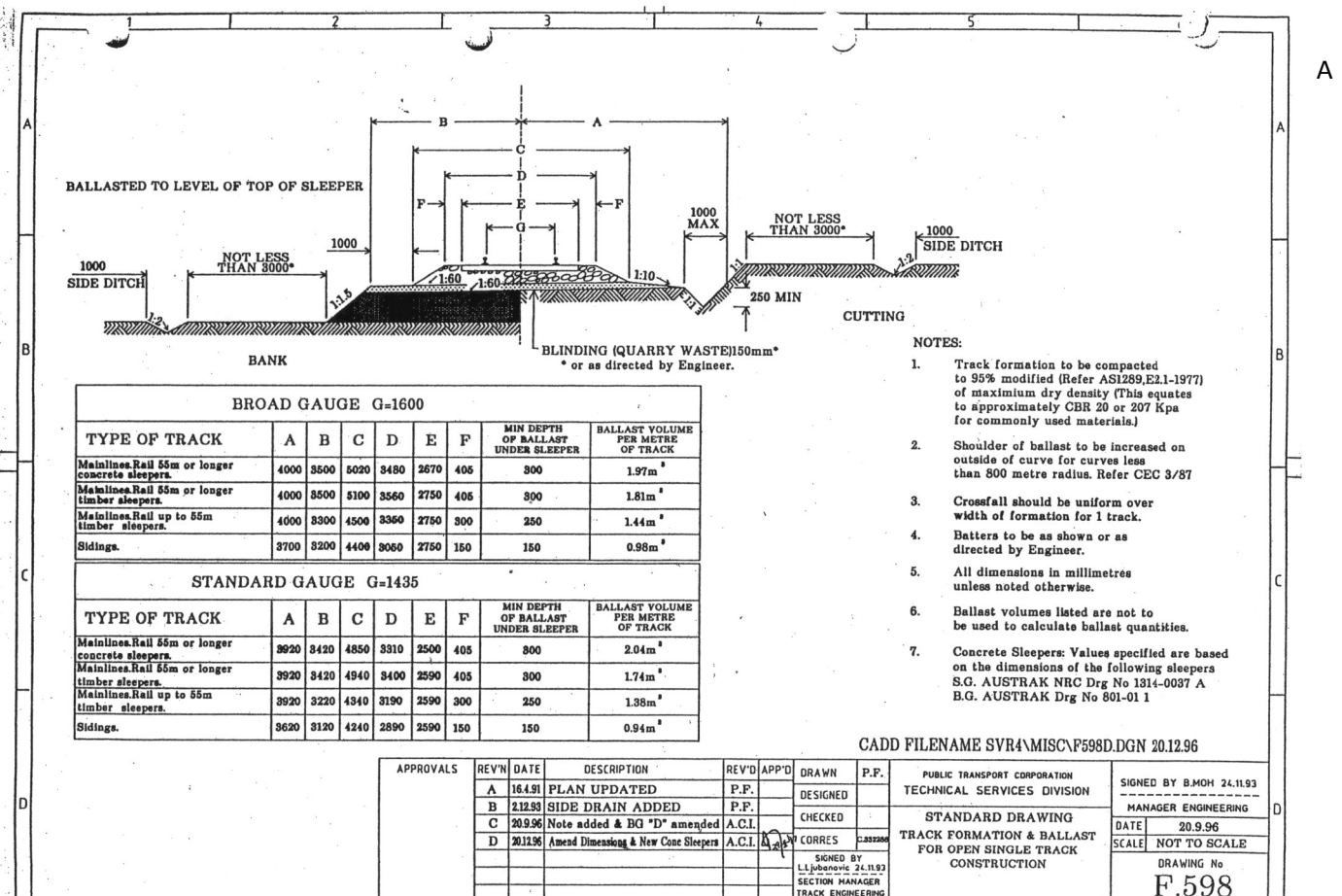
Depending on the brand the point work may or may not have fixing holes in the sleepers. A single point can be secured in place by the track it is connected to. Arrays of point work need to be pinned into place to locate them so they don't move when the point motor throws the point blades.

Again it is important not to drive the track fixing pins in too tightly as this can pull the track out of gauge and prevent free movement of the point blades.

## Ballast and road bed

Most railway track is laid in a bed of ballast for support and drainage. Typically the ballast is 300 mm deep below the sleepers, though it can be shallower or deeper. Narrow gauge track such modelled in On30 was often laid with minimal ballast.

Common modelling practice in Australia is to lay track on sheet cork. (1.6 mm for N scale, 3.0 mm for HO and OO scales) The cork raises the track and to some extent deadens the noise of the trains. Beyond the ends of the sleepers the cork is bevelled to the angle of repose of the ballast usually a slope of one and a half to one or 35 degrees. Current railway ballasting practice is the ballast is level with the top of the sleepers and extends 150 mm beyond the ends of the sleepers. A typical railway road bed and ballast arrangement is shown below.



variety of manufacturers supply model ballast. The model ballast is spread over the track and cork sheet. Model ballast is secured to the track and road bed with diluted white glue to which a few drops of kitchen detergent has been added. If you need to relocate your ballasted track, spraying the track with water will soften the diluted white glue to allow the track to be removed without damage.

## References

NMRA web site Clinics

- Layout Hints – Turnout tips (Gerry Hopkins MMR)
- Layout Hints – Switching Switch Stands (John Saxon MMR)