

Module Specifications and Standards
for
The North Shore Model Railway Club
HO Modular Group

February 2013

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Introduction

The NSMRC HO Modular group has been formed to offer club members the opportunity to build their own modules with assistance from other club members and afford them the opportunity to set up a running railroad for shows and events.

The purpose of the group is also to offer members the opportunity to learn how to build benchwork, lay track, do scenery work and model buildings within a greater group where help and advice are on hand.

Membership of the group is open to all members of the club.

1.0 General Description

The modular concept has been designed so that anyone can build relatively simple portable modules which can be combined in any arrangement and number to form a large operating layout. All basic modules are interchangeable and can be located in any portion of the layout and quickly and simply connected or disconnected to other modules.

Specialised modules that must connect together are allowed as long as they can connect at either end of the grouping to a basic module, e.g. a double module can be built as long as the ends of the double module conform to the specifications thus allowing for twice the modelling area.

Each module is required to meet and adhere to the specifications as detailed in the following section in order to provide the inter-changeability necessary to allow the modular concept to work.

2.0 Module Specifications

2.1 Framework for Basic Modules

Refer to figures one and two below for drawings of the framework.

2.1.1 Module dimensions:

The module will be 1200mm long and 600mm wide.

2.1.2 Sides and Frames:

The frames should be constructed of 70x20mm nominal timber, such as common pine. The boards should be straight, solid, and free of excessive knots and sanded smooth.

2.1.3 Deck:

The deck shall be constructed of 12mm Customwood. Fixed to the top of the deck shall be 50mm high density polystyrene such as that used of underfloor insulation. This polystyrene must extend from the front of the module for at least 200mm.

2.1.4 Valence:

A 135mm high valence must be attached to the front of the module covering the 100mm frame, 12mm deck and 50mm polystyrene. This will allow an extra 3mm above the polystyrene for scenic material.

Shaping of the top 53mm of the valence is allowed to model non-flat ground forms, i.e. down to the top of the 70mm frame.

Valence material will be 6mm Customwood.

2.1.5 Backdrop:

A 432mm backdrop must be attached to the back frame of the module with the bottom of the backdrop aligning with the bottom of the frame. This will ensure the backdrop protrudes 300mm above the polystyrene deck.

Backdrop material will be 6mm Customwood.

2.1.6 Module sides:

The edge of the module where it joins to the next module must have a flat profile.

2.1.7 Painting and ground foam:

All visible surfaces of the module must be painted. Standard colours must be used for the sky, basic earth colour, the valence and the first layer of ground foam.

The colours will be:

- Sky – tba
- Earth – tba
- Valence – tba
- Ground foam – tba
- Ballast - tba

2.1.5 Legs:

Each module is to have four legs. Legs must have 50mm long adjustment bolts to allow for a total of 25mm of levelling. With the adjustment bolt out 12mm, the measurement from the floor to the top of the mainline rails is to be 1000mm. Length of leg without adjustment bolt should be 920mm. Bracing between legs, to hold the module steady, are required.

2.1.6 Joining modules:

On the right hand end of each module a 40x20mm strip must be attached across the width of the module for the adjoining module to rest on, i.e. a 20mm ledge will be created.

Two sturdy C-clamps or equivalent, of at least 50mm opening size will be used to join the module ends together. Two clamps must be provided with each module.

Figure One

Deck and Frame for straight module

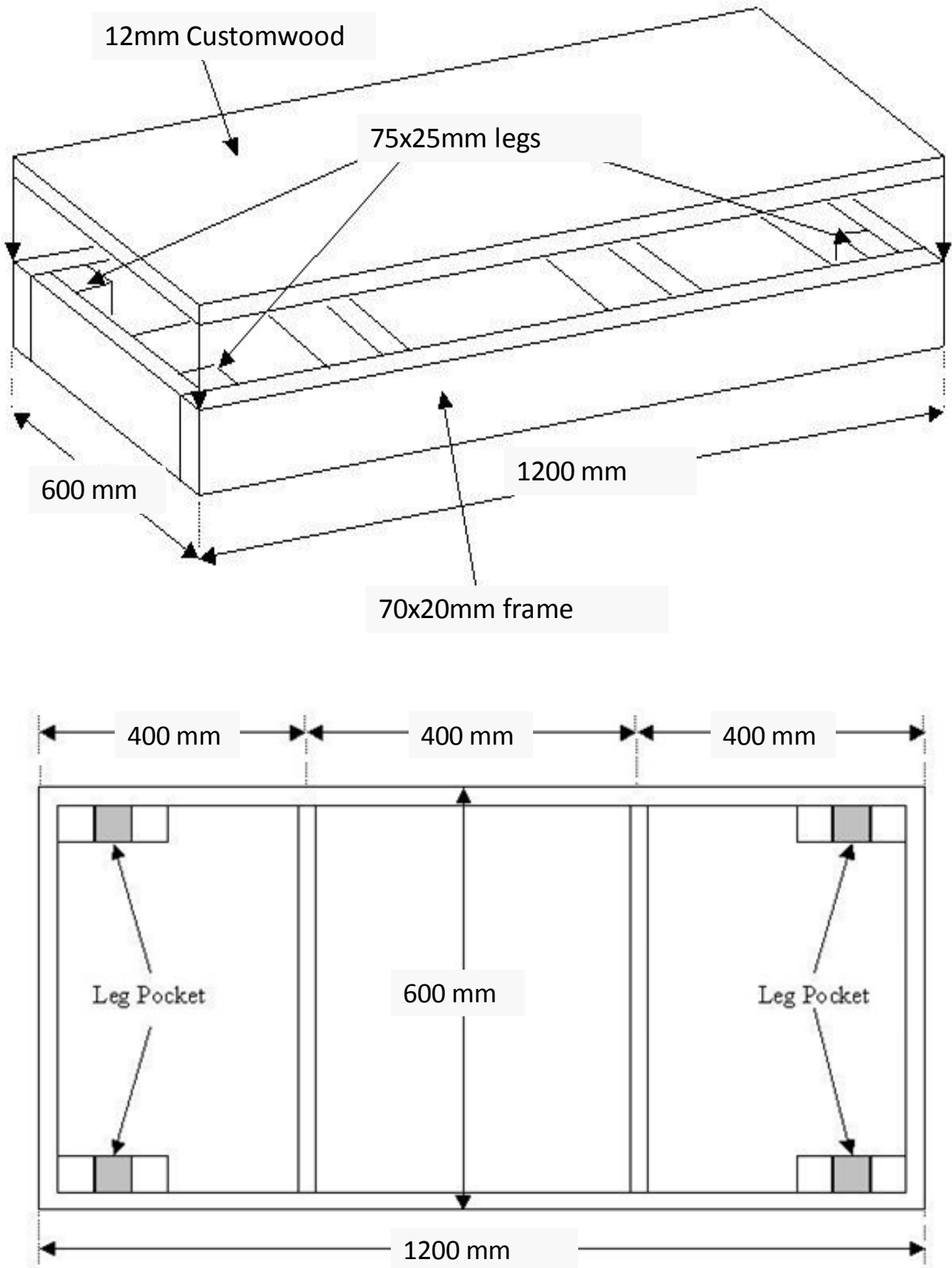
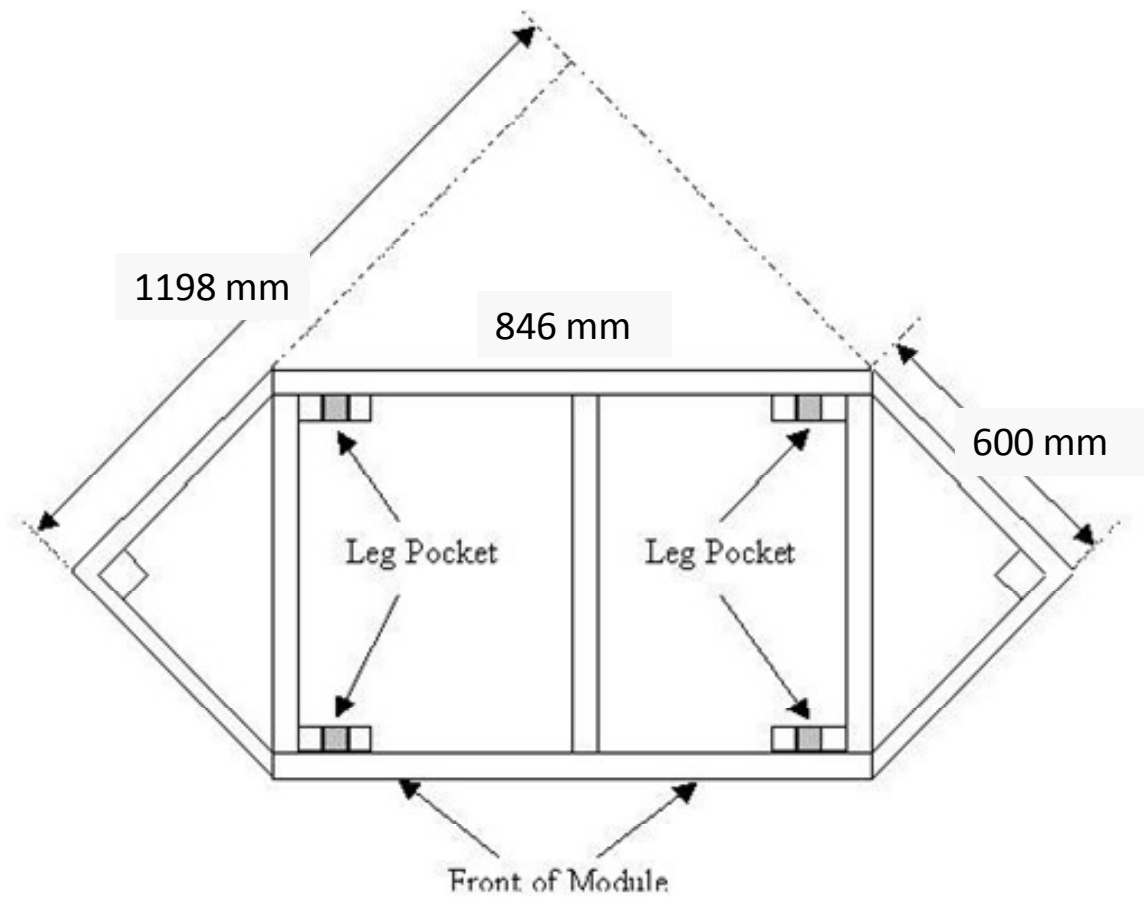


Figure Two

Deck and Frame for corner module



2.2 Track Work for Basic Modules

Track work is the cornerstone of good operation. Track work must conform to the specifications detailed below. Refer to figure 3 below.

2.2.1 Track:

The main line track will be nickel silver code 100 rail with plastic or wood ties with proper ballasting.

2.2.2 Turnouts:

The mainline turnouts will be Peco insulfrog nickel silver code 100 rail with plastic ties. It is required that medium radius turnouts or larger are used for mainline turnouts. All turnouts on mainlines are to have pull rods. Large radius turnouts are to be used for curved turnouts on the corner modules. Turnouts from the mainline to sidings may be small radius.

2.2.3 Mainlines:

Two main lines with proper dimensions will be provided as a minimum on each module. Tracks are to be laid directly onto the polystyrene deck. Mainlines may be curved or straight. The tracks must be centred at 100mm and 150mm respectively from the front edge of the module (back edge of the valence) with the track ending 84mm from the side edge of the module to allow for connecting track (164mm straight) and rail joiners – there must be at least a 50mm section of straight track onto which the 164mm joiner track will connect, i.e the mainline tracks must be straight for a distance of 134mm from the edge of the module. If a crossover is installed it must be an insulfrog type.

2.2.4 Parallel Track:

A minimum of 50mm for straight and 60mm for curved must be maintained between mainline tracks.

2.2.5 Minimum Radius:

Mainlines will have a minimum radius of 914mm. Easements on the curves are recommended.

2.2.6 Clearances:

All clearances must conform to those dictated by a National Model Railroad Association (NMRA) HO track gauge (required NZR clearances to be confirmed). Note certain new equipment requires a higher clearance than what is recommended by the NMRA. It is recommended to allow an additional 25mm above the recommended overhead clearance; however, engineers are required to ensure that their train will clear all modules.

2.2.7 Module Connector Track:

Mainlines will be connected from one module to the next by use of a standard 164mm piece of track, preferably Atlas or Peco brand, code 100, nickel silver with black ties. Each module must have a minimum of two connector tracks.

2.2.8 Uncoupling Ramp:

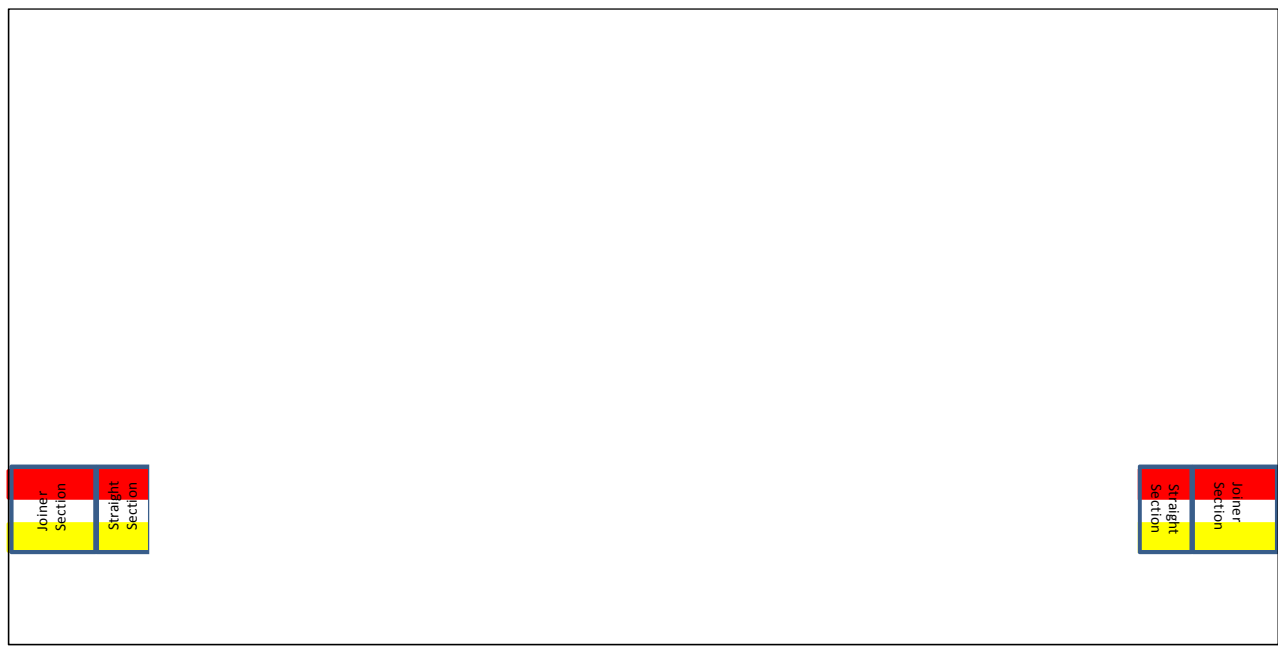
No uncoupling ramps are to be located on the mainline. Sidings may have uncoupling ramps of the fixed magnet type.

2.2.9 Route Convention:

Facing the module from the viewing side, the front mainline will run West (to the left) and the rear mainline will East (to the right), with North being on the rear of the module and South being on the front edge of the module.

Figure Three

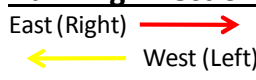
Track Location, Straight Module



600mm x 1200mm



Running Directions



2.3 Wiring and Connections

Each module will provide through connections and outlets for DCC track power and a DCC cab bus.

The power bus must be located underneath the mainlines at 100mm from the front end of the module. On the left hand end of the module a 2-way female connector must be located on the inside edge of the frame. The connector must be suitable for 14-gauge (1.63mm) wire. On the right hand end of the module the power bus must have the corresponding male connector on a 200mm tail for connection to the female connector on the adjoining module.

The cab bus must be located underneath the module 100mm from the back. Cable to be standard Cat 5 cable. On the left hand end of the module an 8-way Cat 5 female connector must be located on the inside of the frame. On the right hand end of the module the cab bus must have a standard Cat 5 male connector on a 200mm tail for connection to the female connector on the adjoining module.

The DCC system must be set up to run with either tethered or wireless cabs. Each module is to have at least one plug point (standard 8-way female Cat 5 connector) set into the front valence 200mm from the left end of the module. Each corner module to have a Cat 5 plug on the inside face.

Connections from the power bus and cab bus to the DCC command station will be at the end modules – suitable wire tails 1000mm will be provided on one corner module.

Refer to figure 4.

2.3.1 Power bus:

Power wiring will be 14-gauge (1.63mm) or larger stranded wire. Wires to be red and black.

Track drops may be a smaller gauge wire - 18-gauge (1mm) wire is recommended. Each track on each module will have its own drop to the mainline bus. Wires to be red and black.

2.3.1.2 Power bus joiners:

Female connector on left end – tbc

Male connector on right end – tbc

Red wire to be connected to the front rail and the black wire to the back rail.

2.3.2 Cab bus:

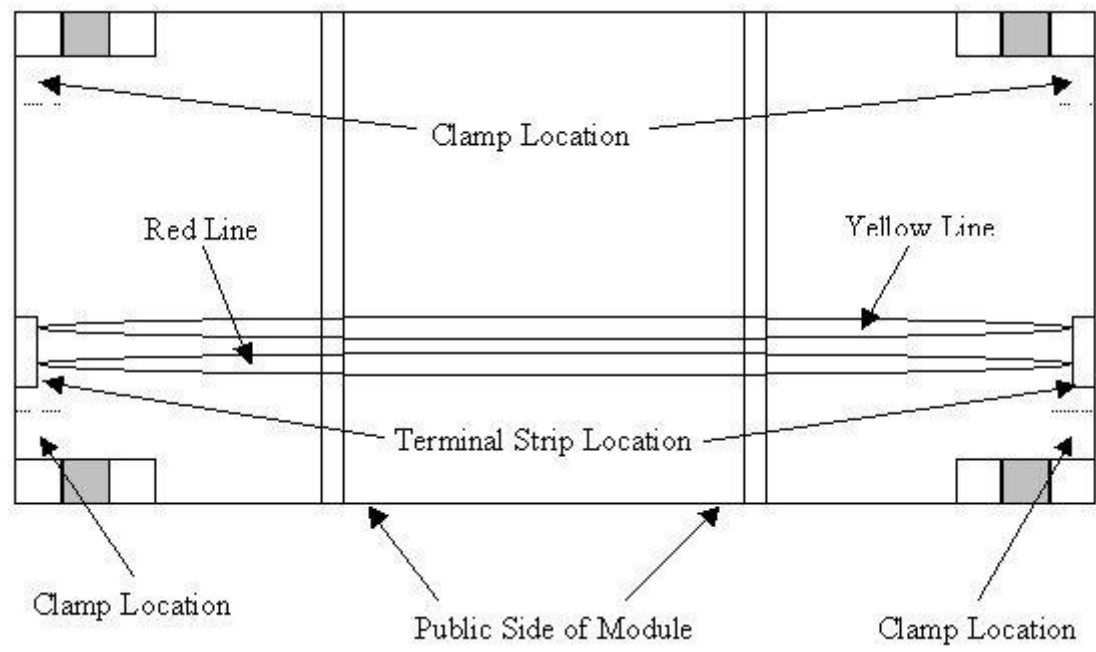
Cab bus wiring will be a standard Cat 5 cable.

2.3.2.1 Cab bus connections:

Female connector on left end and valence – tbc

Male connector on right end - tbc

Figure Four
Wiring location



2.4 Scenery

The overall design, motif, and scenic details are optional to each module builder. Each module can be designed as a diorama in itself, or can be planned to merge with other modules in the layout at the discretion of the model builder.

2.4.1 Ground Cover:

All grass, trees, bushes, ground, and foliage will be in the appropriate shades with no toy like appearance.

Base ground colour must be 'tbc'.

2.4.2 Clearance:

All clearances for buildings, scenery, etc., will conform to the NMRA HO Standard Gauge (required clearances for NZR tbc).

2.4.3 Elevation:

The mainline is to be level for at least 200mm from the edge of the module. Any gradients on the mainline must not exceed 2%. Branch lines may have a higher grade.

2.4.4 Mainline Ballast:

The mainline tracks will be ballasted.

2.4.5 Backdrop:

A 300mm backdrop is required above the surface of the module.

2.4.6 Module identification:

All modules or groups of modules must be named with the owners name on the underside of the module in an easy to read location.

3.0 Rolling Stock Standards

The following standards are designed to facilitate interchange, smooth operation, and reliable performance of rolling stock.

3.1 Trains to be operated on the layout should be inspected for conformation with National Model Railroad Association (NMRA) standards such as wheel gauge, weight and Kadee or Kadee compatible couplers.

3.2 All freight cars, passenger cars, powered and non-powered locomotives should be inspected before they are first used on the layout.

3.3 All cars should conform to the NMRA (National Model Railroad Association) RP-20 weight practice for HO scale, that is, 1-ounce plus 1/2-ounce for each inch of car length. (For example, a 6-inch car should weigh 4-ozs, and a 7-inch car should weigh 4 1/2-ozs). Car weight should not be less than 5%, or over 10% of the standard.

3.4 All weights, loads, and containers should be securely fastened to the cars so that they will not fall off when the cars are inverted.

3.5 All cars should have Kadee® or Kadee-compatible couplers, except locomotives that may have a dummy front coupler. All couplers must be in good repair, and be set to match the Kadee coupler height gauge within 0.03-inches (1/32-inch).

3.6 All wheel flanges should conform to the NMRA RP-25 wheel contour practice. Metal or plastic wheels are acceptable, but no dirty or worn wheels are permitted. (A worn wheel is a wheel having a sharp flange, or missing the proper contour.)

3.7 All wheel gauges should conform to the NMRA S-4 wheel gauge standard.