NORTHWEST PACIFIC Z SCALERS CLUB MODULE STANDARDS

DECEMBER 21, 2002

INTRODUCTION

This document contains the Northwest Pacific Z Scalers standards for module construction. The overall purpose of these standards is to:

- lead to some really good-looking modules which will stand out at public shows, and which we can be proud of for years to come.
- give a certain degree of consistency to the trackwork from module to module.
- allow all types of Z railroad equipment to operate, regardless of length or height.
- allow trains to run at fairly high speeds without looking toylike.
- show off the strong points of Z scale, and maybe do some things those big-scale modules can't do!
- inspire our imaginations as modelers and train-runners.
- make module operation as fun as it can get!

These standards apply to all modules assembled into a Club-operated layout for display at train shows, and to Club members' modules connected to a multiple-club Z layout.

EXCEPTION -- A Club member's **private layout** does **not** need to follow any of the Club standards. You are welcome to display any private layout at train shows, as long as the private layout's track is not connected to the Club's modular layout. Private layouts which follow the Club's modular design guidelines may be connected to the Club's modular layout.

STANDARDS, RECOMMENDED PRACTICES, AND MODELING SUGGESTIONS

The module standards are grouped into three categories: Standards, Recommended Practices, and Modeling Suggestions.

- **A Standard is a guideline which must be followed at all times by all modules assembled into a Club-operated layout at a public display**. Standards are set-in-stone design rules from which no module in the Club layout can deviate.

- **A Recommended Practice is strongly recommended for all modules displayed in public by the Club.** Modules may deviate from a Recommended Practice if necessary, but modelers are urged to follow the Club's Recommended Practices whenever possible.

- **A Modeling Suggestion is not required. Module builders are encouraged to try Modeling Suggestions if they are interested in doing so.** The purpose of a Modeling Suggestion is to inspire the individual module builder to try a particular approach which might add to a module's appearance and operating appeal.

IMPORTANT NOTE. You will see that many Standards and Recommended Practices apply only to the double-tracked mainline on a module. Secondary or "scenery" tracks on a module may be exempt from a particular Standard or Recommended Practice. Each Standard and Recommended Practice is different, so read through each one to see how it applies.

MODULE STANDARDS

All modules taking part in a Club-operated layout at a public display must adhere to the following Standards.

STANDARD 1: THE Z-BEND TRACK MODULE STANDARD

The club standard for modules is basically the Z-Bend Track module standard, plus a few club standards. Modules must follow the Z-Bend Track specifications, except where the Club has adopted a different standard. The Z-Bend Track standard deals mainly with the interfaces where modules join together.

The Z-Bend Track standard is available online at http://zbendtrack.com . The important points you'll need to know are there. The complete standard, including wiring and benchwork sections, is available as an Adobe Acrobat file. Talk to the Club Secretary for a copy of this file, or a printed paper copy.

Z-Bend Track modules use a double-track mainline. Builders are free to add other secondary "scenery" tracks to modules. These might include branch lines, spurs, yards, sidings, and station tracks. Note that some of the following standards apply only to the mainline tracks, and not to the secondary tracks.

STANDARD 2: MINIMUM RADIUS OF 15 INCHES (380MM) ON *VISIBLE* MAINLINE CURVES

Mainline tracks must have a minimum radius of no less than 15 inches wherever they are visible to the public. The Club will offer tips for designing end modules and intersection modules to meet this standard.

There is no minimum radius requirement for secondary and scenery tracks. They can use curves of any size. However, remember that Z scale locomotives have practical limits to the sharpness of the curves they can go around without slowing down, stalling, or derailing.

STANDARD 3: MINIMUM RADIUS OF 8-5/8 INCHES (220MM) ON *HIDDEN* MAINLINE CURVES

Mainline curves may be as tight as 8-5/8 inches (220mm) in radius, **as long as the portions of the curves tighter than 15 inches in radius are hidden from public view** in tunnels, behind backdrops, under buildings, etc. The hidden portions of the track must be sufficiently accessible for cleaning track and clearing derailments.

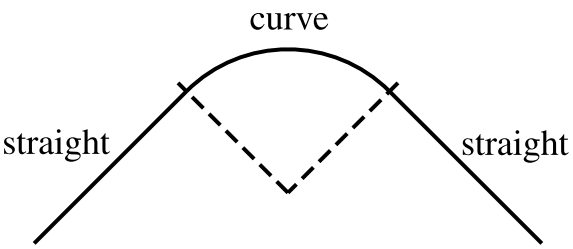
Whenever possible, it's a good idea to use a slightly larger minimum radius for hidden tracks, such as 10 or 11 inches. Some of the recently-released locomotives may still slow down somewhat on 8-5/8 inch curves. Future releases, such as articulated steamers, may need wider curves, so it may be good to plan ahead!

There is no minimum radius requirement for secondary and scenery tracks. They can use curves of any size. However, remember that Z scale locomotives have practical limits to the sharpness of the curves they can go around without slowing down, stalling, or derailing.

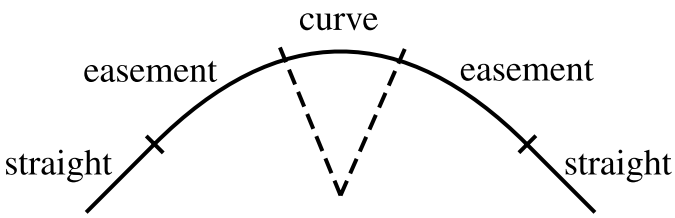
STANDARD 4: EASEMENTS ON MAINLINE CURVES

Easements must be used in all mainline curves. Easements are **not required** on secondary and scenery tracks. An easement provides a smooth transition between the straight portion of the track and the sharpest part of the curve. Here are illustrations of what a curve looks like without easements, and what it looks like once easements are added.

CURVE WITHOUT EASEMENTS



CURVE WITH EASEMENTS

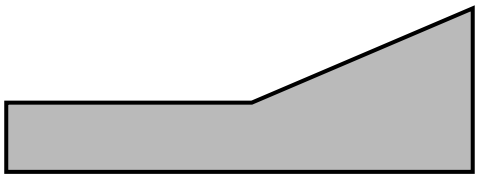


Ask other Club members for tips on building curve easements. The NMRA publishes standards and "how-to" tips for building easements in trackwork.

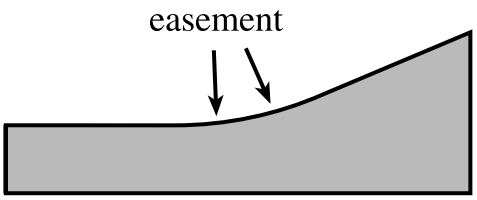
STANDARD 5: EASEMENTS ON MAINLINE GRADES

Easements must be used at the top and bottom of all mainline grades. Easements provide a smooth transition between level track and sloped track. Easements are **not required** on secondary and scenery tracks, though they are an especially good idea on the steeper slopes sometimes used on secondary tracks. Here are illustrations of a grade without an easement, and a grade with an easement added.

GRADE WITHOUT EASEMENT (side view)



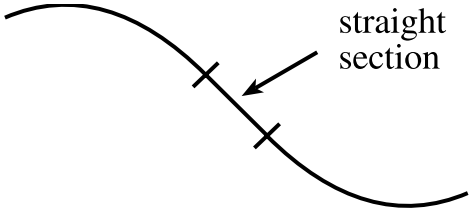
GRADE WITH EASEMENT



Ask other Club members for tips on building grade easements.

STANDARD 6: 4-5/16” (110mm) OF STRAIGHT TRACK BETWEEN OPPOSING CURVES IN AN “S” CURVE ON THE MAINLINE

Anywhere an "S" curve occurs on a mainline track, a length of straight track no less than 4-5/16 inches (110mm) must separate the two opposing curves, including their easements. This standard **does not apply** to secondary or "scenery" tracks, though it is a good idea. Here is an example of an “S” curve with a straight track between the curves.



The crossover between two turnouts forms an “S” curve, but this is unavoidable and will be allowed, even between mainline tracks.

STANDARD 7: MODULE HEIGHT OF 50” AT THE RAILHEAD AT MODULE INTERFACES.

Mainline track must be 50 inches from floor to railhead at all module interfaces during public displays.

STANDARD 8: MARKERS AT CENTERLINE OF MODULE ENDS.

Module ends must be marked on their centerlines to help align modules during assembly. A small finish nail makes a good marker.

RECOMMENDED PRACTICES

The following Recommended Practices are not requirements, but they are recommended for all modules displayed in public by the Club. Modules may deviate from a Recommended Practice if necessary, but modelers are urged to follow the Club's Recommended Practices whenever possible.

RECOMMENDED PRACTICE 1: EASEMENTS ON SECONDARY "SCENERY TRACK" CURVES

Easements are strongly recommended in all secondary track curves, where possible. The amount of easement of secondary curves is left up to the judgment of the individual modeler.

RECOMMENDED PRACTICE 2: EASEMENTS ON SECONDARY "SCENERY TRACK" GRADES

Easements are strongly recommended at the top and bottom of all secondary track grades. The amount of easement of secondary grades is left up to the judgment of the individual modeler.

RECOMMENDED PRACTICE 3: STRAIGHT TRACK BETWEEN OPPOSING CURVES IN AN "S" CURVE ON SECONDARY TRACKS

Anywhere an "S" curve occurs on a secondary track, it's a good idea to add a length of straight track one locomotive length or longer between the two opposing curves, (including their easements, if easements are used).

The crossover between two turnouts forms an "S" curve, but this is unavoidable and can be left as it is.

RECOMMENDED PRACTICE 4: A 1" MINIMUM BASE LEVEL BETWEEN BOTTOM OF MAINLINE CROSSTIES AND TOP OF BENCHWORK AT MODULE INTERFACES.

Modelers should build their mainline trackwork on top of a layer of material which will allow modeling downward below the level of the crossties. This material should be at least one inch thick between the bottom mainline crossties and the top of the benchwork at the module interfaces. A common example is an inch-thick slab of polystyrene foam glued to the top of a module's benchwork. Subroadbed on risers is a suitable alternative to building on a solid layer of material.

RECOMMENDED PRACTICE 5: A REASONABLY PROTOTYPICAL OPERATING SPEED WILL BE OBSERVED AT ALL PUBLIC SHOWS.

Since model railroad curves are almost always much sharper than prototype curves, model trains go around them at speeds which would be unthinkable in the real world. This is a compromise that must be made. However, above a certain speed, a model looks very unrealistic and toylike as it rounds curves. Excessive speed detracts from the realism of a layout. What is "too fast" and what isn't is a matter of personal taste. But the Club is urged to settle on a general rule of thumb for the maximum scale speed allowed on a track with curves of a given radius.

Note that broader curves allow realistic operation at higher speeds. This is another reason to build the broadest possible curves into mainline trackage.

MODELING SUGGESTIONS

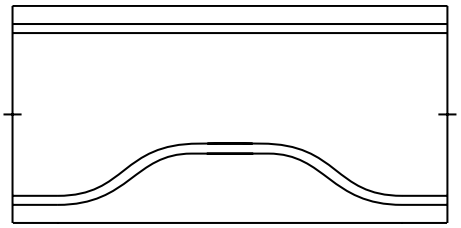
These Modeling Suggestions are not requirements. They are simply ideas you might want to try if they interest you
.

MODELING SUGGESTION: BENT MODULES.

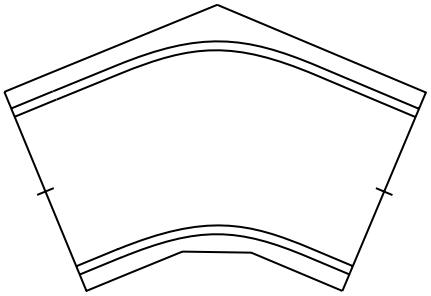
Many module standards use straight, rectangular modules with the track interfaces a fixed distance from one edge. If a modeler wants to curve the mainline, he or she must bend the track away from one module interface, and then back again to the interface at the other end, all in a fairly short space. This can lead to cramped-looking curves.

A module following the Z-Bend standard can be almost any shape. This means that angled modules can be built: not just 90-degree corners, but 60-degree elbows, or 41 degrees or 17 degrees or 3 degrees -- whatever one feels like making. As long as the track at the interfaces is perpendicular to the ends of the modules. By building a bent module, one can easily model a broad, sweeping curve much wider than the 15-inch minimum radius.

STRAIGHT MODULE, TIGHT CURVES



BENT MODULE OF SIMILAR SIZE, WIDE CURVES

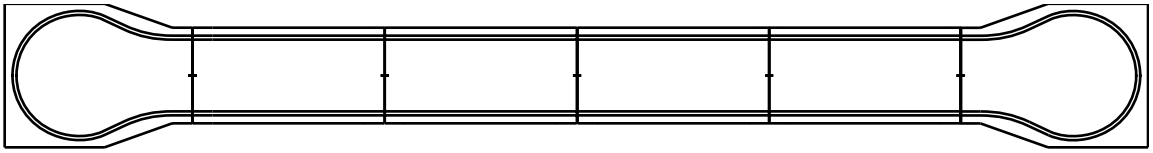


For example, one could build two modules, in each of which the track curves through 20 degrees. By connecting the two modules together, a 40-degree bend would be formed (with a few inches of straight track in the middle where the two modules join, as required by the Z-Bend standard). By removing one module, spinning it 180 degrees, and connecting its opposite end to the other module, we would get a smooth S curve: 20 degrees one way, a straight transition, and then a 20-degree curve the other way.

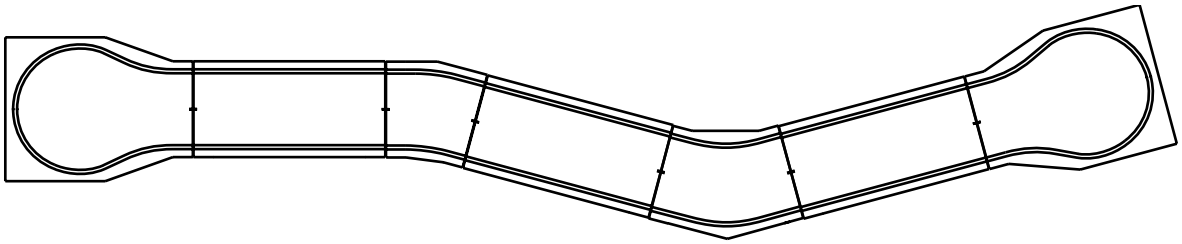
In all but the flattest parts of the world, real railroads are not perfectly straight for very long. Yet many modular layouts feature straightaways connected by 90-degree corners. By building even slightly-bent modules and then connecting them together, we can build a layout that looks much more like a real stretch of track. Even a small deviation of 5 or 10 degrees per module will catch the eye.

The following diagrams illustrate the difference in appearance between an all-straight modular layout and a layout with a few bends in it.

LAYOUT WITH ALL STRAIGHT MODULES



LAYOUT WITH 15-DEGREE AND 30-DEGREE BENT MODULES



MODELING SUGGESTION: SUPERELEVATION OF TRACK ON VISIBLE MAINLINE CURVES.

Superelevation can add to the appearance of mainline curves, and makes trains look more lifelike while rounding them, especially at moderate to high speeds. The Club will provide how-to tips to aid modelers in superelevating the mainline curves on their modules. There has been discussion of superelevation techniques on the Z_Scale internet group. The NMRA should have helpful documents as well.

MODELING SUGGESTION: SCENERY FOLLOWS CURVES.

Real railroads like to lay track in straight lines as much as possible, and when the right-of-way curves, it has a good reason for doing so. When designing curves in mainlines, modelers are encouraged to build geography which gives the curves a reason for being there. Examples are mountain passes, riverbanks, hillsides, and valleys between hills. Building on top of a base layer of foam or other material makes it much easier to form these features.

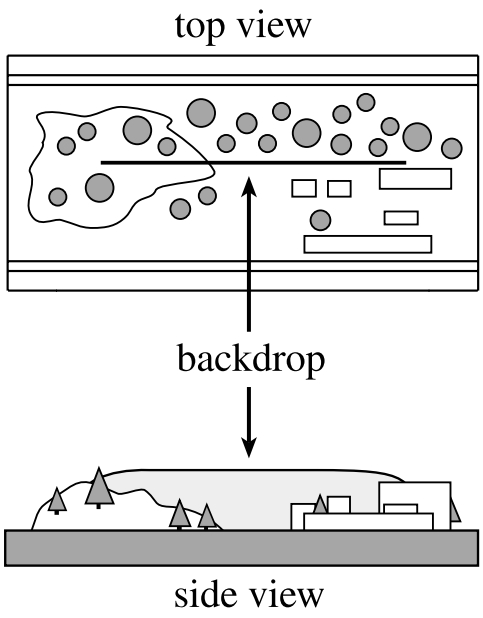
MODELING SUGGESTION: MULTIPLE-SECTION MODULES.

For added freedom in modeling, modules could be built in separate sections. Modules of two parts, three parts, or more could thus be very large or oddly shaped, yet “break down” into smaller sections for easy transport. The sections would be designed to fit together, and the ends of the multi-section module would be designed to the Club specifications to fit together with other builders’ modules.

MODELING SUGGESTION: SKYBOARDS OR BACKDROPS BETWEEN MAINLINES.

One possible drawback of the Z-Bend module standard is that two mainlines are required on each module. This makes it hard to design a one-mainline scene like a mountain pass. By building a skyboard or backdrop down the middle of a module, a modeler can split the module into two halves, with a mainline running along each half. With the module at a reasonable viewing height, an observer will only see one half at a time. This way, a desert scene could be built on one side of a module and a mountain scene on the other, and the scenes will be visually separated. With a two-foot-wide module, each scene would be only one foot deep, but narrow scenery can help to focus the scene on the track.

MODULE DIVIDED BY BACKDROP



MODELING SUGGESTION: FREELANCED LAYOUT "FINGERS".

Large home-layout trackplans published in magazines often use "fingers" or "peninsulas" of benchwork to increase the length of the mainline and allow more room for modeling. Modules could be built which allow the outermost track of the standard double-track main to diverge and loop around a free-lanced peninsula. The peninsula could be formed by several sections for extra length, if the modeler chooses to do so. The club standards for mainline trackage (radius, easements, etc.) would still apply, but the geometry of the peninsula sections would be up to the individual modeler.