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By giving structures unique names and detailing, you can set them apart from otherwise identical models. This HO building is marketed as a hobby shop by Walthers, but I turned it into a TV and appliance store by adding some interior details, a new exterior wall sign, and a hanging sign made from a photograph. The window signs—made from old advertising materials—make it apparent that it's the early 1960s.

# Introduction

As stationary models, structures are, in effect, part of a layout's scenery. Structures help set the tone and mood of a layout, as they establish the era, region, and often the exact town or locale of a layout or scene.

More and more structures are becoming available in built-up form, but there's still a tremendous variety of structures still available in kit form. These range from basic (four walls and a roof) plastic kits to complex plastic, resin, or wood models with hundreds of pieces. And with the Internet, it's easier than ever to track down out-of-production kits, materials, and details through eBay and other online sources.

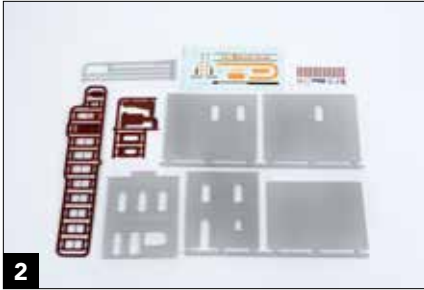
If you're just getting into the hobby, building a simple plastic structure kit is a great way to get started in model

building. The beauty of building a structure kit is that, unlike a freight car or locomotive, it doesn't need to stay on the track: you have more of a margin for error. Building a basic structure gives you experience in working with basic tools, adhesives, paints, and other materials—and helps build confidence for your next model.

The beauty of modeling structures is that there are so many ways of customizing them, making them unique to your layout (and different from the thousands of otherwise-identical models on other layouts across the country). The way you paint and weather them; add interior details and lighting; and personalize them with signs—all add to realism and make structures distinctive.

As with many other facets of the hobby, you can take structure modeling and detailing to any level you desire. In general, the larger your layout, the more you have to concentrate on the overall effect as opposed to giving every model a high level of detail. However, if you have a smaller layout with fewer structures, you can get more adventurous with weathering, interiors, lighting, and other details.

Although this book does have a few how-to projects in it, it is designed as an idea book—the techniques, ideas, and concepts are meant to apply to any project you're working on. Likewise, although most of the models in this book are HO scale, the fundamentals carry across all scales.



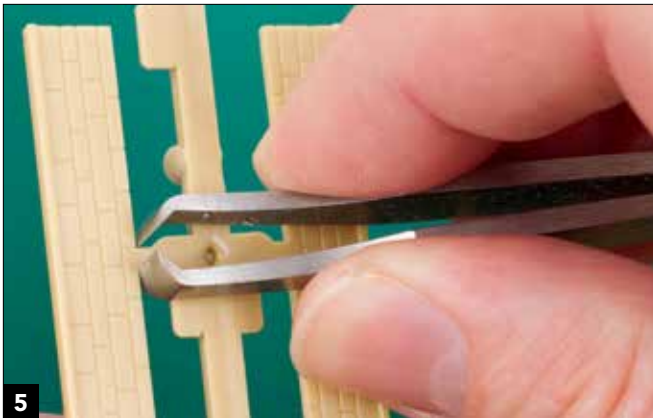
Take a quick inventory of all kit parts and become familiar with them. This HO storefront building from City Classics is a basic kit and contains walls, a roof, and window and door castings, as well as signs and graphics.



Sprues often include identification numbers next to their respective parts. Leave the parts on the sprues until you need them.



A hobby knife with a straight blade (no. 17) works well for removing parts from sprues (and mold gates from parts). Working on a self-healing cutting mat helps preserve blades.



Tweezer-style cutters, like these from Micro-Mark, cut parts from sprues very cleanly. They work best on small, thin sprues.



Larger sprue cutters, like these from Xuron, look like wire cutters, but they cut with a shearing action. They can be used on large parts and thick sprues.



Carefully shave any sprue remnants from parts with a sharp hobby knife. Go slowly and use several passes to avoid gouging parts.

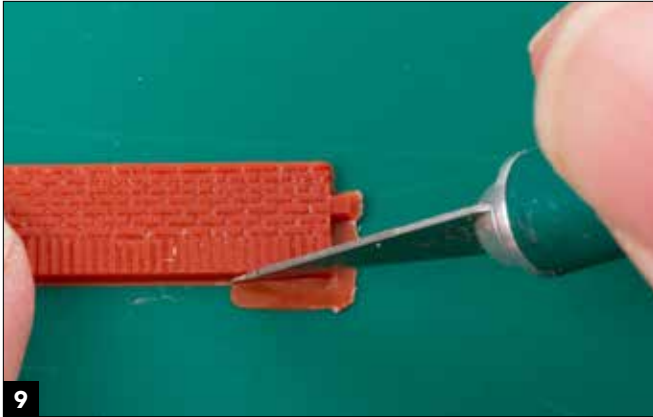


You can use a sanding stick or file to clean up sprue marks or touch up areas where you use a knife.

Kits are made from a variety of materials, but the bulk of them are wood or injection-molded plastic. Resin, metal, and plaster are also used as primary building materials. Mass-produced plastic kits have been produced since the 1950s, and

indeed, some individual kits have been around since that time—often appearing under the labels of many manufacturers. Other kits have been produced in limited runs, a practice especially true for wood and resin buildings.

The best way to get started with building structures is with a simple plastic kit. Whether an injection-molded kit has a dozen pieces or 300, the steps are the same. Once you get the hang of basic modeling techniques, you can move to a more complex



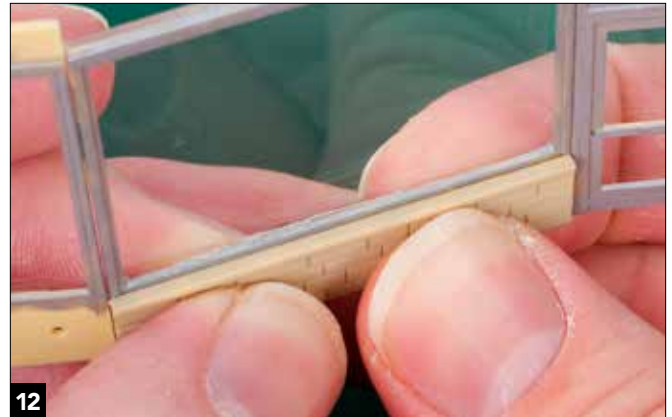
**9** Flash is stray plastic that oozes out along the mold seams. Trim it away with a knife and then file or smooth the area if necessary.



**10** Use a brush (in this case, the brush inside the bottle cap) to apply liquid plastic cement to the joint between a window frame and the wall. Capillary action draws the liquid into the joint. Do this at the rear (nonvisible area) of a joint.



**11** Gel-type cement is good for adding details, such as this brick panel on a wall face. Use the bottle's applicator to apply the cement along the part.



**12** Making sure the alignment is correct, press the part in place until the joint holds.

plastic kit and then to a laser-cut wood kit, a resin kit, or a modified or scratchbuilt structure.

## Basic steps

When starting a kit, it's tempting to just dive in and start putting the pieces together. However, regardless of the material, scale, and prototype, there are a few basic steps you should do before getting out the knife and glue. The first is removing all the parts from the package and taking a quick inventory, **2**. Make sure all of the parts are there—parts sometimes fall off sprues, or a kit might be missing individual components. Also familiarize yourself with the parts—two or more parts might appear identical when in fact they are not.

Instructions can range from a simple exploded-isometric diagram to multiple pages of detailed step-by-step assembly.

If you're reasonably new to the hobby, first read through all the instructions. And even if you're an experienced modeler, it doesn't hurt to go through the steps to see if there are any unusual assembly sequences—some of these can be difficult to undo if done out of order, and on complex kits, these steps might not be readily apparent until it's too late to fix.

Prior to assembly, determine how you want the finished structure to look: How do you want to paint and weather it? What signs do you plan to add? Do you want to include interior details? Are additional roof or exterior details needed? Do you want to incorporate interior or exterior lighting?

Any of these factors will influence how you assemble the structure. As you'll see in chapter 5, interior details and lighting need to be planned ahead

because, by the time you glue a roof in place, it's often too late to go back and add them later.

Wood kits require painting, which makes them seem more complex, but it's a good idea to approach all structure kits as requiring painting. Manufacturers today usually mold their plastic kits in, as they say, "appropriate colors," but unfortunately unpainted plastic—regardless of the color—almost always looks like unpainted plastic. A quick coat of paint will improve the appearance of any kit.

Before starting assembly, determine whether you need to paint individual parts before putting them together, whether you can partially assemble a kit and paint it in subassemblies, or if you can fully assemble it before painting. (Chapter 7 provides details on painting.)





**29** David Popp kitbashed this paper mill complex on Kalmbach's HO club layout using a variety of kits, including several Walthers Lakeville warehouses, a Pikestuff engine house, a Walthers Magic Pan Bakeries, and Kibri tanks.



**30** Jim Hediger rearranged walls from several Walthers machine shop kits to create this appliance factory. The Rix tank at left helps hide the rear structure joint with the backdrop.

along a backdrop to go with my modular building, so I tried two versions: leaving the two-story building as-is and doubling the length of the one-story section, **25**, and moving the rear wall to the front of each section and doubling the length of the entire building, **26**.

I also played around with making the building a more square industrial-type free-standing structure, although

at least one more kit would be needed for this version, **27**. The last version I toyed with—and one that I may proceed with—is converting just the two-story section of it into a school, **28**. In playing with the wall sections, I found it strongly resembled the old high school building in my hometown, in selectively compressed size. But that's a project for another day.

The point is that any one kit can serve as the starting point for several different styles of structures, **29** and **30**.

This chapter can only provide an introduction to the subject of kitbashing. For more in-depth information, take a look at *How to Kitbash Structures* by Tony Koester (Kalmbach, 2013) and *Structure Projects for Your Model Railroad* (Kalmbach, 2014).

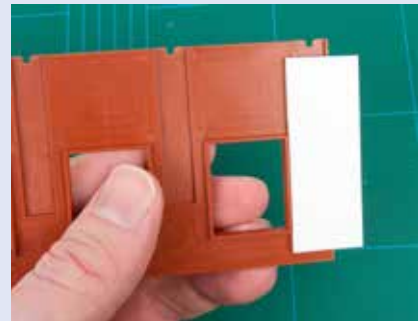
## Kitbashing construction tips



Use a utility knife to cut kit walls. Make several light passes instead of fewer heavy passes.



Any butt-jointed wall joints must be as square as possible to hide the joint. A True-Sander does a nice job of providing clean edges.



As with modular structures, back wall joints with a piece of thin styrene to strengthen the joint.

When modifying buildings, you'll find yourself having to cut walls and other components. For thick walls, a razor saw or utility knife works better than a hobby knife—use a straightedge as a guide, and try to cut walls at a wall feature, such as a pilaster or post.

Be sure corners and mating edges are square before trying to join them. Reinforce joints with small backing pieces of thin sheet styrene, and reinforce corners as well.

Structures can also be modified by changing roofing and wall material: replacing

shakes with shingles, adding rolled roofing over existing roofing, or laying corrugated metal siding or roofing over existing walls.

Roofs of many kitbashed buildings, such as the potential modifications shown in photos **25–27**, usually require

substantial modification. It's often easiest to discard the kit's roof sections and start over with commercial roofing material.

Chapter 4 provides ideas for scratchbuilding materials and techniques that will also work for kitbashing.



This 1941 photo of Swift's Caldwell, Idaho, branch house was the inspiration for my HO scale model. I didn't try to create an exact copy; instead, I wanted to capture the overall flavor of the real thing. *Library of Congress*

## Raw materials

Let's look at the raw materials, starting with plain sheet and strip material, **3**. Plain plastic and wood sheets are great for basic structure shells, walls, bases, and roofs. My first choice is usually styrene:

- It's inexpensive
- It's easy to cut, shape, and glue
- It's dimensionally stable
- It's unaffected by temperature and humidity

Sheet styrene is made in thicknesses from .005" to .125" (and even thicker), with .010", .020", .040", and .060" sheets especially handy. Clear styrene (usually .005" and .015") is generally my first option for window glazing.

You'll find strip styrene useful for many purposes, including interior bracing, window frames, trim, railings, molding, wall caps, and other details. It's typically sold in packages and usually sized in thousandths of an inch (such as .020" x .040"), but in some cases, it is available by prototype dimensions, such as HO scale 4 x 6.

Evergreen and Plastruct are brands readily available in hobby shops or online. If you're working on large projects, and you live in or near a large metro area, I highly recommend finding a plastics wholesaler (check the Yellow Pages or online) as a source. You can get styrene in various colors and other types of plastic in sheets up to 4 x 8 feet. Many wholesalers also offer cutoffs and scraps, which are larger

than hobby sheets, at very reasonable prices, **4**.

Clear acrylic sheet, such as Plexiglas, is also handy for modeling, forming structure shells and bases, and other uses. It's heavier (generally .100") and thicker than styrene, and very strong—especially effective for large walls. In addition to clear, it's also made in white, translucent gray, and black.

Strip and sheet wood is also available in a variety of sizes and thicknesses, **5**. Unlike styrene, wood is affected by moisture and humidity. It can warp when painted or stained, and the grain can show through paint. Its greatest asset is its appearance—nothing looks more like wood than real wood. It takes stain well and has a naturally varied look.





14

Photos of store shelves provide the interior for this HO City Classics store. A single Miniaturics bulb, run through a brass tube and mounted to a City Classics L-bracket, provides lighting.



15

The interior shelving is visible, but great detail is not needed. Window signs and an interior figure add additional detail.



16

Photos of cartons can be combined, resized, and multiplied to create stacks of cases as large as needed. This one will be glued to a block made from thin sheet styrene at right.



17

Stacks of food cartons behind the open dock doors reinforce that this business is indeed a grocery wholesaler. This is the warehouse building from chapter 3.

## Shadowboxes

A good option for many structures is to build small scenes in enclosed boxes and then glue the boxes in place behind windows and doors. These shadowboxes provide a great deal of detail in a small space, and can also be extended to fairly large areas. The warehouse building has several of them, including a small corner office and an area along the loading dock behind two large doorways, **18** and **19**.

You can build shadowboxes out of styrene sheet (.040" to .080"). Start by measuring the space needed and then assemble a floor and walls from styrene to fit the space. Use mat board for inner walls and glue the walls in place with small drops of cyanoacrylate adhesive (CA or super glue). You can also print your own walls if you want to simulate wallpaper or patterns.

Detail the walls with doors, bookcases, clocks, advertising signs, and other graphics (all easy to print on your own). Glue printouts in place with white glue. Follow this by adding details as needed: boxes, crates, furniture, figures, etc. Test-fit the shadowbox to make sure the details are in places where they can be seen.

You can see a shadowbox for an HO City Classics salon that I detailed as a barber shop in photo **20**. The box slides into place on the first floor of the structure and is glued in place with liquid plastic cement, **21**.

Remember that this detailing doesn't have to be perfect—you want to give the impression of a high level of detail, but viewers looking through windows and doorways won't be able to see small imperfections, and they won't be able to see the rear side of most interior details.

## Interior lighting

If you operate your layout at night, interior structure lighting can add a great deal of atmosphere to the experience. You don't need to light every structure, but having select buildings (and rooms within buildings) illuminated, along with streetlights and other lighted details, helps create a distinctive mood, **22**.

You should decide whether to illuminate a structure early in the construction process. With some buildings, by the time you glue the roof and/or floor in place, it becomes very difficult to go back and add lighting.

Start by determining the type of lighting you want to install, and the specific areas of a structure that you want to illuminate. Some assembled buildings include an interior lamp, **23**. Unfortunately most of these have no interior, and a lighted building with no



**14** To simulate peeling paint, brush patches of rubber cement on a stained wood wall.



**15** Paint the wall, and when the paint dries, use a pencil eraser to scrub off the patches of cement.



**16** The finished wall will look like it's in need of a fresh paint job. The more you rub with the eraser, the more weathered the wall will appear.



**17** For raised surfaces, such as this window header, working slowly, use the side of the brush to dab and push paint to the edges.

To duplicate this on a model, start by determining the color you want to capture. Acrylic model paints work well for making stain—start with a mix of about 1 part paint to 10 parts water (or the thinner for that brand of paint), **10**.

You can also use artist's tube acrylics. My favorite colors for stain are black for any shade of gray, and raw sienna, burnt sienna, and burnt umber for various shades of brown. Squeeze a bit of each color into one recess in an aluminum palette and then add water, **11**. Use a brush to apply the stain (first try it on a scrap piece to check the color), **12**.

Let the stain dry completely. You can then add another coat to darken

the effect or highlight individual boards, which helps sheet material look more realistic, **13**.

Another popular stain mix is India ink and alcohol. Fill a 1- or 2-ounce bottle with common rubbing alcohol and then add a few drops of India ink. Test it on a scrap piece and add more ink if needed.

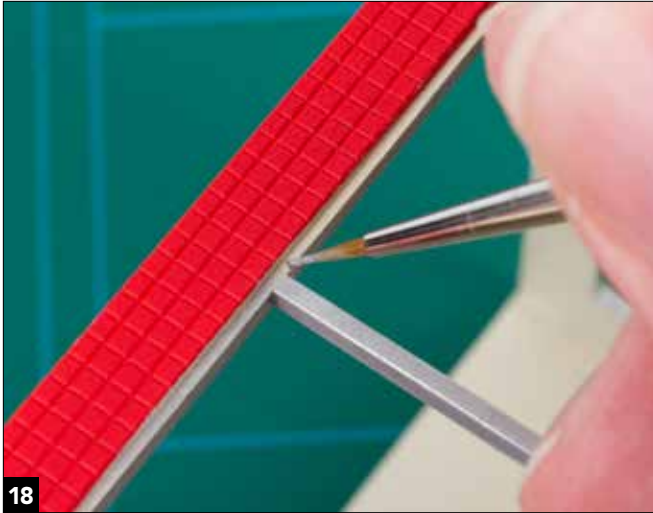
It's a good idea to stain siding and trim pieces before assembly, as glue will keep stain from penetrating the wood. You can build up effects with multiple coats. Start with a lighter color or mix and then follow with an additional coat of stain, building up the color gradually. Let the piece dry completely before evaluating

the color—when dry, the wood will usually appear lighter than when the stain was first applied.

Sheet material will warp when the stain is applied. Staining both sides (or painting the back side with primer) helps reduce the warping. The warping also usually lessens as the piece dries. Let stained wood pieces dry thoroughly before continuing to assemble the kit or gluing pieces together.

Simulating peeling paint is another effect that you can show on wood structures. Start by staining the walls light to medium gray and then assemble the structure. Use a fine brush to apply rubber cement as a mask to





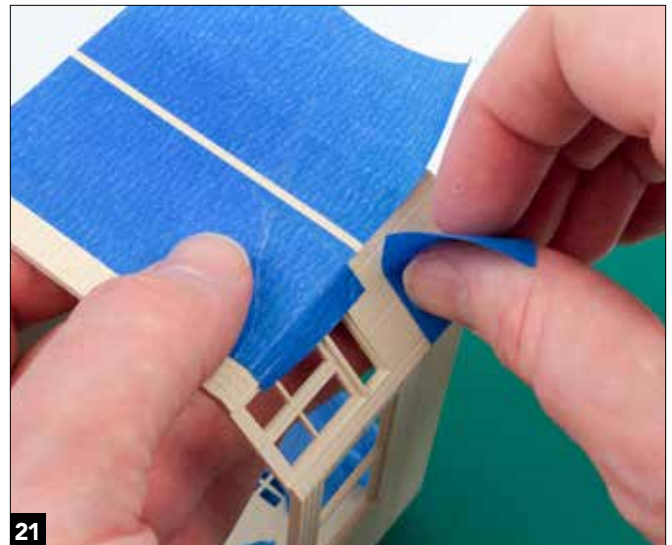
**18** On recessed surfaces, such as this window frame, ease the paint toward the raised surface with the brush angled downward, so only the bristle tips contact the neighboring ridge.



**19** Paint markers, such as this white marker from Sharpie, can also be used to color trim and details.



**20** Cut masking tape on a piece of glass using a straightedge to get a clean edge.



**21** Use multiple pieces of tape to mask the surface. Follow lines on the model surface whenever possible.

small areas along the siding, **14**. Brush-paint or airbrush the walls, and then as soon as the paint dries, rub away the rubber cement with an eraser to leave patches of bare wood showing through the paint, **15**. You can vary this effect from a few small patches to large areas of peeling paint, **16**.

### Detail painting

A lot of details require painting, including window frames, door frames, trim, vents, and other small parts. Whenever possible, paint details separately before adding them to a model. You can stick small pieces to a

piece of tape as a holder to make the details easier to paint.

Many kits—especially injection-molded styrene models—have details molded in place. Paint the main walls first and then proceed to the details. Use a small brush (generally no. 0 or smaller), but one that's as large as practical. Dip just the tips of the bristles in the paint and carefully paint the detail, **17**.

Use the shape of the details to your advantage when painting. For raised surfaces, such as window ledges, dab the brush with the paint on the surface to the edge. Let the surface tension

of the paint keep it from flowing to a neighboring surface. Another trick is to use the side of the brush to dab paint on raised surfaces.

For recessed areas, work the paint slowly to the nearest raised surface, **18**. Keep the brush angled downward so that only the tips of the bristles contact the raised area, which keeps paint in the recessed area.

Paint markers are another choice for details and trim, **19**. The markers don't offer as fine control as a brush, but they are quick and easy to use. As with the window frames seen in the photo, you can get most of the areas covered with



## CHAPTER EIGHT

# Structures and flats from photos

Photos of prototype structures can be resized, printed out, and combined with model buildings. This HO Rexall drugstore has photo-print storefronts on two sides, which are mounted on a Design Preservation Models building.

Earlier projects in this book have shown how easy it is to use photos, scans, and imaging software to reproduce items such as signs, interior walls, and details. You can also use photos and graphics to produce entire building sides or complete structures, 1.



This photo, a slide taken in the 1990s, was the starting point for my HO laundromat. The angle of the photo is good, but the problems are the car parked in front and the hanging sign, which obscures part of the building sign.



I edited the image in Photoshop Elements. I have already fixed the perspective with the Skew tool, and the Clone Stamp tool has taken care of most of the car and the top part of the hanging sign.

As well-detailed as many of today's structure kits are, and as good as we may be at painting and weathering these models, it still can be difficult to capture all the variations and minute details of some prototype structures, especially the appearance of brickwork and old weathered metal or wood siding.

Taking photos of these buildings, then resizing them, printing them, and assembling them can give you extremely realistic buildings that are unique to your layout. You can customize them with signs and other details on the computer, and combine them with other model details (window frames, door frames, loading docks, etc.) to help blend them with other structures.

You can also combine parts from different structures, such as taking a front wall from one building, side walls from another, and door or window frames or signs from still another.

The photo-realistic aspect makes these structures appear quite authentic, especially from a distance, where the lack of three-dimensional detail isn't readily apparent.

## Starting photos

You need a good photo or two of the prototype structure that you're modeling. The best option, if a building still exists, is to take digital photos yourself. If you're taking photos with

modeling in mind, a lightly overcast day is often the best—sunny days result in brighter colors, but also leave dark shadows that can be difficult to fix or hide.

Use a standard-length or smaller telephoto lens (somewhere from 50mm to 85mm) if possible to limit distortion of straight lines in the photo. Take the photo from straight on, centering yourself with the wall, again to limit distortion. Do this with each of the building's walls.

If there are objects in the way, such as parked cars or trucks, light poles, or mailboxes, take photos from several vantage points. This will allow you to choose the best viewpoint later, and also give you the option of blending two or more photos to eliminate the objects.

Over the past several years, I've tried to get into the habit of photographing any old or interesting structures that catch my eye, with the thought that someday they might make good modeling subjects. These photos don't have to be of a complete structure. For example, a photo of a large brick wall is an excellent starting point toward creating another building.

Another option is to scan older color photographs and slides. This is likely your only option if the building no longer exists or has been extensively remodeled. The more straight-on that these are taken, the better, and you'll be

able to correct quite a bit of perspective distortion with photo-editing software. Scan these images at high resolution to preserve as much detail as possible.

You can sometimes find usable photos of structures via the Internet. The Library of Congress photo collection is a great place to search ([loc.gov/pictures](http://loc.gov/pictures)), and you can find many high-resolution color images of structures and signs dating back to the 1940s. Be aware that many photos on the web are low-resolution (typically 72 ppi, or pixels per inch). To print well, a photo should be at least 150 ppi (preferably 240 ppi) at the size you'll be using it.

Be aware of copyright laws when using photos from the web. Remember that the copyright rests with the person who took the photo. You can typically use any photo you find for your personal use, but you do not have the right to distribute the photo (or anything you've made from that photo) to others, regardless of whether you charge for them.

## Straighten and size

Once you have your photos, come up with a plan for the structure. As an example, here's what I did to turn a photo into a structure for an HO scale scene. My original image was a slide that I shot in the 1990s of the King Koin Launderette in LaMars, Iowa, 2. King Koin was a Midwestern chain