Building terrain contours for models and model railroads has evolved and improved over the years due to better products and easier methods of working. The purpose of this chapter is to teach you the easiest and quickest way to make terrain contours with the help of these products and methods. Basic terrain building steps are defined in this chapter.

WOODLAND SCENICS SUBTERRAIN SYSTEM

Model builders have created several ways to build terrain contours involving different materials and varying amounts of required skills. **Woodland Scenics SubTerrain System** is the easiest way to build a base for your terrain contours and landscaping.

With the SubTerrain System there are no expensive power tools required, no complicated calculations and no dusty mess to clean up. You can accurately create grades, or inclines, which permit a model train to change levels and give the layout a more realistic appearance. If grades are not made properly, your train may not be able to climb the grades.

The five steps of the revolutionary Woodland Scenics SubTerrain System make building a base for your layout simple. Install the Risers, Inclines, Profile Boards and Foam Sheets, then stack newspaper wads to form your terrain and cover with Plaster Cloth. It’s that easy.

You can find more information on the SubTerrain System with **Woodland Scenics SubTerrain: A How-To Video**, or **Woodland Scenics SubTerrain Manual.** The SubTerrain: A How-To Video is a step-by-step VHS instruction tape that shows you how to build a model railroad layout with the revolutionary SubTerrain System. It is approximately 60 minutes long.

The SubTerrain Manual is an illustrated, how-to manual that teaches you how to create the ideal lightweight base for scenery and landscaping in five easy steps. Woodland Scenics has made building the SubTerrain System easy, with a line of tools and accessories, shown on pages 22-23.

Woodland Scenics SubTerrain System Tools and Accessories

A Foam Pencils – Foam Pencils have a special lead designed to draw on foam without causing damage. The colors will not bleed through paint or other coverings. Each package contains two red and two black pencils.

B Foam Nails – Use Foam Nails to temporarily pin track, foam, or other products to your layout.

C Foam Knife – The Foam Knife comes with a 2-inch blade that is ideal for cutting thick foam pieces.

D Foam Knife Blades – Replacement blades come four in a package.

E Hot Wire Foam Cutter – The *Hot Wire* Foam Cutter has adjustable collars, allowing for clean, accurate cuts in foam. Woodland Scenics recommends using only on SubTerrain white foam products, which emit no toxic fumes. The Cutter transformer/plug is available for Europe, United Kingdom and Australia/New Zealand.

F Foam Cutter Replacement Wire – This special Nichrome wire retains an even temperature needed for cutting our products. Use only with our Hot Wire Foam Cutter.

G Foam Cutter Bow and Guide – The Foam Cutter Bow and Guide attachment adds versatility to the Hot Wire Foam Cutter. It is used to make precise, angled cuts.

H Foam Tack Glue – This specially formulated glue is high-tack and effective on most materials, especially foam. Use as a contact glue whenever bonding two large surfaces.

I Low Temp Foam Glue Gun – The Low Temp Foam Glue Gun operates at a temperature that will not damage foam. It bonds instantly.

J Low Temp Glue Sticks – Our Low Temp Glue Sticks work in the Low Temp Glue Gun. The sticks are 10-inches long and come 10 to a package.

K Foam Putty – A non-shrinking, lightweight filling material, Foam Putty has the same characteristics as foam.

L SubTerrain: A How-To-Video – Approximately 60 minutes. A step-by-step video that shows you how to build a model railroad layout with the revolutionary SubTerrain Lightweight Layout System.

M SubTerrain Manual – An illustrated manual that teaches you how to create the ideal base for scenery and landscaping in five easy steps.

PLANNING TERRAIN

Few land areas are flat for more than a short distance. *Terrain* of varying heights not only makes the railroad look more natural, but it also adds the illusion of greater space by allowing the trains to briefly disappear from view and then reappear again. Take a look at the plan created for the railroad to see where hills or mountain areas are located. These are some of the first terrain features that will be built.

Use varying terrain areas to create some *view blocks* or obstructions that allow the trains to play *peek-a-boo* with the viewer. Using terrain of varying heights can also help prevent viewers from perceiving that the trains are merely running around in a circle. It is easier to finalize the track plan and lay track before beginning terrain. This allows the exact perimeters of the terrain area to be known.

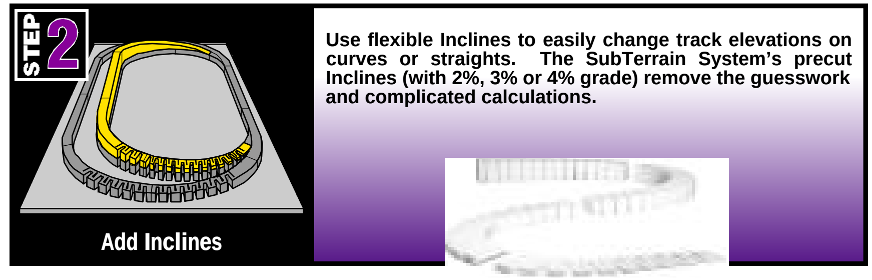
Within a modular group, the available area for terrain features will pretty much be decided by the module specifications. The scenery on a module may be required to be compatible with the other modules or at least the ones that will be located adjacent to it. If a module is planned for part of a rail yard or a city area, there might not be much selection on what type of terrain would be built. The group may want the terrain areas to flow realistically from one module to the next.

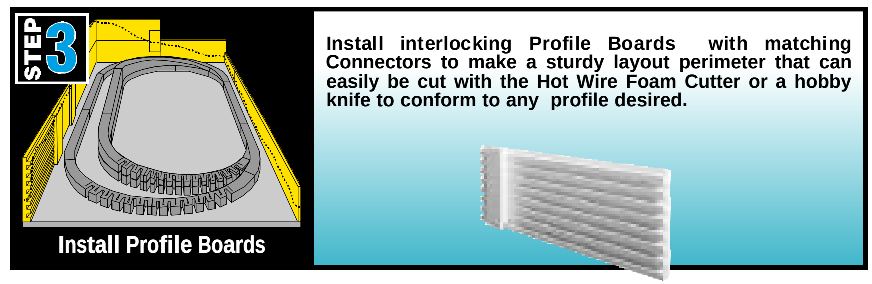
When building a module that will eventually be part of a larger home layout, decide which section to begin building now. Is it a railyard, a section of main line track through a town, or a tunnel area through a mountain? It will be helpful to consider the terrain for the entire railroad before beginning on the first module, but it will not really matter which module is built first.

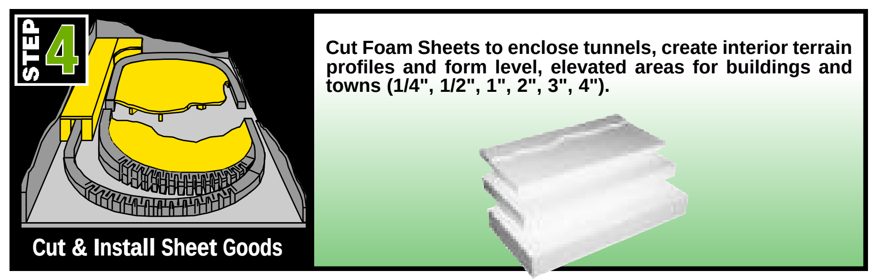
With a larger layout, let your imagination go. Many types of terrain can be included in one layout. Perhaps the entire layout will be mountainous or maybe the mountains will be confined to one area, building up to them with rolling hills and dropping off to nearly level land. Keep in mind that real railroads go from one place to another and they exist for a purpose. Therefore, be sure to plan some room for towns, industries, and rail yards.

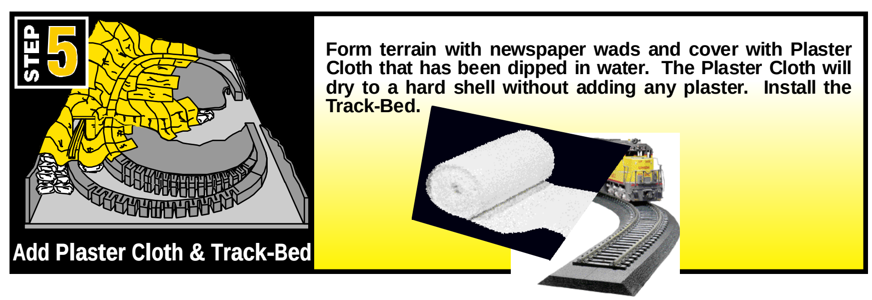
MOUNTAINS, HILLS AND OTHER TERRAIN

There are many terrain possibilities available for the layout. Flat land can flow into rolling hills which rise to become foothills and finally mountains. Any part or all of this chain can be modeled successfully. Remember that mountains seldom exist individually. They are usually grouped together in mountain ranges. The same is true for hills. Groups of rolling hills are much more common than one hill set in the middle of flat land. There is probably not room on the layout to put in entire mountain ranges or groups of hills. This is where selective compression comes into use in developing scenery. By building a mountain or two and using a backdrop that continues this theme, the illusion of an entire mountain range is created.









OTHER TERRAIN CONTOUR METHODS

The SubTerrain System came about from older and much more cumbersome methods of building a layout. Mountain building, developed in the 1920s, came from cutting the desired terrain profiles from plywood and attaching them to the benchwork at intervals in the terrain area. Metal screen wire was then attached to these boards to form the raised shape of the mountain. The wire was covered with paper towels dipped in plaster to complete the form and give it a hard shell. This was a slow technique for building terrain and is difficult for beginners.

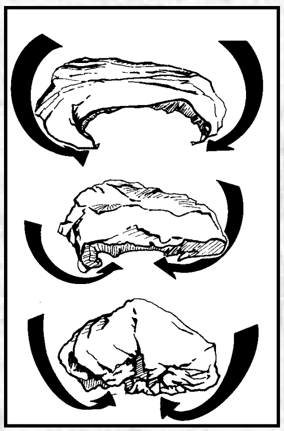
Another method that gained a following was to use *papier-mache* to build the mountains and hills. Papier-mache was inexpensive, but not very desirable. It was extremely messy to work with and took a long time to dry, particularly in wetter climates and wetter seasons of the year. In addition, the adhesive materials in papier-mache are attractive to insects.

BUILDING YOUR TERRAIN CONTOURS

Creating terrain contours on your layout with newspaper wads is quick, easy and inexpensive. It allows even a beginner to do a good job, because it makes experimentation simple. There are no costly materials to ruin or waste, and whole mountains and hills can be moved, made smaller, or eliminated entirely.

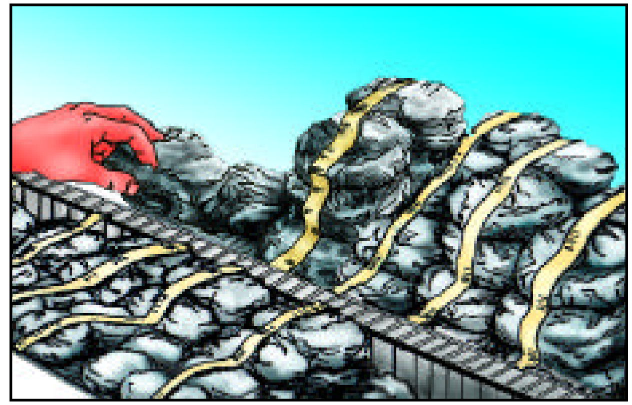
TECH TIP

When making newspaper wads for terrain building, the best shape for the wads are a pillow shape. Start with a sheet of newspaper and roll the edges underneath from each side until a small pillow with a gently curved top, slightly concave bottom, and rounded edges is achieved. These pillow shaped newspaper wads will be easier to stack up than wads of miscellaneous shapes to form the terrain contours.



The newspaper wads are made into a pillow shape and stacked on the layout to from the contours (see the tech tip to learn the pillowing technique). The stacks are held together with masking tape. The mounds of paper help to form the contours of your layout, so arrange them to your satisfaction.

If you have trouble visualizing these mounds as terrain features, place a single



Stack wadded up newspapers on the terrain base to create rolling terrain, hills and mountains. Cover with strips of masking tape to hold in place. The newspaper wads can be rearranged, moved around, added to, or removed in experimenting with different terrain before the final form is achieved.

sheet of newspaper over the wadded up paper and use the **Woodland Scenics Scenic Sprayer** to wet it down with a fine mist of water. The newspaper sheet will conform to the shape that has been created and provide a better idea of how the contours will look. Newspaper wads can still be added or removed as needed.

Be certain that there is enough clearance surrounding the tracks for the trains to get through. Try rolling a boxcar over the tracks to see if it hits any newspaper or derails anywhere because of newspaper wads. If it does, remove a few wads of newspaper. Also notice the places where buildings are planned. Has enough open space been left for the size of building being planned? Although it is easy to remove some of the terrain material later on if needed, save some time by considering these items ahead of time and making allowances for them.

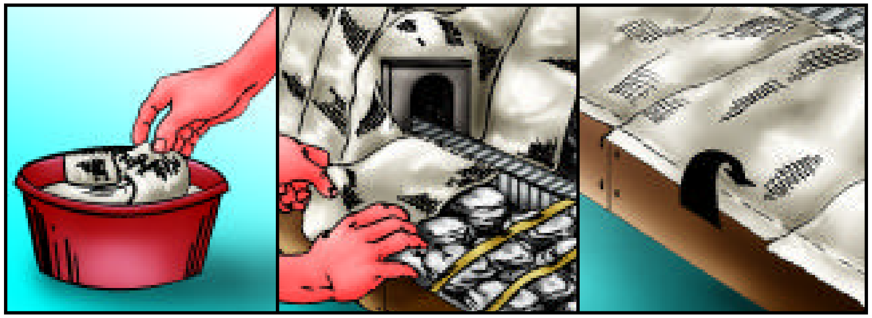
After you have wadded your newpaper "pillow" style, stack them and use masking tape to hold them in place on your layout. Then dip Plaster Cloth strips in water, lay them bumpy side up over the newspaper wads and smooth them with your fingers.

THE TERRAIN SHELL

Plasters have generally been the material of choice to complete the terrain contours on a layout. They are used for creating the hard *terrain shell* on top of the terrain contours, for casting rocks and other items, for filling in holes and breaks in scenery, and for detailing terrain areas. Because plasters are so important, we are going to consider the different kinds, their uses, and properties before continuing to complete the terrain shell.

Woodland Scenics Plaster Cloth is a plaster-coated cloth designed for terrain modeling. Use Plaster Cloth to form a hard shell that easily accepts coloring, rock castings, and landscape material. It is also used to fill in terrain cuts and resculpt around terrain features. Because it comes in a roll, it is easy to cut off to the amount needed to cover the work area. Dip the cloth in water and place it, bumpy-side up, where desired and then smooth it with your fingers. Some modelers prefer to lay dry strips of Plaster Cloth on the newspaper wads and spray them with water. Either way, there is little mess and no left over plaster to harden before it can be used. Plaster Cloth dries completely in about 30 minutes to provide a tough, durable terrain shell.

Hydrocal* and molding plaster have been used by model railroaders for many years for casting rocks and completing the terrain contours. They are very heavy products, making them particularly difficult to use with a module or other layout that will be moved around. When dry, Hydrocal is extremely hard and very difficult to carve. Molding plaster is somewhat easier to carve, but is still not desirable. If you plan to use either of these products to cast rocks, the **Woodland Scenics Rock Molds** can be used with them. The older method of creating terrain contours included plywood profiles, screen wire and paper towels dipped into a plaster and water mix. If you choose to dip paper towels in a plaster and water mix, a lightweight durable terrain shell can be created by using a Hydrocal and water mixture to coat the paper towels. This is a messier procedure than using Plaster Cloth and results in more waste because the plaster usually hardens before it can all be used.



Dip strips of Plaster Cloth into water and lay on newspaper wads, bumpy side up. Smooth with fingers to spread plaster evenly. When the Plaster Cloth overlaps the edge of the layout, be sure to fold it back on itself for a smooth, even edge.

**Hydrocal is a product of U.S. Gypsum*

Woodland Scenics Lightweight Hydrocal is specially formulated for terrain modeling. It is used to cast rocks and to fill in open spaces around plaster castings and as an adhesive for joining plasters and castings. Lightweight Hydrocal is easily mixed with water to form a tough plaster shell, or to pour into molds. See Rock Molds section (page 38) for complete instructions on casting. For maximum strength, mix Lightweight Hydrocal according to the package directions. Even when dry, it can easily be carved with a hobby knife or dental pick to add details or allow rock castings to fit together. Always wet the adjoining plaster surfaces when using Lightweight Hydrocal as an adhesive. Modelers who build modules or other models that will be moved, will particularly appreciate this lightweight product.

Woodland Scenics Mold-A-Scene Plaster is a sculptable plaster that can be shaped without a mold, similar to modeling clay. It is also formulated especially for terrain modeling and can be used to add detail, repair holes and breaks in the scenery, or to change the original contouring. It can be used to build up the banks of a river, blend a raised railroad track into the terrain, or enhance a mountain area that did not turn out quite right. Mold-A-Scene provides the opportunity to work with the plaster, shaping it to fit an area. Mix it with water according to package directions for maximum strength and pack it tightly together for best results. Mold-A-Scene will set up in approximately 20 minutes to a hard, durable plaster surface that can be colored, carved, or detailed.

TECH TIP

Plaster is a porous material which accepts color by absorbing it into the pores. If anything occurs to close the pores on the face of a plaster casting, it will not accept a color wash. Do not sand or mar the face of a plaster casting that is to be colored. A marred area will appear much lighter when stain is applied. If this occurs, daub on more concentrated Earth Color Liquid Pigments. It may help to use a hobby knife to rough up or chip away the lighter areas and then re-stain.

When installing rock castings using the *brick method*, some Lightweight Hydrocal will ooze out around the rock. It can be removed by water carving: that is, spraying with a solid stream of water from the Scenic Sprayer until the Lightweight Hydrocal washes away, (see illustration in Tech Tip on page 39). Or, leave the excess in place until it dries and use a hobby knife to chip it off. Do not use sandpaper.

Glue on the face of castings will prevent the casting from accepting stain in that area. You may want to stain sections of plaster castings before assembling them. If glue does get on a face, use a hobby knife to chip the glue away. Or, daub on undiluted Liquid Pigments. See Coloring Plaster Castings section for additional information.

TUNNELS

As the terrain on the layout is built, be sure to consider some of the optional features that can add both realism and interest to the railroad. These options include tunnels, retaining walls, culverts and rock outcroppings. They are easy to install during the beginning stages of a layout, but can also be added later to a finished layout.

Railroad companies built many tunnels through mountains and hills. They used them as a way to avoid the extra cost and danger of building track over mountains and to shorten the amount of distance between points. If your railroad includes mountains or hills, consider adding a tunnel for realism and to give the trains a chance to briefly disappear from view. There may be a section where a tunnel would be appropriate even if extremely high mountains are not being modeled. But no railroad company would have built a tunnel where there was so little rock above it that a simple rock cut would have been faster and less expensive to build.

Tunnels are most easily planned into the scenery at the time terrain contours are being created. It is usually easier to build the tunnel first and then add the terrain contouring material over it. The track going through the tunnel will need periodic cleaning and there is always the possibility of a derailment inside the tunnel. For these reasons, tunnels need to be constructed so there is access to the inside.

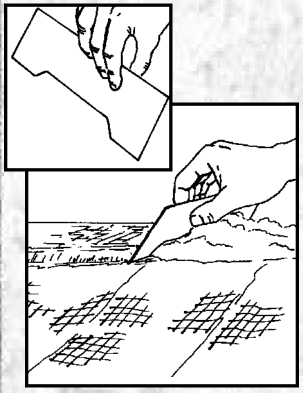
Because the tunnel will be enclosed inside a mountain, it will be necessary to have an opening in the mountain or benchwork to get to the tunnel. The mountain can be left open on the back, if the opening is away from the sight of viewers. This opening allows an access area which can be reached from the back of the layout or underneath through the benchwork, allowing work on the track as needed.

TECH TIP

Lightweight Hydrocal can be used to create terraces, berms, and raised roads. Sculpt these items by cutting a pattern from styrene.

Mix a small amount of Lightweight Hydrocal to a thicker consistency than is recommended on the package by adding extra Lightweight Hydrocal. The thicker consistency will cause fast setting, so be prepared to work quickly. Spray water from the Scenic Sprayer on the surface before applying the Lightweight Hydrocal. Place the Lightweight Hydrocal on the terrain base in the area where the feature is to be located. Use the styrene pattern like a trowel to shape the land feature. More water sprayed on the Lightweight Hydrocal will help to keep it workable while the land form is being shaped.

Tire tracks in roads or other detailing can be marked in the wet Lightweight Hydrocal.



TUNNEL LINERS

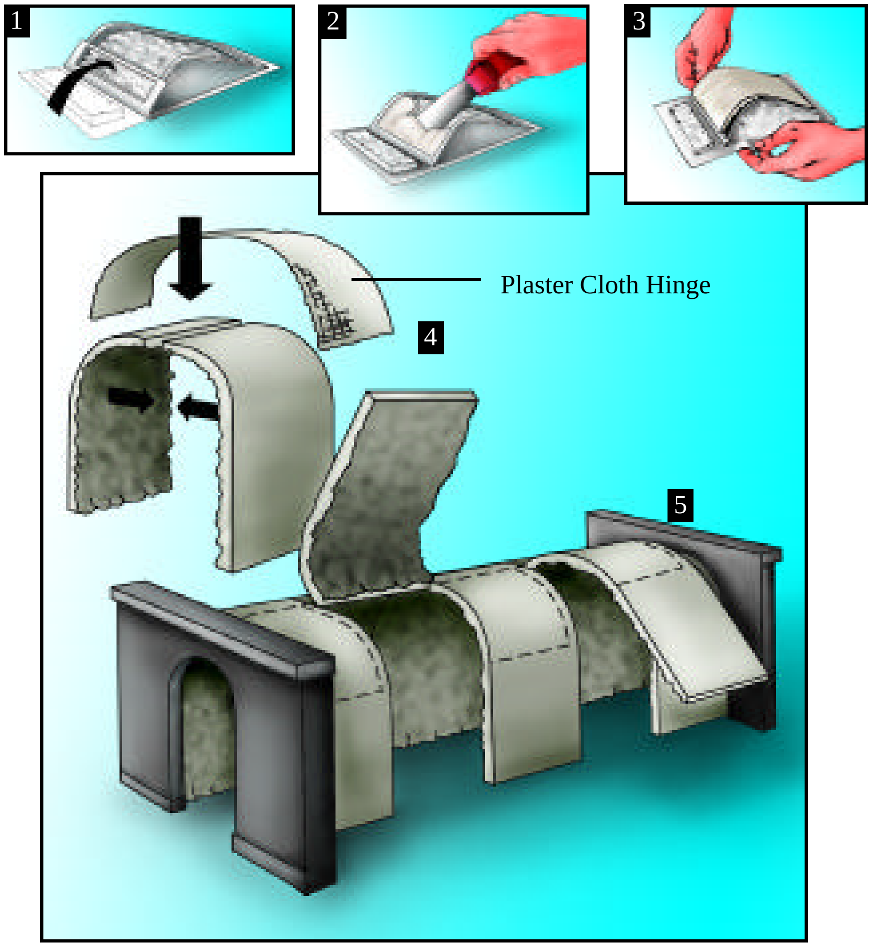
There are two important considerations for tunnels. First, a tunnel must have the proper shape and size to allow the trains to pass through without coming into contact with the tunnel walls. And second, a tunnel needs to realistically resemble the rock from which it has been cut. Woodland Scenics has taken both features into consideration when designing the **Woodland Scenics Tunnel Liner Form**. Each casting from the form with Lightweight Hydrocal will produce one half of a tunnel section in either *single or double track width*. These halves are then connected on the top with a strip of Plaster Cloth which forms a hinge. The entire half of the tunnel liner that will remain stationary is attached directly to the terrain base while the other half can be raised for repairs to the track.

To make a section of liner, mix Lightweight Hydrocal and water according to package instructions. For a double track width, use the entire mold. For single track, fold the bottom section onto the main form area to shorten the top width of the tunnel liner. See the illustration on page 32. Continue stirring the Lightweight Hydrocal until it begins to congeal. Then with a spatula, quickly fill the outside curve (convex side) of the mold with the Lightweight Hydrocal and level it off even with the side ridges. Allow the Lightweight Hydrocal to dry for approximately 30 minutes before removing the tunnel liner from the form. An easy method of removing the casting from the form is to pull out on the two sides of the form, allowing the casting to pop free. Handle the casting as little as possible while still damp. Continue drying the casting overnight before coloring. Make as many sections as are needed for the tunnel length on the layout.

Assemble the tunnel liner by smoothing the edges of all sections and trial fitting. This is the time to add any additional detailing with a hobby knife or to smooth out any holes left by air bubbles in the Lightweight Hydrocal. The inside of the tunnel liner sections should be colored to look like the rock of the terrain area being built. At least part of this tunnel liner will be visible to viewers and will not look natural unless it looks like rock. Coloring the inside of the tunnel liner can be done with **Woodland Scenics Earth Color Liquid Pigments**. Follow the directions under the Coloring Plaster Castings section of this book.

The tunnel liner sections are put together with a strip of Plaster Cloth. Cut the Plaster Cloth as wide as the individual tunnel section and long enough to cover the entire top of the two tunnel liner half sections. Spray the top of the tunnel liner sections with water. Then dip the Plaster Cloth in water and place over the top of the tunnel sections forming a hinge. Even when dry, the Plaster Cloth has enough flexibility to allow one half of the tunnel liner to be raised for servicing the underlying track. If the tunnel is long enough to require more than one of these units, the units can be joined with Lightweight Hydrocal, reinforced by strips of Plaster Cloth on the stationary side. Be sure to spray or paint water on adjoining sections before applying the Lightweight Hydrocal. If the pieces are not wetted first, the Lightweight Hydrocal will not be effective as an adhesive.

As the terrain is shaped with newspaper wads or cardboard strips, create the locations for tunnels and install the tunnel liners. Use Lightweight Hydrocal to attach the entire stationary side of the tunnel liner to the layout, being careful to position the tunnel liner so one side can be lifted. Be sure to wet both plaster surfaces with water before using Lightweight Hydrocal. If appropriate, Foam Tack Glue or **Woodland Scenics Scenic Glue** can also be used for attaching the tunnel liner, but do not wet the castings or tunnel liner area.



1. Fold the bottom section onto the main Tunnel Liner Form to make a single-track width. Use the whole form for a double track tunnel liner. 2. Fill the outside curve (convex side) of the form with Lightweight Hydrocal, leveling off even with the side ridges. Allow Hydrocal to dry thoroughly. 3. Pull out on the sides of the form to allow the casting to pop free. 4. Complete one unit of tunnel liner by joining two half sections on top with a strip of Plaster Cloth. Spray the sections first with water. The Plaster Cloth forms the hinge allowing the tunnel to be opened. 5. Connect units of tunnel liners with Lightweight Hydrocal reinforced by Plaster Cloth on the side, which will not be raised. The units on the side to be raised can all be connected so the whole side is raised as one piece, or the sections can be left separate to be raised individually.

TUNNEL PORTALS

In most instances, railroads finished off their tunnels with tunnel portals. Tunnel portals are the stone, concrete, or timber facings built at the entrances of tunnels to hold back rock and dirt from around the tunnel entrance. Sometimes these tunnel portals carried the name of the tunnel, the name of the railroad building it, or the date it was built. Once the tunnel liner is in place, finish it with a tunnel portal if desired. **Woodland Scenics Tunnel Portals** are made from high-density plaster which can easily be stained and further detailed. They come in both single and double track widths, in various styles, and are designed to fit the castings made from the Tunnel Liner Form. Select the type that best fits the locale and time period being modeled. All of the Woodland Scenics Tunnel Portals have been awarded the National Model Railroad Association's Conformance Warrant for height and width in N and HO scale and are adjusted to handle the tightest N and HO turning radius.

TECH TIP

Although the Tunnel Liner Form is designed to be used in HO scale, it can be modified for other scales. For N scale, both the width and height need to be decreased. One method is to cast the entire mold and cut off the excess with a hacksaw. Or, cut dams from styrene and glue onto the original form to decrease the length and width before pouring the mold. To use with scales larger than HO, make multiple pours of the form in HO scale. Enlarge the tunnel liner by cutting up some of the liners and using these pieces to add on to the height and width of an HO liner. These pieces can be added to the original liner with Lightweight Hydrocal reinforced by Plaster Cloth on the back side.

In many cases retaining walls are used with tunnel portals to stop rock and dirt from falling on the track. If retaining walls are going to be used with the tunnel portal, select and prepare them at the same time. Woodland Scenics Retaining Walls coordinate with the Woodland Scenics Tunnel Portals and can be used individually or in groups.

To apply a Tunnel Portal, remove any rough edges as suggested by the package directions. Trial fit the pieces with the tunnel liner as you work. Should any Woodland Scenics Tunnel Portal or other plaster pieces break while they are being prepared, repair them with a super glue. This product gives the best joint between surfaces, which are smooth and even. Be careful to keep glue off the face of the Tunnel Portal. Stain the pieces according to the instructions for Coloring Plaster Castings.

If used without Retaining Walls, the Tunnel Portal can now be attached to the layout with Lightweight Hydrocal or Scenic Glue. Remember to wet both plaster surfaces with water before using Lightweight Hydrocal as an adhesive. If Retaining Walls are being used, it may be easier to attach them to the Tunnel Portal before installing on the layout. Check for fit. The adjoining corners may need to be mitered to achieve a proper fit. This is easy to do by placing a sheet of sandpaper on a table and rubbing the casting over it until the proper angle is achieved. Assemble the pieces with Lightweight Hydrocal, or Scenic Glue. If using Lightweight Hydrocal, be sure to wet the adjoining surfaces with water before applying. Be careful to keep Scenic Glue off the finished surfaces of the pieces.

Blend the tunnel liner and Tunnel Portal into the terrain surface using newspaper wads or cardboard strips and Plaster Cloth. Lightweight Hydrocal or Mold-A-Scene can also be used to fill in around the Tunnel Portal if needed. A lift-off mountain or lift-out section may be required in some instances to allow access to the tunnel. After the Tunnel Portal is installed, hide any seams, rough edges or repairs with vines made from Woodland Scenics Foliage material. See Chapter 3, Medium Ground Cover, page 75.

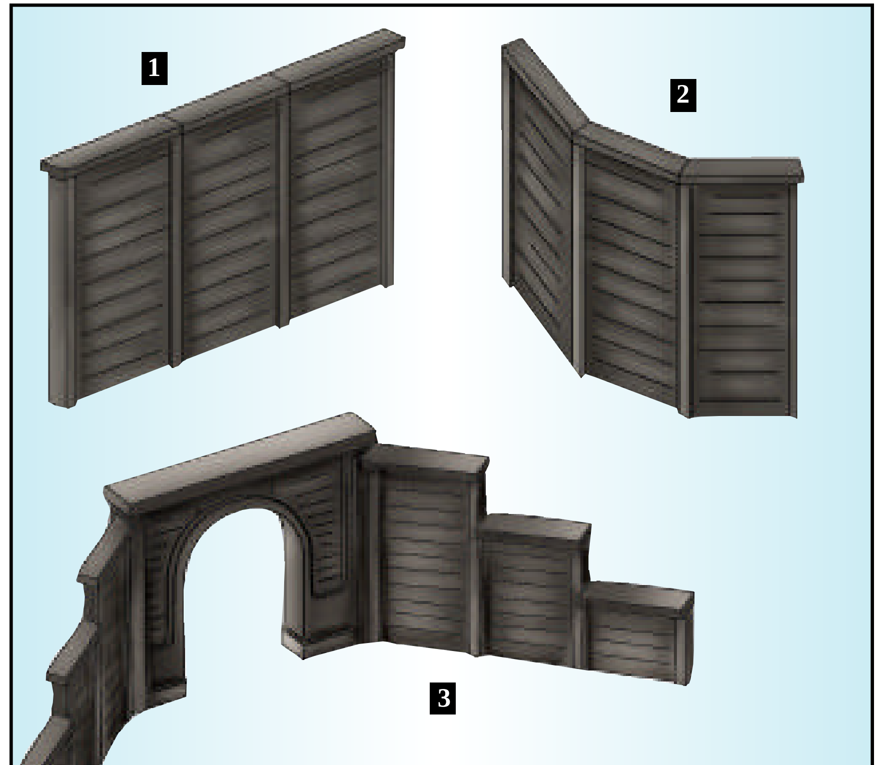
If a tunnel is being added to an existing layout, cut a space into the existing terrain. Then hollow out the inside of the mountain to allow the track to be laid and the tunnel liner, Tunnel Portal and Retaining Walls to fit. Any terrain recontouring that is needed can be done with Plaster Cloth strips or Mold-A-Scene Plaster by filling in cut areas to make the mountain fit snugly against the Tunnel Portal and Retaining Walls.

RETAINING WALLS

Retaining walls are built where terrain cuts and fills are required. They prevent rock and dirt from falling on tracks and roads and they are also used in general landscaping and terrain resculpting. Retaining walls are seen individually, butted together to form longer walls and as extensions of tunnel portals. Sometimes a length of retaining wall is all the same height, and sometimes it is stepped to conform to the shape of the terrain. Retaining walls are often built to fit as required by the terrain.

Woodland Scenics Retaining Walls are high-density plaster castings which can be cut and stained to fit individual needs. They are cast in sections, making it possible to use them in a number of different ways. The Retaining Walls can be used alone or coordinated with the Tunnel Portals.

The wall sections can be used in the same height, stepped down, or mitered to form a curved wall. Assembling the Woodland Scenics Retaining Walls begins with removing any rough edges from all pieces. The pieces must be cut to make stepped walls or extensions of a tunnel portal. A hacksaw is the recommended tool to use. We prefer using a blade with 18 to 24 teeth per inch. To finish the pieces, lay sandpaper on a table and rub the cut edge of the piece over it until smooth. To shorten a Retaining Wall section, cut the unwanted length off the bottom of the piece.



1. Retaining Walls can be joined together in groups as pictured here or used individually. 2. By mitering the adjoining corners, walls can be made to fit around a curve. 3. Trim off various lengths from the bottom of the pieces to form stepped wing walls at the sides of tunnel portals.

If any section breaks while it is being prepared, repair it with a super glue to achieve the best joint between pieces which are smooth and even. Stain the Retaining Walls according to the instructions in Coloring Plaster Castings. Glue the Retaining Wall sections together with Lightweight Hydrocal. Be sure to spray or paint water on the adjoining edges before applying the Lightweight Hydrocal. Scenic Glue may also be used. These adhesives provide the best joint when filling gaps between uneven surfaces. Be careful to keep Scenic Glue off the finished surfaces (see Tech Tip on page 29).

If you would like to fill the joints, use a thin mixture of Lightweight Hydrocal and water. Apply with a fine watercolor brush and allow *capillary action* to fill any spaces. While the joint is still wet, use a brush dipped in water to brush off any excess Lightweight Hydrocal. This is much easier to do while wet, rather than waiting until the piece is dry. The Lightweight Hydrocal used for filling joints will then need to be stained in the same manner as the Retaining Walls.

Retaining Walls can be installed on the layout at the time terrain is being built. They can be used at the sides of tunnel portals or at other areas where the track would have forced cuts in the terrain. Install Retaining Walls by attaching them directly to the terrain base or terrain shell with Lightweight Hydrocal, Flex Paste or Scenic Glue. Adding Retaining Walls to an existing layout will require cutting a space in the terrain material and attaching them. Fill any gaps or repair the contouring with Plaster Cloth strips or Lightweight Hydrocal. After the Retaining Walls are installed, hide any seams, rough edges or repairs with vines made from Foliage material.

CULVERTS

Culverts are drains which help direct water by diverting it under roads and railroad tracks rather than onto them. Culverts are seen in virtually every kind of terrain, including areas where it is usually dry. Normally culvert facings appear in pairs, one on either side of the road or track, and they can be constructed from a variety of different materials. On the layout there are a number of places where culverts can fit in, no matter what type of area or scenery is being modeled. In some instances only one culvert facing will be needed since its partner will be hidden by other scenery items.

Culverts can be installed on the layout at the time terrain is built or they can be added later on. **Woodland Scenics Culverts** are high-density plaster castings that can be stained and further detailed if desired. They are available in a number of different styles which are easy to assemble and install.

To assemble a Culvert, first remove any rough edges, trial fitting the pieces together as they are prepared. Should any section break, it can be easily repaired with Scenic Glue which will give the best joint with smooth even surfaces. Stain the Culvert with Earth Color Liquid Pigments according to the directions under Coloring Plaster Castings.

Glue the sections together with Lightweight Hydrocal to provide gap filling for a joint between relatively uneven surfaces. Scenic Glue can also be used to glue sections together but be careful to keep it off the finished surfaces. See Tech Tip on page 29. Be sure to spray or paint water on the adjoining edges before applying the Lightweight Hydrocal. If desired, fill joints with a thin mixture of Lightweight Hydrocal and water. Apply it with a fine watercolor brush and allow capillary action to fill the spaces. If any excess Lightweight Hydrocal gets on the Culvert pieces, dip the brush in water and brush off before the Lightweight Hydrocal sets. The Lightweight Hydrocal used to fill the joint will need to be stained in the same manner as the Culvert sections.

If Culvert spaces have not been left in the terrain, add the Culverts by using a hobby knife to slice out a small section of terrain material. Then attach the Culvert to the layout with Lightweight Hydrocal being sure to wet both plaster surfaces with water. Scenic Glue can also be used. Any repairs to the terrain around the Culvert can be made with strips of Plaster Cloth to make the Culvert facing fit.

ROCK OUTCROPPINGS

TECH TIP

Sometimes culverts are built so that the drainage pipe running under the road or track is visible. Use a piece of brass or plastic tubing to model this detail.

To make the layout scene look more realistic, the next step is to add the natural terrain features known as rock outcroppings. These come in all sizes from simple field rocks to entire rock cliffs. If you have photos of an actual location being modeled, study them to see what is in the area. Rock outcropping colors and types vary across the country. In modeling a mountainous area, there would be some rock cliffs and rock walls as well as large boulders and surface rocks. In areas of rolling hills there might be rock cliffs leading down to a river bank, miscellaneous surface rock, boulders and perhaps embankments. In flatter areas of the country, field rock, small boulders, and eroded creek and river beds would be seen.

In addition to the differences in the types of outcroppings, different areas of the country feature various geologic types of rocks. Rock from volcanoes or rock that comes to the surface in a molten form is usually more massive. Rock, that was once under great seas, is made from deposited layers of dirt, sand and animal remains. This rock is layered, sometimes with each layer being a slightly different color.

In general, rock outcroppings are added to the layout by casting rocks from Lightweight Hydrocal and attaching them to the terrain shell that has been created. In this manner, one or two outcroppings, or a whole wall of rock can be added to the layout. Woodland Scenics Lightweight Hydrocal is preferred for casting rocks because it is easy to carve, and detail, as well as being light enough for modules or other layouts that will be moved. Rock outcroppings can easily be installed on the layout at the time other terrain features are created or they can be added as a detailing feature to a more complete layout. The rocks can be colored either before attaching them to the terrain shell or after they are in place.

To obtain rock molds, either purchase them pre-formed or make your own molds. Highly-detailed **Woodland Scenics Rock Molds** are available in a wide variety of different sizes and configurations to meet most modeling needs. Also available is **Woodland Scenics Latex Rubber** for making molds of your own. An infinite variety can be achieved in the rocks installed on the layout if several of the Rock Molds are used and if the rock castings are turned and positioned in different ways. Be sure to keep scale in mind when making your own rock molds. Rocks in the real world come in many sizes. But be sure to note the layering and texture of the rocks when planning to make molds of them as those found in the real world may look grossly out of scale on a model.

Smaller rock debris which is continually breaking away from rock cliffs, rock outcroppings, and mountains is known as *talus*. This rock is too small to cast but is packaged by Woodland Scenics. Talus comes in several colors which will blend with many rock colors. Talus can be custom colored in the same manner as rock castings. For more information on the application of Talus, see page 68.

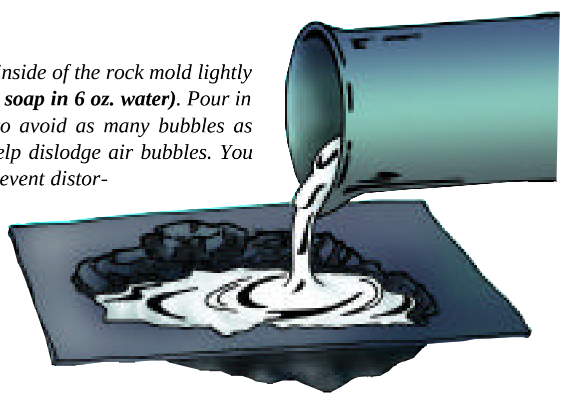
ROCK MOLDS

Before beginning to cast any rocks, decide how they are going to be attached to the terrain shell that has been created. We recommend the brick method of attaching rocks. This method involves casting a number of rocks then installing them on the layout like bricks, fitting and shaping as they are placed. Another method of installing rocks is the shingle method. With this method the rocks are attached to the terrain shell while they are in the molds and the Lightweight Hydrocal is still wet. Either method will work to attach rocks to a terrain shell made of Plaster Cloth or Lightweight Hydrocal.

<u>Casting Rocks</u>: Lightweight Hydrocal is ideally suited to casting rocks because it reduces the weight, and makes carving and shaping the rocks to fit easy. Be sure to use clean bowls and utensils when mixing Lightweight Hydrocal. Dried Lightweight Hydrocal flakes which contaminate a mixture will weaken the castings and alter the drying time.

More variety in castings can be obtained by intentionally distorting the molds before pouring Lightweight Hydrocal into them. Place the molds in a box of sand or wadded up newspapers to hold them in place while the Lightweight Hydrocal is being poured and drying.

In some cases you may find that rock castings removed from the molds are flaking, that is, part of the plaster from the face of the casting remains in the mold. This flaked surface may, or may not, look realistic like rock and it will not accept stain in the same manner as the rest of the casting. One reason for flaking is removing the casting from the mold before it is completely dry. Try lengthening the setting time, perhaps as long as overnight. If there is still a problem, it is probably because the Lightweight Hydrocal and water were not mixed in the proper proportions. Check the package directions and be sure to weigh or measure the Lightweight Hydrocal and water carefully.



To create a rock casting, spray the inside of the rock mold lightly with ***wet water (two drops of liquid soap in 6 oz. water)****. Pour in the Lightweight Hydrocal, trying to avoid as many bubbles as possible. Tap the mold gently to help dislodge air bubbles. You may want to support the mold to prevent distortion. To create variety in castings, distort the mold when pouring in the Lightweight Hydrocal. Allow the casting to dry before removing from the mold. This usually requires a minimum of 30 minutes.*

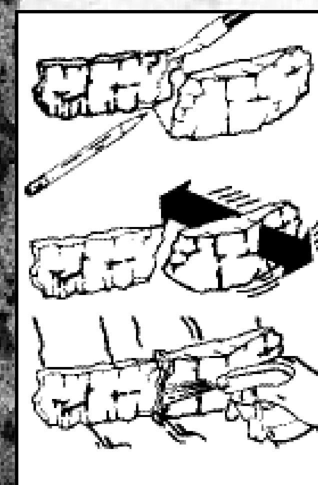
<u>Brick Method of Rock Application</u>: To use rock castings in the brick method, first cast a number of rocks and let them dry. The Lightweight Hydrocal is easily carved with a hobby knife. Do any shaping that is needed to fit the rocks together in the area where you are working. In fact, the rocks will carve themselves if the joining edges of two rocks are rubbed together until they sand each other into a fit. If large sections of the rock casting are to be removed, cut with a knife for a rough fit first. Any additional detailing should be added to the rocks at this time.

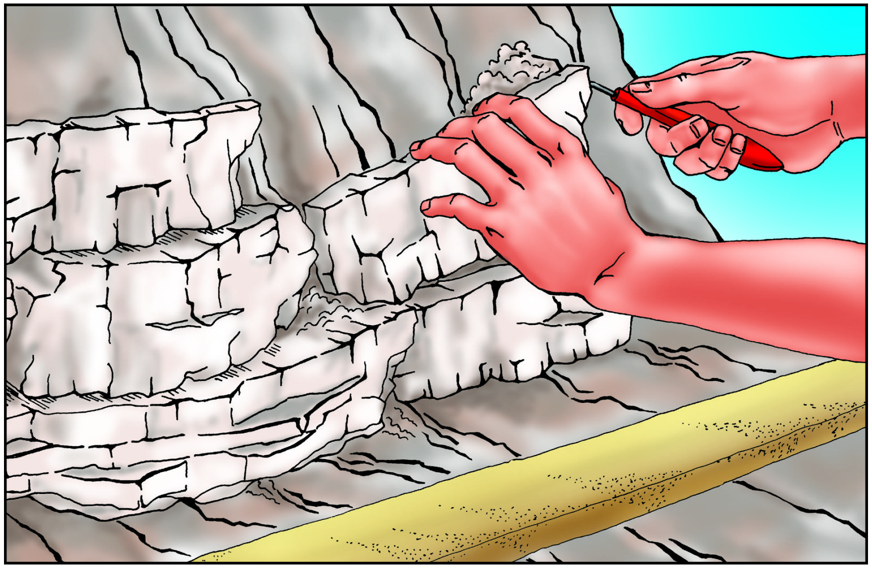
To attach the rocks, first mix a small amount of Lightweight Hydrocal. Next, spray both the terrain shell and the back of the rock with water. Then, apply the Lightweight Hydrocal to the back of the rock with a spatula and place the rock on the terrain shell, holding it briefly in place until setting begins. It takes three to four minutes before the Lightweight Hydrocal begins to set up, so there is some time to move the rock into the proper position. Some excess Lightweight Hydrocal may ooze out around the rock. Leave this excess in place to help provide some adhesive for the adjoining rocks and to serve as a gap filler between rocks. After the Lightweight Hydrocal has dried, any excess can be easily chipped away. See Tech Tip on this page. Complete setting of the Lightweight Hydrocal will take place in about 30 minutes.

<u>*Shingle Method* of Installing Rock Castings:</u> An alternate method of installing rock castings is the shingle method. This involves using the Lightweight Hydrocal in the Rock Mold as its own adhesive for attaching to the terrain shell. Installing a rock by shingling takes place before the Lightweight Hydrocal in the Rock Mold is dry.

TECH TIP

In some areas you may want rock castings to fit tightly together. When making castings from Lightweight Hydrocal, there is an easy way to accomplish this. First cast several rocks. Place the edge of one over the edge of another and trace the outline of the top rock onto the bottom one. Then use a hobby knife to carve away this marked section on the bottom rock. Install the rocks with Lightweight Hydrocal as an adhesive. Because of the tight fit you have carved, there should be little space between the two rocks. Use water from a Scenic Sprayer, adjusted to a stream rather than spray, to remove any excess Lightweight Hydrocal that oozes out between the rocks.



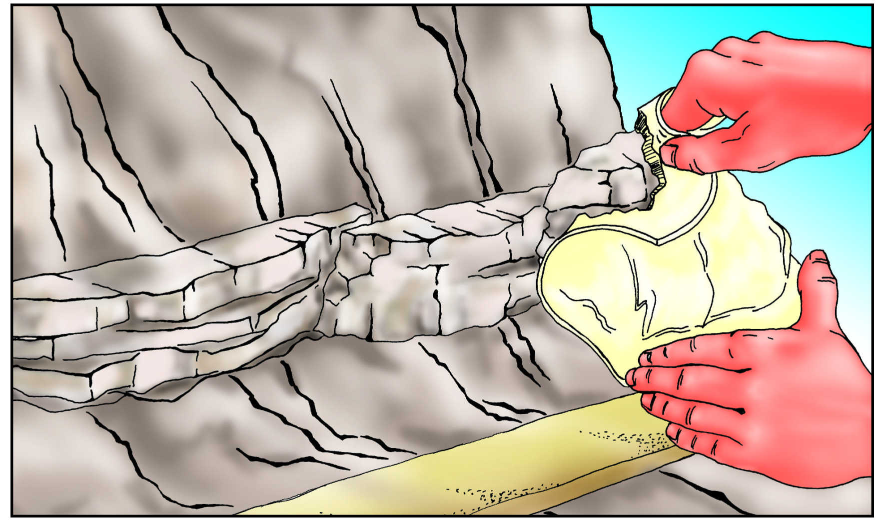


To attach rocks using the brick method, make a number of rock castings from Lightweight Hydrocal and let them dry. Carve or shape the rocks as needed with a hobby knife to make them fit the area. Spray the rock and the terrain shell with water. Then attach by applying a Lightweight Hydrocal mixture to the back of the rock as an adhesive.

Therefore, the mold must stay attached for the entire drying time. Each new rock that is added is shingled over the edge of its neighbor. A second rock cannot be added in the same area until the first is dry and the mold for it is removed. This makes shingling a slow process of working.

Plan to pour only one or two Rock Molds at a time in shingling. When Lightweight Hydrocal is first poured in a mold, it looks shiny and wet. When dry, it appears dull. Look for the transition point when the Lightweight Hydrocal is just beginning to set. At this point the shine will begin to skim over. To install the rock, first spray the terrain shell with water, then press the wet rock and its mold firmly against the terrain shell in the desired location. Hold in place until it sets sufficiently to attach. Leave the Rock Mold in place for the entire drying time of at least 30 minutes and then pull it off carefully. If you experience flaking when pulling off the Rock Mold, allow a longer drying time. After drying, chip off any excess Lightweight Hydrocal from around the rock and blend the rock into the other castings by removing any edges that seem to stand out too far. See Tech Tip on page 43. The next rock mold can then be poured and attached with its edge slightly shingled over the neighboring rock. Use a hobby knife or dental pick to chip away any excess Lightweight Hydrocal.

If there are any remaining rough edges or breaks in the terrain around the areas where rocks have been installed, they can be repaired by covering with small strips of Plaster Cloth or filling in with Lightweight Hydrocal. These products will also help provide any additional terrain blending that is needed.



When attaching rock castings using shingling, pour Lightweight Hydrocal into the mold while it is on a flat surface and wait for the Lightweight Hydrocal to partially set. Then place the rock, with the mold still attached, into the desired location and press firmly against the terrain shell. Leave the Rock Mold attached until the Lightweight Hydrocal is firmly set and carefully pull off the Rock Mold. Successive rocks are attached with the edge of each one shingled slightly over the edge of the previous rock.

MAKE YOUR OWN MOLDS

If you prefer to make your own rock molds, it is possible to duplicate the rocks in a particular part of the country or some rocks you happen to like. The molds can be made either at home or in the field, if there is the time to allow the Latex Rubber to set. In selecting rocks to mold, keep in mind that it will be difficult to work with castings which are very large as they will not fit onto the terrain shell easily. Note: national and state park areas do not permit the removal of any natural materials, including rocks, from the premises.

If working with rocks in the field, begin by spraying the rock face with **Woodland Scenics Scenic Cement** and allowing it to dry. Scenic Cement is a water-base, ready-to-use matte-medium which dries clear. It will help solidify any loose talus or rock debris on an individual rock. The rest of the instructions for making a rock mold are the same whether working at home or in the field.

Using an inexpensive synthetic fiber brush, paint on a layer of **Woodland Scenics Latex Rubber**. Carefully push the Latex Rubber into all the cracks and crevices and do not leave air bubbles between the rock and the Latex Rubber layer. Allow approximately 30 minutes drying time for the Latex Rubber. Wash the paintbrush immediately with water, using a wire brush to help clean bristles.

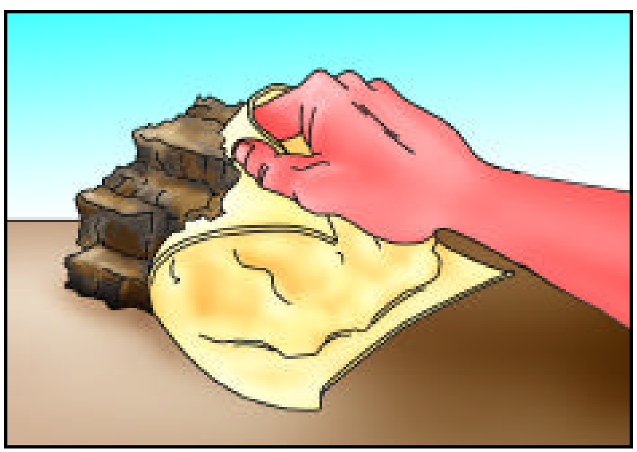
Before applying a second layer, consider how much use the rock mold will get. If only a few castings are planned from an individual mold, we recommend three layers of Latex Rubber. Proceed with a second and third layer application of

Make your own rock moldsby painting layers of Latex Rubber onto whatever rocks you choose with an inexpensive synthetic fiber brush. Use three layers of Latex Rubber if only a few rocks will be made from the mold and six layers plus a gauze or cheesecloth layer if many uses of the mold are planned. Allow each layer of Latex Rubber to dry before adding another.

Latex Rubber in the same manner as the first layer. Allow the proper amount of drying time after each layer and carefully peel the finished mold off the rock. The mold is now ready to use.

If your plans include a large number of castings from the mold, a more durable mold may be desired. You will want to use a layer of gauze or *cheesecloth* (available in fabric stores) and a total of six layers of Latex Rubber to make the mold thicker and more durable. Apply the second layer of Latex Rubber. While it is still wet, press in a layer of thin, non-stretchable material, such as gauze or cheesecloth, working it into all the cracks and crevices. Do not use a stretchable material such as nylon because it will allow the mold to distort. The third coat of Latex Rubber is painted on over the cheesecloth after the second layer is dry. The fourth, fifth and sixth layers are then added, allowing drying time between each layer. After the final layer of Latex Rubber has dried, carefully pull the mold off of the rock.

After the final layer of Latex Rubber has dried, carefully pull the mold off of the rock. This mold is thinner than the Woodland Scenics Rock Molds, which are purchased pre-formed. To successfully make rock castings, support the mold in a box of sand or wadded up newspapers to hold it firmly in place while the Lightweight Hydrocal is poured.

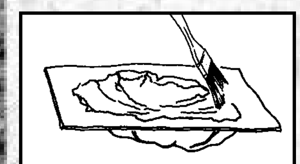


Notice that the Latex Rubber mold you have made does not seem to be as stiff as the highly-detailed **Woodland Scenics Rock Molds** that are purchased. This does not lessen its ability to give excellent rock castings, provided some kind of support is placed under the mold when pouring Lightweight Hydrocal into it. Supply this support by placing the mold in a box of sand or wadded up newspaper to hold it firmly in place and prevent distortion when the Lightweight Hydrocal is poured. With this support, the Latex Rubber molds can be used in the same manner as the preformed rock molds. If desired, some distortion of the rock mold can be created by its positioning in the box of sand or newspapers to provide variety in the rock castings.

TECH TIP

When casting rocks from Rock Molds, it may be desirable to create concave backs on the castings. This will make the rocks more lightweight and may help them to fit the curved contours of the layout.

To do this, pour a small amount of Lightweight Hydrocal into the bottom of the mold. Then use a paintbrush to stroke the Lightweight Hydrocal up the sides of the mold until it begins to set. The Lightweight Hydrocal should be 1/4" to 3/8" thick on the inside of the mold. Remove the casting carefully from the mold when dry.



REPAIR TERRAIN GAPS

While installing Tunnel Portals, Retaining Walls, Culverts, tunnel liners and rock castings on the layout, some gaps may have been created between these items and the surrounding terrain shell. These gaps in the terrain should be repaired before continuing with coloring. Rock and plaster castings should fit smoothly into the surrounding terrain without gaps and holes between castings and the underlying terrain shell. You can fill these gaps with strips of Plaster Cloth or Lightweight Hydrocal. Use Plaster Cloth to fill a large gap around a Tunnel Portal or between rock castings. If there are small holes or cracks, use Lightweight Hydrocal. Some contour changes can also be made at this time with Lightweight Hydrocal or Plaster Cloth. Add these materials to the layout to build up the banks of a river or pond, put in terraces or berms, or enhance the height or mass of a mountain.

If you want additional Tunnel Portals, Retaining Walls or Culverts on your layout, use a hobby knife to cut into the terrain surface and create a space the appropriate size. Install the casting by attaching with Lightweight Hydrocal or Scenic Glue, depending on the underlying material. Then use some Plaster Cloth strips to make the casting fit snugly to the surrounding terrain.

Additional rock castings can be attached directly to the existing terrain shell. If

TECH TIP

When mixing Lightweight Hydrocal, have some extra Rock Molds available. Use up any Lightweight Hydrocal left over from another molding project by casting a rock or two. Parts of the larger Rock Molds can be used to create new shapes of rocks. Save these castings to use later as field rock, boulders, or rock outcroppings on the layout. They can also be used as practice pieces for the Earth Color Liquid Pigment coloring system.

the castings jut out too far, cut into the underlying terrain material and recess the castings into the hillside. Strips of Plaster Cloth can then be applied around the casting to blend it into the terrain.

COLORING PLASTER CASTINGS

The plaster castings you place on a layout can include tunnel liners and rocks which you cast yourself, plus the Tunnel Portals, Retaining Walls and Culverts which you purchase ready made. All of these castings help to add realism and detail to the layout. But none of these castings will look realistic until they are colored. Color will make the layout come alive.

A young child would probably color the sky blue, the sun yellow and the leaves green. The real world is not this perfect, but rather it blends colors together in lighter and darker shades and mixtures of color. This *mixing* and *blending* will create the most realistic look for the layout. It may sound difficult, like something only an artist would be able to do. But do not give up. It can be much easier than it sounds. First of all, what is needed is some information about the actual colors that appear in rocks.

Rocks contain a variety of different colors. If you are modeling a particular area of the country, you may want to familiarize yourself through photos or books with what appears there. If your layout is not based on a particular prototype area, you will be more interested in creating realistic looking rocks with colors which look natural.

Many ideas about color are available by simply observing. Look around and learn by observing the colors in your area, being particularly careful to note the imperfections. Is concrete just gray, or does it sometimes appear to have a brown or black tint? Does it have cracks or spots of oil that are darker than the rest? What about the timbers in a tunnel portal? Are they brown or gray? Are there dark and light areas caused by *weathering* or other substances on the timber? By sharpening your powers of observation you will be able to help yourself create realistic color on the layout.

The Woodland Scenics Earth Color Liquid Pigments system includes appropriate colors for all terrain features. There are earth tones for rocks and earth-warm grays for concrete, asphalt and rocks-undercoats for green and earth Turf areas. The Pigments are designed specifically for model use and come in natural earth tone colors which can be difficult to find. One feature which makes the Liquid Pigments unique is that they contain pigment only, with no sealer. In some instances this is all that is needed. And it makes it possible to wash the Pigments off if you do not like what has been colored. When you want to seal the color in, just spray or brush on Scenic Cement to complete the painting process. Then the colors will be permanent.

The Pigments are non-toxic and water soluble, making them both safe to use and easy to clean up. The Pigments are highly concentrated. Use them like an opaque paint, or thin them with water to make a stain or transparent wash. The Liquid Pigments can be used on most surfaces including plaster, Plaster Cloth, foam, paper, papier-mache and wood. This versatility helps make the Pigments economical because one product can be used for many purposes.

Woodland Scenics Earth Color Kit contains one small bottle each of eight colors plus mixing tray, foam applicator and complete instructions. Four-ounce replacement bottles of these eight Pigments are available individually, as are the 8-oz. bottles of Green Undercoat and Earth Undercoat. The Earth Color Kit is a very convenient and economical way to get started with all of the items needed for coloring plaster castings. With the complete selection of colors, it is easier to mix and blend for the most realistic result. Other paints may be used for coloring plasters but they will not blend in exactly the same manner as the Earth Color Liquid Pigments. The coloring instructions that follow are for use with the Earth Color Liquid Pigments System.

Earth Color Liquid Pigments can be mixed into wet plaster to color it. However, color added to plaster tends to be an even pastel shade that is reminiscent of ice cream. Therefore, we like to add color after plaster has hardened because it looks more natural.

Before beginning to color the castings on the layout, practice using the colors and the coloring techniques on some surplus castings. This will provide some experience in blending the colors and you will learn how easy the system is to use. Check the Dilution Formulas on page 46 and the color samples on page 57 for some ideas on rock coloring.

An important factor when coloring plaster castings is the absorbency of the plaster surface. Some plaster surfaces are very absorbent and accept color washes and stains readily. Some surfaces are non-absorbent and will not accept washes and stains but must be painted with opaque painting techniques. The surface of plaster castings may vary from extremely absorbent to non-absorbent. The Liquid Pigments can vary from transparent wash to opaque coat as required to color any absorbency condition.

Dry plaster absorbs more readily than wet plaster. Therefore it accepts washes more readily and appears more intense, or darker. If a plaster casting is completely saturated with water, it will not accept washes or stains. Different castings, even different spots within the same casting, can have different levels of dryness which will make them absorb color differently.

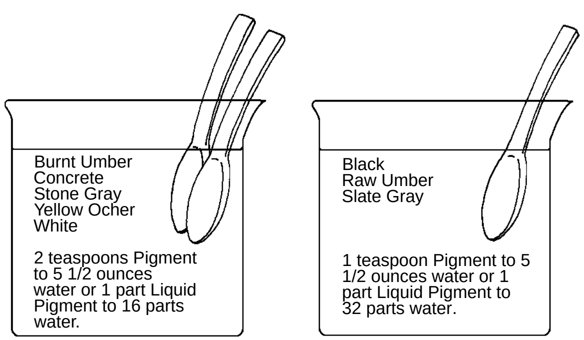
Different products like Lightweight Hydrocal, Mold-A-Scene Plaster, Plaster Cloth and other plasters will absorb color differently and may impart some color of their own.

The porosity of plaster surfaces can vary from highly porous to non-porous. The more porous the surface the more readily it will absorb color washes or stains. Non-porous surfaces may not absorb washes or stains at all. Marring, rubbing, smoothing out, or polishing can close the pores on the surface of a casting, making it less absorbent. Materials such as Scenic Cement, Flex Paste, Scenic Glue and super glue will seal plaster surfaces and require coloring with opaque painting techniques. Be as careful as possible to avoid marring, rubbing or polishing plaster surfaces. Avoid getting Scenic Cement, Flex Paste, Scenic Glue or super glue on surfaces you want to color with a wash or stain.

The Earth Color Liquid Pigments can be diluted into thin washes, used undiluted, or mixed to any number of dilutions in between these two extremes. Liquid Pigment colors can be premixed before applying to create custom colors that match colors of rocks in a specific locale. Color can be combined on the mixing tray if a small amount is needed or in a jar or Scenic Sprayer. The Scenic Sprayer is especially convenient because it has the ounce markings noted on it.

<u>Staining With Washes</u>: A wash is created by adding large amounts of water to Liquid Pigment. The more water the lighter the wash. The more pigment the stronger (more intense) the wash. Washes are intended to be transparent coatings so even light washes on plaster can be made to look darker by applying an additional wash to the plaster after the previous wash has dried. Several coats of one color of wash will provide different intensities of color. Several transparent washes of two or three different colors will create new shades of color where the washes of the two or three different colors overlap. This wide range of intensities and shades of color is very natural and realistic looking.

If a wash is too dark to begin with, it will not be very transparent and the wide range of shades and intensities will not develop. Therefore, we recommend diluting the Liquid Pigments to a very light wash before beginning. More pigment can always be added if a stronger wash is desired later. Some colors are more intense and should be diluted with more water than other less intense colors.



DILUTION FORMULAS

We recommend the following Liquid Pigment dilutions to create a light wash which is virtually foolproof. The washes can be mixed in a Scenic Sprayer or any convenient container. Stir or shake frequently when using.

TECH TIP

Rocks in many areas are made up of layers of different colors. These layers can be modeled by using a paint brush to apply the colors in uneven horizontal stripes. Blend all the colors together with a thin wash of Black Pigment.

<u>Coloring Tunnel Portals, Retaining Walls, and Culverts</u>: These plaster castings are usually easier to color before they are assembled. Lay the pieces on paper towels with enough room between pieces so that the Liquid Pigment can get to all side areas of each piece. While several different coloring methods and color combinations can be used, we recommend the following as being the easiest and producing the most consistent results. All coloring is done with the washes described above.

1. For Concrete or Masonry pieces—Spray these pieces first with the Concrete wash then with an over-coating of Black wash. For a darker color, repeat the process.

2. For Cut Stone or Random Stone—Spray on a layer of Stone Gray wash followed by Black wash repeating more layers until the color is dark enough. For an even darker color, allow the castings to dry between coatings of Pigment. Several colors of washes can also be used on Cut Stone or Random Stone if you prefer.

3. For Timber pieces—Spray on a layer of Burnt Umber wash followed by Black wash. Repeat these layers as many times as needed allowing the castings to dry slightly between each spraying.

If some white spots remain or you want additional detailing with color, dip a brush in water and then in pure Pigment. Daub on the areas which have remained white and blend into the previous coloring. Additional spots of highlighting color can also be added in this way.

When you are satisfied with the color, allow the castings to dry, then spray or daub on Scenic Cement to seal the color. After the Scenic Cement has dried, an additional over-spray of a more concentrated Black wash can be added if desired to emphasize cracks and crevices. Repeat the Scenic Cement application to set this color.

TECH TIP

Random intensity of color on plaster castings can be created by applying several layers of thin washes of different colors. Partially overlap the edges of the different colors to create variety in color, depth, and shading.

Techniques for Coloring Rock Castings: There are many techniques available for coloring rock castings. We prefer the "*leopard spot*" technique where spots of various colors of washes are randomly placed on the rock castings, then blended together with an overcoat of the dominant rock color. This technique provides the most variations of color. Another technique which may be particularly appropriate for modelers who have never colored rock castings is to apply an initial light coating of the dominant rock color, then use other colors in a leopard spot pattern to add variations.

The following directions explain the "leopard spot" method of coloring rock castings:

1. Consult the color chart to select a dominant rock color and as many secondary colors as desired. See page 136.

2. Mix the diluted washes of these colors as shown in the dilution formulas on page 46.

3. The washes may either be squirted on with a Scenic Sprayer (adjust the setting to squirt instead of spray) or daubed on with a foam applicator or acrylic brush.

4. Begin with one of the secondary colors. Squirt or daub it in random spots covering approximately one third of the rock casting if you are using a total of three colors; one fourth of the casting if you are using four colors; etc. Don’t try to cover all the white.

5. Apply the second color and squirt or daub on random spots of color in a similar amount.

6. Continue with this procedure using all the selected secondary colors and the dominant color. You may want to squirt or daub additional overlapping layers of one or all of the colors being used. Allow the washes to run and overlap on the casting.

7. Use the dominant color and spray or daub on a flood coating which covers all areas of the casting.

8. Because of the porosity differences in plasters and the possibility of marring before the casting is colored, there may be areas which do not accept the washes and remain very light or white. Touch up these spots and areas that don’t accept washes with more concentrated Liquid Pigment, slightly thinned with water, or pure if necessary. Daub this color on with a brush or foam applicator. If the color is too dark, dilute it or wash it off by spraying with water from the Scenic Sprayer.

9. Allow the rock casting to dry, then spray or brush on Scenic Cement.

10. When the Scenic Cement is dry, spray or daub on a more concentrated Black wash to emphasize the cracks and crevices.

If too much water seems to be accumulating on the layout, use paper towels to help soak it up. A small corner of the paper towel can be rolled into a point to reach into cracks and crevices to soak up excess water in these areas.

Repainting Previously Colored Castings: Plaster castings or rocks made of material other than plaster can be recolored if they are first brought back to a white base color. Use the White Pigment and brush it on the previously colored castings or rocks to cover their color. Use the White Pigment full strength to achieve this. Allow the Pigment to dry, then spray on a coating of Scenic Cement to seal the White. When this dries you are ready to apply coloring. Wet a foam applicator or synthetic fiber brush with water, then dip it in Liquid Pigment which is full strength or a heavy concentration. Daub on the castings. Apply spots of various colors in the leopard spot pattern and allow them to mix and blend by lightly spraying with water from the Scenic Sprayer as you add Pigment. When the color is satisfactory, allow the castings to dry, then spray with Scenic Cement to set the color. An additional coating of a more concentrated Black wash can then be added to emphasize the cracks and crevices. This can be either sprayed or daubed on. Spray again with Scenic Cement when this coating is dry.

Removing Liquid Pigment: Should you decide you do not like the coloring you have done, the Liquid Pigments make it possible to remove color which has not been sealed with Scenic Cement. Simply *flood-spray* the castings with hot salt water (1 tsp. salt in 6-oz. water). Wait one minute and spray again if needed to remove color. Now you are ready to begin the coloring process again.

Sealing the Color: When you are satisfied with the color on the castings, allow them to dry. Then spray or brush on a sealing coat of Scenic Cement and allow it to dry. The color will now be permanent.

Flyspecking: Additional textures and *realism* can be added to rock surfaces with a flyspecking technique. Mist the rock surfaces lightly with water. Bend a sheet of paper into an L-shape, placing a small amount of Soil Turf on the horizontal section of the paper. Gently puff air down the vertical side of the paper, blowing only a small amount of the Turf onto the rock surface. This adds additional detail to rock surfaces for more realism. It also adds an additional texture suggesting holes and porosity in the rocks and suggests soil which may have collected on the rock. If you have added too much Turf, brush it off and begin again. When you like the effect, mist the rock surface lightly with Scenic Cement to hold the flyspecks of Turf in place.

You will experience some differences in the way different materials (high density plaster castings, Lightweight Hydrocal, Mold-A-Scene Plaster, Plaster Cloth, etc.)

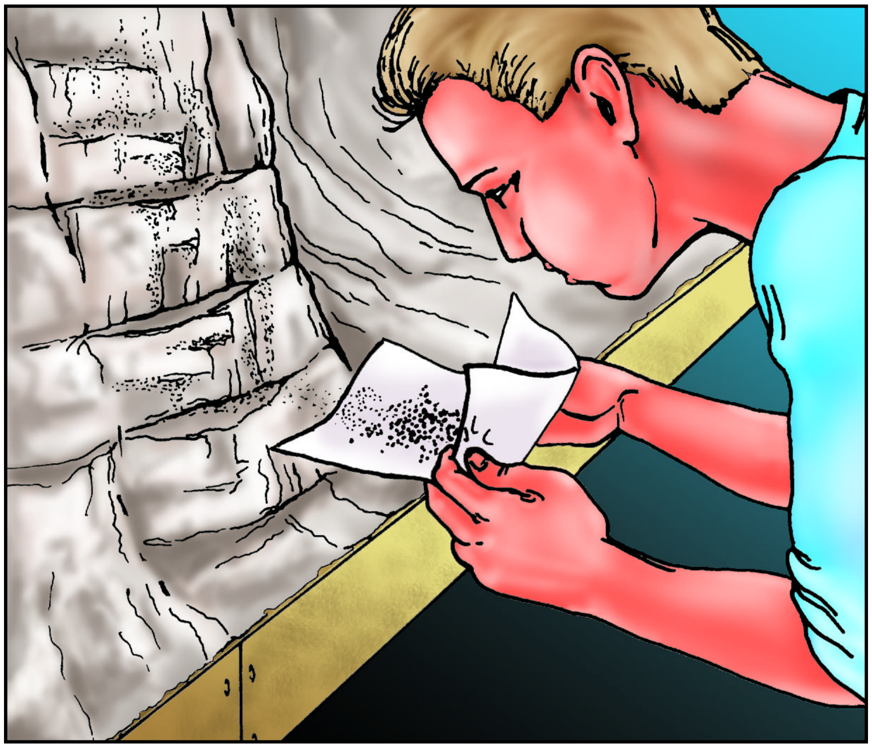
TECH TIP

Thoroughly wash the Scenic Sprayer spray head and nozzle in hot water, and spray clear water through it when you finish using it. This is particularly important when using Scenic Cement in the sprayer. If the Scenic Sprayer should clog while using it, try turning the adjustment to "stream", and spraying firmly to push out the clog.

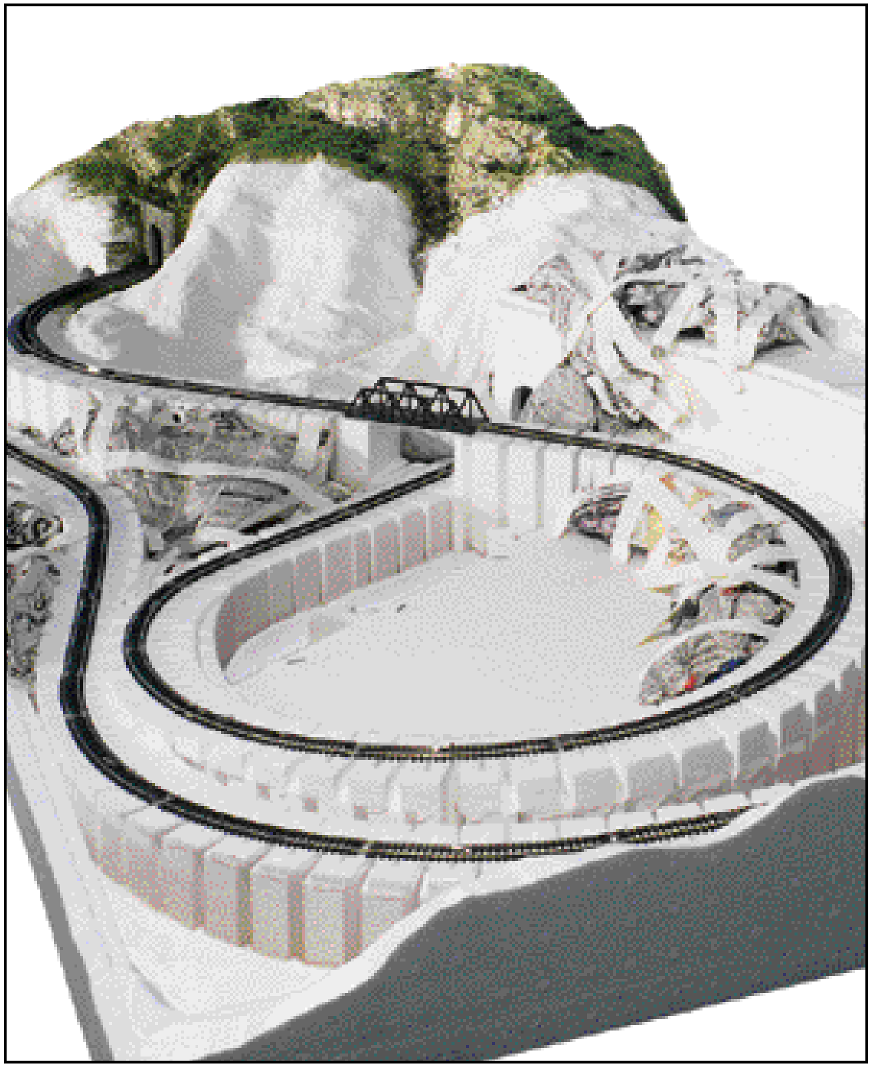
accept color. Do some experimentation on excess material to find the particular mix of Pigment and water which works best. The age, and therefore the dryness, of materials will also affect coloring. Again, experiment on surplus materials to determine what works best.

The Earth Color Liquid Pigments can also be used to tint Woodland Scenics Flex Paste and Scenic Cement. Mix either of these products with a small amount of Pigment until the desired color is obtained. Talus is another product which can successfully be colored with the Liquid Pigments. Talus will look the most natural when its color is a close match to the rock castings. To color Talus, diluted Liquid Pigment can be squirted, dribbled or daubed on Talus after it has been attached to the layout. Use the same colors of Liquid Pigment as are used in coloring the rock castings.

Since the Liquid Pigments are water soluble products, cleaning brushes, mixing tray, jars, and hands is fast and easy with soap and water.



Flyspecking is a technique used for adding texture and realism to rock surfaces which have been colored. Use a Scenic Sprayer to lightly mist the rock surfaces with water. Bend a sheet of paper into an L-shape and place a small amount of Soil Turf on the horizontal section of paper. Lightly puff air down the vertical section of the paper to blow a little Turf on the rocks. This adds additional detail to rock surfaces for more realism. If you have added too much Turf, brush it off and start over. Permanently attach the Turf with a light spray of Scenic Cement.



This photo shows our SubTerrain System in progression. Begin with a base and add the SubTerrain System's Risers, Inclines, Profile Boards, Foam Sheet Goods and finish with newspaper wads and Plaster Cloth. After laying down your roadbed, track and bridges, etc., your layout is now ready for Culverts, Tunnel Portals and rocks. Color the plaster castings with Earth Color Liquid Pigments and the layout is ready to be landscaped.

CHAPTER SUMMARY

NEWSPAPER WADS

Create the terrain contours on the layout. Wad up sheets of newspaper and stack them on the layout to form the shapes of mountains, hills, and land contours. Move the newspaper wads around to experiment with different contours in various locations. Use masking tape to hold the newspaper wads in place when you reach a satisfactory appearance, see pages 26 and 27.

CREATING A TERRAIN SHELL WITH PLASTER CLOTH

There must be a hard terrain shell covering the newspaper wad contours to which rock castings, stains, and landscape materials can be attached. This is accomplished by covering the newspaper wads or cardboard strips with Plaster Cloth. Dip the Plaster Cloth in water and apply, overlapping each strip 50% on the previous strip and 50% on uncovered area. Extra strength can be obtained by using another layer of Plaster Cloth or applying a layer of Lightweight Hydrocal. To review this section, see pages 28 and 29.

ADDING PLASTER CASTINGS

Plaster castings for tunnel liners, tunnel portals, and retaining walls should be fitted to the layout contours before the terrain shell is completed. Tunnel liner castings permit easy and foolproof tunnel construction. Use the Woodland Scenics Tunnel Liner Form to cast as many sections as needed using Woodland Scenics Lightweight Hydrocal. Assemble with strips of Woodland Scenics Plaster Cloth creating a hinge so the tunnel can be opened. Woodland Scenics Tunnel Portals and Retaining Walls make the railroad more realistic and interesting. These castings are purchased preformed. Assemble the castings you will use and install on the layout using Lightweight Hydrocal as an adhesive. Woodland Scenics Culverts may be assembled and installed before the terrain shell is created or later when rock castings are added. To review this section, see page 33.

ADDING ROCK OUTCROPPINGS

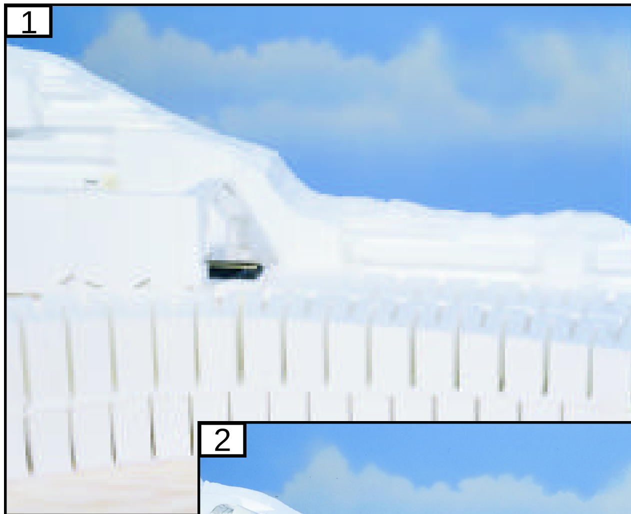
Cast rocks for rock outcroppings with Lightweight Hydrocal using several different Woodland Scenics Rock Molds to create a variety of rock faces on the layout, or by making custom molds with Woodland Scenics Latex Rubber. Carve and reshape the rock edges to fit as required. Attach the rocks to the terrain shell using either the brick method of installation with Lightweight Hydrocal as an adhesive and filler between rocks or the shingle method of attaching rocks while the Lightweight Hydrocal is still wet. To review this section, see page 38.

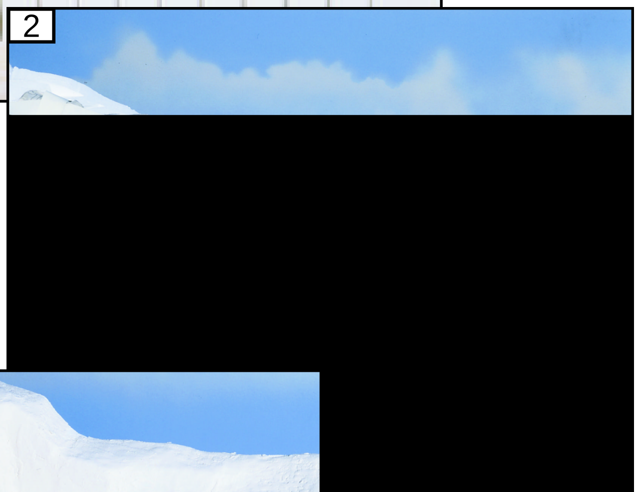
REPAIR TERRAIN GAPS

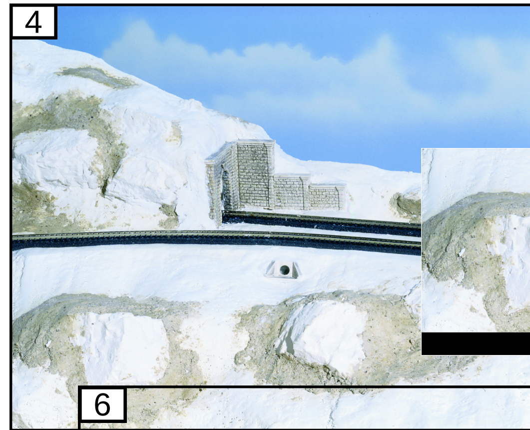
Repair any gaps or breaks in the terrain contours by using Woodland Scenics Plaster Cloth to repair large areas. Use Mold-A-Scene Plaster or Lightweight Hydrocal to repair small problems or change the contouring. To review this section, see page 43.

COLOR PLASTER CASTINGS AND ROCK CASTINGS

Use the Woodland Scenics Earth Color Liquid Pigments in diluted form to color the plaster castings and rock castings. Dilute the Liquid Pigments with water in the ratio of 1 part Pigment to 32 parts water for Black, Slate Gray, or Raw Umber, and 1 part Pigment to 16 parts water for all other colors. This dilution creates a wash which can be squirted, sprayed, or daubed on. Apply color to Tunnel Portals, Retaining Walls, and Culverts before assembly. Squirt, spray, or daub on Concrete followed by Black for Concrete or Masonry items, Stone Gray and Black for Cut Stone or Random Stone items, and Burnt Umber and Black for Timber items. For rock castings, review the Dilution Formulas on page 46 and color swatches on page 136. Choose a base color and one or two secondary colors. Squirt or daub the colors on in a leopard spot pattern. Over-spray the entire casting with the base color. Allow to dry, and spray on Scenic Cement to set the color. Then apply a Black wash to emphasize cracks and crevices. To review this section, see pages 47 and 48.







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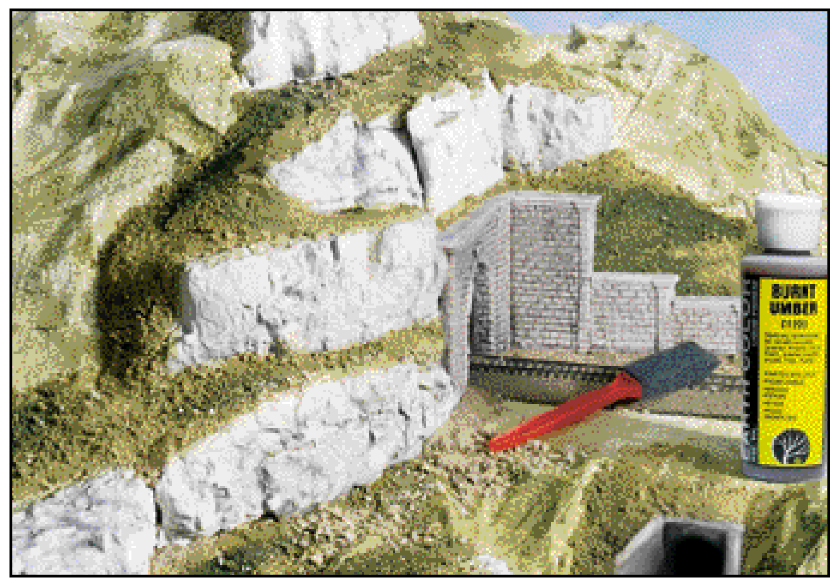


This series of photos shows the progression of terrain building on a layout. 1. Begin with the terrain base, and roadbed in place. 2. This photo shows a number of steps. The newspaper wads are in place and Foam Sheets to form the tunnel have been made and installed. The Tunnel Portal and Retaining Walls are trial-fitted. 3. The entire contour area has now been covered with Plaster Cloth to form the hard terrain shell. 4, 5 and 6. Rock castings are trial-fitted in place. Tunnel Portals and Retaining Walls have been colored, assembled and installed. The rock castings have been attached using Lightweight Hydrocal. Mold-a-Scene plaster has been used to fill in gaps around the castings. Below caption 6 is the finished product.

COLOR FORMULAS

(Refer to page 57)

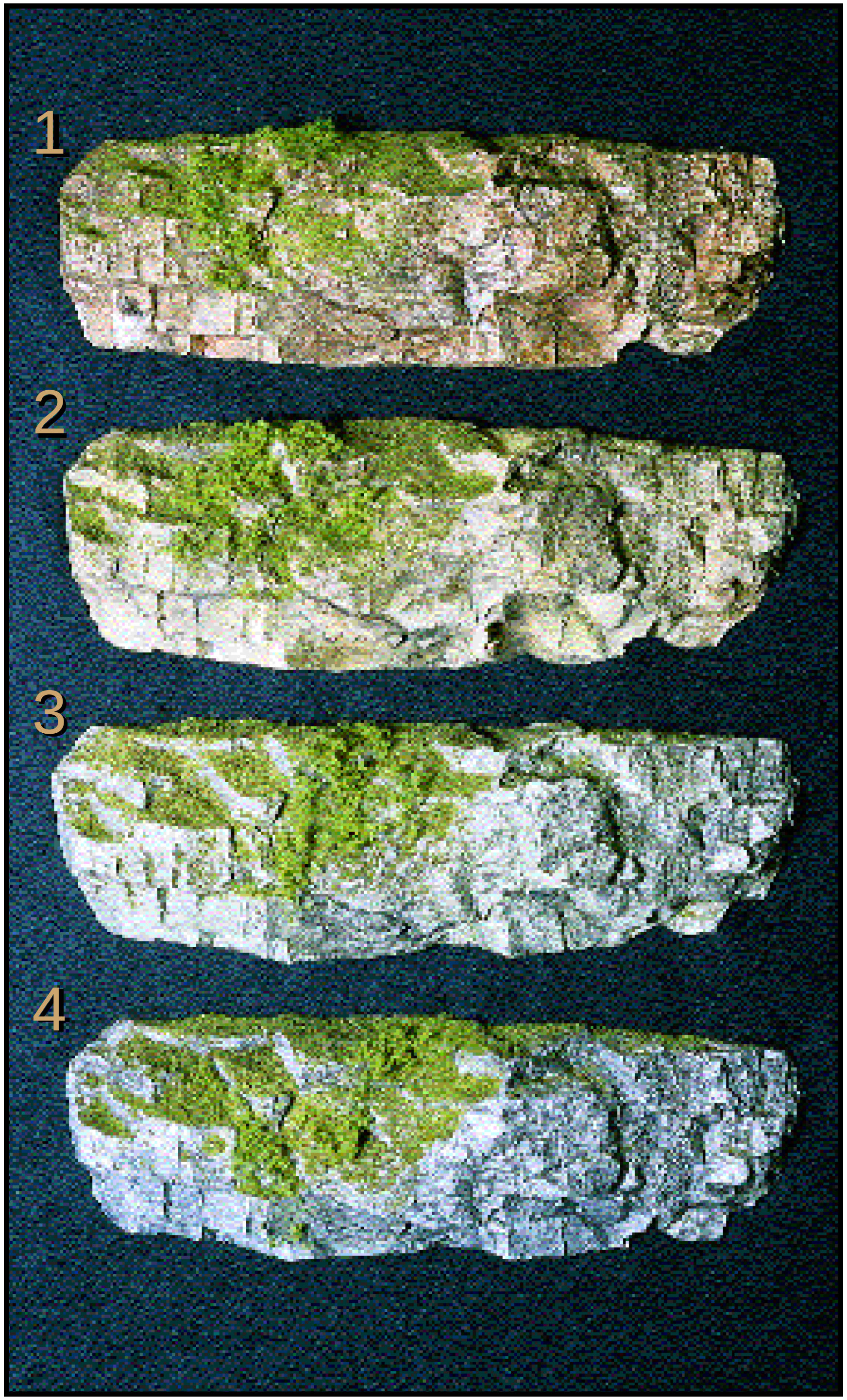
Apply multiple layers of Earth Color Liquid Pigments to create infinite variations in rock color. These samples show some possibilities. Use excess pieces of castings and experiment to find the combinations which look best for the area you are modeling. Use the "leopard spot" technique to create overlapping layers of transparent colors.

Sample 1—Achieve this type of coloring with leopard spots of Burnt Umber, Stone Gray, and Slate Gray repeated a couple of times. The selected dominant color is Burnt Umber so squirt on a flood spray of this wash. Allow to dry and spray or brush on Scenic Cement to set the color. Finish with an overall spray of Black wash which capillaries into the cracks and crevices to accent them. When this has dried, spray or daub on Scenic Cement to set the color.

Sample 2—This casting was squirted with leopard spots of Yellow Ocher, Burnt Umber, Raw Umber, and Slate Gray washes. The colors are then repeated with the spots falling in different areas. Apply a flood spray of the dominant rock color which is Raw Umber. Allow to dry and spray or brush on Scenic Cement to set the color. Finish with an overall spray of Black wash which capillaries into the cracks and crevices to accent them. When this has dried, spray or daub on Scenic Cement to set the color.

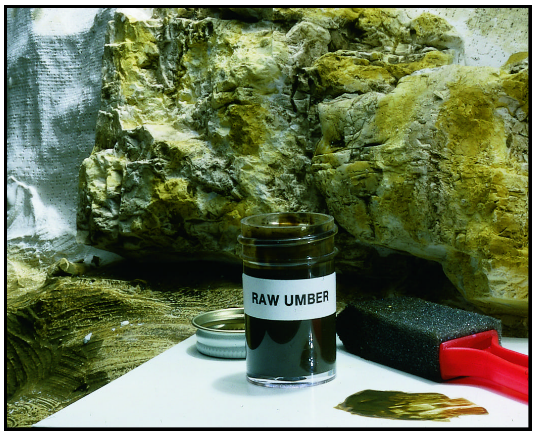
Sample 3—Squirt on leopard spots of Stone Gray and Black washes. Repeat this leopard spotting with Stone Gray and Black hitting different spots with the colors. Flood spray on the dominant rock color of Stone Gray. Allow to dry and spray or brush on Scenic Cement to set the color. Finish with an overall spray of Black wash which capillaries into the cracks and crevices to accent them. When this has dried, spray or daub on Scenic Cement to set the color.

Sample 4—The coloring on this casting was all done with Black Pigment. Squirt on leopard spots of Black wash in the ratio of one part Pigment to 32 parts water. Dry slightly and then squirt on another leopard spotting of Black wash. Dry slightly then over-spray the entire casting with Black wash. Allow to dry and spray or brush on Scenic Cement to set the color. Finish with an overall spray of Black wash which capillaries into the cracks and crevices to accent them. When this has dried, spray or daub on Scenic Cement to set the color.

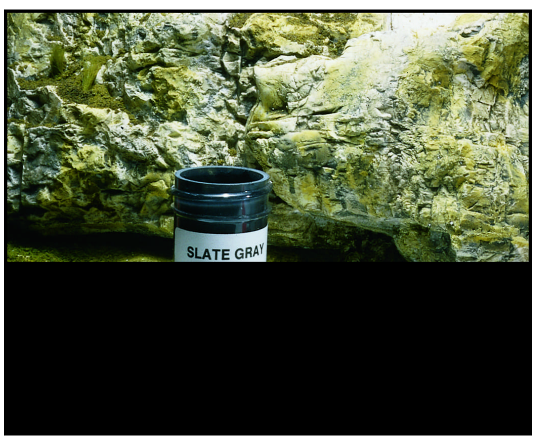


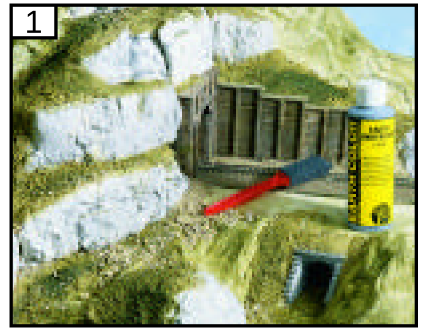
The Earth Color Liquid Pigmentscan be used to color or re-color almost any surface. This photo series shows the method used to re-color these surfaces. First, brush on an opaque layer of the White Pigment in full strength concentration. Allow this to dry and spray on a coating of Scenic Cement. When this dries, you are ready to re-color. Dip a foam applicator in water and then into full strength Yellow Ocher Pigment. Dab on the Yellow Ocher in a leopard spot pattern.

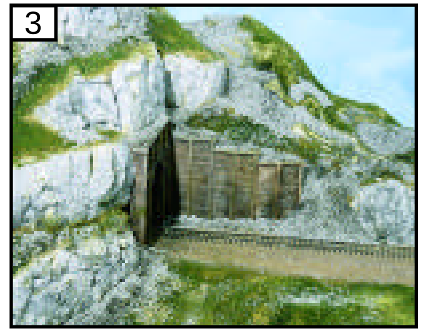
Dip the foam applicator in water and then into diluted Raw Umber Pigment and dab on in the leopard spot pattern. Then dab on an overall covering of Raw Umber which is the dominant color. You can cover any white spots with full-strength pigments after the rock has been colored with diluted pigments.

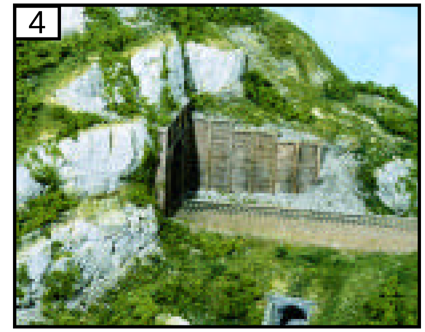


After the initial coloring has dried, spray or brush on Scenic Cement to seal the color. Then over-spray with a Slate Gray wash in a 1:32 ratio. Allow this color to flow into the cracks and crevices to highlight them. The result is a completely re-colored rock face, which features blended colors for the most realistic look.

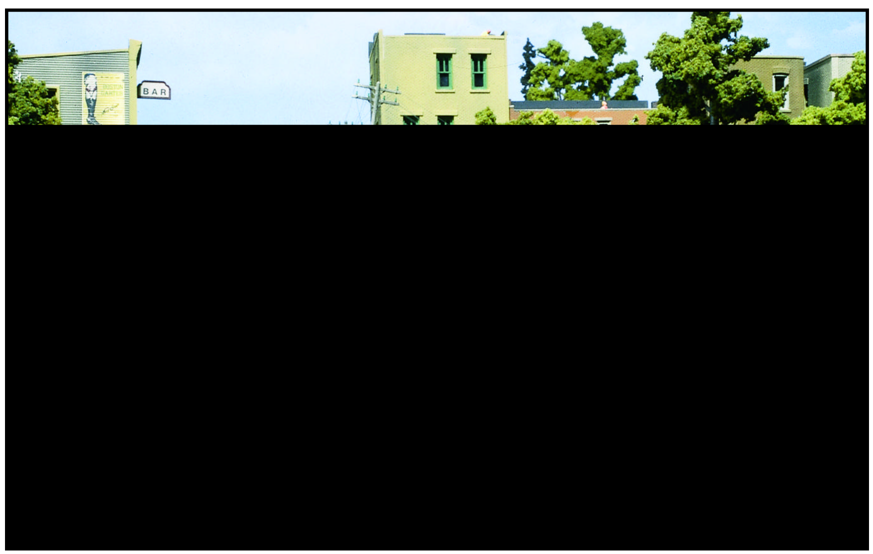








This series shows the development of an area with the Woodland Scenics Landscape System products. 1. The open ground areas have been painted with Undercoat Pigments. 2. These areas have now been covered with Green Blend Turf, which is attached with Scenic Cement. 3. Texturing is added with the application of Coarse Turf , Underbrush and Talus. 4. Texturing continues with Clump-Foliage, Bushes and Foliage Clusters used as bushes and Foliage stretched to form vines and ground cover plants. 5. The completed scene has both Field Grass and trees added to it.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