

# Building a Diorama

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# Presentation Outline

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- What is a Diorama?
- Examples of dioramas, modules and micro layouts
- Why build a diorama?
- Art vs. Craft
- Favorite techniques and tools
- Conclusions

# What is a Diorama?

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- Webster's definition:

a **scenic representation** in which sculptured figures and lifelike details are displayed usually in miniature so as to blend indistinguishably with a realistic painted background

- Wikipedia:

A **diorama** is a replica of a scene, typically a three-dimensional model either full-sized or miniature. Sometimes it is enclosed in a glass showcase for a museum. Dioramas are often built by hobbyists as part of related hobbies such as [military vehicle modeling](#), [miniature figure modeling](#), or [aircraft modeling](#)

# What is a Diorama?

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- NMRA does not talk explicitly about dioramas
  - **Displays** - Scenes or dioramas which may include multiple structures, locomotives, rolling stock, scenery elements and other detail. A *display* distinguishes any contest entry that has scenery (otherwise it can be a structure). There are on-line (with track) and off- line (w/o track) displays.
  - **Modules** - A module is a portable section of table type structure which is but one part of a large group of like tables which, when all assembled together, form a large and fully operating model railroad.

# Examples of dioramas, modules and micro-layouts

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- Modules and Micro-Layouts have (the ability to) run trains on them.
- Dioramas (displays) are essentially static with no moving trains.

# Examples of dioramas, modules and micro-layouts



Photo by permission of Sam Swanson, MMR

# Examples of dioramas, modules and micro layouts

Windes Inlet

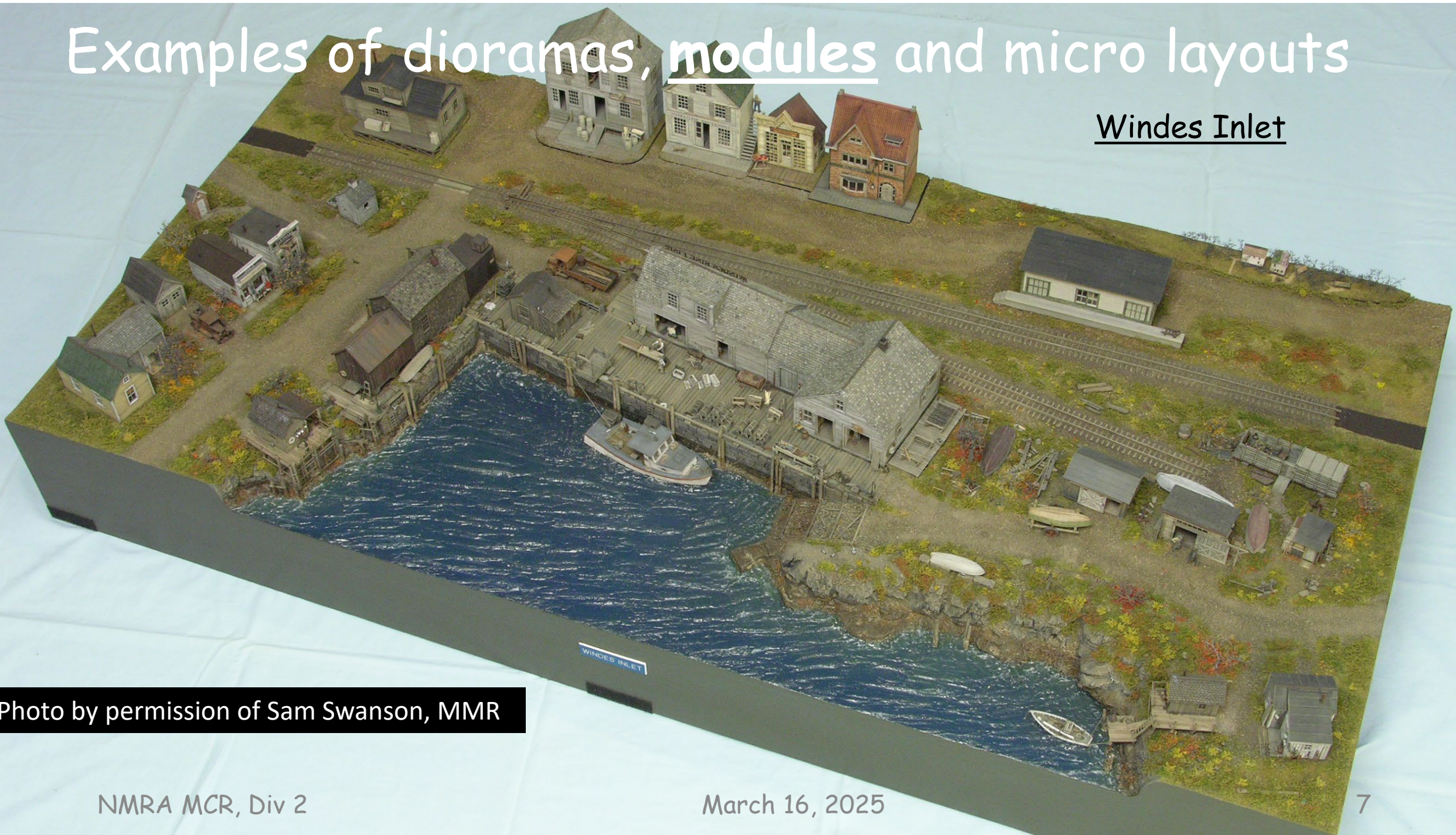
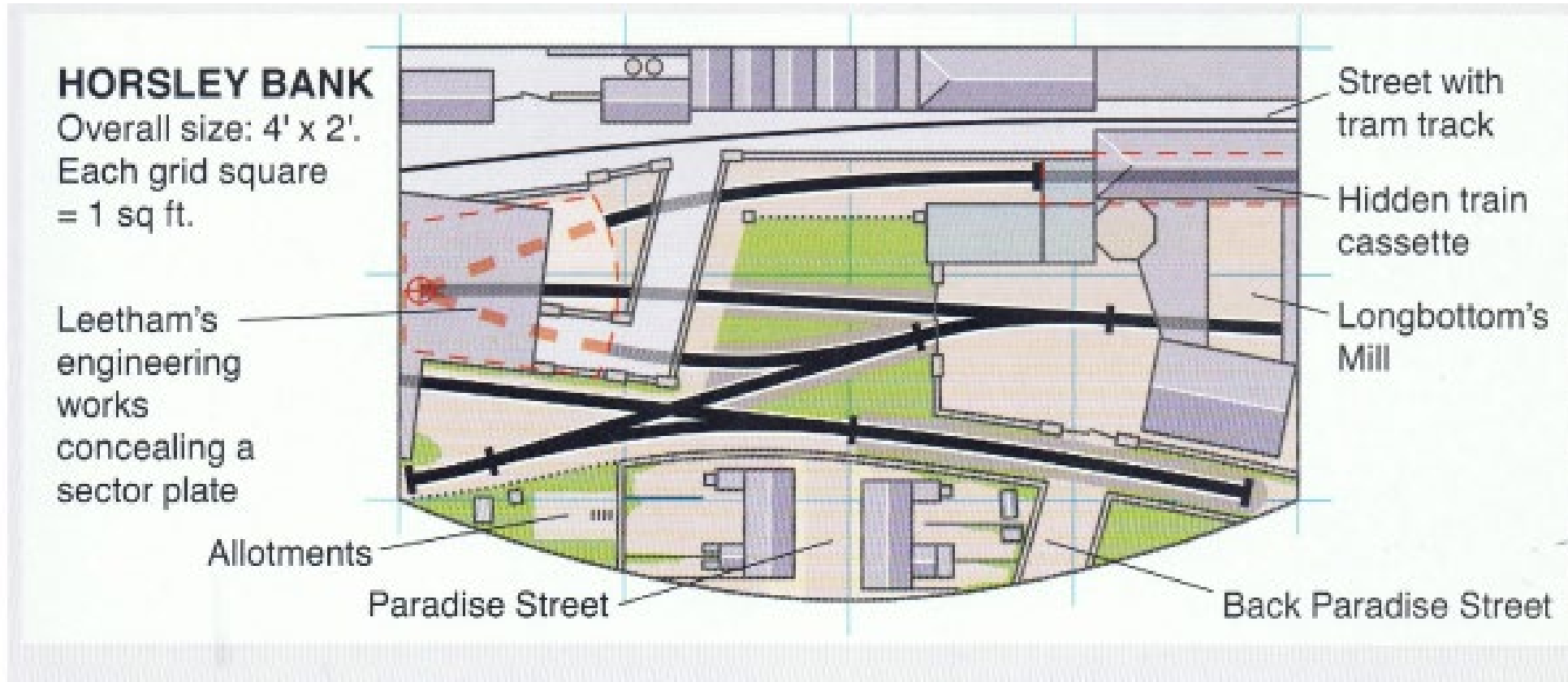


Photo by permission of Sam Swanson, MMR

# Examples of dioramas, modules and micro layouts

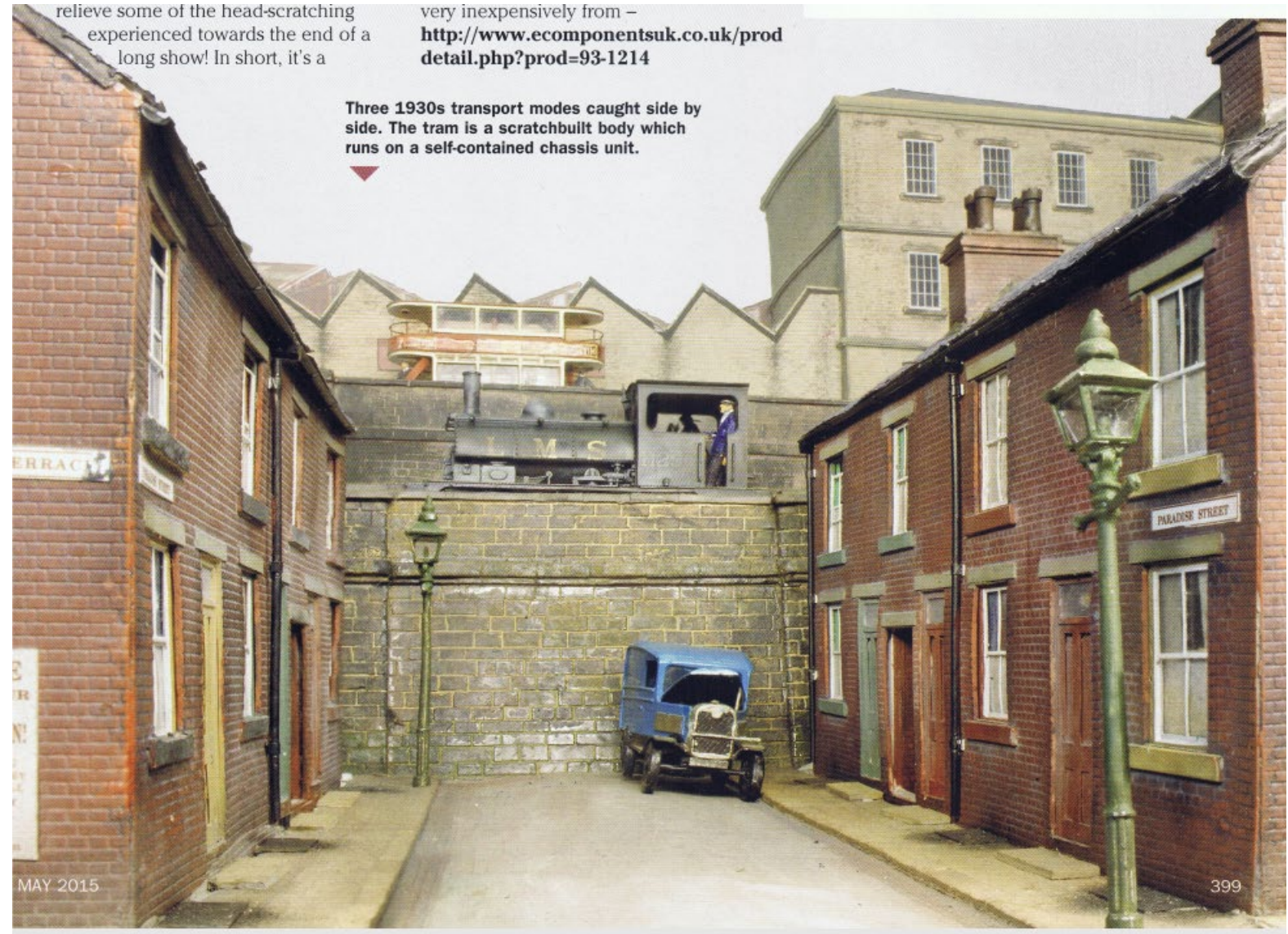


Railway Modeller, vol 66, 775 - May 2015



# Examples of dioramas, modules and micro layouts

Railway Modeller, vol 66,  
775 - May 2015



# Why build a Diorama?

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- Asked by your wife to enter the 3D art category at upcoming art show!
- **Build a scene that will be incorporated in a larger layout**
- **Build a scene that might not work on a layout**
- **A means to test new scenery techniques**
- **An opportunity to build a small scene with very high detail**
- others?

# Art vs. Craft

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Craft - the ability to build something - structure, a piece of scenery (tree), small detail, etc.

Art - placement of objects, surface finish, overall effect of scene

The perfect scene might be obtained by aiming a "shrinking-ray gun" at a real scene and reducing it to your scale of choice... or would it?

Not possible to shrink a real scene due to size limitations, subject matter, etc. So, we compromise - both in size and scope of scene. Lots of great ideas and techniques in

**Model Railroading as Art - Lance Mindheim, CreateSpace.com, 2018**

# Art vs Craft - Appropriate scenes for Dioramas

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An example of a scene that might work in a diorama but might not work well on a layout (in my opinion):

Crowded platform scene

- Too many figures to model - modeling detail on figures very hard to get right - very expensive
- Figures just stay put as passenger trains come and go - before train arrives the scene looks ok but after the train departs ...

# Art vs Craft - Appropriate scenes for Dioramas

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- A diorama is more of a 3D photograph so capturing or freezing a scene is ok
- This illusion breaks down when there are moving elements in the scene (trains).
- An effective diorama for a crowded station - model a portion of the figures - maybe descending stairs on the platform after train has departed - interesting artistically and many fewer figures.

# Art vs. Craft

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## Some Guidelines for Composing Scenes

- Choose the number of features (structures, utilities, scenery, and details) to make the scene interesting but not too busy
- Features should not be distributed evenly but rather clustered in areas on which you want viewers to focus
- Avoid lots of people and vehicles - use high-quality people and vehicles but use sparingly
- Subtle is better than overt - it is often better if you can hint at something rather than making a large effort to model it precisely.
- Keep colors muted

# Art vs. Craft

Number of features

Distribution of features

Vehicles and People

Subtle vs overt

Muted colors

High Craft - Low/medium Art



**Model Railroad Ballast**  
Arizona Rock and Mineral

# Favorite Techniques and Tools

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Determining the placement of major elements - my approach for diorama

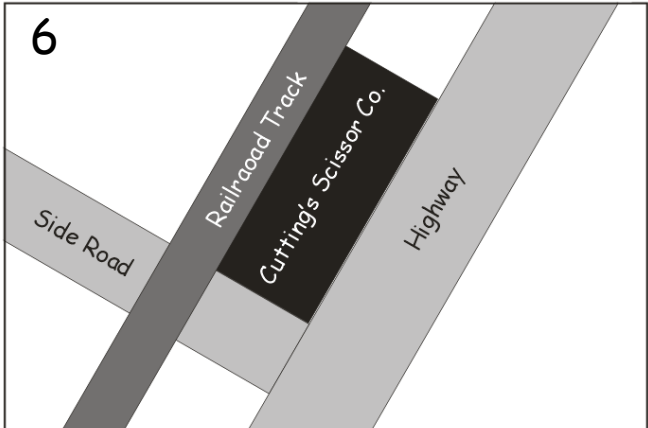
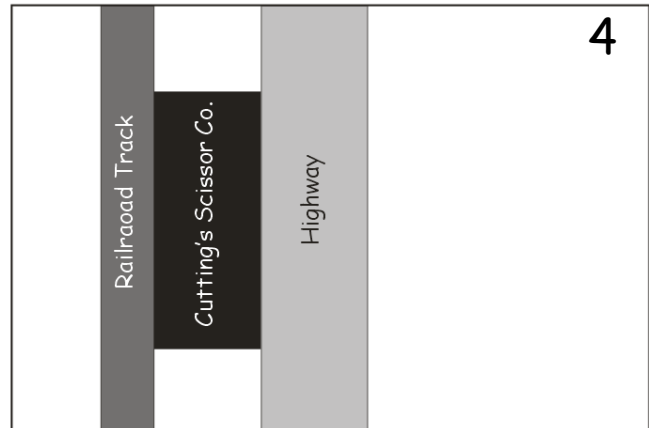
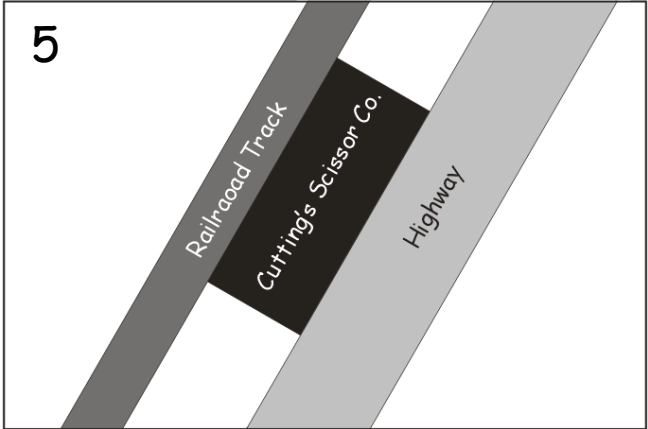
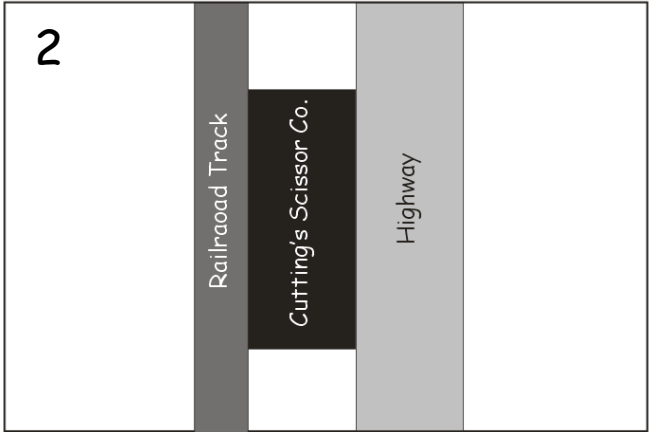
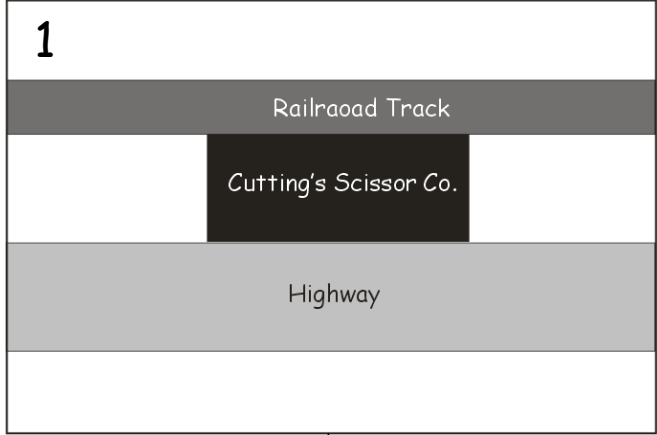
1. Major Element(s) - Start with a single building - Cutting's Scissor Co. by DPM (footprint - 7.25" by 3" in HO)
2. One (long) side of building served by rail (1-1.5 inch wide - HO) and other side served by road (3" wide - 22 ft in HO)
3. Size of diorama (12" x 18") - arbitrary but appropriate for building size

How do we arrange these elements

1. Avoid symmetry
2. Make the scene interesting



# Favorite Techniques and Tools







# Favorite Techniques and Tools

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1. Signature trees
2. Wire fencing
3. Streetlights and utility lines/poles
4. Static grass and grass mats
5. Figures, vehicles, and details

# Favorite Techniques and Tools


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Since Diorama is too large to hand around - I put together 3 mini-modules that illustrate some of the elements that I want to emphasize and I will hand these round as the talk proceeds

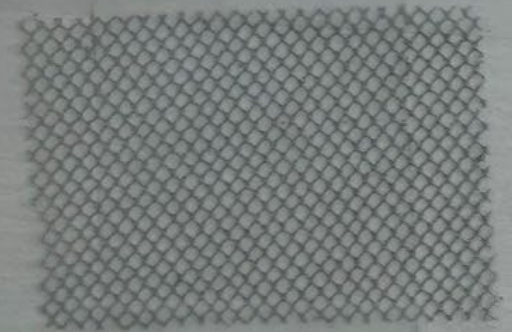
**Please handle mini-modules with care!**







**Twisted 32 ga copper wire**



**Tulle**



**Complete Chain Link Fencing**



**0.81 mm (1/32") brass wire  
Cut and soldered**



# Favorite Techniques and Tools - Signature Trees

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For large areas of deciduous trees cannot beat SuperTrees from Scenery Express

# Favorite Techniques and Tools - Signature Trees

- My preference is always to use SuperTrees from Scenic Express - but they have one major drawback - **trunks are too narrow**



- For great looking tree trunks, you can't beat sage brush - but it has one major drawback - **no branch structure to support leaf canopy**



- Solution combine both products to give a great looking "signature" tree at the front of the layout/diorama

# Favorite Techniques and Tools - Signature Trees

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Step 1 - Prepare SuperTree armatures by removing any large leaves

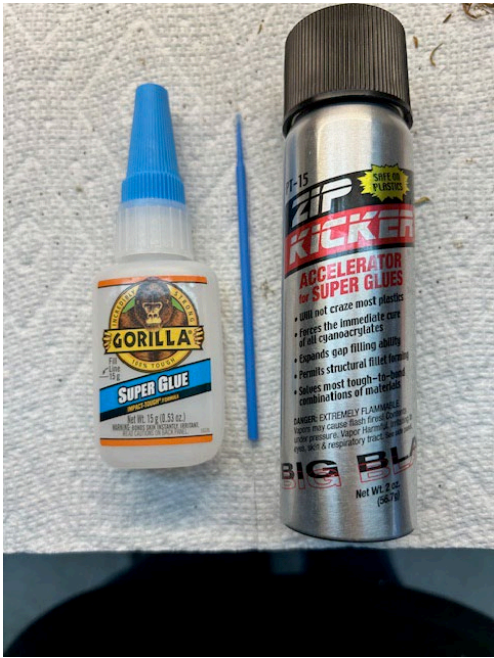
Step 2 - Glue armatures to sagebrush

Step 3 - Paint branch structure black

Step 4 - Mist tree canopy with white glue/water mix and add leaves  
(Super Leaf - Scenic Express)

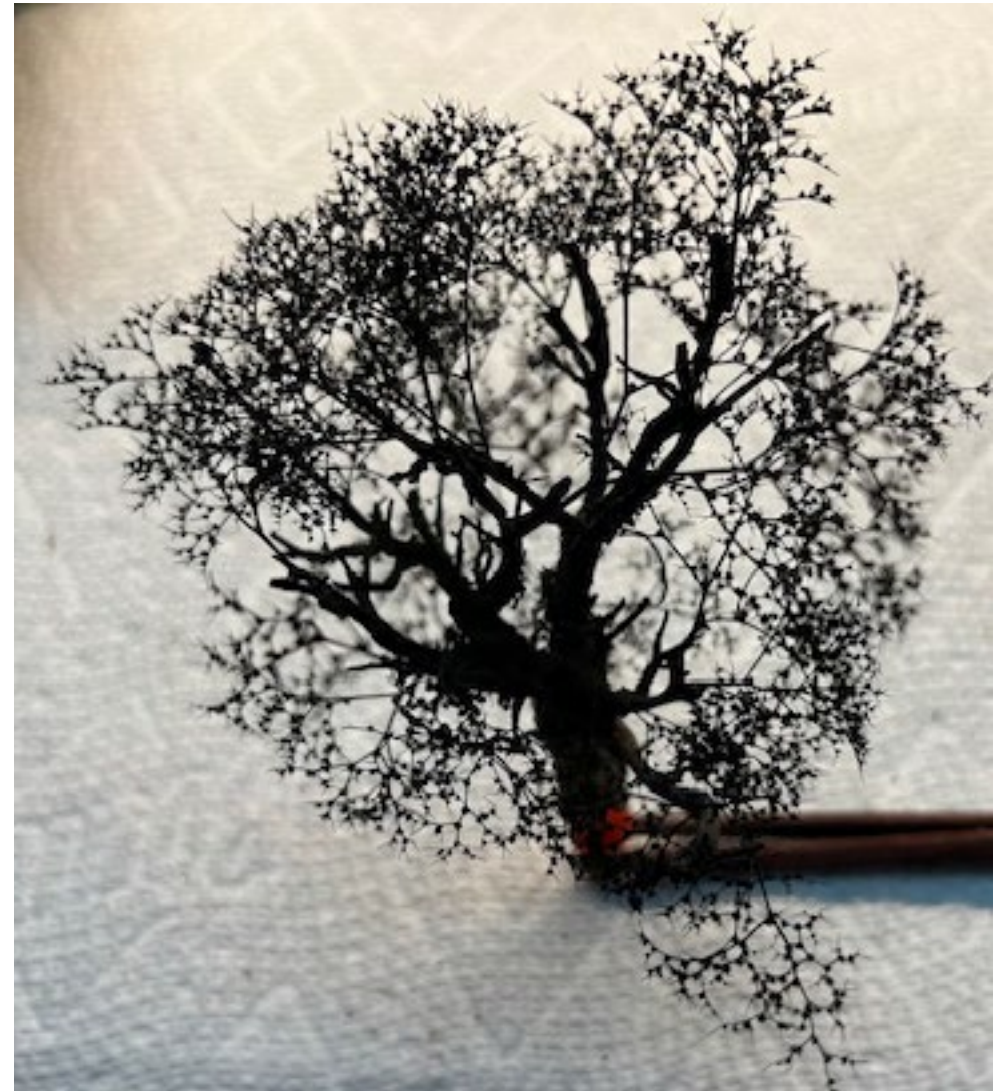
Step 5 - Spray with Matte Coat





Place layer of super glue on SuperTree armature (along edge to be glued). Hold against Sage Brush armature and quickly add a drop or two of ZipKicker. Repeat until you have a canopy of for branches.  
(super glue on sage brush and ZK on SuperTree also ok).





Once satisfied with the canopy spray the top of the tree with flat black paint



Spray the canopy with a diluted mixture (1:1 or 1:2) of white glue and water. Once whole canopy is covered with glue sprinkle on SuperLeaf - (medium green with 5-10% light green). When dry spray with dullcote or similar

SuperTrees, Sage Brush, SuperLeaf - Scenic Express

# Favorite Techniques and Tools - Street Lights and Utility Lines/Poles

## Key points

1. Coloring - older poles usually grey with brown at the bottom due to movement of creosote under gravity
2. Spacing typically 125 ft (urban) and 300 ft (Rural) - for modeling a good compromise is 60 scale feet (8 - 9" in HO)
3. Add line transformers if supplying residences
4. Add wires/lines - in his book LM says no to adding lines

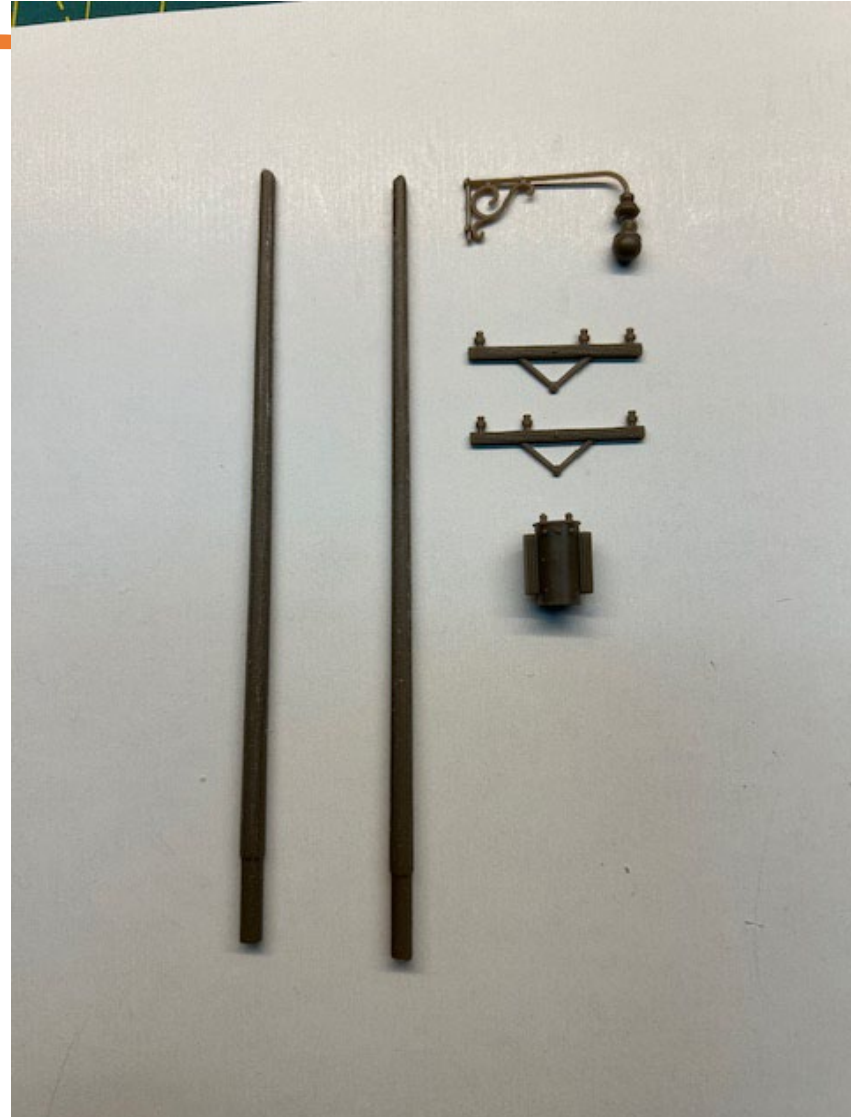
Issue is getting characteristic droop of line between poles  
- very difficult in smaller scales maybe ok in O and larger

**Yes** if at back of layout but **No** if at front of layout



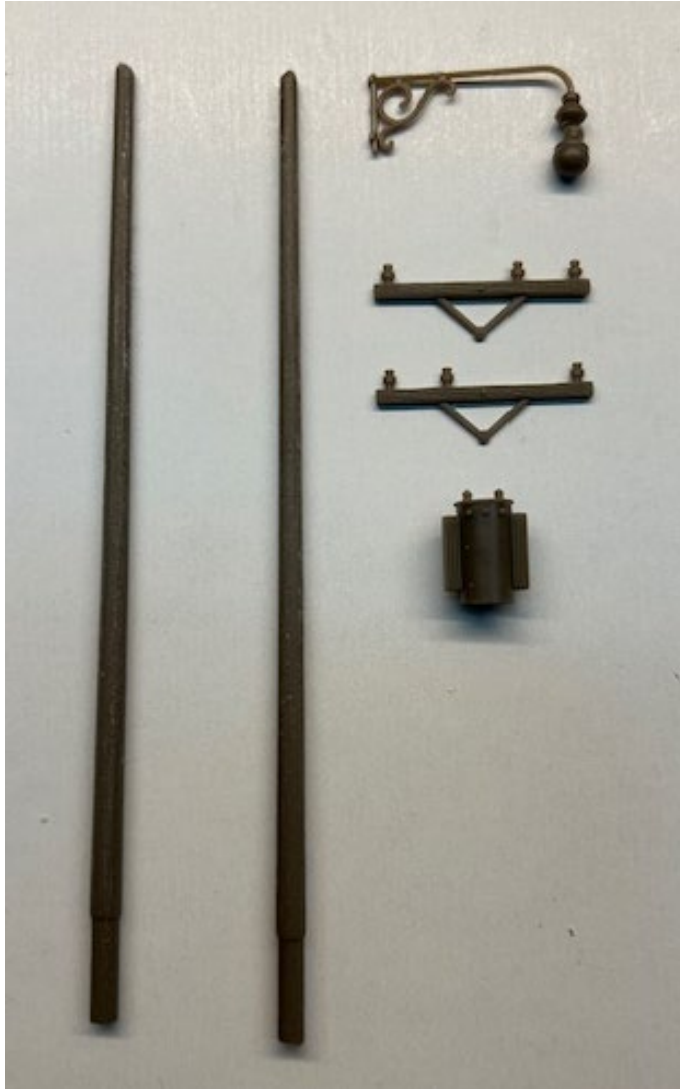


# Favorite Techniques and Tools - Utility Poles



Walther's Product  
Enough material to make 24 poles and 8 lights  
- \$18

# Favorite Techniques and Tools - Utility Poles



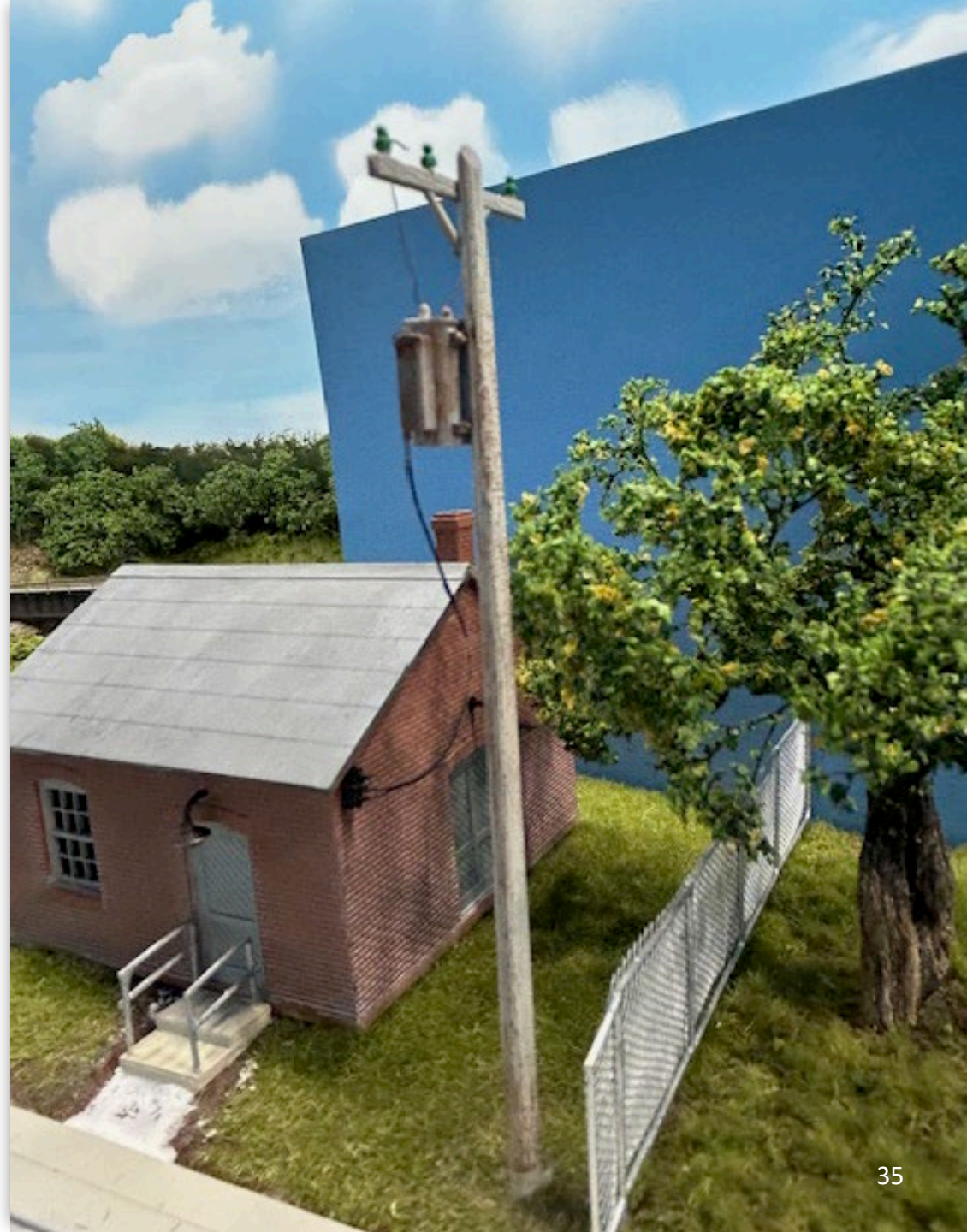
1. Scrape pole with razor saw to add wood grain
2. Spray pole with Testors Light Aircraft Gray
3. Dry brush with burnt umber
4. Paint insulators green or clear
5. Add wires as shown

3 wires go to residence or business

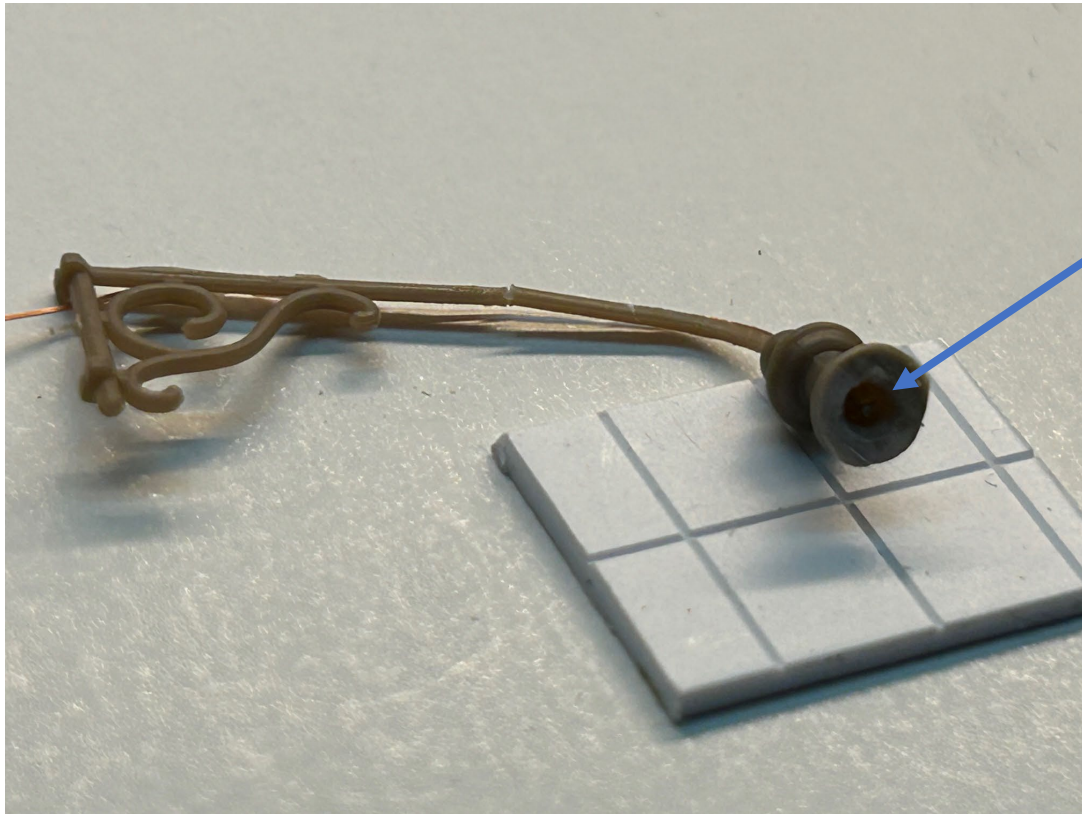
# Favorite Techniques and Tools - Utility lines/poles

Utility Pole with transformer -  
shown in mini module that will be  
passed round

Also shown is Signature Tree  
Static Grass - left  
Martin Welberg Grass mat - right



# Favorite Techniques and Tools - Street Lights



1. Cut lamp off and then Drill #72 hole through center of remaining fixture.
2. Open up hole with a 3/32 drill
3. Insert leads of micro-LED through hole so that LED sits inside remainder of lamp



# Favorite Techniques and Tools - Street lights



4. Carefully pour Glossy Accents (Michael's, Walmart) liquid onto LED and lighting fixture to give a dome of liquid - note liquid is very viscous and will just sit on top of lamp. KEEP LAMP HORIZONTAL
5. After Glossy Accents has set - check for shrinkage and add a little more GA if needed.

Note do not test the led until the GA has set (leave overnight)

# Favorite Techniques and Tools - Street lights

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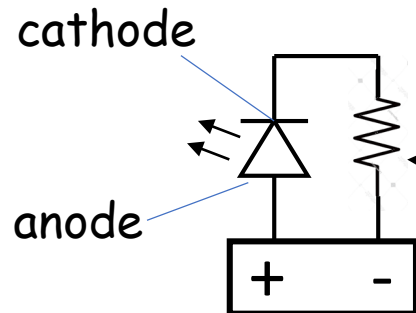
Hook up LED to power source and add an appropriate resistance in series with the LED.

What is the appropriate resistance?

Depends on voltage of Power Source and voltage drop across LED.  
Apply Ohm's Law OR use the table on the next page.

# Favorite Techniques and Tools - Street lights and utility lines/poles

Guide for adding resistances in series with LEDs



Adapter Voltage		3	4.5	6	7.5	9	12	15	18
1.8 v	White								
	Red								
	20 ma	60	135	210	285	360	510	660	810 $\Omega$
2.2 v	White								
	Red								
	20 ma	40	115	190	265	340	490	640	790 $\Omega$
2.8v	White								
	Green								
	20 ma	10	85	160	235	<b>310</b>	460	610	760 $\Omega$
3.2 V	Blue								
	20 ma		65	140	215	290	440	590	740 $\Omega$
	10 ma		130	280	430	580	880	1180	1480 $\Omega$
	2 ma		650	1400	2150	2900	4400	5900	7400 $\Omega$

# Favorite Techniques and Tools - Street lights



Resulting Lamp and utility pole are shown in the mini module that will be passed around. Note that the three switches show the effect of using different resistors - roughly corresponding to 2, 10, and 20 mA current flow through the LED.



NMRA MCR, Div 2

March 16, 2025



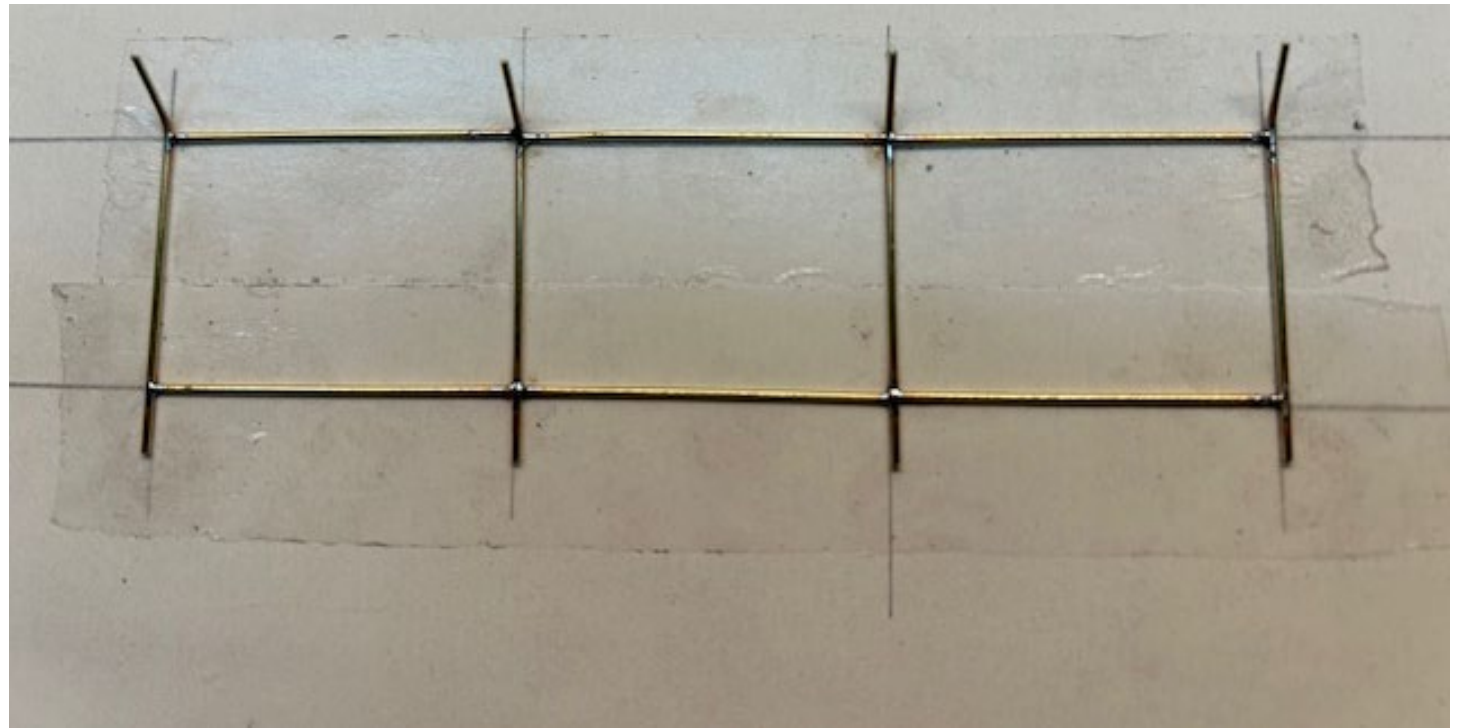
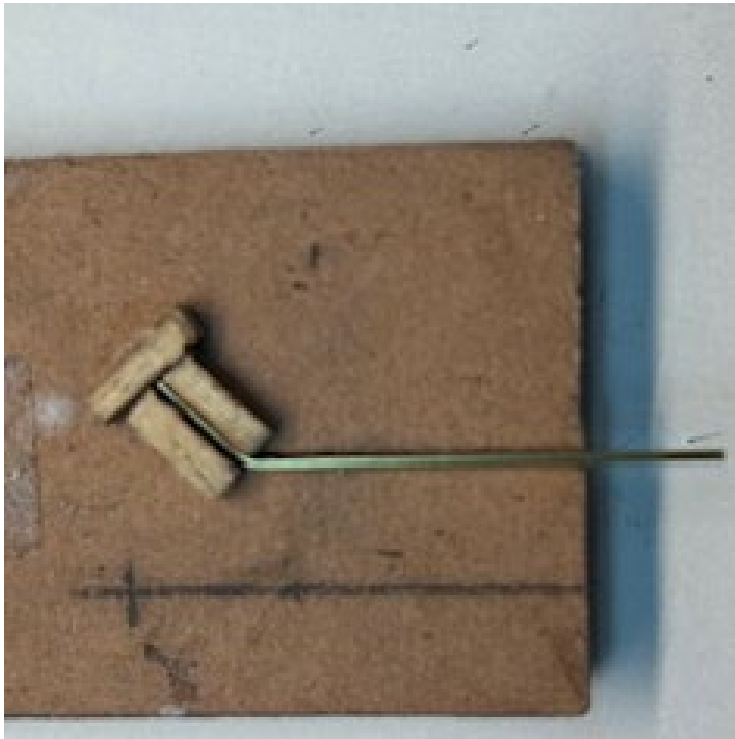
# Favorite Techniques and Tools - Wire fencing



Wire or chain link fence - many styles to choose from

# Favorite Techniques and Tools - Wire fencing

Step 1 - set up a jig and cut lengths of 0.081mm (1/32") brass wire to length and solder together (wire is ~2.75" in HO scale)



# Favorite Techniques and Tools - Wire fencing

Step 2 - prepare "barbed wire" by taking lengths of 32 Ga copper wire, bending in half and attaching to a drill



Regular power drill - do not use a Dremel tool

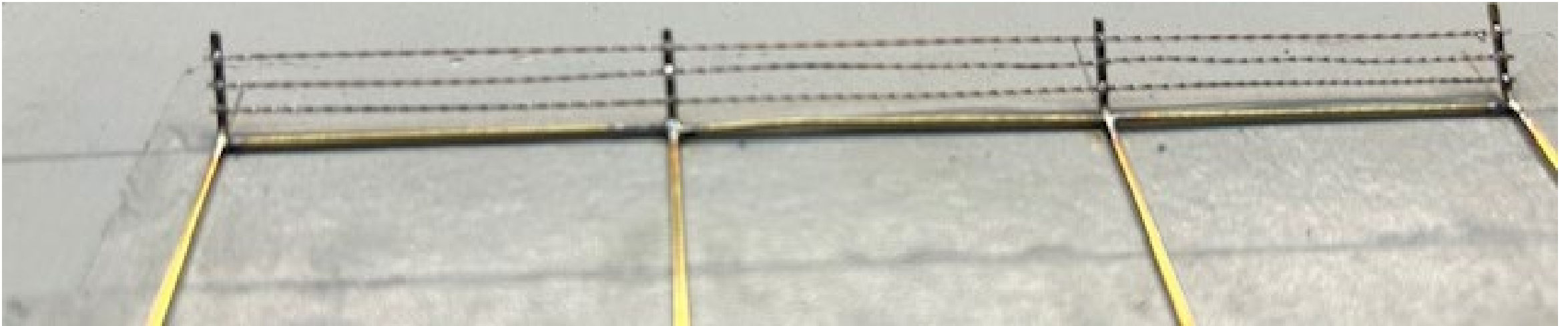
Step 3 - slowly rotate the drill and wind the wire to give multiple turns

# Favorite Techniques and Tools - Wire fencing

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Step 4 - run a bead of solder along "twisted 32 Ga copper "barbed" wire - this strengthens it and makes it less flexible

Step 5 - solder 3 strands of "barbed wire" to fence posts

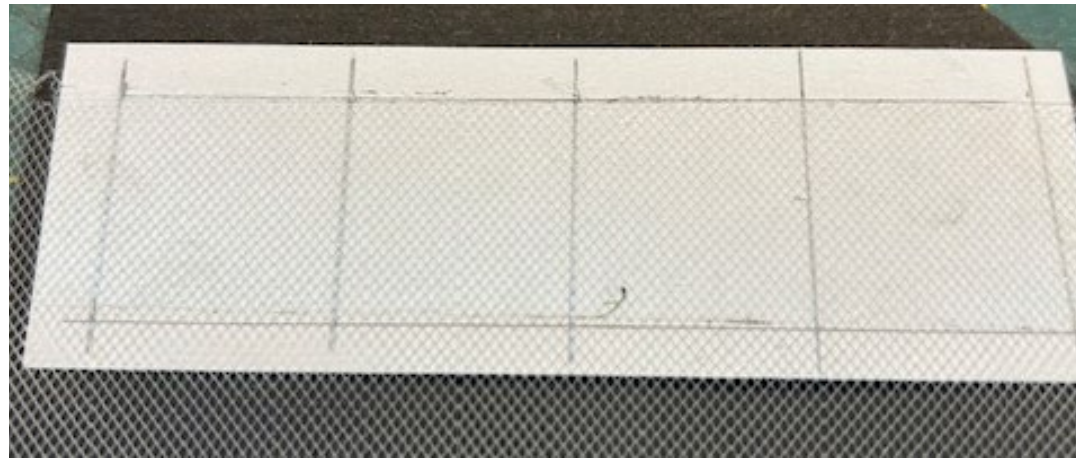


# Favorite Techniques and Tools - Wire fencing

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Step 6 - Cut a strip of Tulle the width and length of the wire fencing.

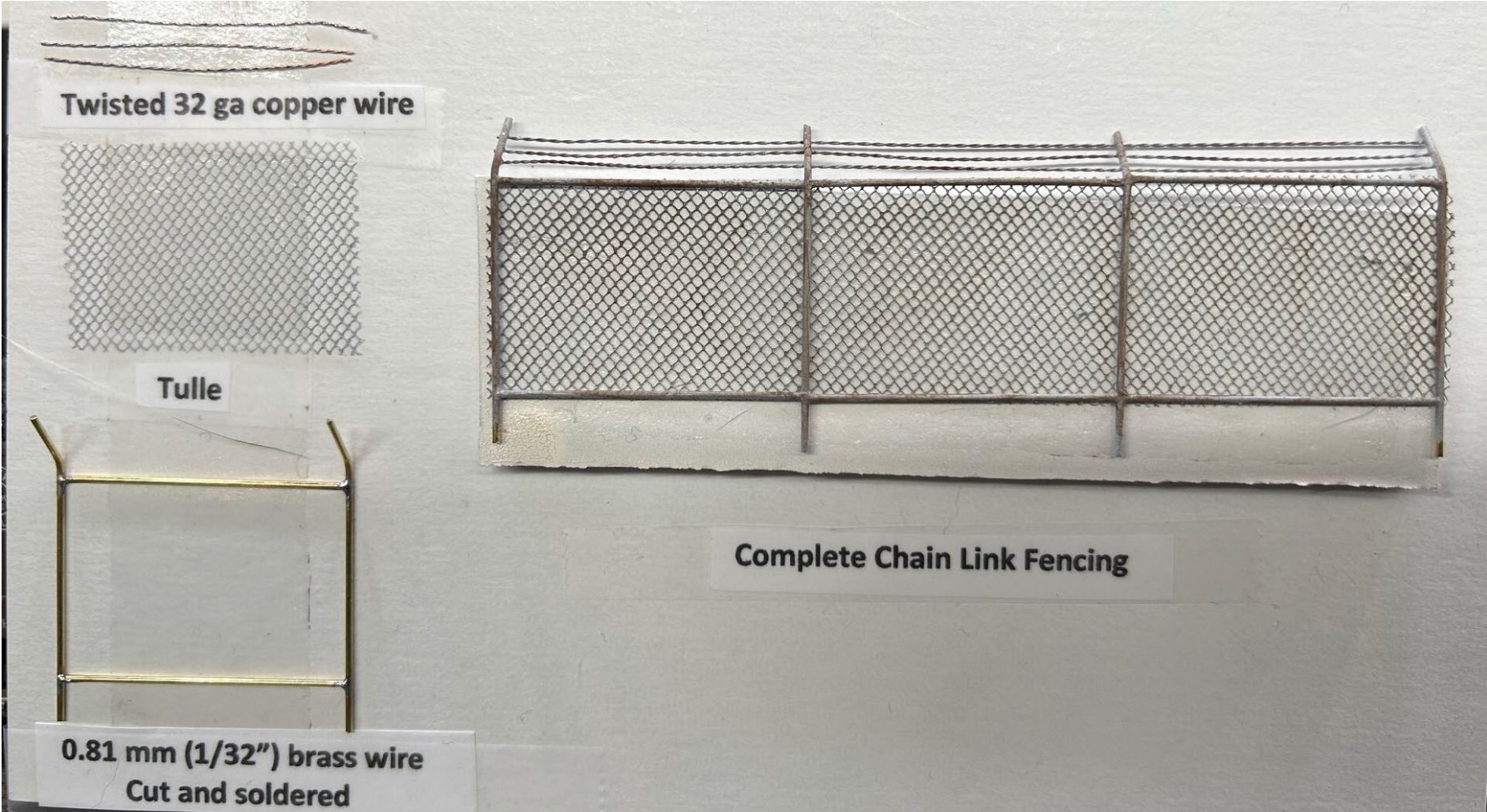
Hold Tulle in place with double backed tape over fence template and cut with scalpel



Step 7 - glue Tulle to posts using super glue and ZipKicker

Step 8 - lightly spray whole assembly with a silver paint and weather using burnt umber

# Favorite Techniques and Tools - Wire fencing



# Favorite Techniques and Tools - Static grass and grass mats

Easy to overdo static grass - so use sparingly

Common sizes - 1mm (~ 3" HO), 2mm (~6" HO), 4mm (~14" HO), 7mm (24" HO) these are applied with a static grass applicator - longer strands up to 12 mm available - do not work well with static applicator

Colors - avoid bright green - more muted

For a mowed lawn 2mm in HO is about right (1mm ok for putting green)

For unmowed area use 4mm and 7mm (HO)

For unmowed and scrub land in particular, my preference is to use grass scenic mats (Martin Welberg - Scenic Express). These look very realistic for scrub land - excellent look, quality, and easy to use

# Favorite Techniques and Tools - Static grass and grass mats





# Favorite Techniques and Tools - Figures, Vehicles, and Details

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## Figures

- For scenes on my layout, I prefer static figures - usually seated.
- For a Diorama dynamic figures (walking, talking, etc.) are ok but I still prefer static!
- Animals (cats and dogs) are also good - cats especially!
- Use high quality figures when possible - often better to have figures facing away from the observer due to poor facial details
- Use figures sparingly (less is more)

Manufacturers - [miniprints.com](http://miniprints.com), [modelu3d.co.uk](http://modelu3d.co.uk), Woodland Scenics

# Favorite Techniques and Tools - Vehicles

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## Vehicles

- Again, I prefer static poses for vehicles, i.e., parked not moving on a road.
- Use a few high-quality vehicles (less is more) - I use models from Oxford Diecast - very nice details and you can read the license plates!
  - Mask windows and spray with a matte medium (Dullcote or similar)
  - Add weathering powder to knock down the shine more
  - Place in static position - parked

# Favorite Techniques and Tools - Figures



# Favorite Techniques and Tools - Figures + Vehicles



# Favorite Techniques and Tools - Vehicles



# Favorite Techniques and Tools - Details

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## Details

- For this diorama, most details are construction-site- or railroad-related
- My observations are that most "debris" is arranged in a somewhat orderly manner but with some randomness. It is not totally random - except maybe for a junk yard but even there - some order is apparent.
- Again - less is more when adding detail

# Favorite Techniques and Tools - Details



# Favorite Techniques and Tools - Details

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# Favorite Techniques and Tools - Details



# Favorite Techniques and Tools - Details



# Questions?

