

# SUPPLEMENTAL INFORMATION FOR NMRA CONTEST JUDGING FORM

## OCKHAM RAZOR FACTORY Main Building



**PART**

**ONE:**

### Construction Technique

#### A. Project Objective

The objective of this project was to scratchbuild a structure or a small group of related structures that would represent a small lineside industry near (but not on) a waterfront as it would have existed in the 1930's. It was designed to be a test for me (self administered) as to how well I could translate various techniques learned through structure kit building to a scratch built project. My goal with each construction project is to do more than make a building, but to tell a story (hopefully with a bit of humor as well).

#### B. Original Plan

The original plan was developed from an article by E. L. Moore in Model Railroad Craftsman from 1969. A copy of the article is included as **Attachment A**. The goal was to create a small lineside industry.

## C. Modifications to Plan

After reviewing the plan I decided to make a number of changes. Those changes are reflected in the hand drawn plan that is **Attachment B**

The building was reversed, with the side with a single commercial door placed in the back of the building and the former back put in front with a redesigned entrance and loading dock.

The relocated loading dock, intended to accept rail traffic, was given a roof.

The furnace room to the right side of the building was extended to make it more proportional to the building.

The smokestack was relocated to the back of the boiler building. This was done because the rail was also being relocated from the front to the back in order to be consistent with its location in the “Long Wharf” area. A photo of the track relationship is included at the end.

The relocated front was given a different appearance, with a front door with steps as well as a covered loading dock.

The window treatments were changed to allow commercially available parts. A wood frame window called for on the plans for the boiler annex was replaced with a masonry window.

Signage was expanded and changed to reflect the nature of the business.

The original plan calls for a building 30 scale feet long. I extended it to 48 scale feet to provide a more prototypical feel to the structure without become overwhelming.

The annex was extended from 12 to 16 feet to give a more prototypical space for the boiler while maintaining the visual balance between the two parts of the building.

## D. Construction techniques

- Hand drawn plans

The original wall dimensions for the main structure were maintained. They were transferred to graph paper for the purpose of repositioning windows and doors.

The brick addition plans were hand drawn as an expansion of the original. The design was done on graph paper using a square.



- Construction article

The construction article was loosely followed. Substantial changes were made as construction progressed.

- Plastic material

Styrene was used for the brick addition, both for the under material and the brick facing sheets.

All windows are commercial plastic parts.

The smokestack was fabricated from a styrene tube and other styrene forms.

Railings for the front steps were made from round styrene lengths.

The light above the main entrance was fabricated from seven separate styrene parts and a commercial light shade.

Vent pipe was made from styrene tube.

Brick foundation made from styrene material from N Scale Architect over balsa.

- Metal

Metal corrugated sheeting was used for the brick extension.

Metal castings used for smokestack, vents, and window fan in back.

Ribbed copper sheeting used for rear roof extension.

Copper metal sheets used for small detail parts.

- Wood

Balsa wood was used for interior framing of the foundation and interior layout of walls.

Sides of main building made from sheet clapboard siding.

Trim from strip wood.

Rafter tails from strip wood.

Sign supports from strip wood.

Decks made from strip wood.

- Cardstock

Roof made from cardstock.

Roofing on front roof extensions made from cardstock.

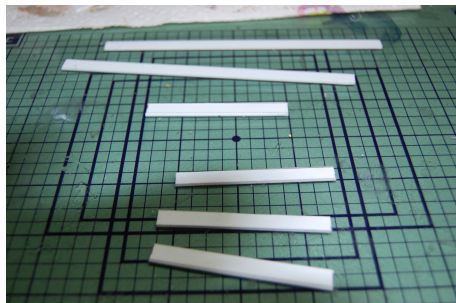
Roof sign printed on cardstock, then board on board backing added.

## E. Construction narrative

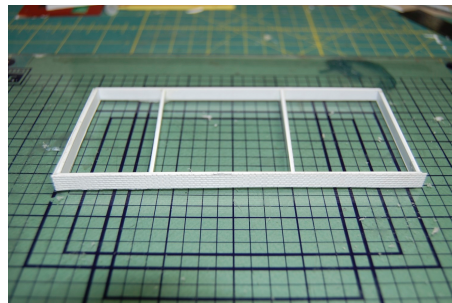
### 1. Foundation

The foundation was built in two steps. After transferring dimensions to graph paper for the footprint of the main building two squares were built, the second being  $\frac{1}{8}$  inch smaller in all dimensions than the first. The first was made out of styrene and was used to support the foundation sheets, which were N Scale Architect brick sheets. The second square was made from balsa and was the base for the main building, allowing the walls to extend slightly beyond the foundation in a prototypical manner. The foundation was painted Tuscan Red. The color was darkened using a mixture of Bragdon powders and alcohol once the paint had dried. Several colors of red powders were used to provide variation. Prismacolor markers were used to apply darker tones to bricks to provide further variation in coloring. Finally, a very thin wash of white acrylic craft paint was applied and allowed to sink into the mortar lines to represent mortar. Any white on the bricks was blotted away to preserve the color variation in the bricks. Foundations were beveled and glued to provide 45 degree angles. Bracing was placed parallel to the end walls to ensure uniformity of shape, and 45 degree bracing was installed to ensure square corners.

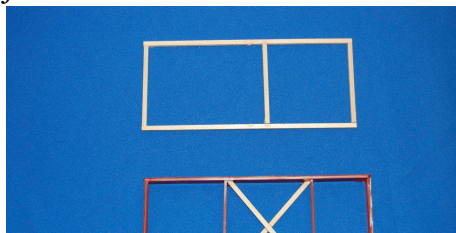
*Pieces of the brick styrene foundation*



*The foundation plan as laid out on grid*



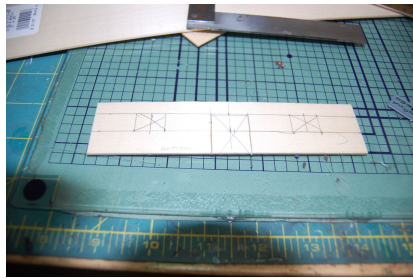
*foundation and walls*



*Assembly of*

## 2. Walls

Walls were constructed from Northeastern clapboard siding.

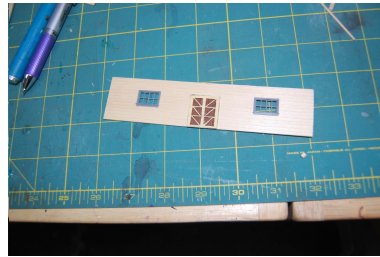
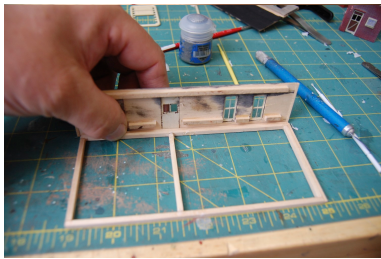


Interior

framework was constructed from  $\frac{1}{8}$  inch strip wood over the balsa base. The higher level walls were constructed separately, with the siding attached to a balsa wall designed to fit into a groove created by stripwood on the side walls. This was done to ensure a straight alignment between the two wall sections.

Window alignment was drawn on graph paper and transferred to the back of the wall sections. Windows were cut out by drilling corner holes using a Dremel motor tool on slow speed, then connected using corner squares and an x-acto knife.

After the window openings were cut out and the back of the walls braced (total of six wall sections) the walls were stained with Hunterline Driftwood weathering stain.



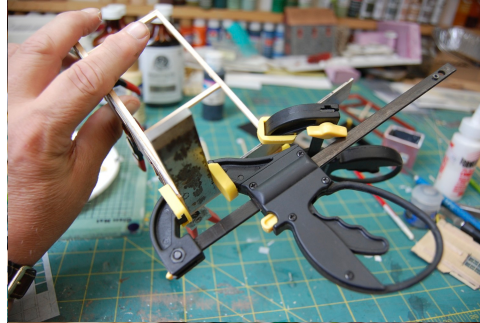
Nail holes were applied with Monster Modelworks Monster tool. Rubber cement was applied in various areas to create a peeling paint effect. The wall was then painted with a dilute layer of Pewter Gray acrylic craft paint. The rubber cement was then removed. NB: the intent was to have a subtle transition between paint and peeled and weather sections. You have to look closely. The effect is most apparent on the right side wall.

Red oxide Bragdon powders were mixed with alcohol (as a fairly pasty mix) and used to simulate rust stains running down the siding. Darker powders were used as a drybrush process to further weather the walls.

*Two walls attached to foundation*



*Clamping wall to foundation*



*Inserting the upper wall into framework*

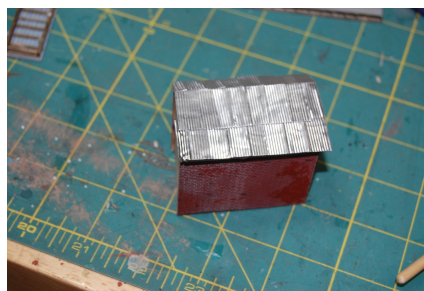
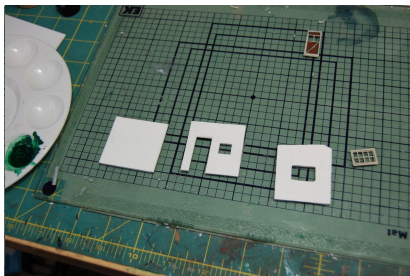


*Completed wall sections*



Some of the clapboards were peeled back and distressed, but this technique was used sparingly, since the intent was to represent a building in reasonably good condition. Window treatments are discussed separately.

Walls for the boiler extension were made from styrene sheet covered by N Scale Architect brick sheets. Window and door openings were first cut on the underlayer and then opened on the brick sheet.



The door is from a FOS scale kit. The walls were made using the same techniques as were used for the foundation. Bricks were painted Tuscan Red. The color was darkened using a mixture of Bragdon powders and alcohol once the paint had dried.



Several colors of red powders were used to provide variation. Prismacolor markers were used to apply darker tones to bricks to provide further variation in coloring. Finally, a very thin wash of white acrylic craft paint was applied and allowed to sink into the mortar lines to represent mortar. Any white on the bricks was blotted away to preserve the color variation in the bricks. Corners were beveled to reduce corner lines.

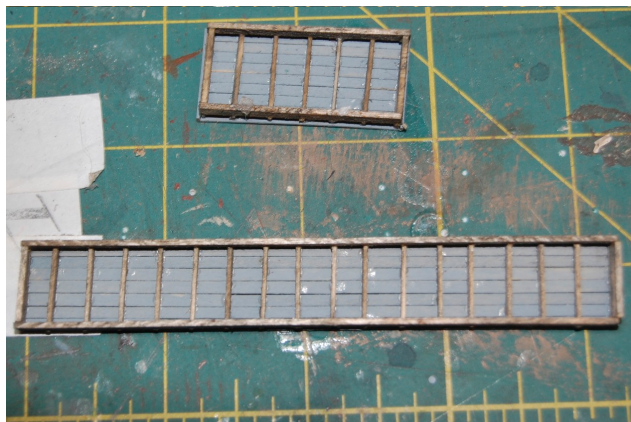
The extension was attached to the main building using styrene corner pieces painted and distressed (using Sophisticated Finishes system) to resemble copper flashing. Discussion of the roof and windows is provided in several following sections.

All trim was fashioned from Northeastern Scale lumber strips, painted and weathered.

## 2. Loading Docks

The loading docks were constructed board by board over templates drawn on graph paper. The construction process using the framework was adapted from the techniques used in South River Modelworks and Micro Scale Models kits. The framework was built over graph paper to ensure square construction and initially held in place with double sided Scotch tape. All wood was weathered using Hunterline Driftwood stain. The lowest layer was glued together with CA for maximum strength. Stringers were then laid on top and attached using canopy glue. The deck boards were cut and fit to have board ends match the stringers and the Monster Nailer used to place nail holes in the appropriate locations. Care was taken to ensure a random pattern.

*Underside of loading docks (pre-cleanup)*



*Surface pattern of loading docks*



Deck surfaces were painted with Ceramcoat Dolphin Gray and weathered with Bragdon powders. Red oxide was used to highlight the nail holes.

The front loading dock is secured to the ground by simulated concrete footings made from stripwood colored aged and distressed to represent concrete. The rear (trackside) platform was secured with a traditional wood footing.

### **3. Roofing**

Each of the roof sections (corrugated metal on extension; copper roof on back deck; main building roof; front porch roofing) is dealt with separately below since each technique is substantially different.

#### **Corrugated roof on extension**

The brick extension has a metal corrugated roof. This is made from Campbell metal stock attached to a thin card underlayer. The card was blackened using a Prismacolor marker around the edges and underneath. Lines were scored on the card to ensure level layers of panels. Each strip was cut in half using a graph paper template, then cut into individual pieces. The pieces were attached to the undercard using 3M transfer tape.



The roof was finished first with sprayed auto primer, allowed to dry, then painted with red oxide and gray diluted craft paint. After drying, more coloring was applied with diluted oil paint using Mike Rose techniques. Finally, streaking was applied with both dry and wet Bragdon powder.

#### **Copper roofing over back deck**

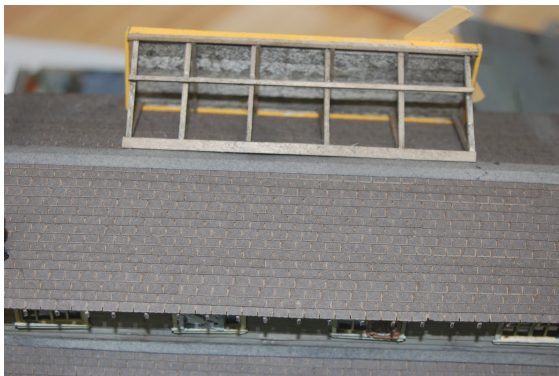
Ribbed copper roofing from Campbell was used for the back roof. The copper roofing was applied to a card underlayer painted with Old Ivory craft paint. Once again 3M transfer tape was used to attach the roofing. Wood strips were applied along the under edge of the card to represent bracing for the roof.

Several layers of coloring were applied to achieve a copper patina. The first process was to apply Sophisticated Finishes coppering solutions to the roof. This is a two step process. The first step was to apply a metallic surfacer to the metal to enhance the metal gripping power. After drying, a patina blue antiquing solution was applied. To ensure full coverage Cactus Green Ceramcoat was diluted and washed over the surface. Finally, an alcohol and India ink solution (light) was applied to the surface, which was then dusted with weathering powder. A dilute of white glue and wrought iron black craft paint was used to represent the tarring at the joint between the roof and the wall. The roof is held up by 2x4 bracing.



### **Main building roofs**

The main roofs were made in the traditional manner. Cardstock was cut to fit the main roof and the two lower roof extensions. Prismacolor markers were used to darken the edges and under the overhang. Lines were drawn on the roof pieces to even the shingling material. Transfer tape was then applied, followed by BEST shingle strips. A hip strip was used from the original material. The roofing was then washed with Hunterline weathering stain, followed by a dusting of Bragdon powders.



The larger stack is a BEST casting, the smaller vent was made from a styrene tube. Both were painted weathered black and dusted with weathering powder. Holes were drilled using a hand drill and then reamed to size. A mixture of glue and paint was then put on the bottom

Rafter tail marks were made on the bottom of the roof, which was then attached using canopy glue. Rafter tails were cut using a handmade template. The rafter tails were stained, and then clipped to size using a sprue cutter. The

### **Front Porch and Loading Dock Roofs**

Both these roofs were built board by board over a grid based plan. The underroof was then painted antique ivory and weathered with alcohol and india ink. A framework was also added. Best rolled roofing was then applied using transfer tape and weathered and stained as previously related.





#### 4. Windows and Doors

The front main door, the annex door and the back door are all surplus multilayer constructs that were left over from a FOS Scale Models kit. The loading dock door on the front is a metal casting of unknown provenance. The remaining windows are Northeastern Scale Models windows with included glazing.

The windows were primed with automobile gray and allowed to dry. Diluted antique white was applied with a sponge technique. They were then washed with India ink and alcohol and weathering powder.

Glass was applied to the rear of the windows using Future Floor Wax as a bonding agent. Windows in the front were given venetian blinds from Builders in Scale.

The loading dock walls were painted with Citadel metallic copper (a wargamer paint line with terrific metallic colors). The door knob was painted black. Hinges on the front door were made from small copper ship plating painted black.

#### 4. Main sign

The main sign was designed on a word processing program. It was attached to a board on board backing made of strip wood. Framing was then attached around the outside of the sign. The razor was found on the internet, attached to styrene, and the edges were then painted. The framework was constructed using available internet plans from stripwood.



#### E. Materials Used

Northeastern sheet clapboard

N Scale Architect brick sheets

Northeastern scale lumber, various sizes

Northeastern Scale Lumber windows and glazing

Midwest Models balsa sheets and forms

BEST shingle strips

Doors salvaged from FOS Scale kit

Evergreen sheet styrene

Card stock

Evergreen styrene forms

Campbell metal corrugated roofing

Campbell copper ribbed roofing

BEST detail parts (stack, vent, fan)

Sierra West details on decks

Prismacolor Markers

Builders in Scale venetian blinds

Paints, stains and washes

Delta Ceramcoat Paints

Valejo acrylics

Hunterline stains

Homemade alcohol ink stains

Winton oil paints  
Sophisticated Finishes Surfacing System  
Red and Gray spray automotive primer  
Citadel metallic paints

#### Glues

CA: medium dry with zip kicker as necessary  
Elmer's white glue  
Future Floor wax  
Formula 560 canopy glue  
Ambroid ProWeld  
Elmers Rubber Cement  
Woodland Scenic liquid latex

#### Tape

Double sided Scotch tape  
Transfer tape (3M, purchased from framing store)

## **PART TWO: DETAILS**

Details included on the model:

The light fixture on the front was scratch built from seven separate pieces of styrene attached to a commercial lampshade. Photos are attached.

The front step railings were fabricated from styrene tubes. A slightly larger styrene tube was sliced thinly to make the hardware attaching the railing to the wall. The styrene was painted weathered black and touched up with red oxide weathering powder.

The front steps were made from forms with additional siding and under bracing made from strip wood. The steps were painted to represent painted concrete rather than wood.

Multiple era appropriate signs were attached. A full listing of the signs and their significance is included under the conformity section.

Nail holes were applied on the walls with the Monster Nailer from Monster Model Works. This provides two small holes rather than the horizontal press line created by other tools.

Rubber cement was used to provide a peeling paint effect.

The smokestack was made from styrene tubing and styrene strips, painted aged black, weathered with powders, and attached to a brick base using the same paint/glue combination described in the roof section.

Ivy on the extension wall was made from ground foam. A piece of aluminum foil was laid out and a pattern made using Woodland Scenics latex. After the latex dried it was detached from the foil and attached to the side of the building using canopy glue.

The small window on the annex was propped open using a piece of painted stripwood.

Right side vent casting was added, manufactured by BEST.

Electrical attachment was left over from another kit.

White cover of one back window was made board by board then painted.

White and distressed using CA (yes, really!). Window fan was a BEST casting painted and weathered with weathering powder.

Broom casting painted and placed on loading dock.

Junk piles from Sierra West primed, painted and weathered.

## **PART THREE: CONFORMITY**

### **1. Structural conformity**

Since this building is from plans for a non-specific prototype, structural conformity was approached in several other ways:

*Conformity to form and substance of era structures.* Attached below is a photograph from the cover of the Newport Rhode Island City Directory

from 1956. This shows the Long Wharf area of Newport, which was the railroad terminus. It served both passenger and freight traffic. There were both large and small industries, and not all were related to water based industries. The Newport waterfront area of the time had small machine shops and factories, such as the Garreau Machine Shop, where my father worked after World War II. A razor factory is therefore in conformity with prototype. Many of the buildings and the trackage from the 1930's were still present. I have identified the building marked as "K" as a similar structure. It is a lineside industry smaller than most of the buildings around it and serviced by its own siding. The whole area is now a destination Marriott resort.

*Appropriate construction techniques for the era.*

Weathered clapboard siding in dull or muted colors.

Attached boiler structure with stack made out of brick.

Multiple brick colors, including dark shades, to represent the fact that such structures were generally not built out of top grade bricks but out of a run of the mill quality.

Visible rafter tails, not included on the original plan.

Use of "cast iron" railings for the front rather than the usual wood stair rails.

*Appropriate aging*

Peeling sections of paint representing deferred maintenance.

Rusted window fans and covered over back window to make it era-placement appropriate.

Some windows in state of disrepair.

## **2. Visual conformity.**

I use the term visual conformity to refer to the ability of the model to transmit to the viewer the era it represents. This is primarily done through details and signage. I consider signage to be crucial to conformity: Looking at the model you should see what a person walking around in that era would have seen around them. The following details are examples of what I call visual conformity:

Political posters on the back wall are from the 1936 Roosevelt reelection campaign. They read: Roosevelt: A Gallant Leader. They are aged to represent two year old posters (my railroad is set in 1938). Multiple

posters, one after the other, are also prototypical.

The Robbins Brothers Circus with Hoot Gibson poster is also from 1938 tour of that circus.

The sign on the front showing the number of days without an accident (the worker is currently changing the number to zero, the most days this factory has gone without an accident is nine....(pre-OSHA, obviously)) is from the mid-1930s, surprisingly.

The WPA (Works Progress Administration) commissioned many artists and designers to create posters and signs. There are two examples on this building. The first is the sign on the far left of the front, which is a warning to have injuries examined by a doctor. Infections were much more of an issue at this time, and awareness of the dangers of infection was a constant theme during this period. The second WPA sign is on the right side of the main building, which is an exhortation to go to school for adult education classes.

The “be careful” sign on the front does not appear to be a WPA sign, but is something that would often appear on buildings at this time.

Prints of all signs in larger sizes are included in **ATTACHMENT C**

## **PART FOUR: FINISH AND LETTERING**

A number of the finish and lettering techniques are described in full in the construction narrative. The objective in each case was to create layers of coloring by using multiple thin washes and alternating techniques. For the purpose of this section a summary is as follows:

All wood was stained prior to painting where painting was necessary.

Stains were also applied after painting where appropriate.

Roof material was stained to dull down the colors.

Brickwork was painted, colored with markers, weathered with powders, given mortar using diluted acrylics and weathered again with dry powder.

Metal roofing was given multistage treatment as explained in the construction narrative. The corrugated roofing was primed, painted with oil paint, given an acrylic wash, and weathered with powder. The copper

roofing was given a multistep finish with coppering solution as well as acrylic paints, powders, and a stain wash.

Walls were given a stain undercoat, an acrylic wash, peeling paint with rubber cement, another wash of stain and weathering powders.

Weathering powders throughout were used both as a dry brushing technique and as thin and sludgy coloring using different dilutions of alcohol.

Detail castings, metal parts and styrene were all primed with spray automotive primer, either gray or red as appropriate.

## **PART FIVE: SCRATCH BUILT PARTS**

As noted in the construction narrative, the structure was scratch built from a magazine building plan that was freely adapted. Non-scratch built parts are limited for the most part to windows, details, and roofing materials. In particular, scratch built parts include:

The main sign and support structure.

The loading docks in the front and back, as well as their roofs.

The front stairs.

The front light fixture.

The front step railings.

The smokestack.

The base for the workbench attached to the annex.

All window openings, siding, rafter tails and strip wood was cut using hand made templates.

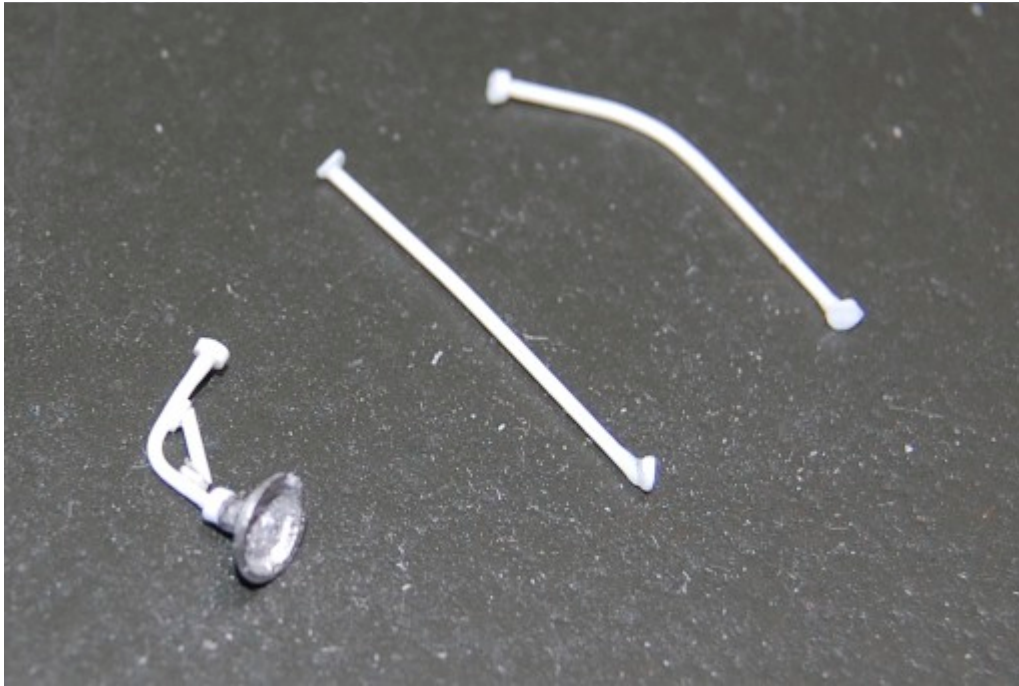
Roof pieces were cut from cardstock or built board on board.

Loading docks were built over a template using board on board construction techniques.

There are several specific items that should be pointed out.

### *Lamp fixture and front rails*

First, I fabricated a light fixture for the front and the front rails out of styrene. The lampshade was made from seven separate styrene pieces assembled with CA. The front stairs had three pieces of styrene bent to shape. All pieces had brackets to hold them to the wall made out of styrene.



### *Smokestack*

The smokestack was fabricated from a styrene tube and several styrene strip forms to give it a credible top. It was then primed, painted, and weathered. It was then attached to a styrene base covered with N Scale architect brick sheets and a plain styrene sheet to represent the cover.



### *The main sign*

As previously noted, components: the underlayer for

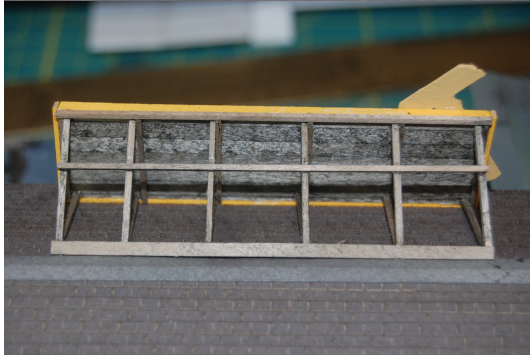
the main sign is made up of three itself, and the supporting structure.



The sign was generated using a word processing program.

The underlayer for the sign was built board by board to allow it to be thin, have board lines visible through the front, and have the board on board nature visible from the back.

The framework was adopted from various plans I have accumulated from other kits as well as blueprints found on the internet.



## Evolution of the Name

E.L. Moore called this Pud's Putty Factory. I wanted something different. Some of the industry names I am building or have built have family names and some are "inside baseball jokes" derived from my interests in science fiction, folk music, and my twenty year career as a criminal and civil court judge. This is a relatively unsubtle example of the latter.

The physics department at UC Riverside posted this explanation online:

"Occam's (or Ockham's) razor is a principle attributed to the 14th century logician and Franciscan friar William of Ockham. Ockham was the village in the English county of Surrey where he was born. The principle states that **"Entities should not be multiplied unnecessarily."** Sometimes it is quoted in one of its original Latin forms to give it an air of authenticity:

"Pluralitas non est ponenda sine neccesitate"

"Frustra fit per plura quod potest fieri per pauciora"

"Entia non sunt multiplicanda praeter necessitatem"

In fact, only the first two of these forms appear in his surviving works and the third was written by a later scholar. William used the principle to justify many conclusions, including the statement that "God's existence cannot be deduced by reason alone." That one didn't make him very popular with the Pope. Many scientists have adopted or reinvented Occam's Razor, as in Leibniz's "identity of observables" and Isaac Newton stated the rule: **"We are to admit no more causes of natural things than such as are both true and sufficient to explain their appearances."**

I have heard this used and misused many times, and have used it myself in analytical endeavors (you would not believe how many criminal trials can be decided using this simple rule of thumb).

So, it is a short step from putty knife to razor, and then on to Ockham. I am not the first to think of this, of course. The next sheet shows some of the similar images I found online, together with the actual (and appropriately simpler) sign I used.

## PART SIX: PROTOTYPE PHOTOS

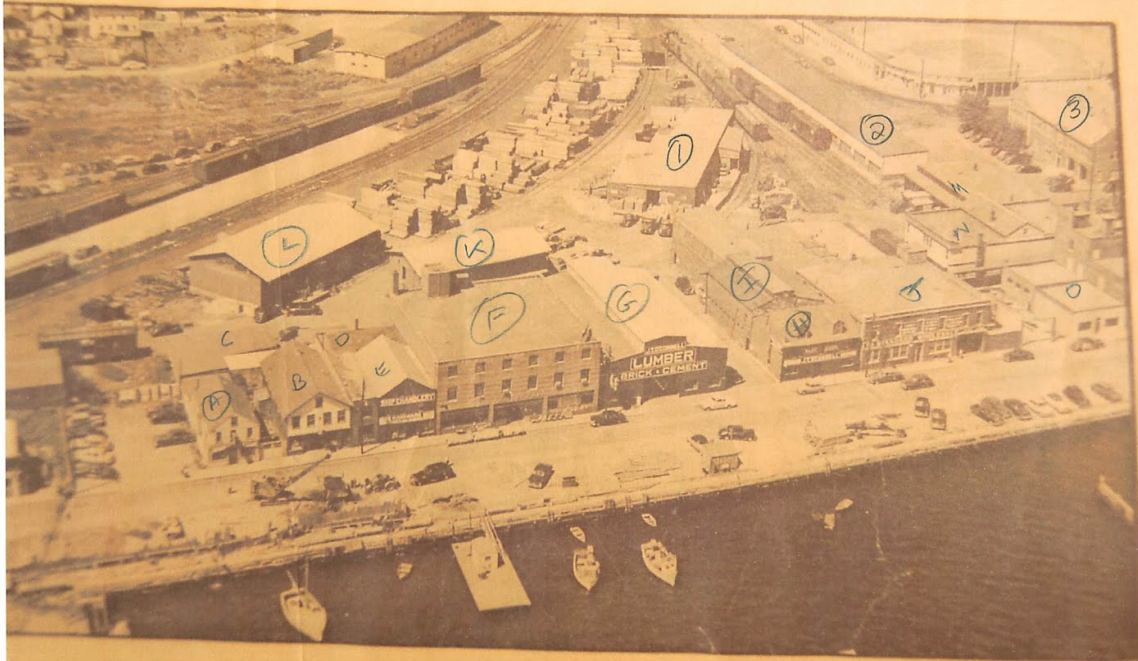
The first photo shows a similar roof design on a factory.



The second picture is of the Long Wharf area of Newport Rhode Island that is part of the inspiration for my waterfront terminus town. The structure marked "K" represents the building that I have modeled here: a small factory in a waterfront business zone but not directly on the waterfront. Although this is dated 1956, all the buildings present were there in 1938. This is an area where things were mostly subtracted over time, not added.

Note that to match the prototype building "K" it was necessary to move the trackside to the rear of the building, leaving the big open area in front for parking.

OF THE  
CITY OF NEWPORT, RHODE ISLAND  
1956



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