HO Scale Structure Kit 933-2971

ROLLING MILL

Thanks for purchasing this Cornerstone Series® kit. All parts are made of plastic, so use only compatible paints and glues. Please read these instructions and study the drawings before starting.

Rolling mills are one of the most important and numerous buildings on the property of a steel works. Inside these massive structures, raw steel is transformed into dozens of useful products. A typical works will have several mills, each specializing in a particular product. Some common types include blooming, billet, plate, structural, rolling, rail, bar, pipe and rod mills, and there are many others.

The process begins as molten steel is poured into large ingot molds. When the steel has cooled sufficiently to form an outer crust, the mold is stripped. The ingot is then transferred to the soaking pit (actually a furnace), where it's reheated to a uniform temperature before rolling.

The first mill is the primary or ingot breakdown mill. Here, depending on the finished product, the ingots become rectangular slabs measuring perhaps 6 x 48", billets are rolled up to 5" square, while blooms are larger than 5" square. After the initial pass, the ingot begins to assume its new shape, but the ends are never square. Subsequently, they may be cropped once or twice to true up the piece before the final rolling.

Slabs are rolled into hot strip, which is pickled and oiled. Cold strip (rolled once the slabs have cooled) is annealed, then temper rolled for tin mill products. It may be galvanized and coated for other types of flat, rolled products. It can also become "scalp" for welded pipe and finally plate, for steel plates. Billets become hot rolled bars, and further in the process, can be used as a source for cold drawn bars. Rods are used for wire and wire products. Tube rounds are a semifinished rod product, which are pierced to make seamless pipe and tubing. Blooms become structural shapes or rails, but only after several passes back and forth through the rollers. All of these operations are accompanied by thunderous noise as the ingots are flopped from side to side, and sprayed with water for cooling and removing scale.

The slabs then head for additional rolling mills where they will again be shaped. This treatment is actually beneficial to the steel, altering its microscopic structure and making it stronger. The rolls that do the work are machined cylinders of various sizes (all of them big!) which actually form the hot strip.

Once shaped, the material may undergo additional work. Beams, bars and sheet steel can now be cut to length. As the piece cools, stresses caused by temperature differences can drastically affect its straightness. As a final step, it will be run through a straightener, a large, specialized roller which bends the piece back into alignment.

Sheet steel also receives additional treatments. This would include pickling with acid baths in preparation for plating with tin, zinc or other materials. It may also be coiled or slit to a specific width. Some will be allowed to cool to room temperature for cold-rolling. This process re-rolls the steel sheet under extreme pressure, producing a sheet just a few thousandths of an inch thick, with a very smooth surface. An example of this process are tin coils made at the Weirton, West Virginia, works, which are shipped to a maker of pet food cans. A finished coil approaches 80" in diameter and may hold up to 27,000+ feet of very, very thin steel. Many times, these coils will be shipped in wrappings bearing the name and insignia of the pet food company.

Completed products are then sent to storage yards, while beams and rails may be placed anywhere, coils are wrapped and stored under cover. Larger items will be shipped in gondolas, or specialized coil cars (which handle coils up to 84" in diameter) while some smaller items may be loaded for shipment by truck.

ON YOUR LAYOUT

When completed, this building is suitable for virtually any type of rolling or general mill. As part of a steel works, it's right at home alongside the Blast Furnace (933-2973), Electric Furnace (933-3056) and Coke Ovens & Quench Tower (933-2972). Prototype rolling mills tend to be very large and long to house the machinery, and at 32" long this mill is ideal! This kit is modular and is easily enlarged simply by combining kits, making it easy to customize to fit available space. Several kits placed end-to-end could also be used as a hidden storage yard for modeling loads-in, empties out operations. To use the kit as a background along your backdrop, build it half-depth—it'll yield a background building over five feet long!

To help dissipate the tremendous heat and moisture inside, these structures are equipped with full-length, monitor-type roof vents, and some are built without a ground floor sidewall. Both options are included in this kit. Leaving off the sidewall will also reveal the interior reversing mill and soaking pit details.

In buildings where it may be necessary to operate rail cars inside, plastic rails have been molded into the baseplate. Optional cut-outs let you install end-doors where you need them. For safety's sake, locomotives don't usually enter the buildings. Instead, idler cars are placed between the engine and the first car. Following this practice, you can move cars in or out just like the prototype, without laying track inside the building.

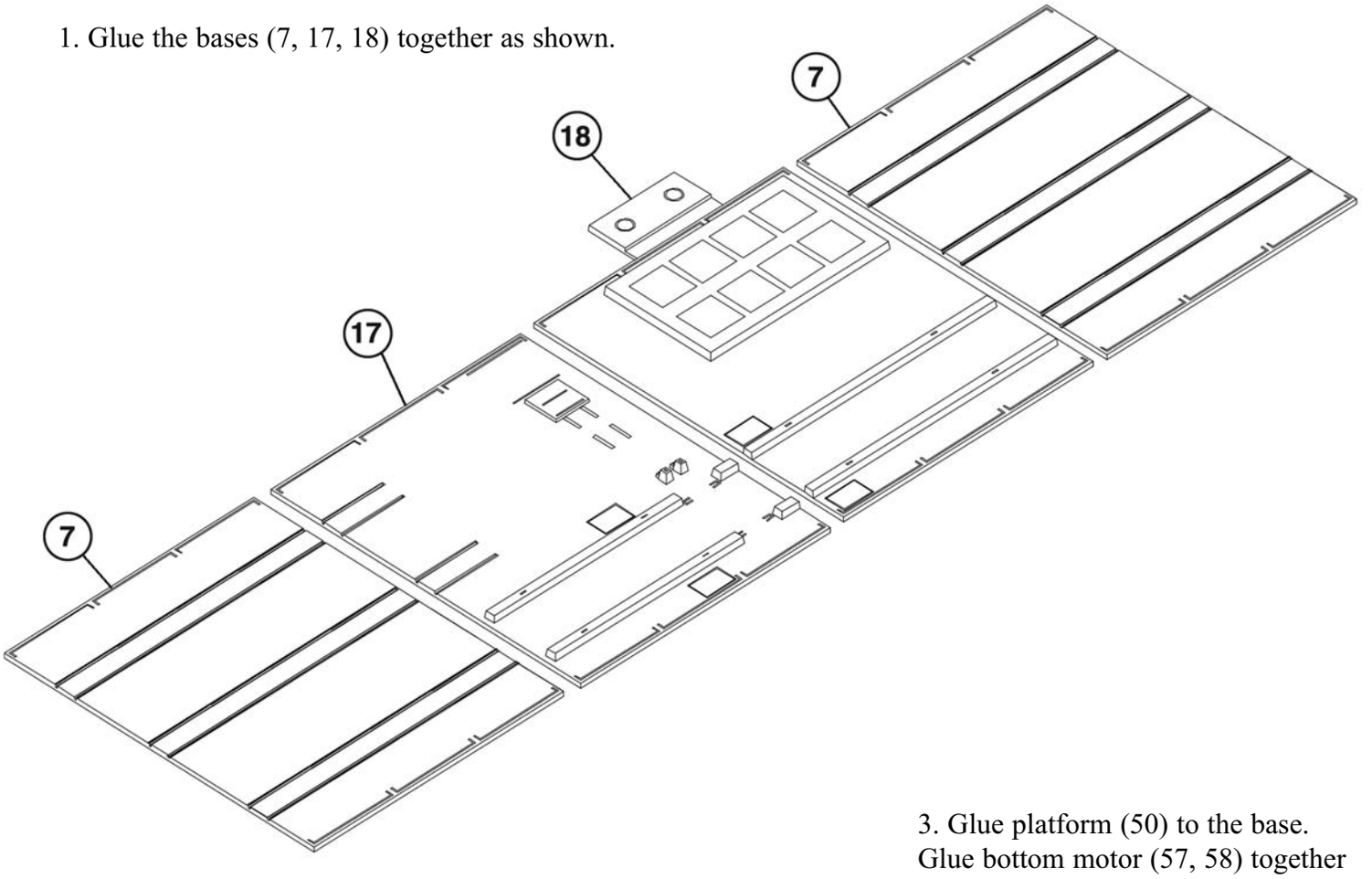
The actual type of machinery and interior details vary depending on the kind of products made in the building. This version of the Rolling Mill includes a reversing mill complete with non-working motor, shaft and roller table details as well as soaking pit and cover parts.

From about 1915 on, rolling mills began using giant electric motors in place of steam engines to power their machinery. To meet the demand, the Northern Light & Power Powerhouse (933-3021) or the Tri-State Power Authority generating station (933-3055) can be installed nearby. And, don't forget to add High-Voltage Transmission Towers (933-3121) throughout your complex—all those machines in the buildings consume plenty of power!

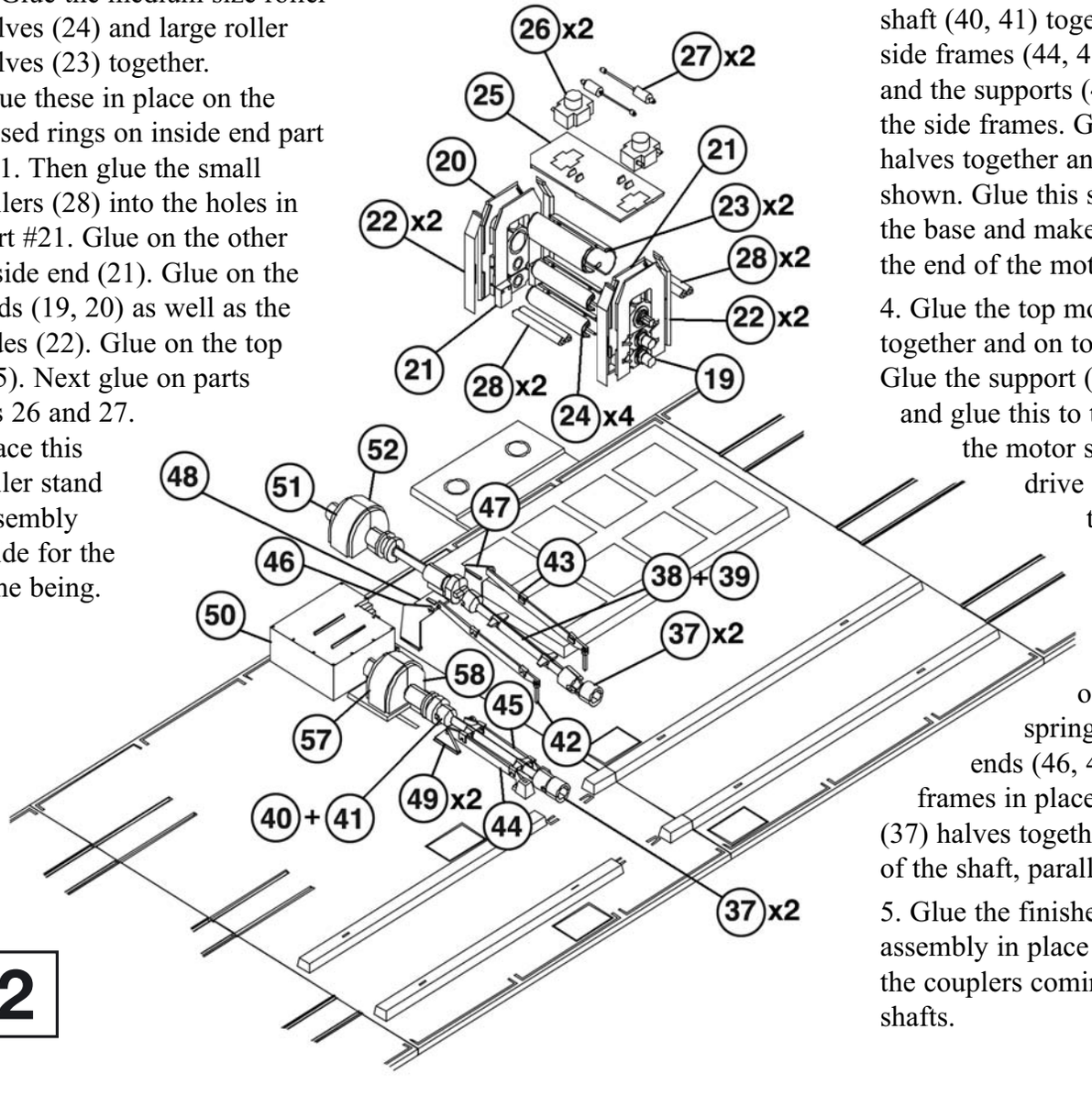
Coils can be shipped aboard Gold Line™ Evans 100-Ton 55' Cushion Coil Cars (932-3820 series). Beams and structural shapes can be moved in Gold Line™ 65' Mill Gondolas (932-3270 series). Pipes and other small items can be moved in PROTO 2000® 52'6" Drop-End Mill Gondola and Gold Line™ Thrall 53' Gondolas (932-40250 series). Strips and plates will look great on PROTO 2000 AAR 53'6" Flat Cars. Check for the latest cars and roadnames on the internet at www.walthers.com. Don't forget, all kinds of beat-up gondolas handle inter-plant hauls of home scrap that includes cropped ends, heavy scale and cobbles from the rolling process.

Add to the rail action at your steel works by switching cars throughout the complex. PROTO 2000 Fairbanks-Morse H10-44s are perfect for these duties in the diesel era and for steam-era scenes use PROTO 2000 USRA 0-6-0 and 0-8-0 locos. In yards where cars are interchanged to mainline railroads, PROTO 1000™ EMD GP15-1s are ideal for heavy switching.

1. Glue the bases (7, 17, 18) together as shown.



2. Glue the medium size roller halves (24) and large roller halves (23) together. Glue these in place on the raised rings on inside end part #21. Then glue the small rollers (28) into the holes in part #21. Glue on the other inside end (21). Glue on the ends (19, 20) as well as the sides (22). Glue on the top (25). Next glue on parts #'s 26 and 27. Place this roller stand assembly aside for the time being.



3. Glue platform (50) to the base. Glue bottom motor (57, 58) together and to the base. Glue the bottom drive shaft (40, 41) together. Next glue the side frames (44, 45) to the drive shaft and the supports (49) to the pegs on the side frames. Glue the coupler (37) halves together and on the end as shown. Glue this shaft assembly to the base and make sure it couples to the end of the motor.

4. Glue the top motor (51, 52) together and on top of the platform. Glue the support (46, 47, 48) together and glue this to the base, underneath the motor shaft. Glue the top drive shaft (38, 39) together. Glue the side frames (42, 43) to the shaft. Glue this assembly to the base and end of the motor, lightly springing out the support ends (46, 47) to snap the frames in place. Glue the coupler (37) halves together and onto the end of the shaft, parallel to the floor.

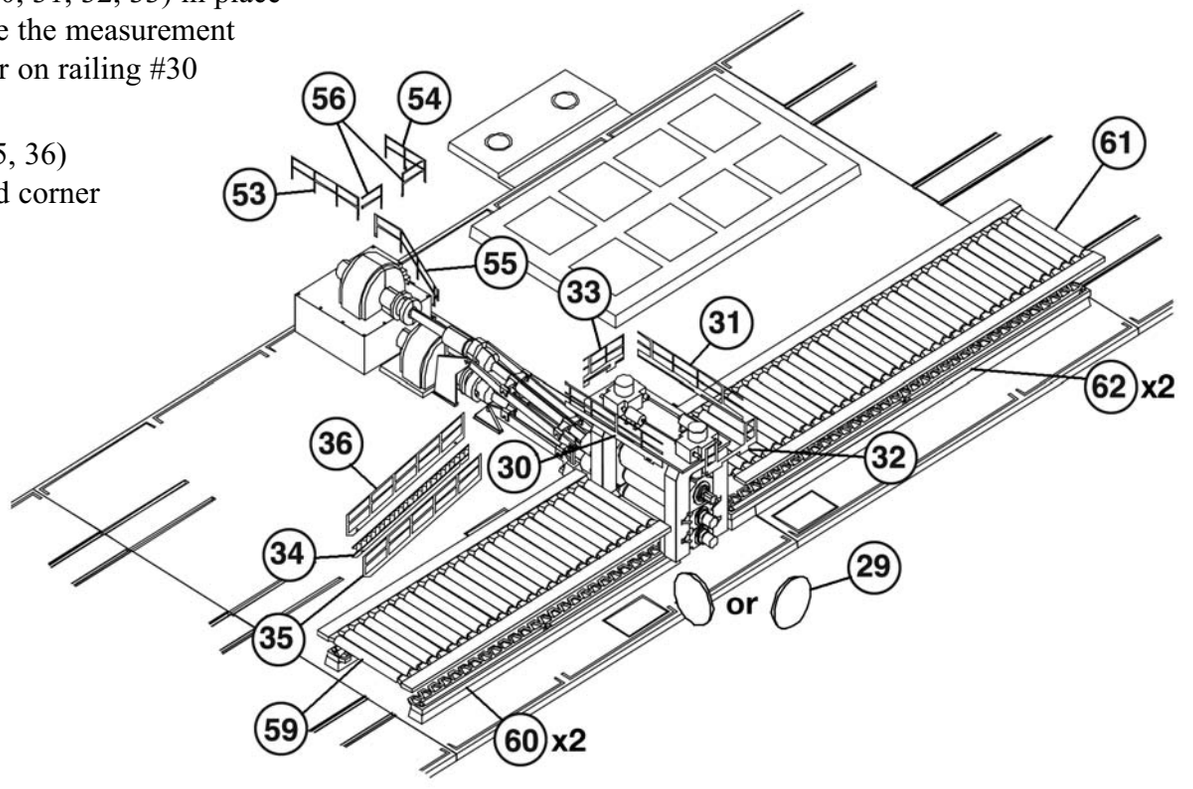
5. Glue the finished roller stand assembly in place on the base and to the couplers coming off the two drive shafts.

6. Glue the rails (60, 62) in position on the bases. Then glue the roller conveyers (59, 61) on top of the rails.

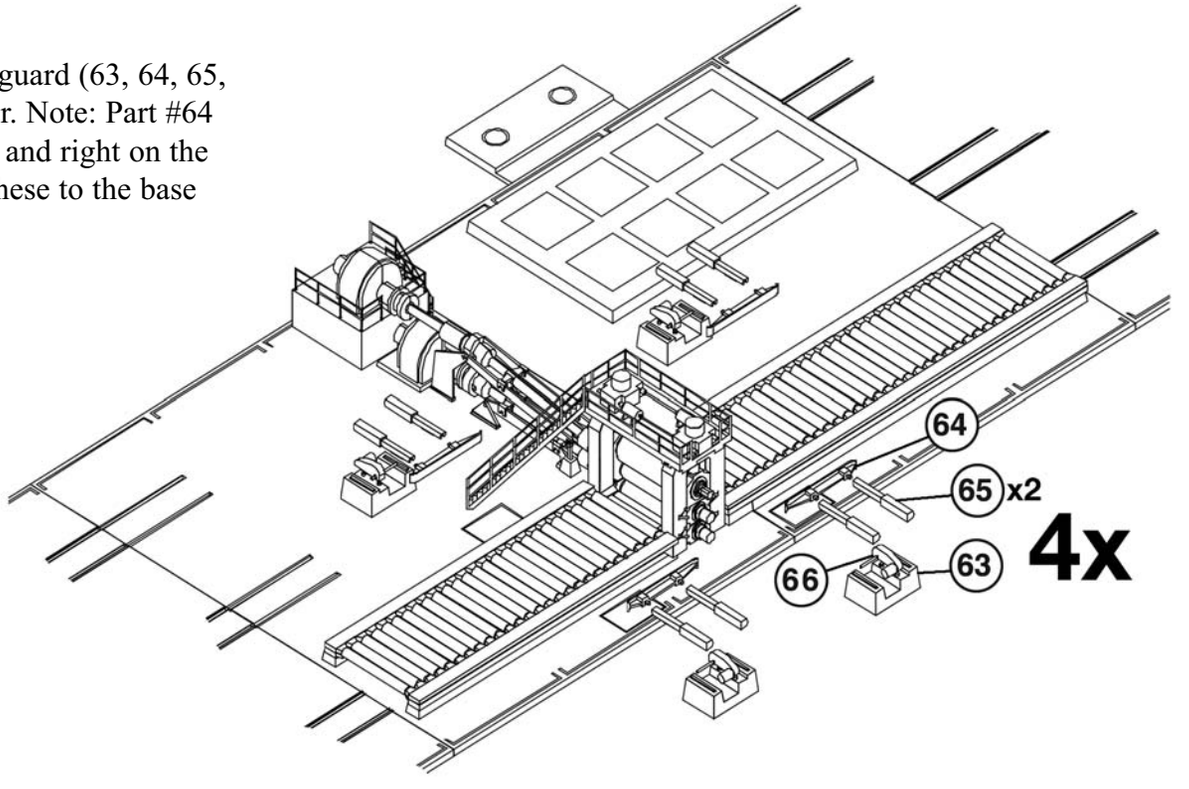
7. Glue the handrails (53, 54, 56) in place on the platform.

8. Glue the handrails (30, 31, 32, 33) in place on the roller stand. Glue the measurement disc (29) in place, either on railing #30 or #32.

9. Glue stairway (34, 35, 36) together and to base and corner of roller stand.



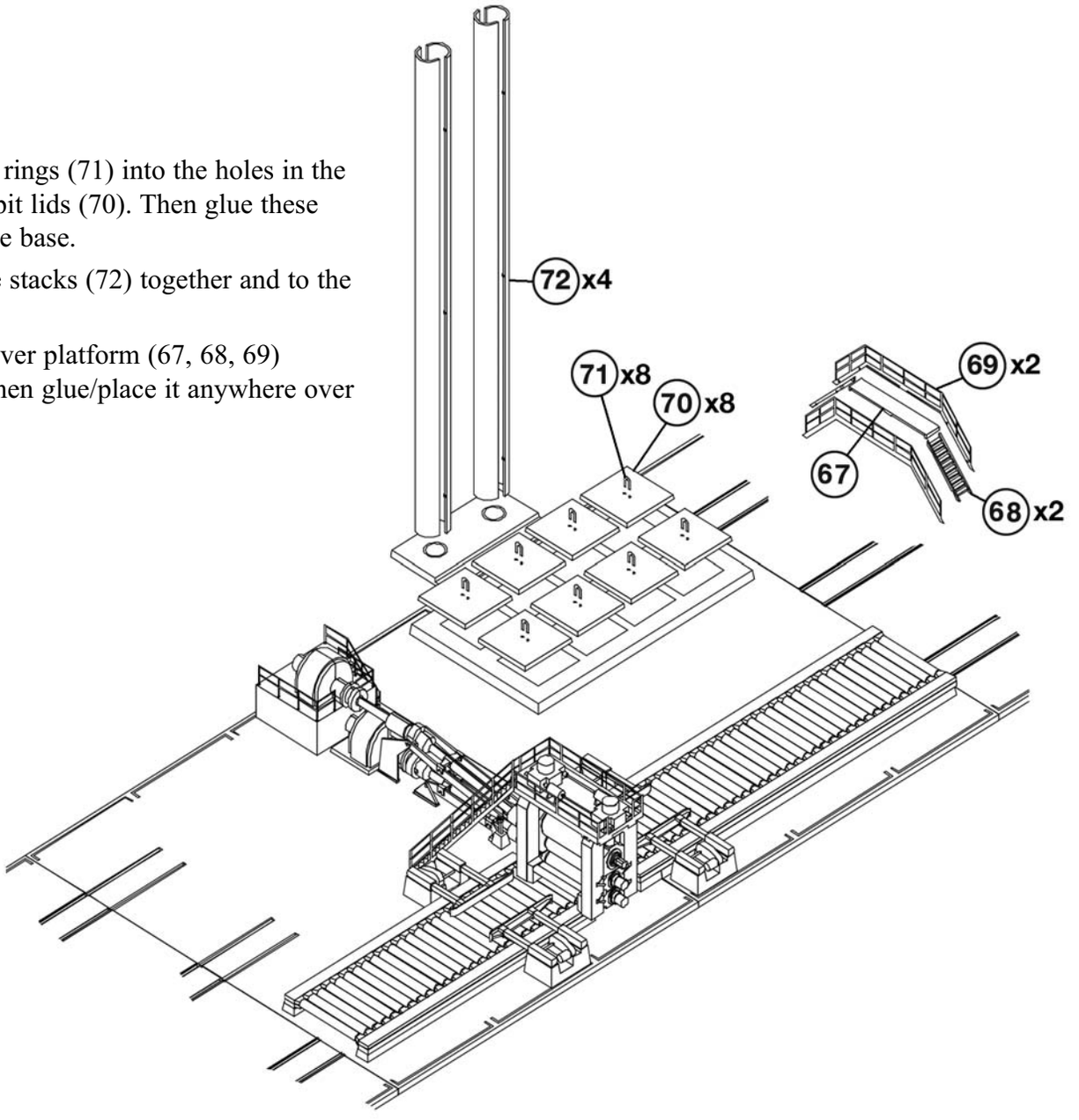
10. Glue the four side guard (63, 64, 65, 66) assemblies together. Note: Part #64 goes to the left on two and right on the other two. Then glue these to the base as illustrated.

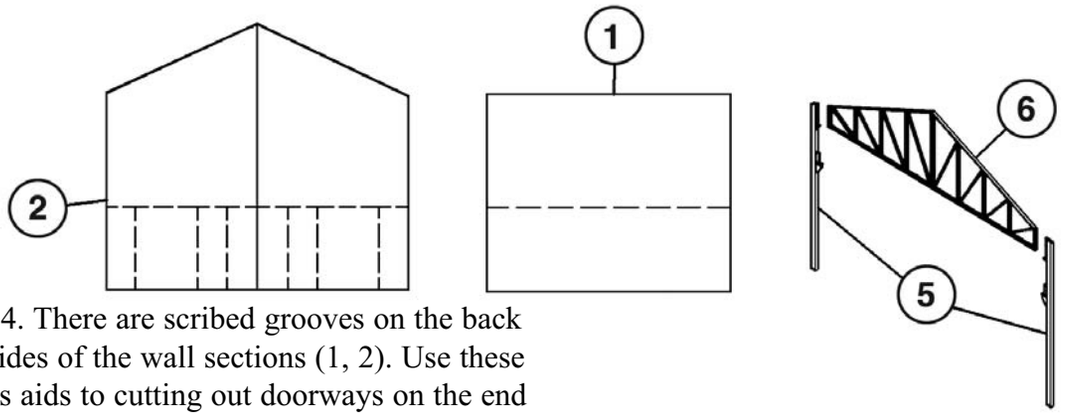


11. Glue the lifting rings (71) into the holes in the top of the soaking pit lids (70). Then glue these over the holes in the base.

12. Glue the smoke stacks (72) together and to the base.

13. Glue the crossover platform (67, 68, 69) together. You can then glue/place it anywhere over the conveyor.



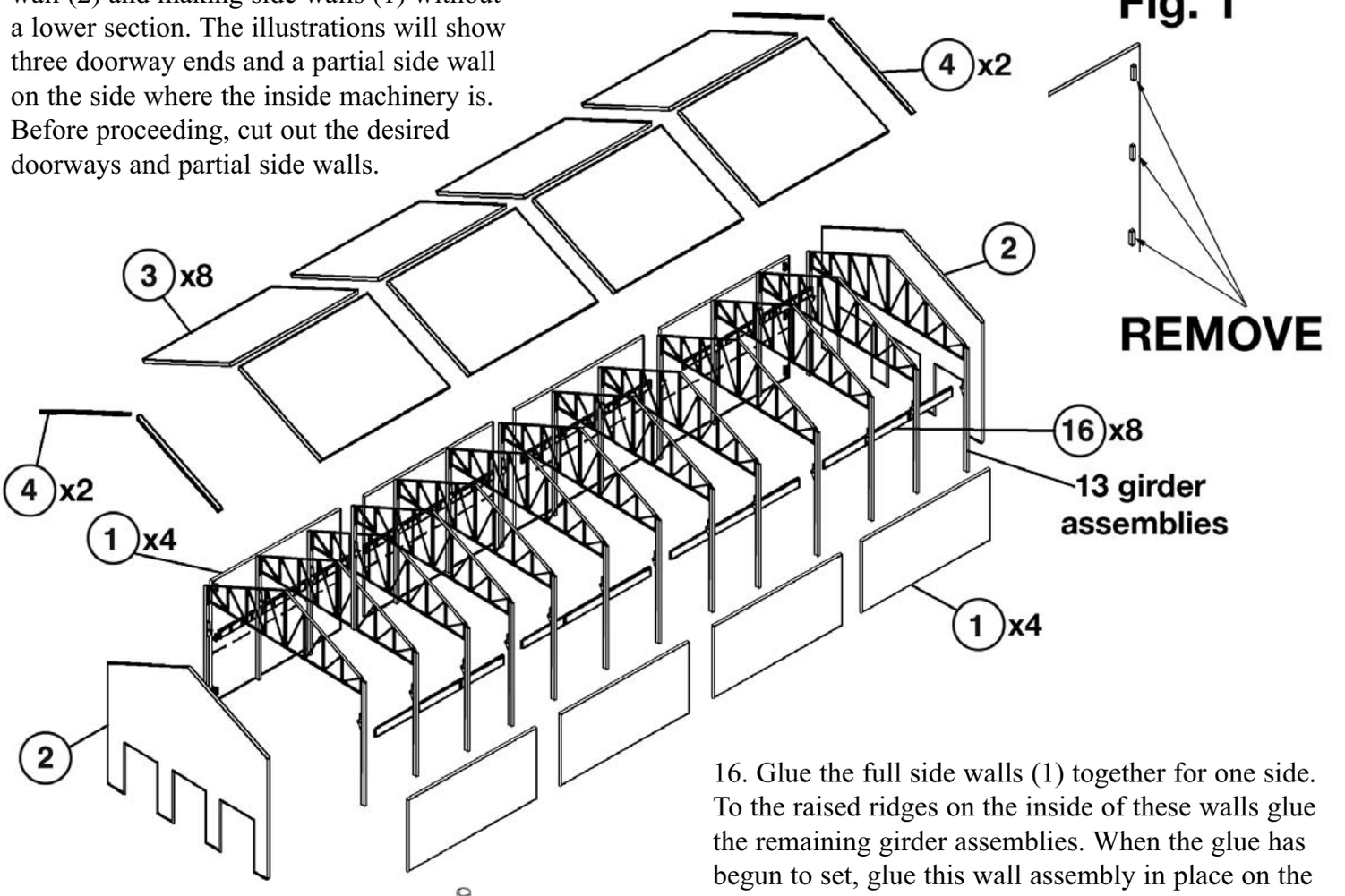


14. There are scribed grooves on the back sides of the wall sections (1, 2). Use these as aids to cutting out doorways on the end wall (2) and making side walls (1) without a lower section. The illustrations will show three doorway ends and a partial side wall on the side where the inside machinery is. Before proceeding, cut out the desired doorways and partial side walls.

15. Glue the girders (5) to the trusses (6). Next glue two of these assemblies, one each, to the inside of the two end walls (2).

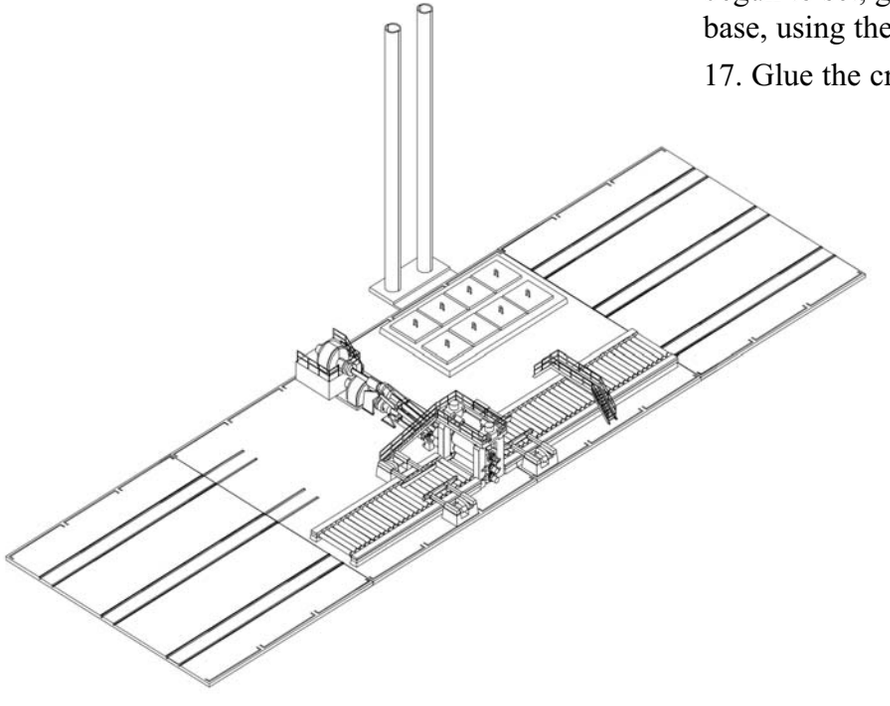
16. Remove the three locating ridges on the end of the sidewalls (1) that will butt up against the end walls (2). Note: See Fig. 1.

Fig. 1



16. Glue the full side walls (1) together for one side. To the raised ridges on the inside of these walls glue the remaining girder assemblies. When the glue has begun to set, glue this wall assembly in place on the base, using the raised ridges on the base to position.

17. Glue the craneways (16) in place on the girders.

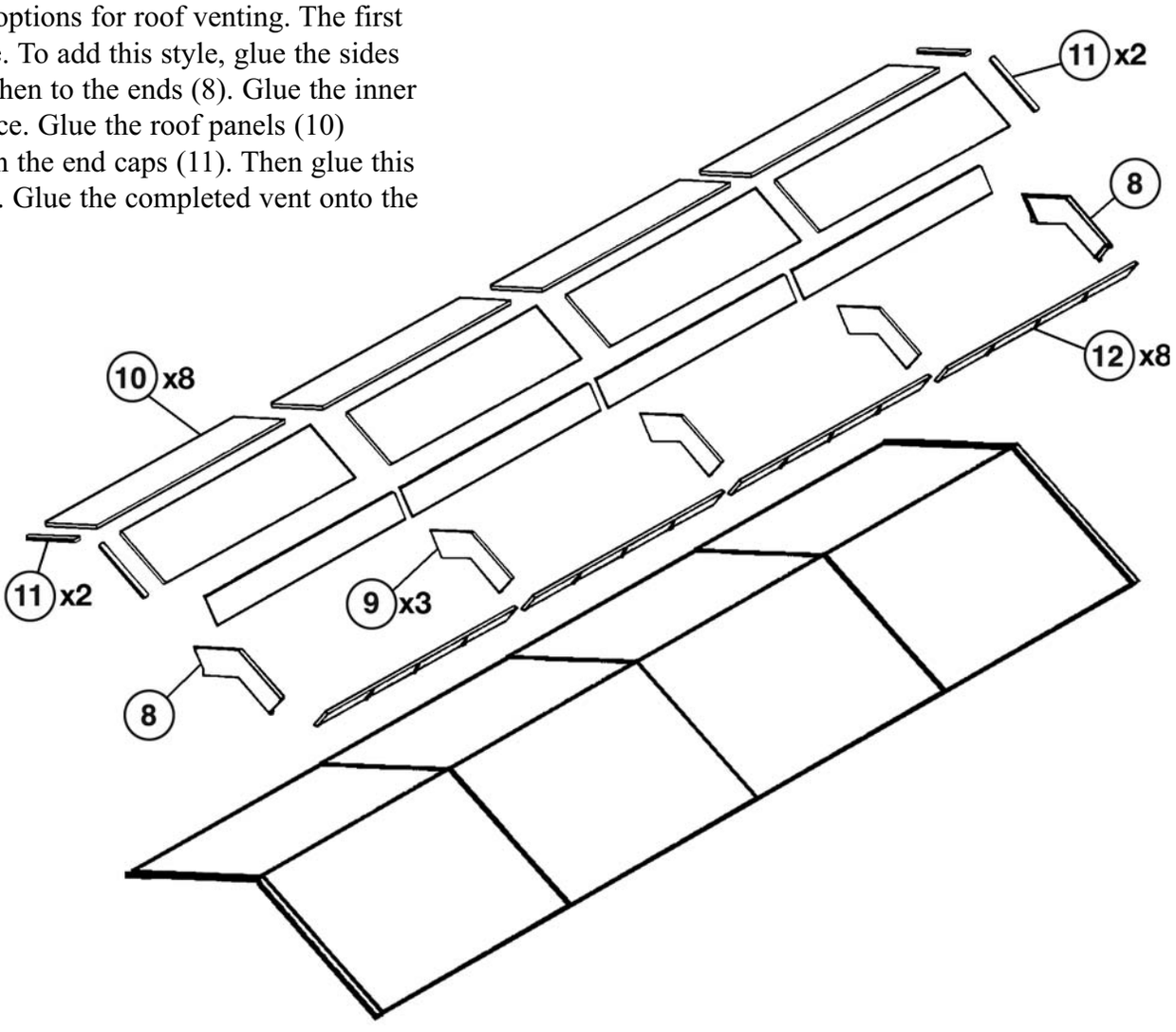


18. Glue the end wall assemblies to the base and the side wall.

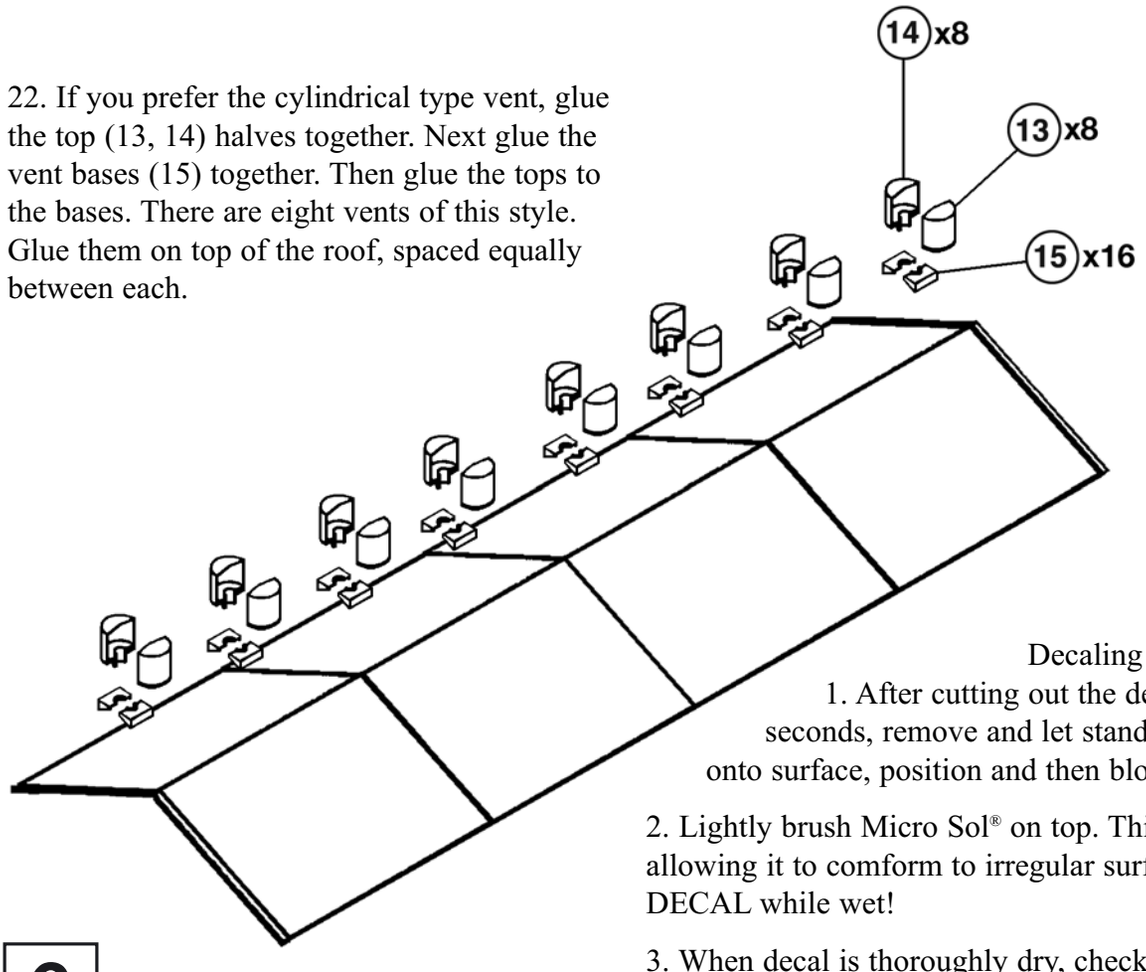
19. Glue the cut down side wall assembly to the girders and the end walls. Note: Make sure the wall is level with the top sides of the end walls.

20. Glue the roof panels (3) together as well as the end caps (4). You have the option of gluing on the roof, or placing it in position, being able to remove it to access the interior.

21. You have two options for roof venting. The first is the monitor type. To add this style, glue the sides (12) together and then to the ends (8). Glue the inner supports (9) in place. Glue the roof panels (10) together along with the end caps (11). Then glue this on top of the sides. Glue the completed vent onto the roof.



22. If you prefer the cylindrical type vent, glue the top (13, 14) halves together. Next glue the vent bases (15) together. Then glue the tops to the bases. There are eight vents of this style. Glue them on top of the roof, spaced equally between each.



Decaling

1. After cutting out the decal, dip in water for 10 seconds, remove and let stand for 1 minute. Slide decal onto surface, position and then blot off any excess water.

2. Lightly brush Micro Sol® on top. This will soften the decal, allowing it to comform to irregular surfaces. DO NOT TOUCH DECAL while wet!

3. When decal is thoroughly dry, check for any trapped air bubbles. Prick them with the point of a small pin or hobby knife blade and apply more Micro Sol®.