



HO Structure Kit **BRICK KILN** 933-4100

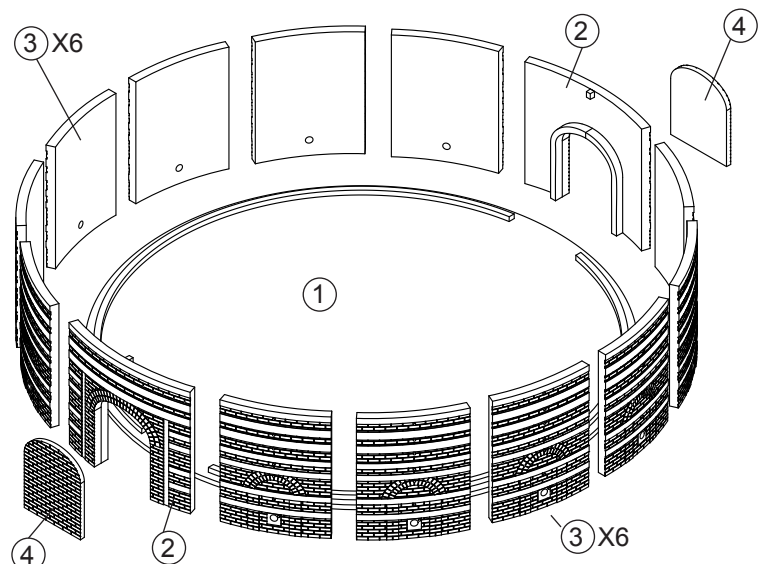
Thanks for purchasing this Cornerstone kit. Please take a few minutes to read these instructions and study the drawings before starting construction. All parts are styrene plastic, so use compatible paint and glue to finish and assemble your model.

For thousands of years, builders have chosen brick for its good looks, durability and natural resistance to fire. Early brick-makers typically set up shop alongside rivers and other bodies of water, where clay could be found in large quantities and hauled short distances. Until the 19th century, brick making was done entirely by hand and a good crew working 12 to 14 hours could produce from 3000 to 5000 bricks in a typical day. Production increased slightly early in the 19th century with the introduction of animal-powered machinery, but by the mid 1800s, demand began to skyrocket. As local sources of clay were depleted, brick makers turned to the railroads to bring in raw materials over longer distances and to move finished products to distant markets. Innovative new machines powered by steam were introduced that processed and prepared the clay for brickmaking. After being allowed to air dry for several days, these "green bricks" were moved into "beehive kilns," named for the rounded shape that resembled an old-fashioned beehive. As firing could take up to a week, most brick works operated several kilns to keep production moving with fewer delays. The body and interior floor was constructed of specially made "fire brick" (also called refractory brick) to withstand temperatures that could reach 1950° F (1065.6C) inside during peak firing. As the kiln would expand and contract substantially, large adjustable steel bands were installed around the outside walls to restrict the amount of expansion. Firing actually began by stacking some 70,000+ individual green bricks inside a kiln with a little air space between them and the flue openings in the floor, a job that might take up to two days by hand, although forklifts would later speed things up considerably. Once this was done, the doorways would be bricked over, and low fires ignited in small "fireboxes" burning coal, oil or natural gas (as depicted by this model). These were evenly spaced inside the kiln and were only open on top to force the heat up towards the domed roof rather than directly at the stacked bricks. While this produced a more even heat inside, it also reduced the chances of burning bricks closest to the fires, and most importantly, drew off their remaining water content slowly to prevent cracking or worse - a sudden surge of super-heated air could turn this to steam in an instant, causing the bricks to explode! While coal fired kilns required constant attention, fuel and air were supplied by overhead lines attached to the exterior of gas- and oil-fired kilns, although the air supply could be adjusted in a process called "flashing" to produce more color variety in the finished bricks. Although there was a small opening in the dome, no heat was lost through it; the hemispherical shape reflected heat downward while the strong downdraft created by the large stack forced the superheated air back over the bricks, and through the flues built-in to the kiln floor. When no steam could be seen venting from the top, the burners were opened wide to raise the interior temperature, and the bricks baked at full heat for roughly three more days. At the end of this time, the burners were shut off, and three or four days allowed for a complete cool down to reduce the chances of cracking or pitting. Unloading or "drawing" the kiln might require another day or two, and the still hot bricks were moved to a safe area until they could be taken to the sorting shed. As there was no way to uniformly heat them, every one had to be inspected and sorted for color and quality. The best were used on exterior walls, second best for interiors and any warped or burned bricks might end up as decorative walls or sidewalks. Although bricks were once loaded in boxcars, gondolas or wagons by hand, palletized and banded shipments became increasingly common to reduce costs. While kilns of this type were standard for making bricks from the 1800s on, many firms also used them to produce clay pipes and tubes of various sizes, durable brick pavers for streets and even small household items such as dinnerware and crocks. Although newer methods and machinery arrived in the 20th century, some of these venerable kilns were in use until the late 1990s, and a few remaining examples are now being preserved. Your new model can be built as either a coal or gas-fired kiln to fit a wide range of modeling eras and is a key part of any brick works. Several can be combined to model a typical operation using the Brickworks (#933-4102), Brick Storage Building (#933-4101) and Stacked Bricks (#933-4103) kits, each sold separately. For additional details, railroad equipment, vehicles and more to complete your brick industry, visit your hobby dealer, see the current Walthers Model Railroad Reference Book, or visit us online at walthers.com.

Parts are included for two complete kits, and both assemble as follows:

1) Align the openings of the Portal Walls (2x 2) with the open areas on the Base (1); glue in place as shown and allow to dry. Doors (2x 4, one per wall) may be left off to model a kiln being emptied or loaded, or glued in place to depict a model being fired.

2) Align lower edge of each Curved Wall (12 x 3; six per side as shown) along raised ridge and glue to Base and at inside edges where each sections meets the other.



3) PLEASE NOTE: Be sure the Right (6) and Left (7) Door Braces are aligned as shown: with the round opening at the top and the molded bolt details facing inward on both pieces. Glue Braces (one each #6 and #7) to the flat inset areas alongside the arches on each Portal Wall.

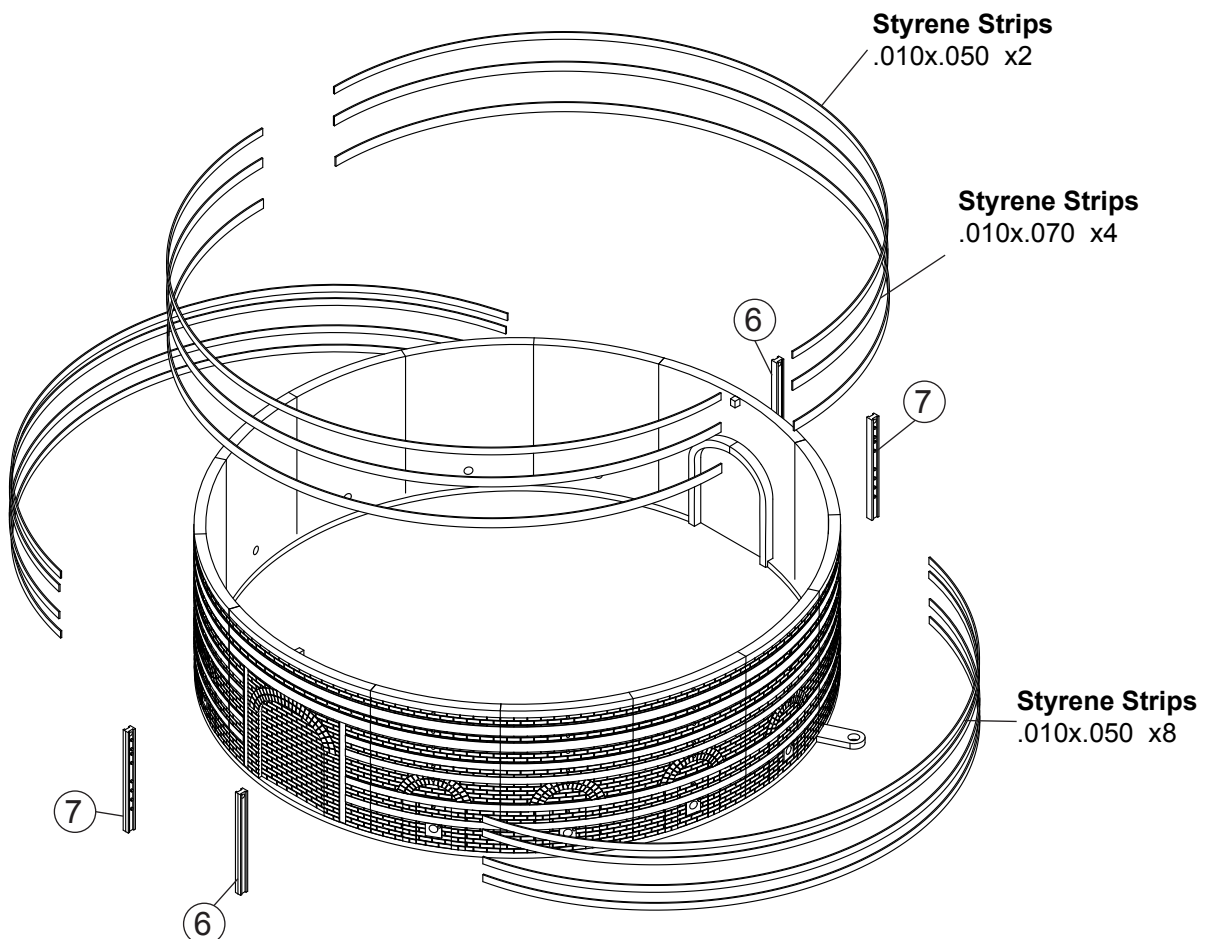
4) PLEASE NOTE: Two different sizes of styrene strip are provided to model the steel expansion bands. For ease of assembly, we suggest painting just the outside surfaces of these pieces before installation. When dry, these will be glued to the flat areas molded on each of the Curved Wall sections; remember, these bands are very thin plastic, so use glue sparingly or use a water-base adhesive that allows some time to position parts and prevent damage. Working from top to bottom, the correct sequence is:

2 strip: .010 x .050" Length 7 1/8" (182mm)

4 strips: .010 x .070" Length 7 1/8" (182mm)

8 strips: .010 x .050" Length 6 3/32" (155mm)

Begin by gluing the end of each strip alongside the Door Braces - work slowly and check the alignment of each strip until you reach the door at the opposite end. Repeat this assembly for the bands on the opposite side of your kiln.



5) Carefully thread the Rod (2x 8, one per doorway) through the opening at the top of the Braces and glue where parts meet.

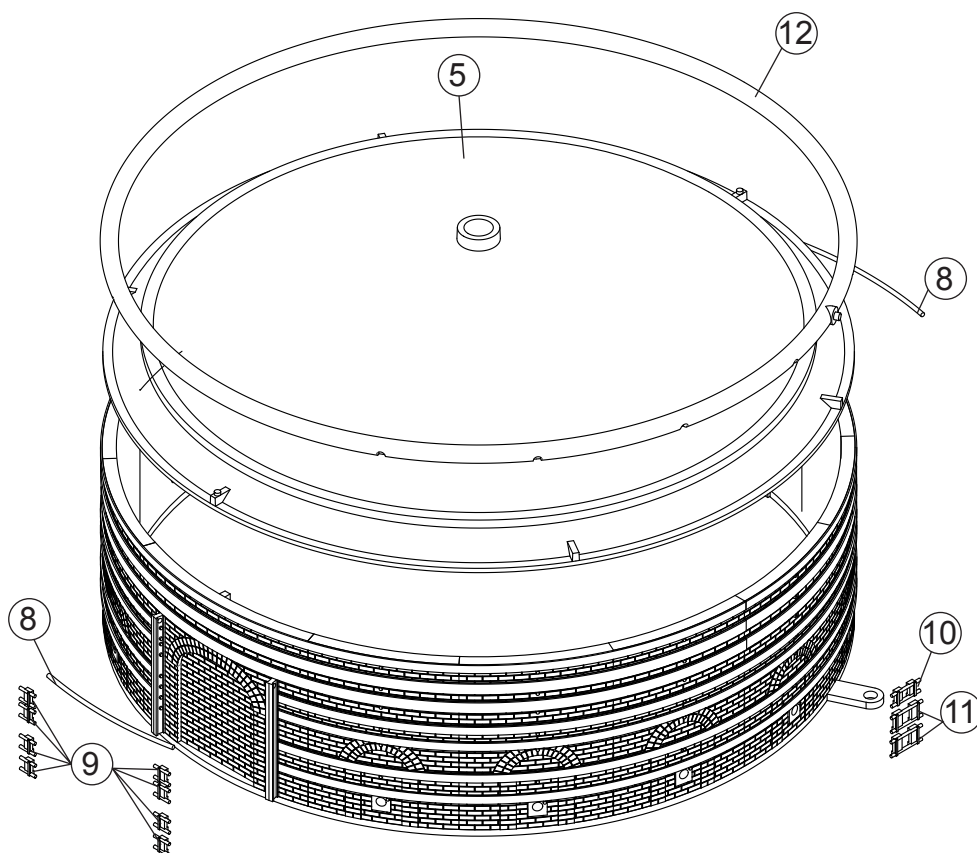
6) PLEASE NOTE: Although similar, there are actually three sizes of Tension Brackets (9, 10 & 11). Glue eight Small Brackets (9) with one end touching the Brace on either side of the doorway directly on the four 010 x .050" plastic bands. Repeat for the opposite door.

7) Glue four Medium Brackets (10) at random on the top 010 x .050" band along each side of the kiln (eight total). Glue Large Brackets (11) at random to the top of both middle 010 x .070" bands along each side of the kiln (two per band, eight total).

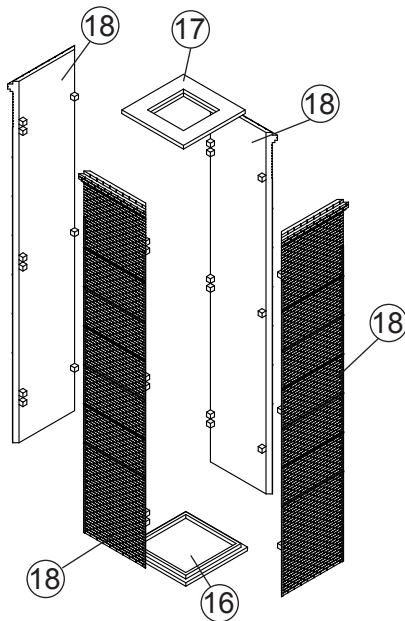
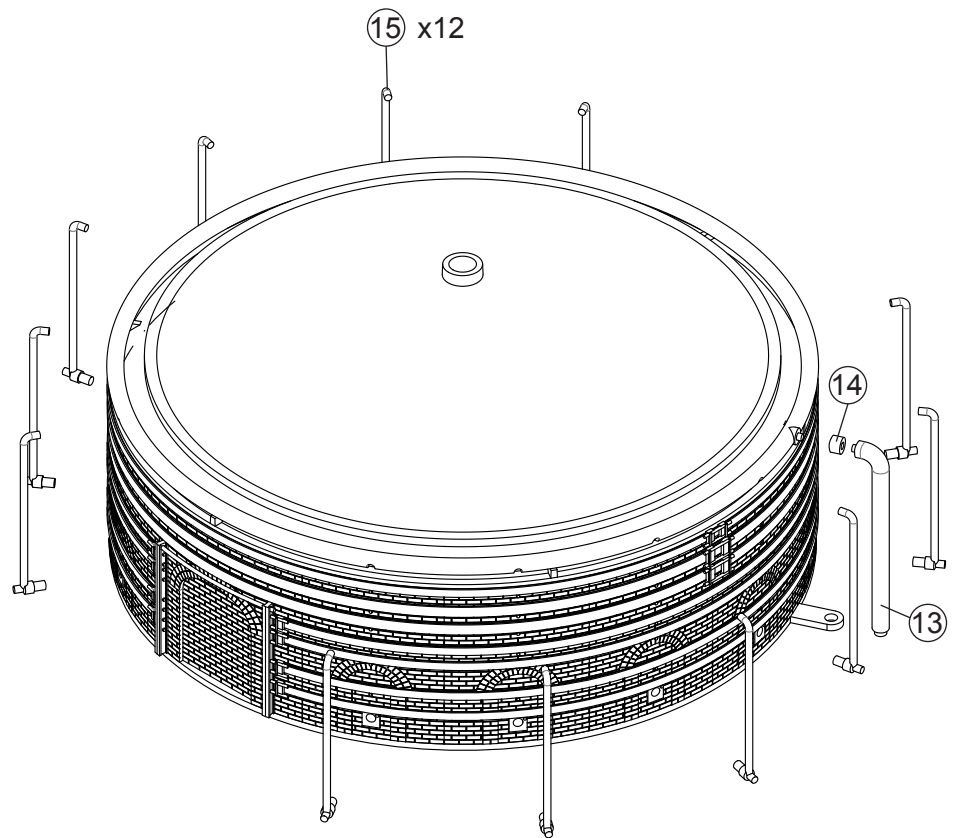
8) Use the raised ridge on the underside to align parts and glue Dome (5) to tops of wall assembly.

If you wish to model an earlier coal-fired kiln, skip to step 11.

9) PLEASE NOTE: To simplify alignment of the Air Line (12), you may wish to install a Gas Burner (15), and/or the Air Supply Pipe (13) as shown in the next step before proceeding. When installing the Air Line, be sure the small notches are on the bottom and face downward to align with each Burner. The small pin on the outside of the Air Line aligns with the flat extension on the Base and is the mounting point for the Air Supply Connector (14).



10) Note the correct alignment of each Gas Burner (15x 12); the lower end is glued to the opening in the wall, while the upper is glued to the notch on the underside of the Air Supply Line (12). Glue pin on lower end of Air Supply Pipe (13) to opening in Base as shown. Glue one end of Air Supply Connector (14) to top pin of Supply Pipe and the other to the pin on the outside edge of the Air Line (12).



11) Using the notches and tabs to align parts, glue Stack Walls (4x 18) at inside corners where parts meet, and along the outside of the raised ridge on Stack Base (16). Align the completed Stack Walls inside the raised ridges on the underside of the Stack Cap (17) and glue where parts meet.

Repeat these steps to build the second kiln.

12) PLEASE NOTE: Parts are included to model two sizes of stacked bricks: as the parts appear similar, you may wish to assemble one size of stacks at a time. As bricks were made of locally sourced material, there are many regional color variations, but in general, any earth tone can be used for a base color to model unfired ³green bricks.² The kinds of raw materials and additives, interior oxygen levels used As firing temperatures were not even inside the kilns, finished bricks would be both lighter and darker, which can be modeled by adding a drop or two of gray, white or black to your base color and painting some bricks at random. Take a look at older brick buildings in your community for ideas on finishing these details.

12A) The beveled edges of the Large (21) and Small (19) Stack Halves are the top; align the pins and mounting points on the back of each half as shown and glue along inside corners where parts meet.

12B) Complete assembly by inserting the beveled edge of the Large (22) and Small (20) Top Bricks into the correct stack assemblies as shown and glue at inside edges where parts meet.

