



HO Structure Kit

MODERN CONCRETE HIGHWAY OVERPASS

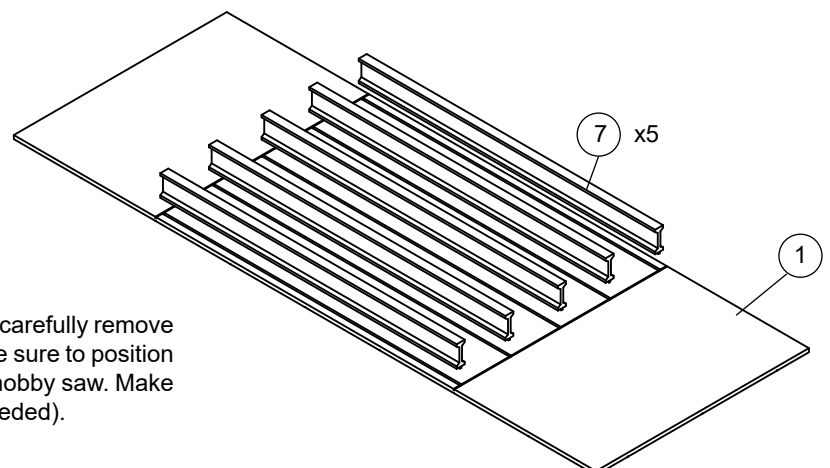
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Thanks for purchasing this Cornerstone kit. Please take a few minutes to read these instructions and study the drawings before starting - if you're not sure how parts fit, test fit before gluing in place. All parts are styrene plastic, so use compatible glue and paint to assemble your model. You may find it easier to build and paint larger parts as subassemblies, smaller parts can be painted on the sprue and touched-up after final assembly. PLEASE NOTE: parts are included to build a single or double-span bridge; additional kits, each sold separately, can be combined if a longer span is needed. Both Round and Square Support Columns are included; these will only be used when building two more spans. Use the short columns to cross another highway, or the taller to clear a railroad right-of-way below. Choose one and follow the appropriate steps. Unused column parts may be discarded or kept for future projects.

While the use of concrete dates to the Roman Empire, it was first adapted to build small arched roadway bridges in the mid-19th century. The need for larger structures that could withstand pushing and pulling forces of heavier traffic soon led to experiments with iron mesh, beams and bars as reinforcements; concrete served to strength the structure and protect the iron from the elements. As the volume of highway traffic soared in the early 20th century, many cities and states found themselves in need of more substantial bridges to handle heavier and larger vehicles. In turn, this led to the creation of Highway Commissions, who established standards and created uniform bridge designs. Fueled by demand from automakers for sheet metal, the steel industry expanded and began branching out with new reinforcements, as well as heavy steel beams and girders made especially for the lucrative bridge-building market. This also began a period of rapid improvements and experimentation with "reinforced concrete" as it was now commonly known, to build longer slab, beam and girder bridges. To reduce the amount of concrete and labor required for construction, engineers also developed significant new designs such as the "tee-beam" with an integrally cast slab floor and support beams. Concrete girders also appeared, made by encasing a steel I-beam in concrete to build both single- and longer continuous span bridges in both deck girder where the floor rests on top and through-girder styles where the floor was between the girders, which served as side rails. To reduce the time and expense of mixing and molding each piece at the job site, engineers next turned to pre-cast sections, however weight and length had to be within acceptable limits for transport, and the lifting capacity of cranes used in construction. Being light and durable, steel had a decided advantage, but the concrete industry began looking at solving both problems, creating pre-cast, pre-stressed concrete beams. These used strong steel tendons, tightened to simulate the stresses each span would be subject to under load, with concrete molded around them. The first highway bridges built with pre-stressed concrete beams appeared in the 1950s, and quickly became a nationwide standard following uniform designs approved for the new interstate highway system. While each is a unique design to fit local conditions, modern highway bridges are still built of steel and concrete. Contemporary steels made especially for bridge construction offer significant cost savings and weight reduction. This allows for the use of lighter cranes and faster placement of components as well as less site preparation. Concrete remains the most popular material however, as it's often cheaper, allows for more flexibility and reduced maintenance. Modern construction also uses a variety of precast concrete support structures to reduce the need for lane closures and lower overall construction cost. While each situation is unique, the basic process begins by preparing the site, installing abutments, wing walls, columns and piers as needed. Precast concrete or steel beams are then lifted into place on top of these supports, aligned and bolted to column caps. Precast slabs are then placed along the girders to provide a solid platform and complete the superstructure. Following installation of a moisture barrier on the slabs, rebar is laid and the concrete deck poured. Next, the deck surface is scored with an anti-slip surface and lateral joints to resist cracking. The structure itself may be painted, and various signs and railings installed as needed. Your new model is typical of highway bridges built from the 1960s to the present, used to cross various natural obstacles as well as other highways and railroads. For vehicles, scenery materials and more to finish your new bridge, see your dealer, check out the latest Model Railroad Reference Book or visit us online at walthers.com.

Single Span Assembly

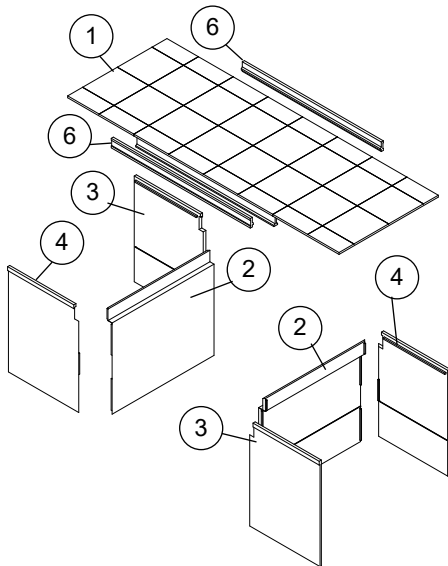
- 1) Note the raised ridge on the top of each Concrete Beam (5x 7); align this ridge with the slots on the underside of Deck (1) as shown and carefully glue where parts meet.



Two or More Spans

- 1) Note the molded cut lines on the underside of Deck (1); carefully remove one end from each deck used with a sharp hobby knife - be sure to position each piece carefully and cut away from your hands - or a hobby saw. Make sure the cut edges of each deck are square (adjust as needed).

2) Note the raised ridge on the top of each Concrete Beam (5x 7); align this ridge with the slots on the underside of Deck (1) as shown and carefully glue where parts meet.



3) Working on a flat surface, carefully align cut ends of each deck and girder assembly: glue where parts meet and allow to dry.

Both Versions

1) Abutments - make two: align tabs on inside of Side Walls (3, 4) with slots and raised ridge on inside of Front Wall (2) and glue at inside edges where parts meet. Once dry, test-fit - do not glue in - in position on your layout.

2) Support Columns - PLEASE NOTE; columns are not needed for a single span. For longer spans, assemble one support for each pair of decks. This kit can be built with your choice of Round or Square Columns for a highway (short) or railroad (tall) overpass. Choose one and follow the appropriate steps:

2A) Column Bases - All Versions: Align Base Walls (2x 9) as shown and glue at inside edges. Align ridges on underside of Base Top (10) with opening on top of Base Walls and glue where parts meet.

Round Columns

2B) Highway Overpass

Align pins and mounting points on inside of each Short Column Half (6x 16) and glue together. Align bottom of each Short Column assembly with raised rings on Base Top and glue together.

2C) Railroad Overpass

Align pins and mounting points on inside of each Tall Column Half (6x 15) and glue together. Align bottom of each Tall Column assembly with raised rings on Base Top and glue together.

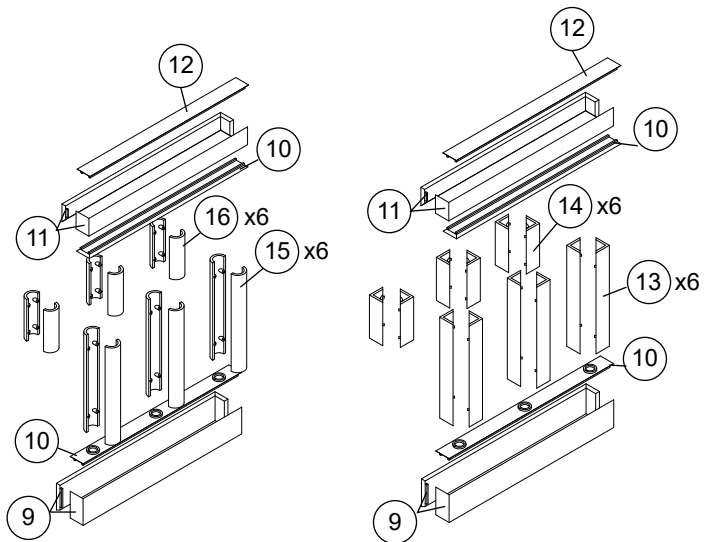
Square Columns

2D) Highway Overpass

Align pins and mounting points on inside of each Short Column Half (6x 14) and glue together. Align bottom of each Short Column assembly with raised rings on Base Top and glue together.

2E) Railroad Overpass

Align pins and mounting points on inside of each Tall Column Half (6x 13) and glue together. Align bottom of each Tall Column assembly with raised rings on Base Top and glue together.



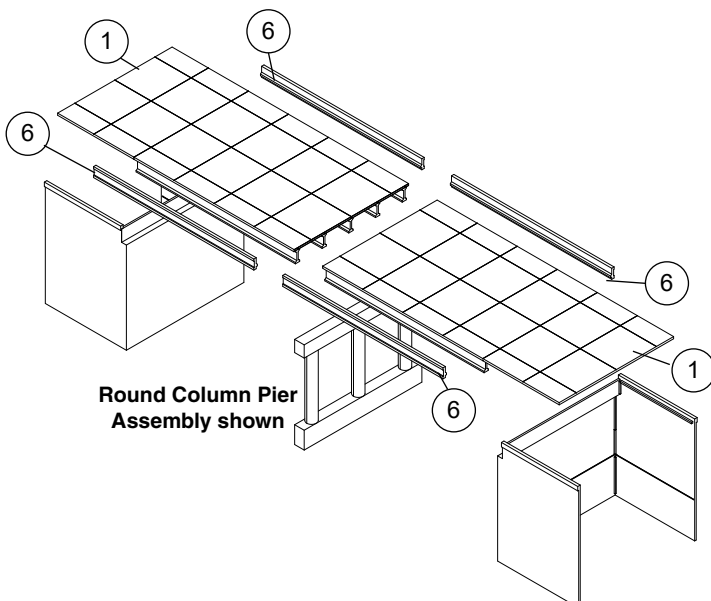
3) Column Caps - All Versions

Align Cap Walls (2x 11) as shown and glue at inside edges. With raised ridges facing down, align ridges on underside of Cap Bottom (10) with opening on top of Cap Walls and glue where parts meet. Align tops of each column assembly with raised rings on Cap Bottom and glue together. Align ridges on underside of Cap Top (12) with opening on top of Cap Walls and glue where parts meet.

Final Assembly

1) Align inset area on bottom of Concrete Sides (2x 6) on top of Deck, even with Girders as shown at left and right, and glue in place. PLEASE NOTE - For bridges with two or more spans, align and glue sides next to each other.

2) Test fit the assembled abutments and the bridge on your layout: for a longer span, test fit each column, aligning the center point of each pair of spans on the center of the cap. When satisfied with the fit, align the deck ends on the inset area of each Abutment Front Wall and glue where parts meet: on longer spans, center the spans as noted and glue to the top of each Cap.



Round Column Pier Assembly shown