



# HO Structure Kit 50' SINGLE TRACK THROUGH GIRDER BRIDGE 933-4501

Thanks for purchasing this Cornerstone® kit. Please read the instructions and study the drawings before starting construction. All parts are styrene, so use compatible glue and paint to finish your model. As part of the Cornerstone Engineered Bridge System ([www.walthers.com/bridgesystem](http://www.walthers.com/bridgesystem)), your new model can easily be used with other Cornerstone bridges and accessories to create a custom structure for your railroad. PLEASE NOTE: Parts are included to build your choice of an Open or Ballasted Deck Bridge. Additional parts are included to finish your model with Walthers Code 83 Bridge Track (#948-886 or 949-899), plus flexible, sectional, hand-laid track or your own rail, all sold separately. An optional Center Girder (14) is included to model a double track or wider bridge by combining kits (each sold separately); this piece may be discarded or kept for future projects if building a stock kit.

While simple bridges had been around for centuries, railroads presented engineers with new challenges to design structures that could withstand the tremendous weight, vibration, pushing (compression) and pulling (tension) forces exerted by a moving train. In 1847, the sturdy "plate girder-bridge" was introduced, with individual iron plates and braces riveted together and directly to the ladder-shaped floor supports. With the rise of the steel industry, durable I-beams and sheet steel became readily available in various sizes, ushering in the next generation of plate girder bridges. Where clearances had to be maintained above highways, other rail lines and navigable waterways, engineers specified "through" designs, so called as the supporting plate girders were installed on top of the floor, and the track passed through them. Two styles of floors or decks were commonly used: open decks used longer bridge ties the width of the floor beams and were cheaper to build, but the ballasted deck with a steel pan to hold standard ties and ballast, required less maintenance, and provided a smooth and quiet ride. Because of their versatility and adaptability, through girder bridges were easily widened for multi-track lines, used in multiples with piers where longer spans were needed, and also used in combination as approach spans for other types of bridges. Today, many of these sturdy steel bridges are still in daily railroad service, or have been preserved as part of recreational trails. For more products and modeling ideas, check out the complete Cornerstone Engineered Bridge System at [www.walthers.com/bridgesystem](http://www.walthers.com/bridgesystem).

## Before starting construction...

The Cornerstone Engineered Bridge System includes a wide range of accessories to complete installation of your new bridge, including:

Single-Track Railroad Bridge Concrete Abutments (933-4551)

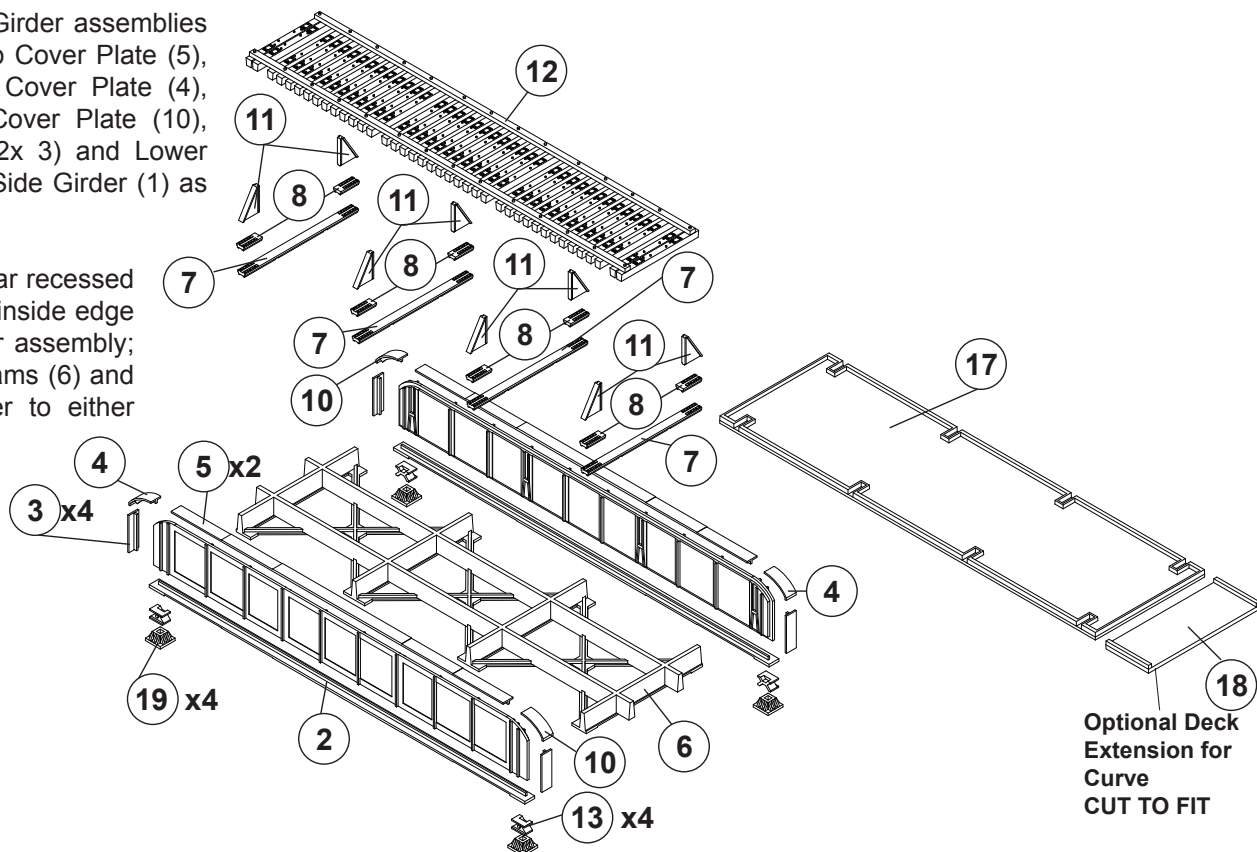
Single-Track Railroad Bridge Concrete Piers (933-4550)

Bridge Shoes & Brackets (933-4559) simplifies aligning & combining Cornerstone bridge kits for longer spans.

## Single Track

1) Make two Side Girder assemblies as follows: glue Top Cover Plate (5), Right Curved End Cover Plate (4), Left Curved End Cover Plate (10), End Cover Plate (2x 3) and Lower Cover Plate (2) to Side Girder (1) as shown.

2) Note the triangular recessed areas on the lower inside edge of each Side Girder assembly; align with Floor Beams (6) and glue a Plate Girder to either side.



### **Optional Double Track or Wider**

**PLEASE NOTE:** Requires two or more kits, each sold separately. Sketch shows arrangement of major parts – refer to standard diagram for complete assembly.

- 1) Make two Outside Girder assemblies as follows: glue Top Cover Plate (5), Right Curved End Cover Plate (4), Left Curved End Cover Plate (10), End Cover Plate (2x 3) and Lower Cover Plate (2) to Side Girder (1) as shown.
- 2) Note the triangular recessed areas on the lower inside edge of each Side Girder assembly; align one Outside Girder with Floor Beams and glue in place.
- 3) Using parts from the second kit, glue Top Cover Plate (5), Right Curved End Cover Plate (4), Left Curved End Cover Plate (10), End Cover Plate (2x 3) and Lower Cover Plate (2) to Center Girder (14): for a wider bridge, repeat this step to make additional Center Girder/s.
- 4) Align the Center Girder (14) with the Floor Beams and glue in place. Align and glue the second set of Floor Beams to the opposite side of the Center Girder. For a double-track bridge, glue the remaining Outside Girder in place; for a wider bridge, repeat this step with additional Center Girder/s.

### **DECK ASSEMBLY - All Versions**

**PLEASE NOTE:** Parts are included to build either an Open Deck (12) or a Ballasted Deck (17, 18) Bridge. We suggest test fitting your completed bridge on your layout to help with final alignment before securing the track.

#### **Open Deck**

**PLEASE NOTE:** This version may be built to use different kinds of track:

*A) To use Sectional Track or Rail (sold separately):*

- 1) Glue Top Plates (4x 7) to upper edge of each Floor Beam. Using the inset areas on the Plates and the inside edge of the Side Girders to align parts, glue Knee Braces (8x 11, four per side) in place. Make sure the Deck is centered side-to-side between the Girders and glue in place.
- 2) Note the two sets of raised alignment points on the Deck (12); the outside set with tie plates and spikes is for the running rail, the inside set with spikes only is for a guardrail. For sectional track, remove ties to fit. Align rails on the outside and glue rails in place. Cut guardrails to fit from lengths of rail and glue to inside mounting points.

*B) To use Walthers Bridge Track (948-886 or 948-899 sold separately):*

- 1) Glue Small Top Plates (8x 8, four per side) to outside edge of each Floor Beam. Using the inset areas on the Plates and the inside edge of the Side Girders to align parts, glue Knee Braces (8x 11, four per side) in place. Align Bridge Track and glue in place if desired.

### **Ballasted Deck (17 & 18)**

- 1) **PLEASE NOTE:** Use the raised ridges on the bottom of Deck (17), and the gaps between to align the Deck with the Floor Beams – the Deck does not actually touch the Side Girders – and glue Deck to Floor Beams.
- 2) Glue Knee Braces (8x 11, four per side) flush against the inset areas on the inside edge of the Side Girders and to the inset areas on the Deck.
- 3) Deck Extensions (2x 18) are optional for use on curves; some cutting or adjustment may be needed. Test fit, then glue to end of Deck.
- 4) Test fit a length of flexible or sectional track to the deck; the last tie at each end should rest against the inside raised lip of the Deck. Center the track and glue in place if desired. Finish assembly by adding ballast (sold separately).

### **Optional Double Track or Wider - Both Deck Styles**

Follow the instructions above and using parts from the second kit, glue the additional Deck to the Floor, and eight Knee Braces (11: four per side) to the Center Girder; for a wider bridge, repeat this step.

### **Final Assembly - All Versions**

**PLEASE NOTE:** Two styles of Bridge Shoes are included; be sure to use the same style at each location. For a custom installation using Cornerstone bridges of different heights, use parts from the Bridge Shoes and Adaptor Assortment (933-4559, sold separately) as appropriate: please visit [www.walthers.com/bridgesystem](http://www.walthers.com/bridgesystem) for information and illustrations of specific bridge combinations.

- 1) Select either the Small (4x 13) or Large (4x 19) style, align the top of the Shoe with the edges of the raised pads at both ends of the Lower Cover Plates and glue in place at all four corners. On multi-track bridges, use parts from the second kit and glue Shoes in place on the Lower Cover Plates of each Center Girder.

### **Optional DOUBLE TRACK Assembly**

