

196 Foot HO Scale Girder Truss Bridge - Self Supporting

SDHayes

VIEW IN BROWSER

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Summary

Fully self-supporting, drop-down model railroad bridge, spanning entryway to the room

Toys & Games > Other Toys & Games

Tags: modelrailroad

I am in the process of designing/building a spare room model railroad and one of the key features I needed was a drop-down bridge to span across the entry to facilitate a loop layout.

My design criteria were:

27" opening, prototypically self-supported (no plywood or other structure underneath), double track, hinged for a drop-down system, 100% printed

I used as my basis of design this bridge on Thingiverse HO Scale 145 ft Steel Arched Truss Bridge by kabrumble - Thingiverse and then re-engineered the whole thing for the added length, width and strength.

The trusses and track support assemblies are broken into 4 main sections to fit the print bed, with staggered joints between the systems to maintain strength. Cross girders slot into the truss bottom chord and I added “wings” to the cross girders that land on a truss joint for further rigidity.

I was not certain of how strong the glued truss joints would be ultimately, so I planned for some 1mm metal pins to be added at the top and bottom of the trusses where the sections mate up. There are two 1MM drilling jigs provided: a left hand and a right hand. They go flat against the INBOARD side of the trusses as shown in the picture. You can order 1MM rod stock if you prefer, but I found that sections of “jumbo” size paper clips work perfectly. I drilled 1MM holes and the paper clips are 1.06 so it's a nice tight fit. Using a paper clip with a 45-degree cut end as a little clean up “drill” makes everything really smooth and satisfyingly snug. Everything is glued with CA and clamped.

There are 35 pieces total, and I have included a printing checklist to help with that, in addition to the visual screenshot showing all of the pieces laid out with print counts per piece. Parts a numbered sequentially left to right A-Z as you face the bridge from either side (mirrored obviously).

I print everything with a brim just to be safe. Supports required are minimal and pretty self-explanatory. Everything prints flat and you'll need supports under the gussets where they hang out in space, as well as for the cross-girder slots in the truss bottom chord where they occur on the ends and won't bridge.

Final picture is a test I did with 10 pounds of hanging weight at the center of the span, with no discernable deflection in the bridge whatsoever. With passing trains I'll never have more than ~4# at any given time, and that would be distributed weight, so no worries.

The drop-down system with be a long through-pin on one side and some sort of spring-loaded pin catch on the other. The bridge will fold back up under the benchwork to be completely out of harm's way when it's in the open position. I've included 3MM holes that run completely through both ends for the pin and catch, and I'll figure that all out later.

(NOTE: The “GIRDER TRUSS BRIDGE - ALL” file is obviously NOT for printing, I included it ONLY as a first position demo piece for the 3D viewer function on this website.)

Model files



girder-truss-bridge-all.stl



truss-right-end-2.stl



truss-left-end-2.stl



truss-left-middle-2.stl



truss-right-middle-2.stl



track-deck-ends-ae-4.stl



track-deck-mid-bcd-6.stl



cross-girders-ends-ak-2.stl



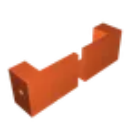
cross-girders-joints-dfh-3.stl



cross-girders-typical-bcegij-6.stl



canopy-braces-sloped-infills-be-2.stl



drill-jigs.stl

196-beefier.skp



canopy-brace-right-center-d-1-v2.stl



canopy-brace-left-center-c-1-v2.stl



canopy-braces-ends-af-2-v2.stl

Other files

196-parts-checklist.pdf

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