

Frequently Asked Questions - Oct. 12, 2016

- 1. If your team proposal/report portfolio is determined to be complete by the judges, you will be invited to the 2017 Bridge Challenge. Are there any costs from the local district associated with the schools participation in this competition?***

Each three-member team with one advisor/chaperone will receive mileage reimbursement for one vehicle based upon the State of Michigan Mileage Reimbursement Rate. This rate is currently at \$0.39 per mile. If you decide to travel with two teams plus chaperones in a larger vehicle, the reimbursement rate is currently at \$0.55 per mile. If you have several teams coming to the Challenge in a bus, please contact Julie VanPortfliet 906-420-4280 to discuss reimbursement rates.

Breakfast and lunch on the day of competition will be provided at the hotel. No other meals will be provided or reimbursed.

Each three-member team with one advisor/chaperone will be allowed two overnight rooms at the Amway Grand Plaza in Grand Rapids. If your team consists of males and females, please contact Julie VanPortfliet. With special approval, you will be allowed to have three overnight rooms. You must reserve the rooms with your own credit card. Upon check-in, the overnight charges for these rooms will be transferred to MDOT's bill for payment.

- 2. Can you use computer printouts for my graphs and charts?***

All graphs, charts, calculations, etc. must be created by students. Students may use computer programs to create the chart, graph, etc. Computer generated date charts

- 3. Can the suspended span be glued or connected to the cantilever span?***

The suspended span of the bridge does not have to be independent of the two cantilevers. However, the judges must be able to tell that the suspended span, prior to "connecting" it to the cantiliver spans, was a span that was completely independent of the bridge.

- 4. Can students use a lap joint?***

Yes, the lap joint is permitted, but the joint is limited to 1/8 inch for the length and width.

- 5. Can pieces be glued on the edge of one piece to the side of the next?***

Yes. At the joints, more than one layer may be required. A multi-layered joint may not exceed 1/8 of an inch in length.

- 6. Does the bridge deck need to be greater or equal to 2 inches or can it be less than 2 inches?**

As long as a block that is 2 inches wide and 1 inch high can slide across the “deck.” There is a maximum width of 4.5 inches for all bridge categories.

- 7. Does the deck have to be the same height of the supporting surface or can it be higher?**

The deck may be higher than the supporting surface.

- 8. Can we have CAD design in 2-D, three views, or does the drawing need to be in 3-D?**

CAD drawings can be in 2-D.

- 9. Can we print the CAD drawing on 11-inch x 8.5-inch paper with 2:1 scale or do we need to submit the .dgn file?**

Students must use the Bentley MicroStation PowerDraft program and must follow the print instructions included in the step by step video. The drawing will print on an 8.5-inch x 11-inch paper. If the print instructions are not followed, the bridge will be disqualified from the bridge challenge. A .dgn file is not required.

- 10. The guidelines say we are limited to the supplies in the challenge kits. Are we limited to the amount in the challenge kit?**

Students are limited to the amount in the challenge kit. You cannot add more items to the kits. You can purchase more supplies to build a test bridge.

- 11. If someone has designed their bridge but not built it yet, would they be able to put much into these tables other than the bridge member information? If they have not tested it yet and therefore have no calculations, is it acceptable to insert into the proposal that "data will be forthcoming following future testing"?**

If ModelSmart is used, they could make a table of design versus breaking load. The table would consist of a main design, then simple modifications and how the modifications affect the breaking load. The different types of designs versus the different breaking loads could be used to create a table. A table could be as simple as time spent versus progress, i.e., planning stage six hours – 5 percent progress of entire project; design stage 30 hours – 35 percent progress. There are several variations that would work. The students need to be creative. Calculations should be done prior to building the bridge. These calculations must be included in the proposal.

12. Are we allowed to use double members – like what is shown in the ModelSmart booklet on pages 7-9?

According to our rules, you may use double members. Joints are limited to a 1/8-inch overlap.

13. I remember reading somewhere during the registration process that I can change group members up to a certain date. Is this true? I have a few people wanting to switch teams.

You can switch team members but you must contact Julie VanPortfliet at 906-420-4280 before the change can be completed.

14. Can the wood from the kits be shaped to any specification, or must it still resemble the stick as it came to us?

The wood can be reshaped, cut, split, etc., as long as it is the balsa wood we originally sent to you.

15. Can you paint the bridge?

Painting the entire bridge is not acceptable, but you can paint decorations on the bridge. Be careful not to paint the joints. Painting the joints is considered lamination. In the first specification, it states, “additional materials may be used for decorations or visual aids.”

16. Are we allowed to use hot glue?

No, you can only use the glue included in your bridge challenge kit.

17. Does the center beam on the cantilever through truss have to be cantilevered or can only the sides be cantilevered?

Only the sides can be cantilevered.

18. Can a 1-inch guide be glued on both sides of the bridge over 1/8-inch in length on both cantilevers?

A 1-inch guide can be used, but no more than two pieces of balsa can be laminated. Where a joint is being used there cannot be more than 1/8-inch contact between balsa-on-balsa.

19. Can the closure truss be glued to both cantilever trusses?

Yes.

- 20. The test support apparatus is intended to have two and only two supports as shown in the packet's diagram. Please confirm.**

The Pitsco tester will be set up as shown in each team's rule packet.

- 21. My understanding of a cantilevered bridge is that it needs four supports (two compression supports in the middle and two tensile supports on the ends. Reference: http://en.wikipedia.org/wiki/Cantilever_bridge). But the competition test apparatus will have only two supports. What constitutes a "cantilevered through truss" on a two-piece support? Is it simply the shape/style? The letter of the law/rules would result in a bridge to support the weight. Not sure in what way the requirement for a "cantilevered through truss" alters the rules. No geometric constraints are given (i.e., maximum bridge height in center, etc.).**

A cantilever truss has two main supports (piers), and the main span is supported by the cantilevers. A cantilever arm, by definition, is only supported at one end, and the other end is free. In the case of a cantilevered truss, the supported end sits on the piers and is counterweighted by the anchor arm, and the free end cantilevers off of the piers to support either a main span or to connect to the other free end of a cantilever. Four supports are not required if an anchor arm is not needed uplift bearings are provided at the piers.

- 22. Does the cantilever through truss bridges have to include a suspended span?**

Yes, an 8-inch suspended span is required.

- 23. For the bridge truly to be cantilever, won't the roadway be split (a joint) where the cantilever meets the suspended span (or where if there is no suspended the other cantilever)?**

Cantilevers can meet the suspended span or other cantilevers without expansion joints, it just depends on where the designers locate the expansion joints. All truss members meet at joints, so you will have a joint that connects the cantilever to other sections.

24. In this design, the bridge dips lower in the center. Is this a requirement?



No, the bridge is not required to dip at the center.

25. Can more information be provided on what a cantilever through truss bridge is?

The cantilever through truss bridge must consist of three independent parts – two 8-inch-long cantilever spans and one 8-inch-long suspended span. These spans can be glued or laminated together.

A cantilever structure is supported at the piers only – in our case, the top supports of the Pitsco testing machine provide support for the design. The cantilever sections extend beyond the pier and provide support for the suspended span. The students must determine how to position the cantilever spans to create the best design possible. The span can be designed to be centered on the testing pads or any other orientation as long as the entire span is 8 inches long and the bridge fits on the Pitsco testing machine. Students may use different designs for each of the cantilever spans. The suspension span may be glued to the cantilever spans or fastened to the cantilever spans using glue and additional balsa wood.

26. Is there a minimum or maximum weight for the bridge competition?

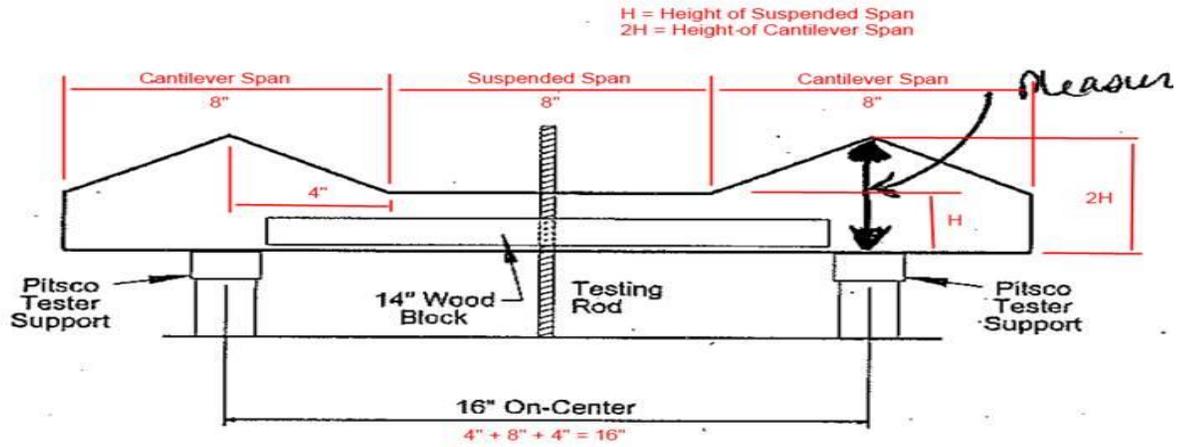
No maximum or minimum. However, the bridge is judged for strength-to-weight ratio.

27. When the bridge is tested, does the entire bridge have to sit on the testing machine?

Yes, the entire bridge must fit on the testing machine.

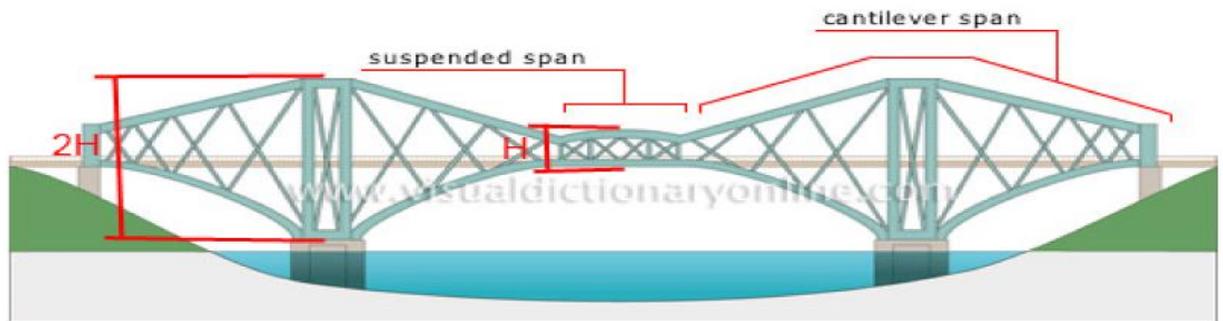
28. For the cantilever bridge, where is the height of the cantilever measured?

Please see the diagram below.



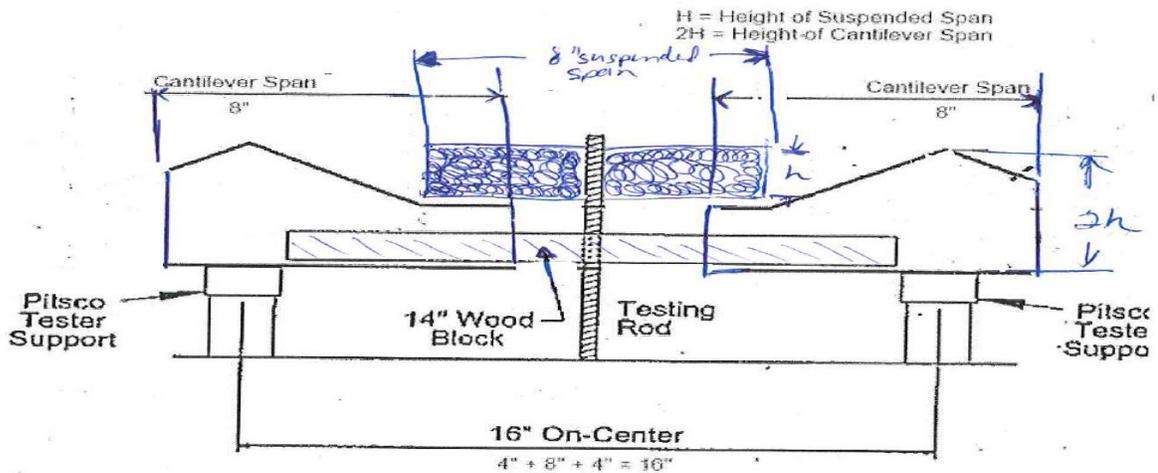
Not representative of required design

If the total height of the cantilever span is 2H, then the total height of the suspended span is H, no matter how the bridge is designed. Below is another variation of a cantilever through truss.



29. Can the cantilever bridge be one continuous piece?

No, there must be a definite separation between the two cantilever sections and the suspended span. You may laminate the suspended span to the cantilever spans, but the judges must be able to see that the span is a completely independent piece. Please see the example below. The length of the counter arms do not have to be the same on each side. As long as the cantilever spans are 8 inches in length they may be positioned anywhere on the tester supports.



30. For the supporting 8-inch cantilever spans, does it have to sit centered like the rules diagram?

No, the cantilever "position" can be placed wherever you think it will hold the weight the best.

31. Can the cantilever spans be glued to the suspended span?

Yes.