Frequently Asked Questions

1. ***If your team proposal/report portfolio is determined to be complete by the judges, you will be invited to the 2016 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 on 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 at 906-786-1830, ext. 317, to discuss reimbursement rates.

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

Each three-member team, with one advisor/chaperone, will be allowed two overnight rooms at the Radisson in Lansing. 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 the suspended span be glued or connected to the cantilever span?***

The suspended span in the middle span of the bridge does not have to be independent of the two cantilevers.

3. ***Can students use a lap joint?***

Yes, the lap joint is permitted, but the joint is limited to 3/8 of an inch for the length and width.

4. ***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. These joints may not exceed 3/8 of an inch in thickness. A multi-layered joint may not exceed 3/8 of an inch in length.

5. ***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 the truss and cantilever through truss bridges.

6. ***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.

7. 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.

8. 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.

9. 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.

10. 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 and must be included in the proposal.

11. Are we allowed to use double members, like what is shown in the ModelSmart booklet on page 7-9?

According to our rules, you cannot use double members.

12. 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 up until Feb. 19, 2016, but you must contact Julie VanPortfliet at 906-786-1830, ext. 317, before the change can be completed. If you have team changes after the Feb. 19 deadline, contact Julie and requests will be considered and made when possible.

13. 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.

14. Can you paint the bridge?

Painting the whole bridge is not acceptable, but you can paint decorations or your name on the bridge. Be careful not to paint the joints so that it looks like lamination. In the first specification, it states "additional materials may be used for decorations or visual aids."

15. Are we allowed to use hot glue?

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

16. Can a truss pass over another truss or is that lamination?

Balsa directly on balsa is lamination. With the exception of the suspension member of the cantilever through truss bridge, any location where balsa-on-balsa exceeds 3/8 of an inch is considered lamination.

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 3/8 of an inch length on both cantilvers?

A 1-inch guide can be used, but at no point, except for the actual suspended span, can there be more than 3/8 of an inch contact between balsa-on-balsa. The space in the middle of the guide would have to be a minimum of one-half inch.

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

Yes.

20. Through truss simply means that the two sides must be connected across their tops and bottoms. Please confirm.

A through truss is when the roadway surface is between the two main truss members, as opposed to sitting on top of the two main truss members (deck truss). Regardless of whether it is a through truss or deck truss, the top and bottom chords must be connected so that all forces acting at each joint are axial forces. Trusses typically do not transfer shear or bending forces from joint to joint.

21. The test support apparatus is indeed to have two and only two supports, as shown in packet's diagram. Please confirm.

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

22. My understanding of a cantilevered bridge is that is needs four supports (two compression supports in the middle and two tensile supports on the ends; ref: 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.

23. Does the cantilever through truss bridges have to include a suspended span?

Yes, two 8-inch suspended spans are required.

24. 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 connect the cantilever to other sections.

25. 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.

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

A cantilever structure is supported at the piers only. In our case, the top supports on the Pitsco testing machine as used to support the student's design. The cantilever sections (deck from both supports) extend beyond the pier and meet. The "meeting" point can be at the half-way point or anywhere the students decide to place it (the 8-inch requirement will limit the placement). Where the cantilevers meet, they are tied together. They can be glued together or an additional piece of balsa wood may be used, as long as two pieces do not overlap by more than 3/8 of an inch. The suspension span may be glued or fastened to the cantilever spans.