WEST VIRGINIA
BRIDGE DESIGN & BUILD CONTEST

2024 OFFICIAL RULES

CONTEST SOFTWARE

BRIDGE DESIGNER 2024
POWERED BY
ENGINEERING ENCOUNTERS

CONTEST SPONSORS

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1 WEST VIRGINIA BRIDGE DESIGN & BUILD CONTEST INFORMATION

1.1 OVERVIEW

The West Virginia Bridge Design & Build Contest (WVBDB) is a statewide contest intended to conduct outreach to middle school and high school students considering a career track in STEM occupations. The contest primarily covers bridge design, but individuals/teams invited to the Finals will also compete in a balsa-wood bridge building contest.

The Qualifying Round of the 2024 West Virginia Bridge Design & Build Contest will **begin Friday, November 17, 2023, and end on Friday, March 1, 2024, at 11:59pm EST**. All individuals/teams must register at https://wvbridgedesignandbuildcontest.com/register/. This will ensure that the correct information is available to contact the finalists. All bridge design files must be uploaded to this website to officially enter the contest. All contest and event updates will also be posted on the website.

The Top 25(approximately) individuals/teams with the lowest cost designs will be invited to participate in the Finals (with at least five Middle School individuals/teams) that will be in-person at the WVU Institute of Technology Campus in Beckley, WV. **Finalists will be notified by Monday, March 4, 2024**, with invitation and details of the Finals event.

1.2 OVERSIGHT AND COORDINATION

The WV Department of Transportation, Division of Highways is coordinating the 2024 West Virginia Bridge Design & Build Contest. The 2024 advisory board members are:

NAME	ORGANIZATION
Hussein Elkhansa	WVDOT – Division of Highways
Dustin Feazell	WVDOT – Division of Highways
Jennifer Dooley	WVDOT – Division of Highways
Erika Klose	WV Department of Education
Horng-Jyh Yang	WVU Institute of Technology
Benjy Simpson	Bridge Walk LLC

If you have any questions about the 2024 West Virginia Bridge Design & Build Contest, please contact dotwvbdb@wv.gov.

1.3 RULES AND ELIGIBILITY

1) Students must be attending a public or private West Virginia school or must be home-schooled at a West Virginia address.
2) Students from grades 6-12 are eligible to participate.
3) Students may compete individually or in teams of two.
4) All eligible students will be placed into one of two contest categories—Middle School or High School—based solely on their grade level. Eligible students in grades 6-8 will be registered in the Middle School Division. Eligible students in grades 9-12 will be registered in the High School Division.
5) Teams composed of one high school student and one middle school student will be considered as a high school team for competition purposes.
6) Students must register on the contest website (https://wvbridgedesignandbuildcontest.com/register/)
   a) **Email**: Students must use an email that is validated in the registration process. Students must have access to the email that is used to register for the competition. Any official communication from the WVBDB team will be made via email.
   b) **Registration Information**: Teams wishing to change the email associated with their account or any other account information must contact dotwvbdb@wv.gov and allow 2 business days for the changes to be made.
   c) **Teacher/Coach/Parent Information**: Students must provide their teacher/coach's name and contact email. Home school students must provide their parent/guardian's name and contact email.
   d) **School Names**: Students must choose their school's name from the dropdown box provided. If the student's school is not provided in the list, please choose "Other" and type the name in the box provided.
   e) **Team Names**: Names should be between 4 and 20 characters long. Team names should be appropriate for a school assignment. Teachers and parents/guardians can review team names and request that a team name be changed or eliminated. The Advisory Board will review these requests and approve or disapprove within 2 business days. The Advisory Board reserves the discretionary right to change a team name, at any time.
   f) **Submission Requirements**:
      i) Teams must have a valid team name associated with each design.
      ii) **File Naming Convention:** The application will generate a default file name. However, the team is required to change the name before uploading to our website using the following naming convention: "TeamNameXXXX.bdc", where "TeamName" is the team name and "XXXX" would equal an iteration number.
      iii) The team's name will be entered at the initial creation of the design on the "Fill

in the Title Block" screen and cannot be changed for the life of the design file. It must match the team's name entered at registration.

   iv) Uploaded designs that do not meet these requirements will be disqualified.

   g) **Ties**: Ties will be awarded by the submission time. If two designs with the same exact cost are submitted, the first design submitted will obtain the highest ranking for cost and the second design will obtain the next lowest ranking.

   h) **Ineligible Submissions**:
   i)   Submissions created by previous versions of the application will be disqualified.
   ii) Design files that do not pass a load test will be disqualified.

7) To officially enter the contest, students must submit at least one bridge design file (https://wvbridgedesignandbuildcontest.com/login/) that passes the simulated load test.

8) Students must create their designs using the **Bridge Designer 2024** software that can be downloaded from the contest website.

9) Students are expected to perform their own work during the Qualifying Round and Finals.

10) The contest advisory board has discretion to disqualify students caught cheating or exhibiting behavior that is not representative of the contest values of teamwork and honesty.

1.4 CONTEST SCHEDULE

The schedule for the 2024 West Virginia Bridge Design & Build Contest is shown in the table below and will be updated on the website accordingly. Registration can be completed at https://wvbridgedesignandbuildcontest.com/register/. The Qualifying Round will *end on Friday, March 1, 2024, at 11:59 p.m. EST*. The Top 25(approximately) individuals/teams with the lowest cost designs will be invited to participate in the Finals.

EVENT	DATES
Registration	November 17, 2023 – March 1, 2024
Qualifying Round	November 17, 2023 – March 1, 2024
Notification of Finalists	March 4, 2024
Deadline to RSVP	March 11, 2024
Finals	April 5-7, 2024 (tentative; subject to change)

2 QUALIFYING ROUND

2.1 *BRIDGE DESIGNER SOFTWARE*

The **Bridge Designer 2024** software can be downloaded from https://wvbridgedesignandbuildcontest.com/software/. The bullets below provide an overview of the software use. Additional tutorials are provided on the website:

- Students will be presented with a requirement to design a bridge to carry a given load from a roadway across a river.
- Students may choose from a wide variety of site configurations for their bridge. Each will carry the load in a different way, and each will have a different site cost.
- Students will develop a design for their bridge by drawing a picture of it on the computer.
- Once the design is complete, the software will test the bridge to see if it is strong enough to carry the specified highway load. This test includes a full-color animation showing a truck crossing the designed bridge. If the design is strong enough, the truck will be able to cross the bridge successfully. If not, the structure will collapse.
- If the bridge design collapses, it can be strengthened by changing the types of steel and the sizes of the structural components that make up the bridge, or by changing the configuration of the bridge itself.
- Once the bridge can successfully carry the highway load without collapsing, the student can then refine the design with the objective of minimizing its cost while still ensuring it is strong enough to carry the specified loads.

2.2 *REQUEST ASSISTANCE*

Assistance can be requested up to Friday, February 16, 2024. Teachers or Students may submit a request for an engineering professional to explain how to use the **Bridge Designer 2024** software and teach some aspects of bridge design. The assistance will be provided by an undergraduate engineering student involved in an American Society of Civil Engineer (ASCE) student chapter (e.g., Bluefield State University, Fairmont State University, Marshall University, West Virginia University, or WVU Institute of Technology), a West Virginia Department of Transportation employee, or another professional engineer volunteer.

These requests will be handled by completing the "Contact Us" form here: https://wvbridgedesignandbuildcontest.com/contact/

2.3 TEAM REGISTRATION

Registration for the West Virginia Design & Build Contest must be completed at the contest website here: https://wvbridgedesignandbuildcontest.com/register/. Any changes to emails or other team member's information provided during registration can be made up to 2 business days prior to the end of the qualifying round by contacting us at dotwvbdb@wv.gov.

2.4 BRIDGE DESIGNER FILE SUBMISSION

The 2024 West Virginia Bridge Design & Build Contest will utilize **Bridge Designer 2024** software located here: https://wvbridgedesignandbuildcontest.com/software/. Bridge design files must be uploaded to the contest website to officially enter the contest.

2.5 FINALIST SELECTION

The Top 25(approximately) individuals/teams with the lowest cost designs will be invited to participate in the Finals. The goal is to have 50 students participate in the Finals. To have a similar number of middle school and high school participants and because students can enter individually or as teams, it is not possible to set an official number of individuals/teams that will advance to the Finals. Twenty-Five is given as an estimate and assumes that the 25 least expensive designs constitute team entries and are primarily composed of high school individuals/teams, with at least five middle school individuals/teams included in the competition.

Finalists will be notified by Monday, March 4, 2024, with an invitation. *Finalists will have until Monday March 11, 2024*, to accept their invitation.

3 FINALS

The FINALS will be a combination of a **Bridge Designer 2024** computer lab design and Balsa wood bridge building contest in-person at the WVU Institute of Technology Campus in Beckley, WV *(or virtually depending upon CDC COVID-19 guidelines)*. All information regarding event details, time, schedule, and location will be posted on the website.

4 PRIZES

All students invited to the FINALS will be awarded prizes. Students can win more by placing 1st, 2nd or 3rd in both computer lab design and Balsa wood building categories. Finalists will win between $100.00 and up to $500.00 each, depending on participation. All prizes are in the form of gift cards. The Top 3 prize winners of each category will also be required to fill out a W-9 tax form and return it to WVU Institute of Technology, 410 Neville Street, Beckley, WV 25801. Additional information regarding prizes will be provided during the Finals.

5 DISCLAIMER

The Contest Organizers & Advisory Board have made every effort to adequately explain the contest format and corresponding rules within this document. However, they reserve the right to change the rules and prizes without notice right up to the Final Round. Any changes will be communicated to the contest participants on the website and via email. ***Please note all advisory board and judges' decisions are FINAL.***

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