Student Steel Bridge Competition

Judges Guide

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SSBC Judges Guide

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Cover image taken by Steve Buhman, New Leaf Studio.

General Competition Information

The Student Steel Bridge Competition (SSBC) is an annual competition that challenges student teams to develop a scale-model steel bridge. The team must determine how to fabricate their bridge and then plan for an efficient assembly under timed construction conditions at the competition. Bridges are then load-tested and weighed. The bridge must span approximately 20 ft, carry 2,500 lbs, and must meet all other specifications of the competition rules. Judges also consider a bridge's aesthetic qualities.

This document provides an introduction to the SSBC for volunteer judges. It explains the preparation and procedures for the competition, and it highlights certain key aspects of the *Student Steel Bridge Competition Rules*. However, this is not a complete explanation of the *Rules*. You should refer to the *Rules* while reading this guide. If there are any discrepancies between the *Rules* and this guide, the *Rules* take precedence.

Competition Format

The SSBC began in the 1980s as an AISC competition between three universities in Michigan. Over the years, it has expanded to include over 200 participating schools. Today, the American Institute of Steel Construction (AISC) and the American Society of Civil Engineers (ASCE) jointly sponsor and organize the competition.

Teams consist of undergraduate and/or graduate students from colleges and universities in North America.

There are two levels of the Student Steel Bridge Competition: regional competitions and the national finals. The regional competitions are typically held at ASCE Student Symposia. Outstanding performance in regional competitions, and only participation in those competitions, qualifies eligible teams for the Student Steel Bridge Competition National Finals, which is organized by AISC in collaboration with ASCE.

Rules

All of the regional competitions, as well as the national finals, are based on the same rules to ensure fair competition on a national level. The SSBC Rules Committee updates the *Rules* every year.

AISC maintains a website, aisc.org/ssbc, where you can download the *Rules* and ask for or review clarifications. Students, judges, and host personnel may submit questions about the *Rules* via an online form. The SSBC Rules Committee only reviews questions

submitted through that official online form; their clarifications are available to all competitors online.

Volunteer and Competitor Roles

Head Judge

The head judge has full authority over the conduct of the competition, safety, and interpretation of the rules. There is a head judge at each regional competition. The national head judge serves as the head judge for the national finals. The head judge is the final authority for the enforcement of the rules of the contest and will make a final decision on any rulings made by the station lead judges that are disputed by the team.

Station Lead Judge

Station lead judges work with a team of other judges to oversee one or more competition stations. They have complete authority for enforcing the rules of the competition at their station. Generally each regional competition will have station lead judges assigned to each construction lane, each lateral and vertical loading station, and the weigh station. With the exception of matters of safety, all communication with the team and any team questions regarding the competition shall be directed to the station lead judge. At regional competitions that do not include marshals (described further below), the station lead judge will be responsible for ensuring the integrity of the judging forms.

Judges

Judges assist the head judge and station lead judges with the safe conduct of the competition. Judges are assigned to one or more stations of the competition: aesthetics, construction, lateral loading, vertical loading, and/or weighing. Judges are directed and empowered to halt any activities they deem hazardous.

Judge giving instructions at load station

Judges oversee bridge construction

Marshals

At the national finals and some regional competitions, marshals escort bridges through the complete construction and testing sequence. The marshals carry the judging forms from station to station, ensure that the bridge is not altered or enhanced after the erection phase, note any damage to the bridge as it is moved, and help the data entry team resolve any questions about the completed judging forms.

Scorekeeper

After completion of all competition stations, the scorekeeper will enter the data from the team's judging form into the official electronic scoresheet in the presence of the team captain. Upon completion of the data entry, the team captain will review electronic entries and sign off on their accuracy. The scorekeeper will collect the judging forms and return them to the head judge at the end of the competition. The scorekeeper may be a student or professional volunteer.

Other Volunteers

The host school may have other volunteers at the competition who help with other tasks such as registration of teams, equipment preparation, venue setup and clean up.

Team Captain

All teams must designate an official team captain who is a builder. Team captains represent the teams and are the point of contact for judges when reviewing scoring information or resolving disputes. With the exception of safety concerns, all communication with the team shall be through the team's captain.

Competition Timelines

The exact dates for each regional competition will vary, but the timeline below shows the major milestones associated with the planning phase leading up to the competition.

- Mid-November: Regions recruit regional head judges for their competitions
- End of January: AISC holds virtual regional head judge training session with national head judge
- February: Regional head judges and symposium hosts recruit judges to assist with the competition

- March-April: Regional competitions take place
  Note: The regional head judge will lead a judges' training session in advance of the regional competition. Some regions opt for a virtual session a few weeks prior to the competition; others may hold the training in person at the competition itself.

- Late May / Early June: National finals is held

Each regional competition is held over the course of one or two days (usually between Thursday and Saturday).

Judging Data Forms

AISC provides an electronic scoring spreadsheet that is used at the national finals and at every regional competition. The scoring spreadsheet can be downloaded from the Host Resources page, and it is typically available for download by February. The zip folder contains the spreadsheet along with a comprehensive user's guide.

Prior to the start of the competition, the scoring spreadsheet will need to be populated with the names of all participating schools. The spreadsheet contains data entry forms to be printed and used at each station of the competition. The head judge and the host school should coordinate on setting up the spreadsheet, printing the data entry forms, and submitting the final scoresheet and scanned data entry forms to the national scorekeeper after the competition.

Each team will have their own set of data entry forms, and the station lead judge will complete the portions of the form associated with their station. Typical data entered in the forms includes material violations during pre-construction, construction penalties and time of construction during the construction phase, dimensional violations during the post-construction check, bridge weight, and deflection at the loading stations. These forms will be passed from station lead judge to station lead judge as the team completes each phase of the competition.

At each station of the competition, the station lead judge will review the data with the team captain, and the captain will sign-off on the entries. Any appeals at that station must be made prior to the captain signing the form. (Refer to the *Rules* and to the Appeals section of this guide for more information about the process.)

Once a team completes all of the competition stations, the scorekeeper will transfer all information on the data entry forms into the electronic scoring spreadsheet. The head

judge will back check the data entry against the hardcopy forms to ensure accuracy prior to announcing the results.

Scans of the hard copy data entry forms will be submitted to the national scorekeeper along with the completed electronic scoring spreadsheet at the conclusion of the competition.

Aesthetics

Aesthetics judging typically takes place before the main competition. During aesthetics judging, all of the bridges are constructed and on display at the same time in the same location. Judges are looking for three things: the bridge's appearance, whether it displays the school's name, and an informational poster about the bridge.

The head judge at each regional competition will assign aesthetics judges and determine the process by which they will rank participating bridges. The scoresheet contains an optional data entry form that can be used at the regional competitions.

At the national finals, aesthetics judging is conducted by members of the Rules Committee using the official scoring spreadsheet.

Bridge with school name clearly labeled and poster

Appearance

The judges will score the bridge for its attractiveness based on their evaluation. This is subjective, but judges generally reward bridges that are elegant in both design and engineering approach. Fabrication quality, including welding, shall not be considered because some bridges may be fabricated professionally rather than by students.

Name

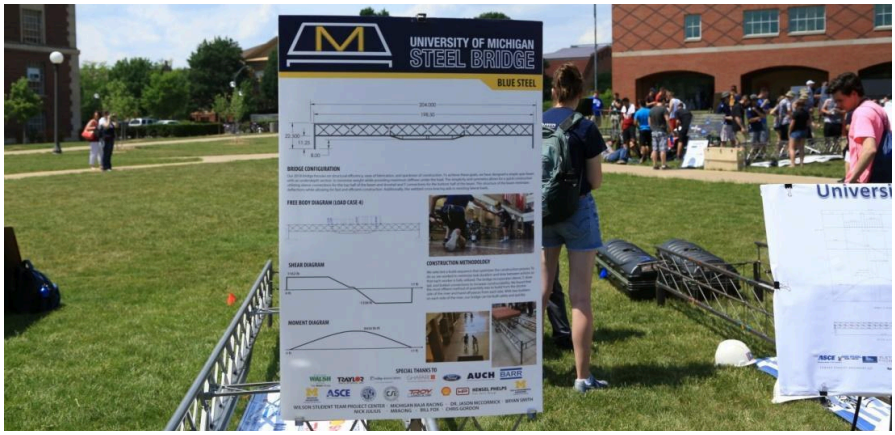
The school's name should be displayed on the bridge so the judges can easily identify it. Bridges that do not clearly identify a participating school or are not labeled to match the poster should receive a low score.

Good example of school name on bridge

Good example of school name on bridge

Poster Board

The poster explains the team's design process to the judges. The *Rules* contain the list of required components for the poster.



Poster at aesthetics judging

Captains' Meeting

Prior to the main competition, a meeting will be held with the head judge and the team captains. The head judge will provide the team captains with details of the main competition, and the team captains will have an opportunity to ask questions. Other judges are encouraged to attend, but judge attendance is not required.

Details that the head judge will provide during the meeting include, but are not limited to the following:

- Overview of how the competition will proceed and what the teams should expect during each phase.
- The order in which teams will compete.
- Significant rule changes from the previous year.

The captains' meeting is the only opportunity that teams will have to ask questions. Judges shall not answer any questions regarding the competition after the captains' meeting in order to avoid giving a competitive advantage to one team over the others.

The teams are also required to submit their construction cost estimates at this time.

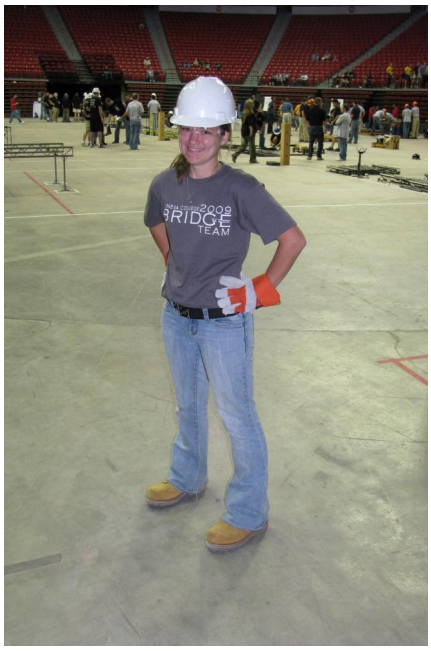
Load Case Determination

Prior to timed construction of the first bridge, the head judge will roll a die (or pair of dice) to determine which of the load cases indicated in the *Rules* will be applied to the bridges. For each possible result of the roll, the *Rules* give the dimensions for where lateral and vertical load are applied, as well as where vertical deflection and sway are measured. The result of the die roll applies to all teams at that competition.

Note that teams are required to submit their cost estimations prior to selection of the load case. Collecting the cost estimations should be coordinated with the host school. They can be collected in advance of the competition using an online form, or they can be collected in-person at the captains' meeting.

Personal Protective Equipment

Builders entering the competition site are required to wear appropriate personal protective equipment. Judges will verify that all participating team members are wearing a hardhat, protective eyewear, work gloves, and leather construction boots at all stations of the competition.



Builder dressed in proper personal protective equipment

All vertical loading judges must also be wearing a hardhat, safety glasses, and foot protection. Judges may provide their own steel or composite toe boots or they may wear closed-toe shoes paired with the steel toe caps (provided by AISC as part of the equipment inventory).

Pre-Construction

Resources

This section contains a general overview of pre-construction. Judges will use the data entry form as a checklist for this phase. Supplement A also contains a list of some other reminders for judges in the construction lane.

General Information

The team's first step is to put all of their equipment and materials in the staging yard (refer to the site plan in the Appendix). As soon as the team begins placing their items, the judges can start checking all items for compliance with the *Rules* by following the pre-construction checklist in the data forms. This includes checking all members, loose bolts, loose nuts, and tools.

Everything that goes into the staging yard is subject to the *Rules*, and any noncompliant item will be penalized and documented on the data forms. Judges should also verify that competitors are properly wearing the required safety equipment.

Staging yard with bridge ready to go

Competitors are responsible for making sure that all bridge components and construction aids are placed in the staging yard as specified in the *Rules*. Competitors are encouraged to be efficient in laying out their items so they do not inhibit the flow of the competition.

While the judges are performing pre-construction checks, the station lead judge shall review the following with the team:

- Identify the team captain.
- Verify number of builders.

- Inform the team captain that violations and penalties will be reviewed after each stage and that they will sign the data entry form once they agree or after an appeal has been identified.
- Remind the team that construction will be stopped for safety violations.
- Inform the team as to where the tape is considered in bounds or out of bounds.
- Remind the team that they are allowed to step on footings.

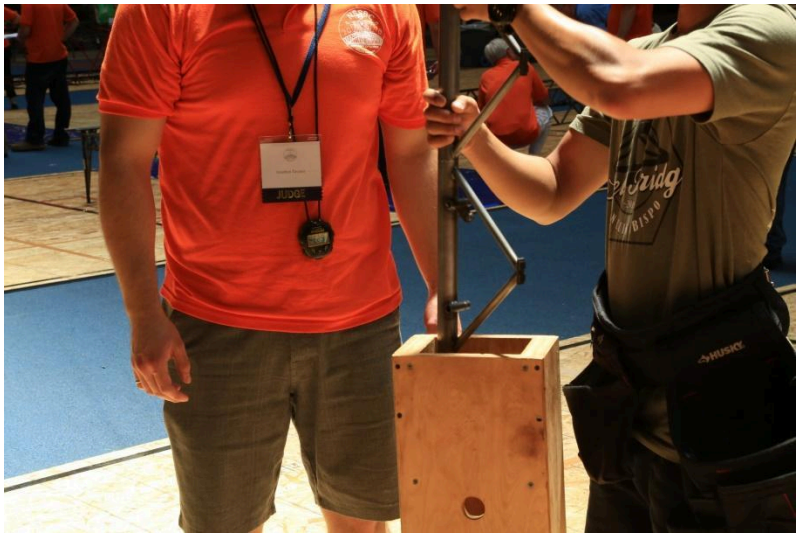
After the judges complete the pre-construction check, the station lead judge will review the results with the team captain, and then the team captain signs the bottom of the pre-construction checklist. The team captain's signature indicates that they understand and accept any penalties that have been levied. The team captain should be given time to check the *Rules* and make any appeals before signing the form. Refer to the *Rules* and the Appeals section of this guide for more information about this process.

Common Violations

Some violations that occur during pre-construction are design issues, and others are either fabrication or erection issues. The possible violations are listed in the data form, and the *Rules* should be consulted for complete information. Common violations are described further below.

Member Size Limits

All members must fit into a box with dimensions specified in the *Rules*. The judges will try to orient the member in the most advantageous position to get it in the box but will impose a penalty if it does not fit into the box using the force of gravity alone. Members shall not be forced into the box.



Bolt, Nut, and Hole Specifications

With the exception of painting, bolts and loose nuts must not be modified in any way from their purchased condition. Bolts may not be ground to a point on their ends. Holes must meet certain requirements as specified in the *Rules*.

Tool Size

All tools must meet the requirements specified in the *Rules.* Some tools may be assembled after the start of construction. The containers with the loose nuts and loose bolts are considered tools that must meet all the requirements of a tool.

Item Layout

There are specific requirements about where particular types of items can be placed in the staging yard. Every member and tool must be in contact with the ground. Loose nuts and loose bolts must be contained in separate containers; these containers are considered tools that are allowed to start in the "Nuts & Bolts" area of the staging yard. In the example image, the nuts and bolts are not in a container and are in contact with the ground and hence are illegal. This must be fixed before timed construction.

Permissible way to lay out items

Illegal way to lay out items

Construction

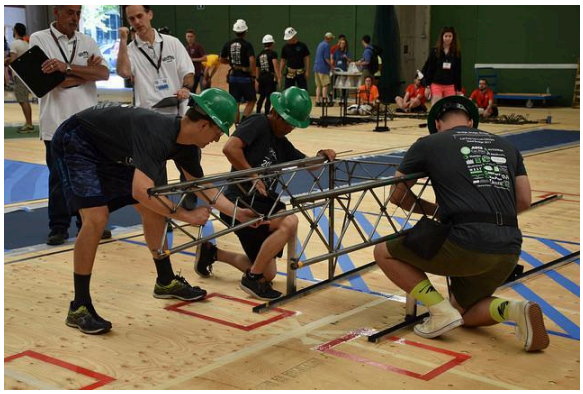
Resources

This section contains a general overview of construction. Judges will primarily use the data entry form as a checklist for this phase. Supplement A also contains a list of some other reminders for judges in the construction lane.

General Information

The team captain will tell the station lead judge when they are ready to start. The station lead judge verifies that the site is ready before starting the countdown.

Team during construction


Team during construction

One lane judge will have responsibility for the primary stopwatch. A second judge will operate a second stopwatch as a backup. If any judge calls out "stop," that judge will pause the stopwatch and the team's activity must also stop. Judges will stop the construction of the bridge if any of the safe construction practices listed in the *Rules* are violated. The lead station judge will tell the team captain why work was stopped, and the team will have a short time to discuss how to build the bridge within the parameters of the *Rules*. Before construction resumes, all builders, tools, and components of the bridge must be returned to the positions they occupied immediately before the violation.

At no time should the judges or spectators make suggestions to the team on how they can comply with the *Rules*. Judges will only tell the team what *Rules* they are violating. Judges may pause construction if advice is being received from spectators.

If the team cannot find a way to construct the bridge in compliance with the *Rules*, the head judge will determine whether they may continue the competition. The head judge will mark any applicable ineligibility on the data form, and the team captain must sign the bottom of the form. If a bridge is ruled ineligible, it is removed from the remainder of the competition and does not proceed to the subsequent stations and load tests, unless otherwise allowed by the head judge.

Accidents

The *Rules* define some penalties as accidents. Judges will call accidents out as they occur, and one judge will be responsible for recording them on the data form. If, for instance, the team drops a fastener in the water, the timer will keep running but the team will continue to earn additional penalties unless they rectify the situation immediately. If they commit an additional violation while resolving the first (for instance, if they must step in the water to retrieve a dropped fastener), they will not be penalized for the second accident. See the *Rules* for a full explanation of accidents.

Construction Time Limits

The lead station judge shall inform the team when construction time reaches 25 minutes. When construction time reaches 30 minutes, the lead station judge shall stop construction and explain the provisions of the relevant section of the *Rules* . Time and construction shall then resume without tracking any more accidents.

The timers will stop when the team captain indicates that they are done and the judges ensure that all items and builders are where they should be per the *Rules.* If the requirements of the *Rules* are not met, the station lead judge will not stop time, will inform the team of what is not in compliance, and will then stop time once the requirements of the rules are met.

Teams have a maximum of 45 minutes to complete construction of their bridge. Once 45 minutes are reached, the construction is stopped, and the bridge is removed from the construction area.

Common Violations

Here are some common violations that occur during construction. Refer to the *Rules* for complete information.

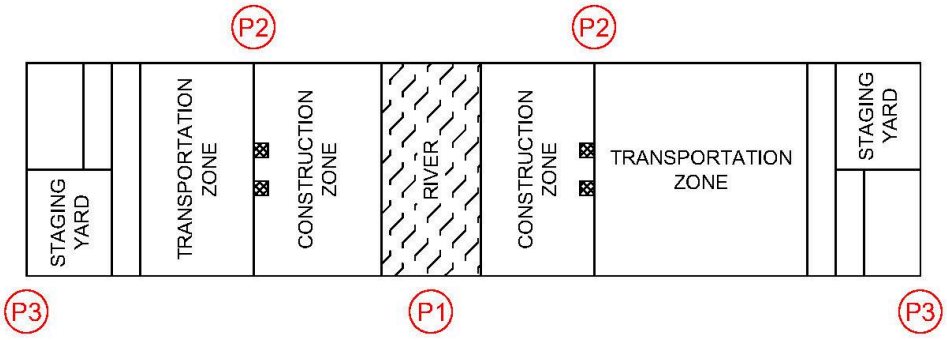
- Competitors stepping out of the back of the staging yards.
- Bridge components sliding out of the back of the staging yards.
- Bridge supports sliding beyond the footing boundaries.
- Tools or pouches touching ground when builders kneel.
- Dropping nuts and bolts.
- Competitors attempting to carry two members at once.

Judges Positions

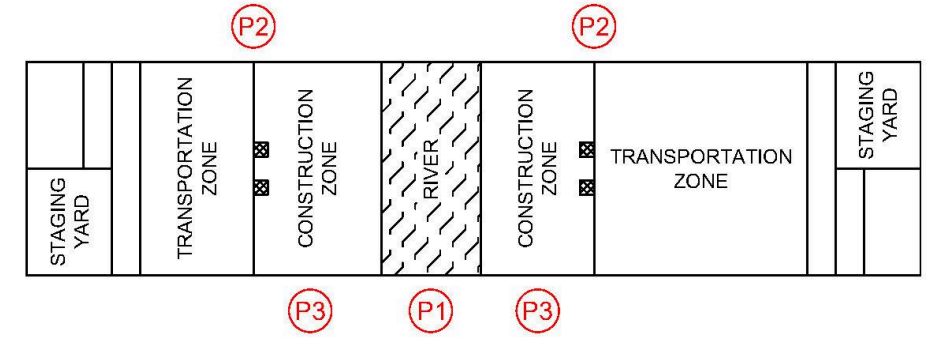
Judges should be positioned around the construction site, and it can be beneficial to assign roles for each position. The figure below shows an example of where judges may be positioned at various times during a bridge's construction. This can be altered

depending on the number of judges available. Exact construction zones layout and dimensions vary from year to year, so check the *Rules*.

The early construction figure refers to the beginning of construction when the majority of the bridge components are still located in the staging yards, and there is significant activity in these areas. The late construction figure refers to the later stages of construction when the majority of the bridge components have been removed from the staging yards and most of the activity is happening within the construction zones.



TYPICAL JUDGE POSITIONS - EARLY CONSTRUCTION



TYPICAL JUDGE POSITIONS - LATE CONSTRUCTION

(The site plan changes every year. This figure is provided as an example. Refer to the Rules for the actual layout.)

Position (P1) - Generally, this position is the station lead judge. This position watches for builders stepping in the river as well as watching for dropped fasteners or tools.

Position (P2) - This position watches the bridge footings and whether the bridge supports slip out of place, while also watching for dropped fasteners or tools.

Position (P3) - During early construction stages, this position watches the back end of the staging yard for bridge components or builders going out of bounds. During late

construction, this position observes both river lines and footings. Throughout construction, this position should also watch for dropped fasteners and tools.

Post-Construction

Resources

This section contains a general overview of post-construction. Judges will primarily use the data entry form as a checklist for this phase. Supplement A also contains a list of some other reminders for judges in the construction lane.

General Information

The team may not do any further work on the bridge after timed construction ends. The judges will inspect the bridge for compliance with the *Rules*, and the data forms contain the full list of items to review. The lead station judge then records the build time, any connection violations, and any clearance violations on the data forms. Teams will be given 2 minutes to also inspect the bridge connections.

Teams will be allowed to repair certain violations as dictated in the *Rules*. Certain violations must be fixed, and if it is not possible to fix these violations, then the head judge will rule the bridge ineligible and the bridge will not be approved for load testing, unless the head judge allows.

Once the judges finish their inspection, the station lead judge meets with the team captain to review the results and give the team captain an opportunity to ask for clarifications or dispute the findings. The head judge may resolve disputes between team captains and lane judges; further appeal processes are detailed in the *Rules*. At the end of this process, the team captain will sign the bottom of the data form, and the team will move its bridge to the next station.

Common Violations

The possible violations are listed in the data form, and the *Rules* should be consulted for complete information. Common violations are described further below.

Clearance

Judges will typically use a plywood template to evaluate clearance, though they may also use a taut string in cases where the floor may not be perfectly flat. Clearance problems arise when teams push the limits defined in the *Rules*. Note that the height and type of clearance varies from year to year. The following do not necessarily reflect the requirements for the current competition year.

Plywood templates for passageway and ground clearance checks

Connection Safety

Several connection safety violations occur each year. Be sure to read this section of the *Rules* carefully.

Special note for the 2025 competition:
There is a supplemental guide available on the Team Resources page that includes several annotated photo examples of both prohibited and allowed connections to help competitors and judges better understand the Connection Safety Rules in Sub-Section 9.5 of the 2025 SSBC Rules. Please note that the examples and connections shown do not represent all possible allowed or prohibited connections for the 2025 SSBC.

Lateral Load Test

Resources

This section contains a general overview of the lateral load test. Supplement B contains step-by-step instructions that are specific for the current year's *Rules* for use at the regional competitions. AISC also provides an Equipment Guide on the Host Resources page that includes step-by-step instruction for setting up and operating the regional competition equipment.

At the national finals, the national head judge will provide a separate procedure that is specific for the national finals equipment, and the procedure will be discussed at the judges' training.

General Information

At the lateral load station, a pulley system will be used to apply lateral load to the bridge, and the overall sway is monitored.

Prior to starting, the station lead judge makes sure that all team members have the required safety gear. The team installs a single decking unit positioned as required by the *Rules*. Judges will verify the positioning of the decking unit, and the team will apply 75 lb load on the bridge as specified by the *Rules*. The judge installs a laser plumb bob and paper target to monitor the sway.

Lateral load test station

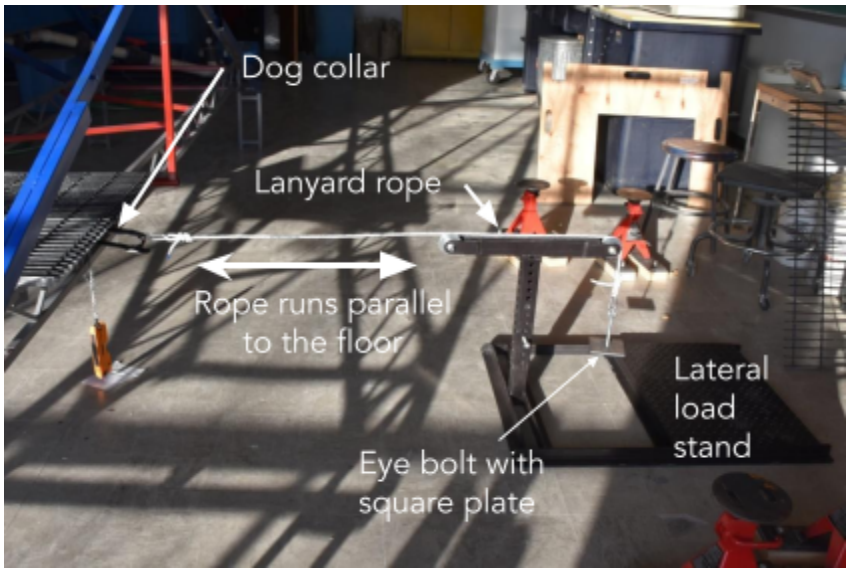
The competitors may provide their own lateral restraint devices to the bridge--that is, they may brace it to prevent the bridge from sliding as detailed by the *Rules*. Note that any device used must only prevent sliding and cannot prevent uplift or rotation. The devices must not do damage to the floor. Competitors usually use their feet as restraining devices.

Foot of competitor used to prevent sliding

Use of an object (steel angle) to resist sliding

Pushing down on bridge is not permitted

Judges will use a dog collar to connect one end of the pulley to the bridge stringer. A team member will apply loading plates to the other side of the pulley. This team member should stand on the pulley stand in order to prevent it from slipping during loading.



Lateral load pulley stand

Vertical Load Test

Resources

This section contains a general overview of the vertical load test. Supplement C contains step-by-step instructions that are specific for the current year's rules for use at the regional competitions. Refer to the Equipment Guide for more step-by-step instructions for setting up and operating the regional competition equipment.

At the national finals, the national head judge will provide a separate procedure that is specific for the national finals equipment, and the procedure will be discussed at the judges' training.

General Information

At the vertical load station, the team loads the bridge with steel angles, and the vertical deflection is monitored and recorded. Prior to starting, the lead station judge will confirm that all team members and judges have the required safety gear (refer to Supplement C for the full list).

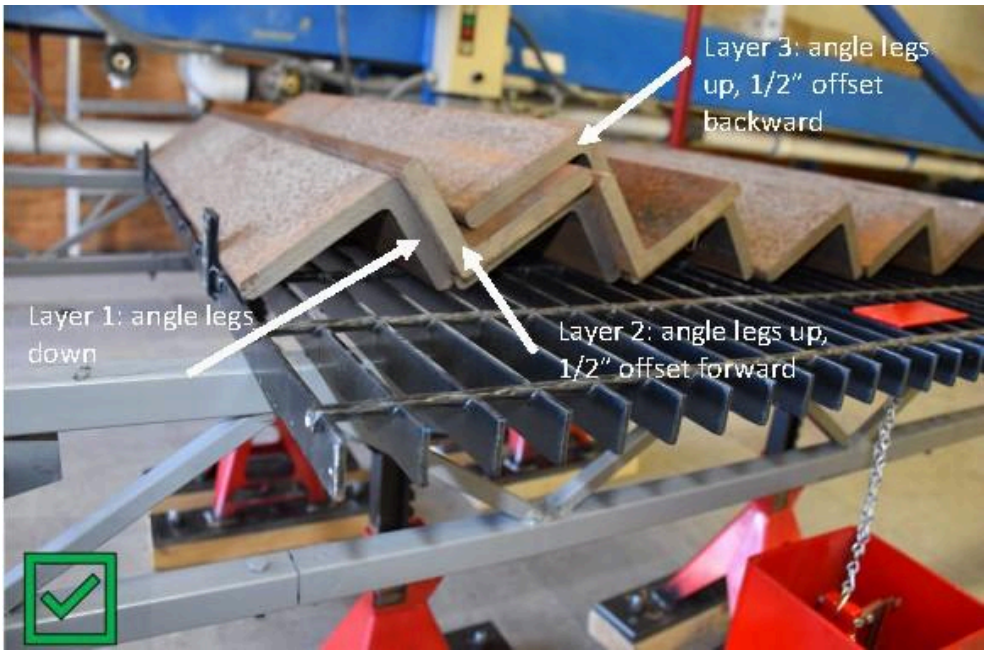
The judge will place safety supports (i.e. modified jack stands) below the bridge. The supports will be positioned to permit the maximum allowable deflection while ensuring that the decking units will not fall more than a few inches in the event of a bridge failure. Refer to the Equipment Guide for more information about the setup.

Vertical load station with safety supports, grating, and loading angles: (a) before loading and (b) after loading

Once the safety supports are in place, the team will locate and place the decking units on the bridge. The judges will verify the positioning of the decking units and have the team apply the preload.

The judge will record initial readings after installing the sway targets and vertical deflection measuring devices. The team captain will be allowed to verify the setup and initial readings before proceeding.

The team members will manually load the bridge; this process should be conducted in a safe, smooth, and continuous manner. All teams should load in the same manner, with the angles stacked in a nested position, as shown in the photo.



Stacked and nested angles for vertical loading

Teams should not be allowed to stop the loading to look at gauges or develop a strategy. Judges may stop loading for safety reasons or if the bridge exceeds sway or deflection limits.

After loading is completed, the lead station judge will record the deflection readings and allow the team captain to verify the readings.

After the last deflection reading, the team should unload the bridge safely and quickly. Note that the bridge does not pass the load test until it is fully unloaded. If it collapses

at any time during loading or unloading, the team will be penalized according to the *Rules*.

Do not touch the deflection measurement devices during loading or unloading. If the devices are compromised in any way during load testing, then the bridge must be disassembled and the team must start the entire competition sequence again in accordance with the *Rules*; the initial loading will take out any slack in the joints, and reloading the bridge has the potential to result in smaller deflections than would have been seen in an uninterrupted first loading.

When all of the deflection data is recorded, the lead station judge reviews the data form with the team captain. The team captain signs the form when all questions have been resolved. The bridge will then be moved to the next station.

Bridge Weight

The team will position the bridge atop four scales, and the lead station judge will enter the four readings on the data form, rounded to the nearest pound.

Bridge positioned on scales to measure weight

The lead station judge should not add up the values; the scoring spreadsheet will automatically compute the total weight.

The team captain should verify all weight measurements and certify the results by signing the judging form. The team may now remove the bridge from the competition floor and disassemble it.

Final Score Entry, Verification, and Awards

After completing the loading stations, the team captain and load judge from the final station will proceed to the scorekeeper's station where the team's data forms are turned over to the scorekeeper.

The scorekeeper will enter the data from the team's data forms into the electronic spreadsheet. When complete, the team captain will be given an opportunity to verify the entries.

The scorekeeper will collect each team's data forms and will provide them to the head judge after the last team's data is entered into the electronic spreadsheet.

After receiving the data forms from the scorekeeper, the head judge will verify the data entries in the electronic scoresheet and determine award winners.

Award winners will be announced at an awards presentation that is usually a part of the symposium banquet.

Final Results Submission

Immediately following the competition, the electronic spreadsheet must be submitted to the national scorekeeper along with PDF copies of the original data forms. Specific instructions for the submission process can be found in the documentation for the spreadsheet. The head judge and host school will need to coordinate and determine who will make the official submission.

It is imperative that the electronic spreadsheet and data form PDFs be submitted to the national scorekeeper in as timely of a fashion as possible since the results for the region are not considered official until reviewed by the national scorekeeper. Invitations to the national competition will not be sent to qualified teams until the results become official.

Additionally, the head judge or host can provide each team with a copy of their score as printed from the scoresheet.

Appeals

A penalty, decision, measurement, score, condition of competition, or interpretation of rules may be appealed by the team captain. The team may submit an appeal at any station of the competition, but the appeal must be made prior to the team captain signing off on that station and the bridge being moved to the next station.

An oral appeal must be made to the respective station lead judge as soon as possible after the situation becomes apparent. The station lead judge will inform the head judge of the team's desire to appeal the decision, and the head judge will discuss the appeal with the team before making a final ruling.

The *Rules* outline the full process for hearing appeals, communicating the decision, and steps for the team to take if the team captain wishes to appeal the decision of the head judge.

Additional Tips for Regional Head Judges

AISC and ASCE will hold a training webinar for regional head judges in the January that precedes the competition season. The training provides an overview of the head judge expectations, a discussion of specific *Rules* changes for the current year, and a Q&A session.

Below are several other tips for regional head judges as they plan for the event and coordinate with the host school:

- Try and connect with the school hosting the next competition during the current competition. Opening lines of communication so they can ask questions early can help a lot as venues and schedules are often set up before the head judge is brought on board.

- Remember that you and the judges will be tied to the competition floor likely for the better part of the day. Ensure the student organizers understand this. Things to plan for that may get overlooked include:
    - Restroom availability (especially if competition is outdoors)
    - Requesting that food be brought to the judges on the competition floor
    - If the event is held outdoors, ensure power is available for the scoring computer.

- Coordinate with the host school to recruit judges. Good sources may include:
    - Past judges.
    - Alumni of the host school.
    - Past bridge team members from the host school.
    - Local engineering, fabricators, or steel suppliers.
    - Symposium sponsors.
    - Local ASCE Younger Members Forum.

- Maintain a contact list of judges along with their roles. It is helpful to have historical information about the judges and to share that with the symposium host so that they can pass it along to future hosts. You will need to direct the host school on the exact number of judges needed. The table below may be used as a guide:

Station	Minimum # of Judges per Station
Construction	3-5 Judges
Lateral Load Test	1-2 Judge
Vertical Load Test	1-2 Judges
Weight	1 Judge
Data Entry	1 Judge

- If possible, assign experienced judges to the lead station judge roles.

- The head judge should verify the taping geometry of the construction lane site plan prior to the start of the competition. Typically, it works well to confirm the dimensions the night before the competition, in the event that modifications

need to be made. A construction lane taping plan is available on the Host Resources page at aisc.org/ssbc.

Appendix

- Supplement A: Construction Lane
- Supplement B: Regional Lateral Loading Procedure (*2025 Rules*)
  **At the national finals, the national head judge and host school will provide a specific procedure.*
- Supplement C: Regional Vertical Loading Procedure (*2025 Rules*)
  **At the national finals, the national head judge and host school will provide a specific procedure.*
- Site Plan for 2025 *Rules*

Construction Area Instructions and Procedures

As teams set up in the staging yards, do the following:

1. Use the PRE-CONSTRUCTION checklist to check members for compliance to specifications.
2. DO NOT allow teams to fix non-compliant members.
3. Review penalties with the team captain.

Meet with the team after checking all members.

1. Identify the team captain who will notify the timer when work is complete.
2. Remind the team of the ground rules (Is the tape in or out of bounds? Other construction issues.)
3. Remind the team that safety violations stop the clock.
4. Remind the team to be safe, thank them for all their hard work and congratulate them for making it this far.
5. Answer any final questions.
6. Review the pre-construction checklists with the team captain. Have the team captain sign the checklists to indicate that they understand the judges decisions.

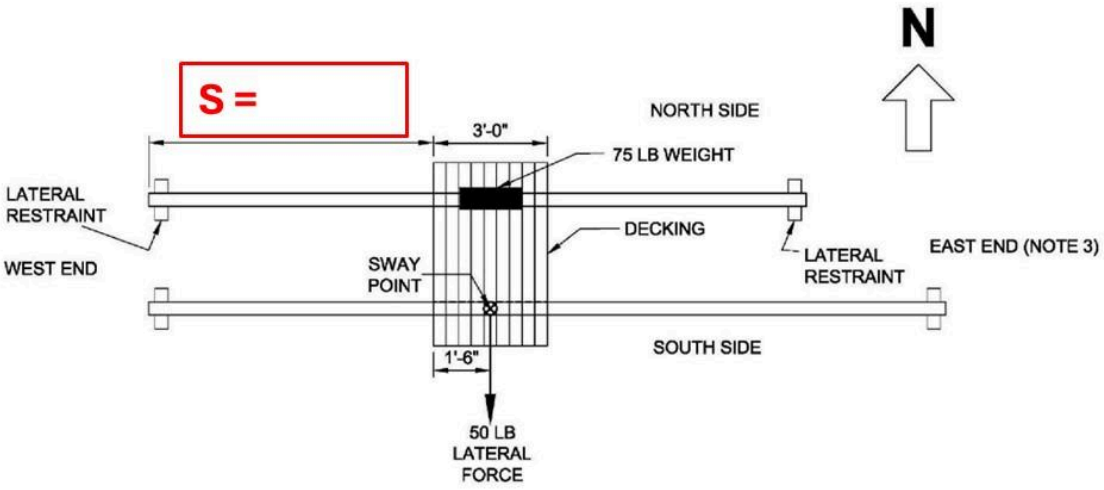
As the team prepares to start, check compliance with Section 10.6:

1. Team members are within the designated staging yard and barges in dock area.
2. Team members have required safety equipment.
3. Members, tools, bolts and loose nuts are in contact with the ground.
4. Members, tools, bolts and loose nuts are in their respective designated areas.
5. All team members (builders and barges) are wearing personal protective equipment as well as optional clothing such as pouches.

Timing:

As a courtesy, the lead station judge may inform the team when construction time reaches 25 minutes. When construction time reaches 30 minutes, the lead station judge shall stop construction and explain the provisions of Rules Section 10.8 to the team. Time and construction shall then resume.

Lateral Load Testing Station Procedure



1 LATERAL LOAD TEST PLAN

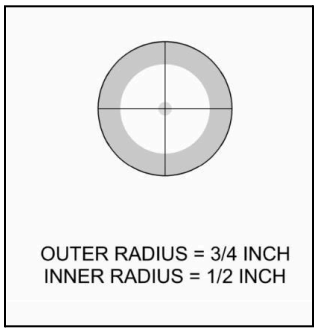
NOTES:
1. DRAWING NOT TO SCALE
2. DECKING LOCATION "S" IS DETERMINED BASED ON THE DICE ROLL AND IS THE SAME FOR ALL BRIDGES.
3. EAST END OF THE BRIDGE IS THE END OF THE BRIDGE WITH STAGGERED PIERS.
4. LOCATIONS OF LATERAL PULL, LATERAL RESTRAINT, AND SWAY MEASUREMENTS ARE SPECIFIC TO THE NORTH AND SOUTH SIDE OF THE BRIDGE. (11.4)

Lateral Loading Procedure

1. Place bridge with south side facing the lateral loading stand.
2. On the north side of the bridge, measure location S (from the west side) to locate the edge of the grating and an additional 1'-6" to locate the sway and lateral pull point.
3. Have team place the end of grating at location S.
4. Attach laser plumb bob at the marked sway point no more than 1 in. off the ground.
5. Have team place 3 angles (75 lb total) on north side
6. Have team locate the lateral stand on the south side of the bridge and have the judge attach the dog collar and lanyard perpendicular to the bridge, no further

than 4 in. from the sway point mark. Set the distance of the stand to make sure that the weight will not bottom out during loading.

7. Have team move the 50 lb weight near the load stand but do not attach.
8. Center the paper target (1/2-in. + 3/4-in. radius concentric circles) under the laser plumb bob and tape to the floor.
9. Confirm with the captain that the laser plumb bob is centered.



10. Have the team restrain the bridge at the locations identified on the lateral load test plan. They cannot hold the bridge down.

**** NOTE *** Before adding weight, remind the team they are only allowed one try as soon as any part of the 50 lb load is applied.*

11. Have the team attach 50 lb load to the load stand, with the smaller slotted plate placed first.
12. After the load is supported by the bridge, observe the location of the laser plumb bob point – it must be within the target to pass. Stop oscillations if necessary
13. If the laser plumb bob point is within the 3/4-in. target zone, the bridge passes. Determine whether the point is within the inner 1/2-in. radius, and mark the corresponding checkbox on the data form. (A bridge whose sway is less than or equal to 1/2 inch will have a reduced aggregate deflection factor applied, which is automatically calculated in the scoring spreadsheet).

    Note to head judges: There is some thickness to the laser line. Come to an agreement, like at Captains' Meeting, on when the laser line is outside this inner zone. Consider simply using the half the laser diameter is outside of the zone as the milestone.

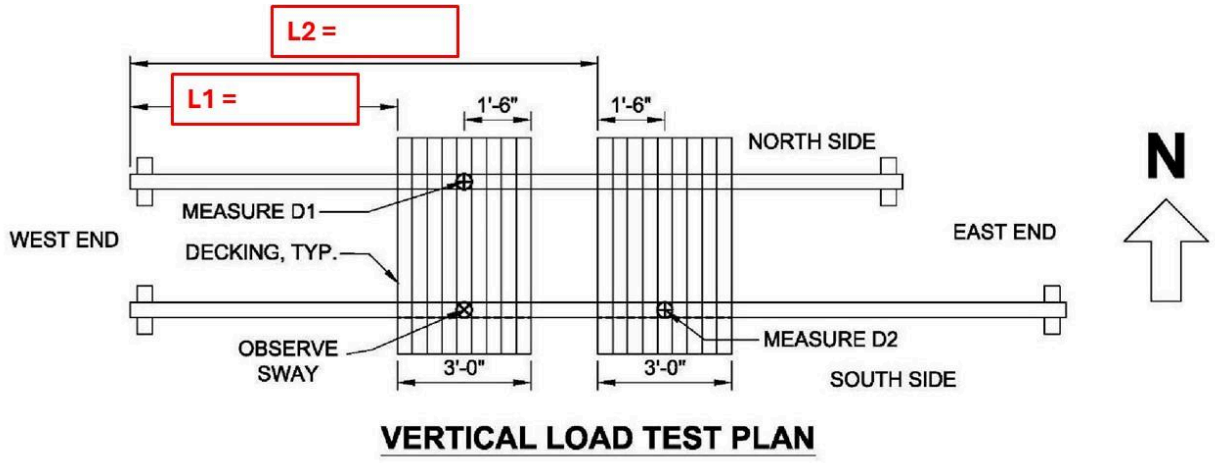
14. If the laser plumb bob point is outside the 3/4-in. target zone, confirm with the captain that it failed and call the head judge.
15. Remove hanging weight and disconnect cable from bridge.
16. Remove laser plumb bob
17. Have the team remove angles and grating.

18. Record the results on Data Entry Sheet 5 of 10

19. Wait for direction from the next station to move the bridge.

20. Repeat this procedure for each bridge. Any questions should be directed to the head judge.

Regional Vertical Loading Procedure



VERTICAL LOAD TEST PLAN

Personal Protective Equipment

Before starting, make sure that all team members and vertical loading judges are wearing the required personal protective equipment (PPE).

The team provides their own PPE. All team members in the vertical loading area must have the following:

- ☐ hardhat,
- ☐ safety glasses/goggles,
- ☐ work gloves, and
- ☐ steel or composite toe boots that extend above the ankle (note that steel or composite toe caps over leather work boots are acceptable).

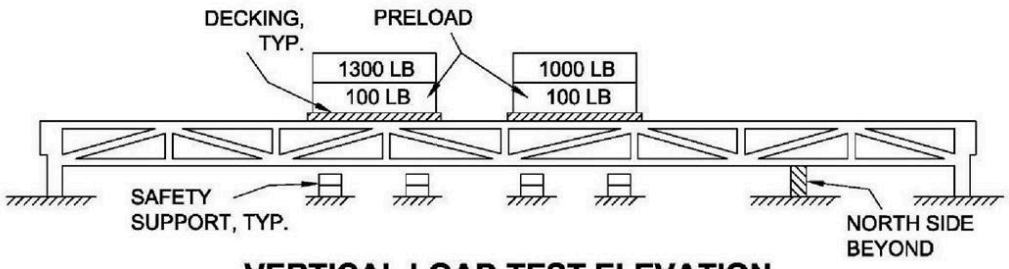
All vertical loading judges must be wearing:

- ☐ hardhat,
- ☐ safety glasses, and
- ☐ foot protection, either in the form of their own steel or composite toe boots or closed-toe shoes paired with the steel toe caps (provided by AISC as part of the equipment inventory).

Note that AISC provides the PPE for the vertical loading judges or judges may bring their own.

General Setup and Preload

1. Verify the number of construction team members participating in loading the bridge. (The maximum allowed is four members.)
2. Have the team locate the bridge with the south side toward angles.
3. The judge marks locations L1 and L2 for decking based on die roll (obtained earlier in competition). Refer to the Vertical Load Test Plan on the previous page.
4. The team installs the decking units (grating) at locations L1 and L2.
5. The judge installs four safety supports under each decking location.
6. The judge places 4 safety supports (jack stands) below each decking and adjusts the tops of the safety supports to be a MAXIMUM of 4" below the decking (measured from top of decking). Ensure jacks won't get stuck on any bridge lateral braces.
   **Note: safety supports can stay in place after the first team.*



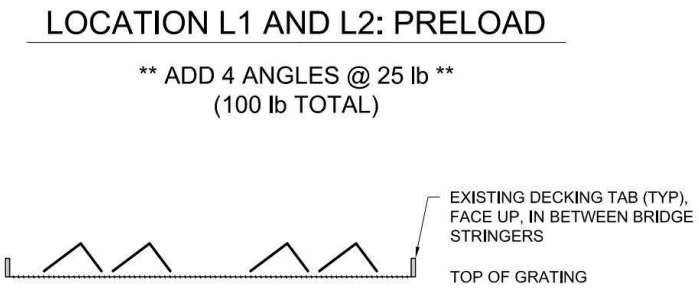
VERTICAL LOAD TEST ELEVATION

7. The judge attaches the laser level to the bridge or decking at the sway point with 4-in. ground clearance. Use 4-in. wood block to position level.
8. The judge attaches the deflection measuring device at locations D1 and D2. These will be indicated by the tape on the grate.
   a. Attach the hook of each chain to a bar on the gratings at the indicated point. The chain shall be attached laterally as close to the top of the stringer (support surface) as possible without touching any part of the bridge.
   b. Lay caution tape over the grating. The caution tape signifies that the deflection measuring device is attached to the grating.
   c. Make sure there are no kinks in the chain.

d. Make sure that the viewing window for the measuring device is safely viewable (i.e. facing outwards with respect to the bridge)

9. Make sure that the decking unit at the deflection measuring device locations is in contact with the top of the deck support. Use clamps if necessary. The clamps will be removed when sufficient load is in place to hold the decking unit in contact with the top of the deck support.

10. The team preloads location L1 with 100 lb and preloads location L2 with 100 lb. The preload is applied to the decking units and positioned identically for each bridge.

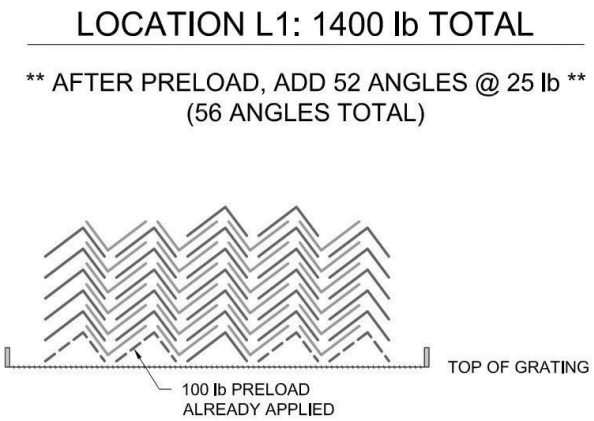


11. Position the center of the paper sway target under the laser point, with the judge and team captain confirming the positioning. Attach the target to the ground with tape.

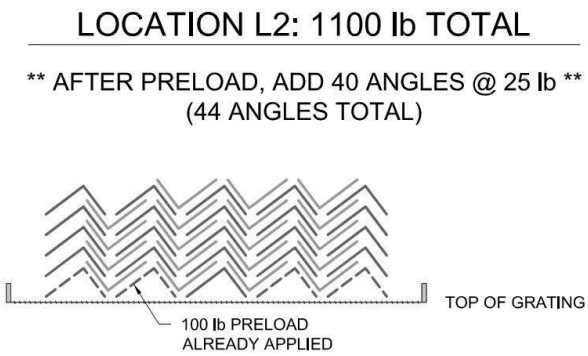
12. Leave the loading area. Make sure the deflection measuring devices are active by lifting the chain. Zero the deflection measuring device or record the initial reading with the judges and team captain's confirmation.

Vertical Loading Procedure

1. The team continuously places 1300 lb of additional load on the decking unit at L1 (for a total of 1400 lbs).



2. The team continuously places 1000 lbs of additional load (for a total of 1100 lbs) on the decking unit at location L2.



3. Observe the sway target and deflection readings throughout the test. Continuously observe the sway and deflection as the load is being placed.

Stop loading if any of the following occur.

- Sway exceeds 3/4-in.
- Any measured deflection exceeds 3 in.
- Decking or any part of the bridge other than intended bearing surfaces (footings at start of loading) comes into contact with the safety support or floor
- Decking unit or any amount of load falls off of the bridge
- Bridge collapses or a dangerous collapse is imminent in the opinion of the judge

Do not let the team observe deflection readings during loading.

If the bridge collapses or is deemed unsafe, unload the bridge carefully. The bridge is still eligible to be ranked in all categories.

4. Observe the final readings. The judges and team captain will confirm and record readings of D1 and D2.

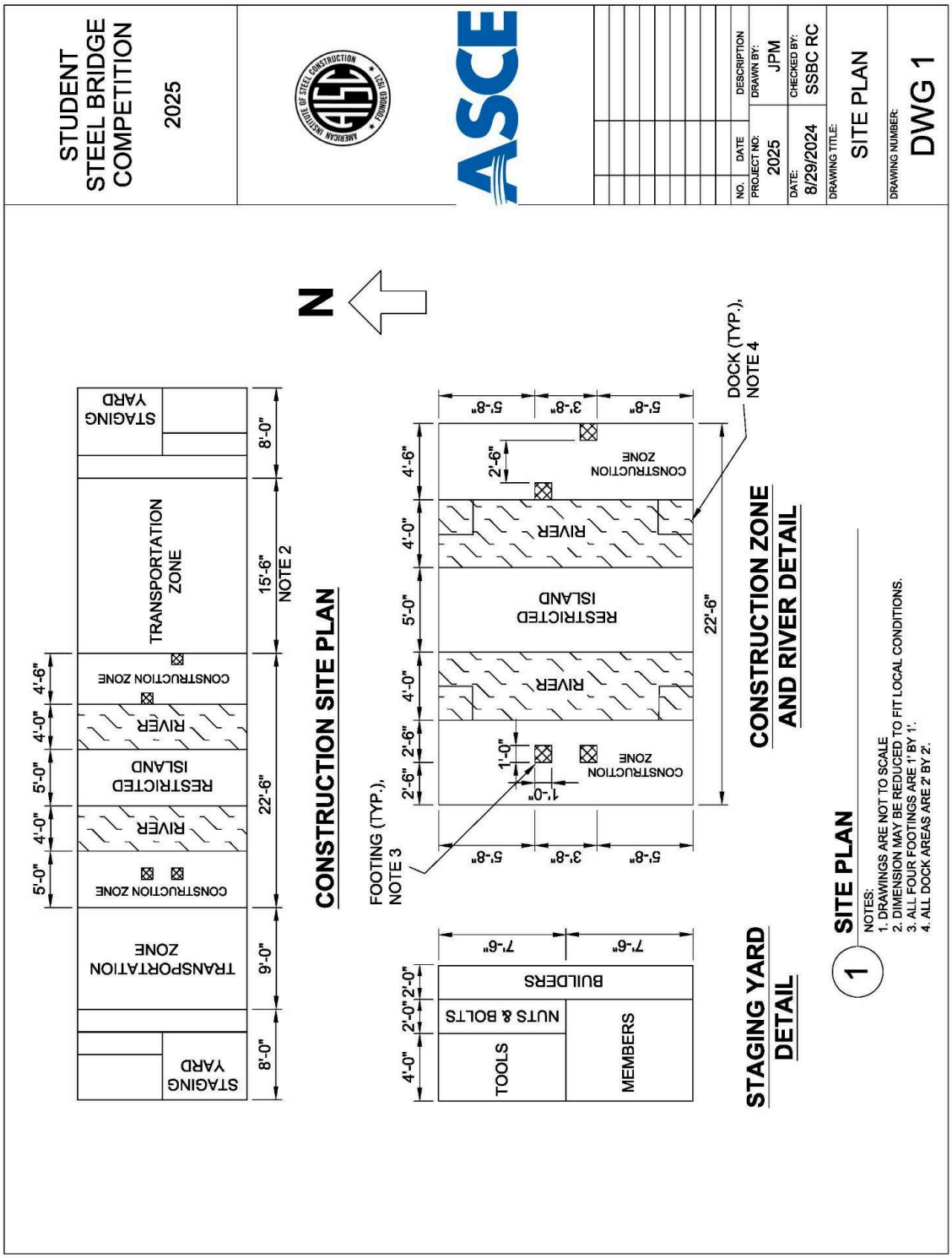
Vertical Unloading Procedure

1. The team removes the angles from location L2, and then removes the angles at location L1.

   *** The bridge has failed the vertical loading test if the bridge collapses during unloading. The bridge is still eligible to be ranked for the aesthetics and video categories.*

2. The judge removes the deflection measuring device
    - Do not remove the decking units until the deflection measuring devices have been disconnected. The caution tape signifies that the deflection measuring device is still connected.
    - Move the deflection measuring device out of the way.
3. The team removes the grates and leaves the safety supports in place.
4. The judge removes the laser level.
5. The team moves the bridge to weighing station when directed.

** Any questions should be directed to the head judge. **


STUDENT STEEL BRIDGE COMPETITION
2025
ASCE
NO. DATE DESCRIPTION
PROJECT NO: 2025
DRAWN BY: JPM
DATE: 8/29/2024
CHECKED BY: SSBC RC
DRAWING TITLE: SITE PLAN
DRAWING NUMBER: DWG 1
N
CONSTRUCTION SITE PLAN
STAGING YARD
TRANSPORTATION ZONE
CONSTRUCTION ZONE
RIVER
RESTRICTED ISLAND
RIVER
CONSTRUCTION ZONE
TRANSPORTATION ZONE
STAGING YARD
8'-0"
15'-6"
NOTE 2
22'-6"
9'-0"
8'-0"
5'-0"
4'-0"
5'-0"
4'-0"
4'-6"
FOOTING (TYP.), NOTE 3
DOCK (TYP.), NOTE 4
CONSTRUCTION ZONE AND RIVER DETAIL
CONSTRUCTION ZONE
RIVER
RESTRICTED ISLAND
RIVER
CONSTRUCTION ZONE
22'-6"
5'-8"
3'-8"
5'-8"
2'-6"
4'-0"
5'-0"
4'-0"
2'-6"
1'-0"
1'-0"
STAGING YARD DETAIL
BUILDERS
NUTS & BOLTS
TOOLS
MEMBERS
7'-6"
7'-6"
2'-0"
2'-0"
4'-0"
1 SITE PLAN
NOTES:
1. DRAWINGS ARE NOT TO SCALE
2. DIMENSION MAY BE REDUCED TO FIT LOCAL CONDITIONS.
3. ALL FOUR FOOTINGS ARE 1' BY 1'.
4. ALL DOCK AREAS ARE 2' BY 2'.