

2008 ASCE
Great Lakes Regional Conference

April 24th – 27th, 2008

University of Evansville
Evansville, Indiana



CONFERENCE RULES
AND EVENTS GUIDE



TABLE OF CONTENTS

1. General Rules and Scoring	2
2. Balsa-wood Bridge	4
3. Concrete Canoe	7
4. Geotechnical	8
5. Steel Bridge	10
6. Technical Paper	11
7. Environmental Design	13
8. Concrete Baseball Bat	15

GENERAL RULES AND SCORING

1. All competitions are open to any ASCE student chapter or student club in the Great Lakes Region. Other organizations may attend subject to the approval of UE ASCE (the “host chapter¹”).
2. Unless otherwise specified, any ASCE undergraduate or graduate student member of any ASCE student chapter or student club may participate in this conference.
3. All judges will be provided by the host chapter.
4. All judges’ decisions concerning compliance to the rules and award of points will be considered final. The judges have the final authority to determine if an entry violates the “spirit of the competition” or if a team or entry has a safety violation, and may take appropriate action towards point deduction or disqualification.
5. Any purposeful act of dishonesty during any competition will be grounds for expulsion of the school from that competition and/or the conference.
6. With the exception of the Steel Bridge event, all events will use SI units. Use of imperial (English) units will not be allowed except for the event listed above or where otherwise stated.
7. Results of the competitions will be announced at the banquet on Saturday night, April 26, 2008.
8. The competitions will be judged based on points awarded. Each team will be competing within the event for points from a number of categories. At the end of the competition, the team that has earned the most number of points for that event wins the event (subject to the evaluation criteria contained herein) and receives first place conference points for the event. Each event has first place, second place, third place, fourth place, fifth place, and participation points; participation points are “consolation prizes” awarded to the competing entries that do not place.
9. The official conference theme is:
“Civil Engineering.... A Way of Life.”
10. Alcohol will not be permitted on the UE campus or at the canoe races. Failure to comply with this rule will result in disqualification of the chapter/club from the conference and forfeiture of any and all trophies/awards won.
11. Scoring for each individual event will be explained within the rules for that event.
12. The conference champion scoring, based on individual events can be found in the Great Lakes Regional Constitution, Article III, Section D. A copy of the Constitution and By-Laws is included in the mailer.
13. Trophies will be awarded for first, second, and third places in each event, as well as for the overall competition. Winners of the individual canoe races and certain parts of the Steel Bridge Competition will also be recognized.

¹ The terms “regional host” and “host,” as used in the Concrete Canoe Competition and Steel Bridge Competition rules, respectively, shall be synonyms for “host chapter.”

14. The number of entries per school per event and the size of each event's team(s) shall be governed by the specific events' rules and the conference By-Laws.

15. Questions concerning these rules must be addressed in writing via email, or fax.

Email should be addressed to 2008glc@gmail.com

Faxes should be addressed to the Dr. Mark Valenzuela; the UE ASCE fax number is (812) 488- 2780.

All rules questions should be sent to the host chapter. If the host chapter is unable to answer the question, it will be forwarded onto the appropriate authority (e.g., AISC, BASF, etc.). The host chapter will then relay the answer to all schools. Under no circumstances is a school to contact AISC, Master Builders, etc., directly.

16. Any and all questions and their answers asked of the host chapter — concerning rules, scheduling, or the conference in general — will be posted to the website.

17. The rules contained herein are subject to change; however, no rule will be changed after January 31, 2008.

18. The website will be the official means of distributing addenda, errata, clarifications, etc., to the rules. Each team is responsible for checking the website for these additions/corrections.

19. All updates, addenda, errata, etc., to rules posted on the website shall supersede those which are written in this rulebook unless otherwise specified.

20. Copies of this rules packet, as well as individual copies of each of the events' rules, shall be found in PDF format (Adobe Acrobat®) on the Conference website.

21. Any material that needs to be submitted to the host chapter before the start of the competition, e.g., submitting the technical paper for the Technical Paper Competition, should be mailed to this address (fill in the blank below with the appropriate event name):

ASCE

_____ Competition Submittal
Department of Civil and Mechanical Engineering
University of Evansville
1800 Lincoln Ave.
Evansville, IN 47722

The envelope must prominently declare that the material contained inside is dated material and that it needs to be opened ASAP. All such material will be time-stamped by the host chapter upon receipt.

BALSA WOOD BRIDGE COMPETITION

Rules of Construction:

1. Bridges must provide for a 2 inch by 2 inch by 1/2-inch (2" x 2" x 1/2") plywood block (Figure 1) to be placed in the loading platform area shown in Figure 2. Note that the loading area is ± 0.5 inches vertically from the elevation of the abutments and is at the center of the span. This plywood block will serve to transfer the testing load to the rest of the bridge.

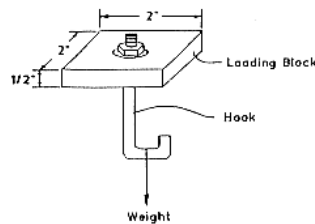


Figure 1

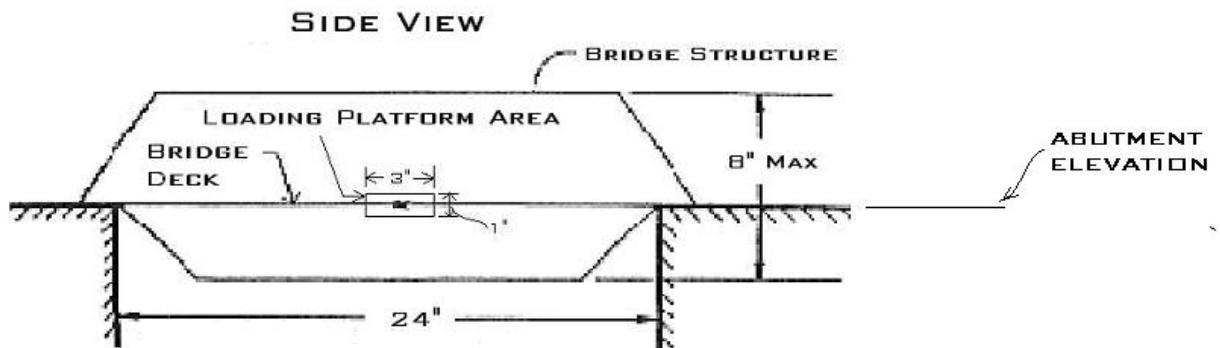


Figure 2

2. All wood to be used in the construction of the bridges needs to be provided by the participants competing in the event. This material consists of 17 sticks of 1/8-inch square balsa wood stock (Approximately 51 linear feet).
3. Participants must provide their own wood glue. Mechanical fasteners will not be permitted.

4. Glue may be placed **only** on the face of the joint being glued (See Figure 3). The bridge may **not** be painted, coated, or treated in any way. Glue may **not** be spread more than 1/8 inch beyond the glued joint.

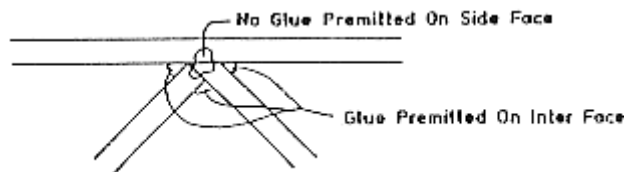


Figure 3

5. Members of the bridge may **not** be laminated together (See Figure 4). The allowable overlapping of one member to another is 1/2 inch (See Figure 5). Parallel members will be glued **only** at their ends or where they come into contact with cross members. The minimum allowable spacing between parallel members is 1/8 inch (Figure 6).



Figure 4

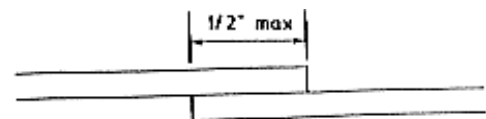


Figure 5



Figure 6

Bridge Dimensions:

1. Bridges may have a total height of no more than 8 inches (Figure 7).

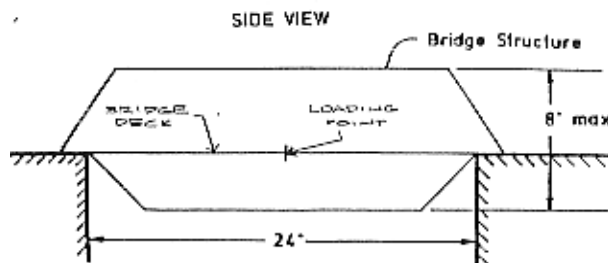


Figure 7

2. Bridges may be **no more** than 30 inches and **no less** than 26 inches long (Figure 8).

3. Bridges may have a maximum width of **no more** than 6 inches (Figure 8).

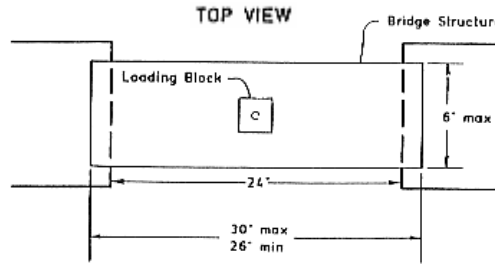


Figure 8

4. Bridges will not be allowed to butt up against the supports (Figure 9).

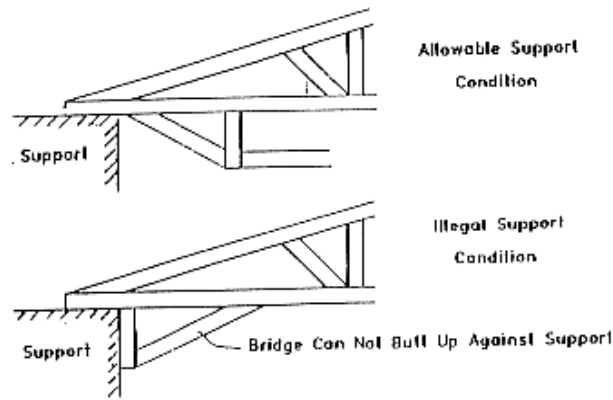


Figure 9

Judging:

1. The UE ASCE Chapter reserves the right to disqualify any bridge that does not meet the criteria outlined in the “Rules of Construction” and “Bridge Dimensions” sections of this packet.
2. Bridges will be scored and ranked based on an efficiency factor calculated by dividing the load sustained at failure by the weight of the bridge (Load Sustained/Weight).

CONCRETE CANOE COMPETITION

The rules for the Concrete Canoe Competition are written and governed by the Committee on National Concrete Canoe Competitions and BASF. Each participating school should have received an official copy of the rules from Master Builders. Any school that has not yet received a copy of the rules is advised to contact the host chapter immediately.

The official rules may also be viewed in PDF format (Adobe Acrobat®) on NCCC website.

<http://content.asce.org/conferences/nccc2008/index.html>

The design paper mentioned in the rules **must be post marked by Friday, March 14, 2008**. Late papers will be penalized 5 points per business day late as per the National rules.

GEOTECHNICAL COMPETITION

1. Only one team per school will be allowed. Each team can consist of no more than four people.
2. The objective of the geotechnical competition is for each team to build a mechanically stabilized earth retaining wall to fit the given dimensions which is capable of supporting the largest surcharge on the backfill.
3. The inside dimensions of the retained earth “box” will be 750mm X 500 mm X 500 mm, in length, width, and height respectively. The top and one of the 750 mm X 500 mm front faces will be open.
4. Each team will be allowed 25 minutes to design and construct their wall. Teams will be timed during the construction of their wall to be used in the event of a tie.
5. The backfill material will be a clean, dry sand that will be provided by the host chapter. No water, additives, or chemical stabilizers may be placed in the backfill material. The index and strength properties of the backfill material will be provided at a later date (at least one month before the teams arrive at the Conference).
6. A selection of reinforcing and facing materials will be provided by host chapter in order to construct the retaining wall.
7. The retained earth box must be entirely filled with the backfill material provided by the host chapter, and the facing materials must be flush with the open side of the box in order for construction of the retaining wall to be considered complete.
8. A 200 mm X 200 mm (40,000 mm square steel plate will be placed in the top center of the backfill, offset 100 mm from the open face. The retaining wall will be loaded to failure. Failure is defined as collapse of the retaining wall or 25 mm deflection at any point on the face of the wall.
9. Each team will be provided scoops and shovels to move the soil from the stockpile to the retaining wall site.
10. Teams may use only materials and equipment provided by UE to construct the wall.
11. No power or mechanized equipment will be allowed for the Geotechnical Competition.
12. No anchoring of the components of the retaining wall to any fixed object or the ground will be permitted.
13. Computers and programmable calculators are permitted for this event, and additional reference materials are allowed. Each team is responsible for bringing any desired computers, calculators, or reference materials.’
14. Each team must provide and wear their own safety glasses and hard hats. Proper footwear is also required. Teams will be disqualified for failure to wear appropriate safety equipment (i.e., safety glasses, hard hats, and footwear).

15. Teams will be ranked in order of largest surcharge to smallest surcharge. The team whose wall holds the highest load will win the event. In the event of a tie, the wall(s) built in the shortest amount of time will receive a higher ranking.

16. Each team must clean the work area to the satisfaction of the judges when they are finished competing. A deduction in the ultimate surcharge a team's wall withstood will be assessed for unsatisfactory clean-up, as defined by the judges.

17. If more than one wall does not fail when subjected to the largest load allowed by the host chapter's testing equipment, then the criteria for scoring will switch to minimum deflection.

The teams will then be ranked in order of smallest deflection to largest deflection. The same tiebreaking rules will apply.

STEEL BRIDGE COMPETITION

The rules for the Steel Bridge Competition are written and governed by ASCE National and the American Institute of Steel Construction (AISC). Each participating school should have received an official copy of the rules from AISC. Any school that has not yet received a copy of the rules is advised to contact the host school immediately.

The official rules may also be viewed in PDF format (Adobe Acrobat®) on AISC's website.

AISC: http://www.aisc.org/Content/ContentGroups/Documents/University_Relations3/2008Rules.pdf

TECHNICAL PAPER COMPETITION

TOPIC: "Ethical Issues Surrounding Infrastructure Privatization"

The following can be used to stimulate, but should in no way limit, the discussion:

Many cities and states in the United States are experiencing financial difficulties. A potential solution is to privatize their infrastructure including sale of water utilities, transportation facilities, and energy production. Infrastructure privatization is also a global discussion with most of the focus on water supply and sanitation needs. Engineers work in both the private and public sectors and may be involved in all aspects of infrastructure privatization. Some questions to consider:

1. What are potential ethical issues of a privatization decision based primarily on financial need?
2. How much does location of the infrastructure impact the ethical priorities of a privatization decision?
3. What ethical issues do engineers in the public sector face with supporting a privatization decision? What about their role after privatization?
4. What ethical issues do engineers in the private sector face with supporting a privatization decision? What about their role after privatization?
5. There are many different forms or strategies of privatization (e.g., working with U.S. firms or international firms) – do some create more ethical considerations than others?

RULES:

1. Papers are not to exceed 2,000 words in length, must be written by only one person, and should not have appeared in any publications other than in school or ASCE Student Organization publications. Reference citations of the papers should conform to the official *ASCE Authors' Guide to Journals and Practice Periodicals*, which can be found on the ASCE Publications website <http://www.pubs.asce.org/authors/index.html>. A complete bibliography should also be included, if appropriate.
2. Authors must be undergraduate students and both ASCE Student Organization members and ASCE national student members in good standing at the time of submission to be considered.
3. One electronic copy of the paper, in the form of a PDF (Adobe Acrobat®), should be submitted to **Small Competitions Committee** at 2008glc@gmail.com. Papers must be **received** by **March 14, 2008**.
4. Each author will be expected to make a 5-minute* oral presentation on the paper. Up to five minutes of questioning by judges will be allotted following each presentation. (*Allowance of + or – 5 seconds without penalty.)

5. The paper portion of the competition constitutes 67% of the final score, while the oral presentation accounts for the remaining 33% of the score based on the GLC Constitution. A detailed breakdown of the scoring procedure is outlined on the scoring summary sheet.

SELECTION:

Winners will be selected by a panel of at least three (3) judges to be identified by the host school. Prizes for winners are as follows:

First Prize: \$100.00

Second Prize: \$60.00

Third Prize: \$40.00

Note: Submission for the ASCE Student Conference Paper Competition does not constitute an entry for the National Daniel W. Mead Student Contest. While the paper topic is the same – and the same paper may be submitted for both contests – they are two separate events and require two separate submissions. For a complete set of rules for the 2008 National Daniel W. Mead Student Contest, please visit <http://www.asce.org/students>.

ENVIRONMENTAL DESIGN

MOTIVATION:

The aesthetics of water can greatly impact consumer use. Water that is cloudy and discolored or that has a foul odor can deter a consumer from drinking the water or participating in recreational activities in a body of water. Besides aesthetics, there can be serious health consequences that result from contaminated water: particles can harbor and transport pathogens dangerous to aquatic species and humans. Additionally, the aquatic environment suffers as turbidity prevents sunlight penetration to plants and animals in the depths of the water. Proper treatment of a water source is a way to protect the environment and human health.

OBJECTIVE:

Design, assemble and operate a laboratory scale filtration treatment system to remove turbidity and color from a source water.

RULES:

- 1) Each school can be represented by one team, consisting of no more than three students. Only undergraduate engineering student members of ASCE student chapter/club are eligible to participate.
- 2) The treatment system must include a flow through reactor (physical removal). Chemical treatments should also be considered.
- 3) Ten liters of **Ohio River** water, augmented with additional color and suspended solids, will be provided to each team for treatment.
- 4) The following materials and equipment, provided by the **University of Evansville**, will be available for water treatment and fabrication of the treatment system:
 - Stirrer
 - Duct tape
 - Column (3" diam., 3' length) w/ cap containing W' diam. hole (NOTE: one per team)
 - Gravel
 - Sand
 - Anthracite coal
 - Alum
 - Granular Activated Carbon
 - Tygon tubing
 - Column screens
 - Clamps (tubing and column)
 - Column support stand

- 0.5 and 1 liter beakers
 - 1 and 5 gallon buckets one -100 mL and one -2 L graduated cylinders
 - 1 and 10 mL pipettes and suction bulbs
- 5) Materials other than those provided by the University of Evansville may not be used during the competition.
- 6) Each team will be given one hour to complete the event, including setup and treatment of water.
- 7) Treatment performance will be evaluated on both quantity and quality of water produced.

EVALUATION CRITERIA:

Total score will be based on a combination of quantity of water treated and recovered and the quality of the water. The score will be computed as follows:

- Quantity will be determined, in liters, by volumetric analysis. The score for quantity is the volume recovered and treated, thus a maximum of 10 points awarded.
- Quality will be evaluated by water clarity consisting of turbidity and absorbance of the water at 254 nm. Three turbidity readings and three absorbance readings will be taken by the judges. The average of these three values will be computed and the score associated with the turbidity and absorbance values will be as follows: 10 points will be awarded to the team with the lowest turbidity average and 10 points will be given to the team with the lowest absorbance average. The highest turbidity and highest absorbance averages will each receive a score of 1 point and the rest of the teams will receive a pro-rated score between 1 and 10, based on a linear distribution of the range produced during the competition.
- The maximum achievable score is 30. The school with the highest total score (quality and quantity scores) wins the competition. In the event of a tie, the school with the lowest average absorbance value will win.

CONCRETE BASEBALL BAT

Reinforced Concrete Baseball Bat Requirements

- Barrel Diameter between 2” and 2 ¾”
- Minimum length 28”, Must not exceed 34”
- Must have single reinforced bar (1/2” diameter max) spanning length of bat with ½” concrete cover at top and bottom
- Reinforced bar and mesh reinforcement must be fully covered by concrete prior to the start of the competition
- Reinforcement fibers and mesh are allowed and encouraged for safety purposes
- No weight limit on bat

Rules for Competition

1. Each team will have one designated hitter for the entire competition.
2. Each team will have five swings (a miss does not count as a swing).
3. If the bat is still safe to swing after five live contacts, the batter will have the opportunity to hit the ball off a tee (one swing). This swing will count towards the distance and weight point distributions.
4. The competition will be judged by measuring the distance away from the back corner of home plate to where the ball stops. The team who has the furthest hit ball will be awarded the most points. Point values will then decrease accordingly based on distance.
5. Each team’s bat will be weighed prior to and after the competition. The team to retain the highest percentage of their bat’s original weight will also be awarded a set amount of points. The point values will decrease accordingly based on weight percentages.
6. Safety glasses, socks and shoes must be worn by batters and all bystanders throughout the duration of the competition.
7. Batting gloves may be worn by the batter during the competition.

If at any point during the competition the judges feel that the bat is unsafe to swing, the team must withdraw from the competition.