

2025

American Society of Civil Engineers®
Concrete Canoe Competition™

REQUEST FOR PROPOSALS



ASCE

AMERICAN SOCIETY OF CIVIL ENGINEERS

Date: September 3, 2024

To: ASCE Student Chapters and Concrete Canoe Teams

Subject: Request for Proposal – 2024-2025 Concrete Canoe



Dear ASCE Student Chapters and Concrete Canoe Teams:

The Concrete Canoe Competition Committee is pleased to present the following Request for Proposal for the 2024-2025 competition year. We welcome all eligible ASCE chapters to prepare a submission to be selected as the most qualified concrete canoe at the ASCE Civil Engineering Student Championships.

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As we do each year, the committee has revised the rules to offer a unique challenge for this year's competition season. Central to this challenge is a unifying concept that encapsulates every element of Concrete Canoe: The Spirit of the Competition. To honor this concept, the committee presents the following adjustments:

General

- Defined Spirit of the Competition.
- Redefined "Appeals," introduced "Revise and Resubmit" and included a flow chart for each process.
- Defined Wildcard process and constraints
- Created an online RFI form to replace the previous process.

Proposal

- Prohibited QR codes and web links in the proposal package
- Allowed Finite Element Analysis for design, with its use requires hand verification.
- Overhauled the structural analysis section to be clearer and added a new design case.

Final Product Display

- Clarified requirements for the Final Product display of design elements.

Mixture Design

- Allowed latex within the concrete mix. Provided standard for gypsum and organic aggregates. Regulated Hydrated Lime.

Races

- Restricted the ability to swim the canoe.

The modifications listed above do not encompass the entirety of those made. Teams should read this year's RFP completely and pay attention to what they are asked to produce, and the deductions associated with failing to do so.

Over the next ten months, remember that this competition is most effective when teams dive into the material, seek help, innovate, collaborate, and network -- just as we do in the industry. You will not know everything, and you are not expected to. You are expected to give your best effort with the resources you can find and use.

Good luck and see you in San Luis Obispo, CA!

Sincerely,

COMMITTEE ON CONCRETE CANOE COMPETITIONS

A handwritten signature in black ink, appearing to read "J. Hilscher". The signature is fluid and cursive, with the first name "Jessica" and last name "Hilscher" clearly distinguishable.

Jessica L. Hilscher, PE, M.ASCE
Chair, Committee on Concrete Canoe Competitions

Contents

INTRODUCTION	3
AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)	4
R. JOHN CRAIG MEMORIAL AWARD	5
MIKE CARNIVALE, III, SPIRIT OF THE COMPETITION AWARD	5
SPIRIT OF THE COMPETITION	6
1. REQUEST FOR PROPOSAL	7
1.1. PROBLEM STATEMENT	7
1.2. REQUEST FOR QUALIFICATIONS (RFQ) PRE-QUALIFICATION FORM & LETTER OF INTENT	7
1.3. REQUEST FOR PROPOSAL (RFP) DOCUMENTS	7
1.4. REQUEST FOR INFORMATION (RFI)	8
2. WEBINARS	9
2.1. PREVIOUSLY RECORDED WEBINARS	9
3. ELIGIBILITY	10
3.1. REGISTERED PARTICIPANTS	10
3.2. LEVELS OF COMPETITION AND STUDENT CHAPTER ELIGIBILITY	10
3.3. AVAILABLE WILDCARDS TO SOCIETY-WIDE FINALS	10
4. SUBMISSION REQUIREMENTS AND DEADLINES	11
4.1. CONFERENCE/TEAM FOLDERS	11
4.2. REQUIRED SUBMISSIONS AND SCHEDULE	11
5. PROJECT PROPOSAL, MIX DESIGN SHEETS, AND MATERIALS NOTEBOOK	13
5.1. GENERAL REQUIREMENTS	13
5.2. PICTURES, FIGURES, GRAPHICS, AND INFOGRAPHICS	13
5.3. PLAGIARISM	13
5.4. PROJECT PROPOSAL	14
5.5. MIX DESIGN SHEETS	22
5.6. MATERIALS NOTEBOOK	22
6. CANOE HULL DESIGN PROTOTYPE	23
6.1. DIMENSIONAL CONSTRAINTS	23
6.2. CANOE MATERIAL COMPONENTS	23
6.4. CONCRETE MATERIALS, MIXTURES, AND REINFORCEMENT	23
6.5. FLOTATION	23
6.6. FINISHING & AESTHETICS	24
6.7. DURABILITY AND REPAIRS	25
6.8. OFFICIAL WEIGH-IN	25
7. PROTOTYPE DISPLAY REQUIREMENTS	26
7.1. GENERAL	26
7.2. RESTRICTIONS	26
7.3. REQUIREMENTS	26
8. TECHNICAL PRESENTATION	28
8.1. TIME LIMIT	28
8.2. PRESENTATION FOCUS	28
8.3. LANGUAGE	28

8.4.	PRESENTATION ORDER	28
8.5.	EQUIPMENT.....	28
8.6.	PRESENTERS	28
8.7.	QUESTION AND ANSWER SESSION	28
9.	CANOE PROTOTYPE PERFORMANCE DEMONSTRATION.....	29
9.1.	DEMONSTRATION COURSE	29
10.	EVALUATION	31
10.1.	GENERAL.....	31
10.2.	EVALUATION PANEL	31
10.3.	EVALUATION SCORING.....	31
10.4.	SUMMARY OF DEDUCTIONS / DISQUALIFICATION	32
10.5.	DEDUCTION RESOLUTION.....	33

Exhibits

EXHIBIT 1:	SUMMARY OF IMPORTANT DATES/DEADLINES	36
EXHIBIT 2:	HOW TO NAVIGATE FOLDERS AND UPLOAD SUBMISSIONS.....	37
EXHIBIT 3:	STUDENT CHAPTER AND PARTICIPANT ELIGIBILITY	40
EXHIBIT 4:	MTDS EXAMPLE	42
EXHIBIT 5:	TECHNICAL SPECIFICATIONS FOR CONCRETE AND REINFORCEMENT	43
EXHIBIT 6:	GENERAL GUIDELINES FOR CONCRETE MIX DESIGN	47
EXHIBIT 7:	MTDS SUMMARY TABLE EXAMPLE	52
EXHIBIT 8:	DETAILED COST ESTIMATE	53
EXHIBIT 9:	RACE REGULATIONS AND SAFETY	55
EXHIBIT 10:	DURABILITY & REPAIRS.....	58
EXHIBIT 11:	EVALUATION FORMS.....	62
EXHIBIT 12:	PRE-COMPETITION SUBMITTALS	71

INTRODUCTION

Since the early 1970s, ASCE student chapters have been building and racing concrete canoes. While designs and mixes have evolved, the tradition of teamwork, camaraderie, and spirited competition remains constant. All participants, including teams, associates, and volunteer judges, are expected to uphold and enhance this tradition.

Concrete Canoe Competition Objectives:

- Provide civil engineering students with hands-on experience and leadership skills in concrete mix design and project management.
- Highlight the versatility and durability of concrete as a construction material.
- Promote concrete technology and its applications to students, educators, and the industry.
- Raise awareness of ASCE's and national sponsors' commitment to civil engineering education.
- Showcase civil engineering as a vital and innovative profession to industry leaders and the public.
- Encourage lifelong ASCE membership among students, professionals, and faculty.

While the competition focuses on learning and gaining technical and social experience, students are on the brink of becoming practicing engineers, contributing to projects essential to society. Ethics, professionalism, civility, and respect are crucial to the competition's success, and ASCE expects all participants to adhere to these standards. ASCE is committed to maintaining the quality of this competition and improving future ones.

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AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)



The American Society of Civil Engineers (ASCE) is the oldest national engineering society in the United States. Founded in 1852 with 12 members, the Society was created to disseminate information among engineers building a young nation's roads, canals, bridges, and railroads.

Today, ASCE is a global organization with more than 160,000 members, including international members residing in 177 countries outside the United States. Individual professional engineers rather than companies or organizations hold membership. The members are organized geographically into ten regions, 94 sections, 160 branches, 122 Younger Member Groups, and 440 student chapters. Student Chapters sponsor meetings, educational outreach, symposia, student competitions, social events, and other activities to help future engineers better prepare for their careers. Numerous scholarships and awards are made available for deserving students of civil engineering, and a variety of Society-wide finals competition opportunities are held so students have a platform to compete with other students from around the world.

A Board of Direction governs the Society. The Board, which includes ASCE officers and representatives elected by the membership, establishes all policies for the organization. A staff of 250 implements the policies; most staff work at ASCE International Headquarters in Reston, Virginia.

For more information, visit <http://www.asce.org>.

R. JOHN CRAIG MEMORIAL AWARD

The concept of a society-wide competition has existed for many years. In the mid-1980s, Dr. R. John Craig, a professor at the New Jersey Institute of Technology and member of the ASCE Committee on Student Services (CSS), and other members of CSS began to formulate plans for more uniform regional competitions. They formalized a plan to study the feasibility of a national competition with finalists from each region.

In the spring of 1985, Dr. Craig first brought his grand vision of the National Concrete Canoe Competition™ to ASCE. He was instrumental in bringing delegates from all over the country to meet one auspicious day in New York City at the ASCE National Headquarters executive conference. During this meeting, the feasibility of conducting a national competition was discussed, preliminary rules were prepared, and a formal recommendation to proceed was drafted.

In the fall of 1985, the preliminary rules were presented to the CSS. During the next year, discussions regarding sponsorship were conducted with Master Builders, Inc. and ASCE Headquarters. After almost two years of CSS debate, while meeting at the fall 1987 ASCE National Convention, the Educational Activities Committee (EdAC) adopted the preliminary rules. It established a standing task committee to implement the rules and requirements.

In the winter of 1987, just as the first National Competition was in sight, Dr. Craig was diagnosed with a rare inoperable brain tumor. He passed away just two months before his dream came to fruition. In June of 1988, the first National Concrete Canoe Competition™ was held in East Lansing, Michigan, hosted by Michigan State University.

In the spring of 1989, CSS approved the formation of a permanent subcommittee to ensure the continuation of the National Concrete Canoe Competition™. Through the efforts and dedication of individuals like Dr. R. John Craig, the National Concrete Canoe Competition™ has become a perennial favorite event for tens of thousands of students.

In that spirit, ASCE has dedicated the Coed Sprint Race as a memorial to the teamwork and dedication of Dr. R. John Craig. It is our distinct honor to present the *R. John Craig Memorial Award* to the school that best exemplifies the spirit and cooperative ideals of the Competition by placing first in the Coed Sprint Race each year.

MIKE CARNIVALE, III, SPIRIT OF THE COMPETITION AWARD

The American Society of Civil Engineers (ASCE) presents the Mike Carnivale, III, Spirit of the Competition Award to the team that best exemplifies the values of camaraderie, teamwork, professionalism, and FUN! This award honors the legacy of Mike Carnivale, who was an integral part of the ASCE Concrete Canoe Competition for 20 years. As a passionate student competitor, dedicated volunteer, and former Chair of the Committee on National Concrete Canoe Competitions from 2004-2006, Mike made significant contributions to the competition.

Even after his tenure, he continued to support the event as a corresponding member, developing rules and guiding students until his untimely passing in 2022. In recognition of his enduring impact, ASCE is privileged to dedicate the Spirit of the Competition Award in his memory. This award serves as a tribute to Mike's passion, leadership, and unwavering commitment, and it is ASCE's distinct honor to present it to the school that best embodies these cherished values.

SPIRIT OF THE COMPETITION

The Committee on Concrete Canoe Competitions (C4) acknowledges and values the competitive spirit exhibited by teams participating in this event year after year. The drive to win stems from a deep understanding of the material, desire for innovative problem-solving, and crafting compelling messages. This intrinsic motivation is vital for advancing the industry in a world that continually demands creativity and uniqueness. However, it is essential that this competitive drive does not overshadow the commitment to learning, growth, and the development of well-rounded engineers and individuals. Therefore, C4 aims to define the Spirit of the Competition clearly by aligning it with the [ASCE Code of Ethics](#).

Section 3.c: Engineers represent their professional qualifications and experience truthfully.

Throughout the nearly year-long competition, it is expected and understood that emotions can run high. Nevertheless, engineers are responsible for always presenting themselves as level-headed, fact-based, and unbiased toward any particular outcome. The task is to provide the best solution given the constraints and to calmly inform clients, teammates, and the public of any restrictions faced, opinions disagreed with, and limits on resources, including withdrawing from situations deemed unethical or not beneficial to the public being served.

Section 3.d: Engineers reject practices of unfair competition

Fairness, coupled with safety, serves as the foundation of this competition. C4 establishes rules and processes that allow each team, regardless of size or history, a fair opportunity to showcase their product. When individuals or teams violate the intent of the rules, the entire competition's foundation becomes unstable, and the trust established between C4, volunteer judges, and competitors erodes. It is recognized that teams invest significant time, energy, and passion into this competition. For that, C4 expresses gratitude and respect. Teams must reciprocate by trusting that C4 and volunteer judges perform each task and make each decision as fairly as possible.

Section 3.d: Engineers uphold the honor, integrity, and dignity of the profession.

Elements of this competition are founded on the principle that volunteer judges and C4 take a team's word at face value. As in industry, once trust is broken, it can be nearly impossible to revive. Teams should strive to always present themselves honestly and be willing, as C4 and volunteer judges are, to change opinions when presented with new information.

Section 3.e: Engineers promote mentorship and knowledge-sharing equitably with current and future engineers.

The community fostered at these competitions is important and unique. Competitors are expected to not only network with those around them but also to promote a culture of knowledge sharing with peers, volunteer judges, and C4, so that collective knowledge can be used to leave the competition, and in time, the industry, better than it was found.

The volunteer judges and/or C4 may take disciplinary action, including warnings, point deductions, or disqualification of a team or entry for the team's behavior, the team's faculty advisors, or any persons associated with the team that violates the Spirit of the Competition. The volunteer regional judges and/or C4 have the final authority on this matter.

1. REQUEST FOR PROPOSAL

1.1. Problem Statement

C4, part of the American Society of Civil Engineers (ASCE), is considering manufacturing 100 concrete canoes for regional lake and river transportation across the US. To achieve this, C4 invites pre-qualified ASCE student chapters, referred to as “Teams,” to submit proposals. Teams:

- **Construct a Prototype and Display** to Educate C4, judges, and the public about the canoe’s design, materials, fabrication process, and durability.
- **Deliver a Technical Presentation** presenting details about their team, design, process, and materials chosen.
- **Prepare a Project Proposal** detailing the technical aspects of their submission and its value to C4 and the consumer.
- **Participate in Race Demonstrations** including 200- and 400-meter sprints with 180-degree turns and a 200-meter slalom course to demonstrate performance.

C4 prioritizes the canoe’s innovative design, fabrication, aesthetics, and paddling performance (maneuverability and speed) over production costs. However, teams should aim to minimize costs where possible and provide realistic estimates for production by conducting research, design analysis, and material testing.

To ensure fairness, C4 has acquired judges to select the most qualified team. Teams will first attend a regional student symposium for an initial evaluation. The top regional team will be invited to the ASCE Civil Engineering Student Championships at California Polytechnic State University in San Luis Obispo in June 2025 for a final evaluation and award.

C4 encourages teams to collaborate with local ASCE professional Sections, Branches, and Younger Member Groups to enhance their project. ASCE and C4 will assist in making these connections and developing contacts.

Contextual Comment: Including proposed costs for 100 canoes is not meant to drive teams toward the lowest-cost solution. Innovation and creativity within the design space are valued significantly more than achieving the lowest cost, which is subject to several variables outside each team's control. C4 highly values **realistic** cost estimates regardless of the total. Local ASCE professional chapters are a great source of information on how cost realism is included in proposals in the industry.

1.2. Request for Qualifications (RFQ) Pre-Qualification Form & Letter of Intent

Interested teams shall complete the Pre-Qualification Form. See **Section 4.2** for submittal requirements.

Contextual Comment: In many instances, for real-world projects, before working on and submitting a proposal, the project owner will solicit interested companies to respond to a Request for Qualifications (RFQ). This helps the Owner determine which companies are interested in the project, their experience/qualifications, and whether they meet the other requirements outlined.

1.3. Request for Proposal (RFP) Documents

The following documents, as part of this RFP will be provided to teams:

Request for Proposal – Release September 3, 2024

Mix Design Template (MS Excel) - Release September 3, 2024

Fee Schedule Template (MS Excel) - Release September 3, 2024

Client Scope Change – Release November 11, 2024

Request for Information Summary – Release Early February 2025

If there are any major clarifications needed, RFP addendums may be released. Release announcements would take place on the C4 Facebook page at <https://www.facebook.com/ASCENCCC>, as well as the ASCE Concrete Canoe website at <https://www.asce.org/communities/student-members/conferences/rules>

1.4. Request for Information (RFI)

Requests for Information (RFI) are opportunities for teams to request clarifications regarding stated rules or to request that material be allowed as an approved equal to a required standard. RFIs will be submitted via the link below. Teams are encouraged to be mindful of which sections are for C4 use only and which are for global release. Official responses will be posted to the C4 Facebook page.

<https://asceforms.wufoo.com/forms/w1p8b54g1whqylf/>

RFI responses from previous years do not carry over.

The cut-off date for submitting an RFI is Monday, January 27, 2025.

Contextual Comment: *In the spirit of competition, C4 does not provide approved equals determinations for materials or provide clarifications privately. Any RFI submitted will be made public so that all teams have the same information, a process that mirrors the engineering profession's standard procedure. For any approved equals a team might seek to use, they must either prove its compliance independently or submit it for public knowledge.*

– End of Section –

2. WEBINARS

The C4 will host live webinars during the academic year to engage and communicate with the teams and prepare them for success. Participation in these webinars is not mandatory but highly encouraged. Registration information will be posted on the ASCE Concrete Canoe Competition Facebook Page. The table below summarizes the planned events. Interested teams should check the C4 Facebook page (<https://www.facebook.com/ASCENCCC>) for upcoming details.

Table 2: Live Webinar Schedule

Live Webinar	Planned Date
Competition Kick-off & Request for Information (RFI) & Material Compliance (MTDS)	September 19, 2024
Concrete Mix Design Calculations	October 17, 2024
Structural Analysis	November 21, 2024

2.1. Previously Recorded Webinars

The C4 has hosted additional webinars in previous years and the content is still valid. The list of previously hosted webinars is below, with associated links for viewing.

Table 3: Previously Recorded Webinars

Previously Recorded Webinar	Link
Proposal Format How-To	Concrete Canoe Proposal Writing Webinar (https://players.brightcove.net/75114961001/SFtvStcMPG_default/index.html?videoId=6315676301112)
How to Give a Presentation	Presentations 101 The Art of Persuasion (https://players.brightcove.net/75114961001/SFtvStcMPG_default/index.html?videoId=6321489682112)
Infographic	A Guide to Infographics: The Art of Simplicity (https://players.brightcove.net/75114961001/SFtvStcMPG_default/index.html?videoId=6342982537112)

– End of Section –

3. ELIGIBILITY

It is expected that teams foster an inclusive culture and treat everyone with dignity and respect.

3.1. Registered Participants

A team can have up to 10 participants, with no more than 5 identifying as she/her/hers and no more than 5 identifying as he/him/his. Participants who identify as they/them/their or do not align strictly with either set of pronouns can choose to compete in either the men's or women's races and must stick with that choice for the entire competition. All participants must meet the requirements listed in *Exhibit 3 - Student Chapter and Participant Eligibility*. **No one is allowed to challenge a participant's gender identity.**

Only registered participants can represent the team in presentations, races, or other activities. Substitutions are allowed until on-site registration, except in special circumstances. Each team must have two registered participants as captains.

Contextual Comment: Substitutions after on-site registration are possible for extenuating circumstances outside of a team's control for example, illness, injury, etc. at the judges' discretion. Note: C4 strongly encourages students not to paddle if they have an injury and strongly encourages judges to find fair solutions for all participating teams in these scenarios.

3.2. Levels of Competition and Student Chapter Eligibility

There are two levels of competition: the ASCE Student Symposia and the Society-wide Final Competition. The Society-wide Final Competition will take place during the 2025 ASCE Civil Engineering Student Championships in June 2025 at California Polytechnic State University, San Luis Obispo.

Teams can be invited to the Society-wide Final Competition by placing as the top qualifying team at one of the ASCE Student Symposia Concrete Canoe Competitions or as the host school of the Society-wide Final Competition.

All qualifying teams must represent an ASCE Student Chapter and meet the requirements outlined in *Exhibit 3 – Student Chapter and Participant Eligibility*.

After each student symposium, ASCE will verify competition scores and the eligibility of each participating student chapter. Teams will only be invited to the Society-wide Final Competition once eligibility is confirmed.

3.3. Available Wildcards to Society-Wide Finals

When possible, in addition to the top qualifying team from each Conference, ASCE may select Wild Card teams through a random draw to compete in the Concrete Canoe Society-wide Finals. The Wild Card process was established to provide broader access to the Championships, allowing teams who might not otherwise have the chance to participate, to gain experience and learn from established competitors, thereby improving their skills for the future. To be eligible as a Wild Card team, the team must:

- Rank in the top third (1/3) of all Annual Student Chapter Reports,
- Submit a Statement of Interest, signed by the Department Chair and ASCE Faculty Advisor, and
- Finish in the top half (1/2) of their respective Symposium Competition.

No Conference may have more than one Wild Card team selected in a given year, and a team cannot be chosen as a Wild Card in consecutive years.

– End of Section –

4. SUBMISSION REQUIREMENTS AND DEADLINES

4.1. Conference/Team Folders

ASCE uses a submission platform called *Cerberus Web Client*. All digital competition deliverables must be submitted on this platform. Submissions outside of this platform will be considered non-responsive and will not be considered.

The main folder (link provided below) contains a sub-folder for each Student Symposium, and within each Symposium Folder is a folder for each school. Please note that these folders will only allow files to be uploaded and viewed, no file deletions will be permitted.). Refer to *Exhibit 2 – How to Navigate Folders and Upload Submissions* for directions.

<https://upload.asce.org/public/folder/ltqovou4w0a7y4ncyxqkta/2025%20Concrete%20Canoe%20Submissions>

4.2. Required Submissions and Schedule

Teams shall meet all submission deadlines listed below. Submissions not received by the deadlines or partial/incomplete submissions will be considered non-responsive and subject to a deduction. Symposia host schools shall not change or amend any of the submission requirements. If a host school does, teams are directed to only follow the requirements listed below. Refer to *Exhibit 1 – Summary of Important Dates/Deadlines*.

4.2.1. Letter of Intent & Pre-Qualification Forms

The *Letter of Intent* along with their *Pre-Qualification Forms* acknowledges receipt of the Request for Proposal solicitation and provides initial information for C4, ASCE, and the judges to use at their discretion. *Exhibit 12 - Pre-competition Submittals* contain the required documents the team must submit. These forms must be submitted and completed **no later than 5:00 pm EDT [Eastern] Friday, November 1, 2024.**

Late submissions and documents missing any of the required signatures, initials, and email addresses will be considered non-responsive and subject to deduction.

4.2.2. Research and Development Schedule

All teams are to upload their Research and Development schedule to their respective folder, no later than **5:00 pm EDT [Eastern] Friday, November 1, 2024.** This Research and Development Schedule will cover the period from the issuance of this RFP up to the Society-wide Competition at California Polytechnic State University, San Luis Obispo, and will include items such as, but not limited to, design and construction-related activities, important milestones, and submission deadlines.

Note: This schedule is different than the production schedule, which will be submitted as part of the proposal.

4.2.3. Project Proposal, Mix Design Sheets, and Materials Notebook

Digital Format

For the Student Symposia Competitions, the following digital documents must be uploaded to their respective folders by **5:00 PM EST on Friday, February 13, 2025**:

- Project Proposal (PDF version)
- Mix Design Sheets (Excel version)
- Materials Notebook (PDF version)

For the Society-wide Final Competition, the digital versions of the Project Proposal, Mix Design Sheets, and Materials Notebook must be uploaded to their respective folders according to the instructions in the Letter of Invitation by **5:00 PM EDT on Wednesday, May 14, 2025**.

File names should follow the format: "School Name – Canoe Name – Document – Year" (e.g., "South Central Louisiana State University – Mud Dawg – Project Proposal – 2025"). Failure to adhere to this format may result in a deduction in scoring.

Hard Copies

- **Regional ASCE Student Symposiums:** No hard copies are required.
- **Society-wide Final Competition:** Six (6) bound hard copies of the Project Proposal must be received no later than **Wednesday, May 14, 2025**, at the following address:

ASCE Student Programs
1801 Alexander Bell Drive
Reston, VA 20191
Attn: Concrete Canoe

– End of Section –

5. PROJECT PROPOSAL, MIX DESIGN SHEETS, and MATERIALS NOTEBOOK

One of the greatest challenges in the engineering profession today is the art of stating a complex idea, solution, or decision simply. From city council meetings to public hearings, engineers are increasingly asked to address the society they work for in terms they can understand.

The setup of this RFP aims to aid each team in learning the importance of simple visuals and concise writing to help others understand complex technical material. The sections below are separated so that each portion of the report serves a different subset of people engineers can expect to interact with.

Each team shall provide their *Project Proposal*, *Mix Design Sheets*, and *Materials Notebook*, which details their approach to meeting the requirements of the RFP solicitation as it pertains to the various areas related to the design and construction of the concrete canoe. The response to this RFP has an Infographic, Research and Development section, Proposal Section, and supporting data in appendices.

Reference documents can be found at the link below:

<https://upload.asce.org/public/folder/lrgovou4w0a7y4ncyxqkta/2025%20Concrete%20Canoe%20Submissions/AAA%20Reference%20Documents%20and%20Webinars/>

5.1. General Requirements

- **Page Size:** 8 ½ in. by 11 in (unless otherwise specified below)
- **Margins:** ½ in. on all sides (except for MTDS).
- **Font:** Times New Roman, Arial, or Calibri, 12 pt., normal width, single-spaced.
- **Headings/Subheadings:** Any legible font and size equal to or larger than body text.
- **Headers/Footers:** Within margins, any legible font/size equal to or larger than body text.
- **Dividers:** Optional for sections and appendices.
- **Units:** Report all dimensions in English units.

5.2. Pictures, Figures, Graphics, and Infographics

Pictures, renderings, illustrations, graphs, figures, etc. are permitted and encouraged.

- No use of copyrighted or trademarked materials is permitted without written approval from the copyright or trademark owner.
- Items from publications must be properly referenced.
- Items developed and owned by the 2024-2025 team do not need to be referenced. Items developed and owned by a previous year's team (for example, photographs depicting a construction method) can be used if they represent what is being proposed for this submission and are properly cited in the proposal as previous teams' work.
- Hyperlinks and QR codes are not permitted to be used.

5.3. Plagiarism

Plagiarism of any kind, intentional or unintentional, will not be tolerated and is grounds for disqualification. Submitted proposals may be screened for plagiarism at the discretion of the judging panel and/or the C4. If plagiarism is suspected, C4 shall make the final determination with regards to disqualification, not the judging panel. Please note the following:

- "Text Recycling", while permissible in some deliverables in the industry, will be considered plagiarism for this competition. Text recycling is considered reusing an organization's writing from a prior deliverable without proper citation.

- All language included in the proposal, presentation, display, and any other incidental deliverable shall reflect work completed within the current academic year, unless otherwise referenced and properly cited as work completed in a prior year. This includes but is not limited to text, pictures, renderings, illustrations, graphs, figures, etc. Failure to properly cite work completed in a prior year will be considered plagiarism for this competition.
- The use of generative artificial intelligence (AI) and natural language processing models (NLP) such as OpenAI's ChatGPT are neither encouraged nor discouraged by C4. However, if such models are used, all instances shall be cited as work completed by the respective generative AI/NLP. Failure to cite all instances of generative AI/NLP use will be considered plagiarism for this competition.

Contextual Comment: Framing the rules and regulations of this competition as a Request for Proposals is intended to provide teams with familiarity and experience with how the competitive bid process works in industry and for teams to articulate in plain language how the deliverables were created within the current academic year. It should be noted that while the framework is that of a competitive bid process, this is still an academic competition. As such, teams are expected to adhere to the principles of academic integrity.

By participating in the 2025 ASCE Concrete Canoe Competition, teams agree to adhere to the ethical publishing standards in ASCE Journals. As ASCE is a Committee on Publication Ethics (COPE) member, all project proposals submitted to the C4 must follow the guidelines recommended by COPE and the requirements outlined above. ASCE reserves the right to publish any project proposal submitted during the competition exclusively and will not review or publish any proposal that violates the ASCE or COPE ethical guidelines.

Proper Citation Method

Citation of the AI and NLP shall be presented in the format provided below.

Format: Author. (Date). *Name of tool* (Version of tool). URL

Example Bibliography: OpenAI. (2023). *ChatGPT (Mar 14 version)*. <https://chat.openai.com/chat>

Example In-Text Citation: (OpenAI, 2023)

Verification of Plagiarism

C4 will use an online program designed to compare two individual documents against one another to verify any potential plagiarism cases. This program analyzes the similarities and differences between the text that is inclusive of relocating a block of text within the document, minor revisions to a previously used sentence or paragraph, and wholesale recycling of text. Any verification of text recycling via this program is grounds for disqualification as stated above.

5.4. Project Proposal

The sections outlined below are expected to be in the order presented and contain all requested information.

5.4.1. Front Matter (3 pages)

5.4.1.1. Front Cover (1 page)

A front cover is required for both:

- Conference competitions, where no hard copies are requested, teams should include the digitized PDF of their back cover as a single page, with no need to include a blank page.
- Society competition, where hard copies are required, the front cover of hard copies shall be single-sided. The front side of the back cover shall be left blank.

5.4.1.2. Cover Letter (1 page)

In an official response to the C4 Request for Proposal solicitation, the following statements will be included. By signing the Cover Letter, the team agrees that

- The proposed hull design, concrete mixture design, reinforcement scheme, and construction of the prototype canoe have been performed in full compliance with the specifications outlined in the *Request for Proposal*.
- Material Technical Data Sheets (MTDS) and Safety Data Sheets (SDS) have been reviewed by the team for completeness and compliance.
- The team acknowledges receipt of the *Request for Information* (RFI) Summary and that their submissions comply with the responses provided.
- The anticipated registered participants are qualified student members and Society Student Members of ASCE and meet all eligibility requirements (including names and ASCE Society Member ID Numbers).
- All text generation AI/NLP algorithm uses are properly cited within the respective document.

The letter shall be signed by at least one (1) team captain and the ASCE Student Chapter Faculty Advisor, certifying that the information presented in the *Project Proposal*, *Mix Design Sheets*, and *Materials Notebook* is valid. The team captain and faculty advisor's phone number and e-mail address shall be provided.

5.4.1.3. Table of Contents (1 page)

List the various sections and appendices of the *Project Proposal*, including appropriate page numbers. A list of tables and figures may be provided but is not required.

5.4.2. Infographic (1 page, 11 in. x 17 in.)

5.4.2.1. Intent and Purpose

To aid in each team's infographic, the C4 offers the following definition: Infographics are graphic visual representations of information, data, or knowledge intended to present information quickly and clearly.

Rather than block text, this one-page maximum is expected to rely heavily on illustrations, lists, icons, and other graphical content.

Contextual Comment: *This infographic replaces previous years' Executive Summary section, which C4 found repetitive from year to year while providing minimal additional value. Introducing the Infographic aims to allow students to express and show more creativity in the project while minimizing the block text judges need to evaluate.*

5.4.2.2. Infographic Required Content

C4 requests an infographic that will serve as a marketing flyer for this project and will be included on the project display (Section 7.3.4). C4 will use this infographic to inform the public and potential manufacturers of the project scope, prototype dimensions and specifications, and the team's unique theme. The Infographic will highlight why the team is best suited to be awarded to provide the standardized design for manufacturing/building canoes for the consumer.

The infographic must include the following, along with any additional relevant information the team deems appropriate:

School’s Student Chapter Profile:

- Brief history, activities, awards, and other relevant details.

Team’s Innovative Features:

- Methods providing external value.
- Unique approach to the problem statement.
- Expected cost of production.
- How the team addressed the client's needs.

Prototype Specifications:

- Dimensions: Length, Width, Depth, Thickness, Weight.
- Composite flexural strength (specify the age of testing).
- All reinforcement used (primary and secondary, type and name).
- Any flotation used (type/name and density, if applicable).

Concrete Mixture Specifications:

- Density: Wet (plastic) and oven-dried unit weights (for each mix).
- Concrete slump/spread and air content (for each mix).
- Compressive and tensile strength (specify the age of testing for each mix).

All properties shall be reported in English units to the accuracies outlined in the industry standards (e.g., ASTM C39, C138, C109, and C496, as examples) and as outlined in the table below. **These shall be used as the official properties used for any compliance checks.**

Table 4: Existing and Proposed Flows

PROPERTY	REPORTED ACCURACY (to the nearest..)
Strength	10 psi
Density (hardened concrete)	1 lb/ft ³
Density (fresh concrete)	0.1 lb/ft ³
Slump, Spread	¼ inch
Weight	1 lb
Air Content	0.1 %

5.4.3. Preliminary Design Report (9 pages maximum)

5.4.3.1. Project Management (4 pages maximum)

The overall Project Management section is limited to 4 pages maximum. Unless otherwise stated in the subheaders below, subsections have no length restriction.

5.4.3.2. Key Team Roles & Organizational Chart (1 page) (8 ½ in. by 11 in. or 11 in. x 17 in.)

Provide team member names, including descriptions of the roles, tasks, or areas in which they contributed at any time during the project. Include the year (Fr., So., Jr., Sr., Grad) for all members. Indicate team captains. As appropriate, list advisors, sub-consultants, and other pertinent individuals.

5.4.3.3. Project Scope

Demonstrate a thorough understanding of the proposal requirements and sequence of tasks to develop a concrete canoe regarding its hull design, structural capacity, material selection and testing protocol, and constructability.

5.4.3.4. Health and Safety

Discuss the team's safety program and implementation, including, at a minimum, material testing and construction. For example, include details on the stain's hazards, application methods, health and safety procedures, and approvals from the faculty advisor and university health and safety personnel.

5.4.3.5. Project Management Plan (PMP)

Present the team's project management scheme and planning process as it relates to scope and risk management. Within the framework of the team's PMP, identify critical path activities from the team's Preliminary Schedule and explain any variation in those activities. Briefly present the team's plan for financial and resource allocation as it pertains to material procurement and construction of the prototype.

5.4.3.6. Quality Assurance and Quality Control

Define quality assurance and quality control. Discuss how the team uses assurance and control independently and in conjunction as part of an overall QA/QC program related to all parts of the project scope as defined in this RFP.

5.4.3.7. Research and Development Cost

Discuss the costs associated with materials, labor, and tools or machinery used in the research and development phase.

5.4.3.8. Research and Development Cost - Fee Schedule (1 page)

Based on the written explanation above, provide a one-page itemized fee summary sheet for the Research and Development Cost using the template located in the link provided in Section 5.0.

- Projected total hours (including a breakdown of person-hours) dedicated to responding to this RFP. See *Exhibit 8 - Detailed Cost Estimate* for further details.
- Costs of labor, mixture materials, and all construction materials associated with the fabrication of the canoe including a lump sum for the mold.

Contextual Comment: *The lump sum cost for the mold should match the detailed cost breakout in the Manufacturing Fee Sheet.*

- Costs associated with testing material
- Costs associated with person-hours for each item.
- Time and material associated with competition travel and participation can be excluded.

Hourly rates, material costs, and appropriate multipliers are provided in *Exhibit 8 – Detailed Cost Estimate*.

For any portion of the project that a team expects to be completed by others (i.e. if the team's mold is fabricated by an outside vendor), the team is still expected to determine labor hours worked and cost of materials, just as if they were completing the task. Teams are highly encouraged to ask vendors about their labor hours and costs to aid in their fee schedule.

Contextual Comment: *Recall from the Problem Statement, the C4 is not necessarily looking for the lowest cost solution, but inclusive and realistic costs assessments.*

5.4.4. Technical Design and Construction Support (5 pages maximum)

The overall Technical Design and Construction Support section is limited to 5 pages maximum. Unless otherwise stated in the subheaders below, subsections have no length restriction.

5.4.4.1. Hull Design

Present the selected hull design and related performance objectives. Include any reasonings supported by data for these performance objectives related to stability, turning, straight-line speed, maneuverability, and other constraints, criteria, or structural elements.

5.4.4.2. Structural Analysis

Present the team's structural analysis and detail the methods chosen for determining the following:

- The governing load case(s);
- Free-body diagram for the governing load case(s);
- Minimum Required Strength: Maximum compressive (σ_c), tensile (σ_t), and punching shear stresses multiplied by any applicable Factors of Safety (FS) or Load Factors (LF). Provide justification for any applied FS or LF;
- Demand-to-Capacity Ratio: Relate the minimum required strength to the concrete mix design's actual strength (as determined via testing), expressed as a percentage. Discuss how any reserve capacity (capacity above and beyond the minimum required strength) in the mix design is justified;
- Critical section moment of inertia (I_x) and location of neutral axis;
- A "spot check" calculation validating results (if FEA modeling is used as the primary analysis tool)

NOTE: If FEA modeling is used, the required additional spot check calculation must fit within this section of the proposal. No additional pages shall be used.

Contextual Comment: *Since 2013, teams have been restricted to completing structural analysis using 2-dimensional concepts of mechanics of materials, strength of materials, and reinforced concrete design. This restriction has been lifted, with the caveat that C4 requires additional verification of your model's results. This is a typical exercise in structural engineering when submitting calculation packages for review. It should be noted that a spot check validating a model does not (and should not) be a complete recreation of the model's results. Rather, it should validate a component of the analysis such that the team can confirm that the model returned reasonable results.*

Modeling software is used every day in industry, and it is important to understand how those software packages work as well as their limitations. Using FEA to determine your canoe's stresses does not inherently make your structural analysis "better". There is a saying that goes along with this: "garbage in equals garbage out". Effectively, your model is only as good as the modeler's understanding of the underlying concepts and the limitations of the software used. Should team's wish to use FEA modeling as part of their analysis, C4 recommends seeking advice from a faculty member.

Regardless of the load case that governs the structural analysis of a team's canoe, teams must also consider the following performance load case:

If your canoe capsizes during the prototype demonstration, it may be required to be towed to shore by the safety boat. Detail your team's analysis of this load case and provide justification proving not only that your canoe can be safely towed to shore, but that it will also be able to continue racing.

Contextual Comment: *This performance load case is purely hypothetical - C4 does not intend to tow your canoes to shore prior to racing to verify or validate your analysis. However, this situation occurs more often than you may think - both at regional symposia and the society-wide finals.*

5.4.4.3. Mix Design

Present the team's approach to planning, developing, researching, and testing the mix design to meet the requirements of this RFP.

At a minimum, describe:

- Quantitative test results of mixtures tested and selected.
- Concrete and reinforcement materials considered and selected.
- Physical properties and composition of the proposed aggregate sources, including specific gravity, absorption, and particle size.
- Admixtures tested and their effects on concrete properties/behavior.

- Primary reinforcement considered, tested, and used, and layering scheme chosen.
- New or innovative ideas, materials, and methods implemented in developing the concrete composite and the impacts on budget, schedule, and safety.

Refer to standard test methods where appropriate.

5.4.4.4. Construction Process

Describe the construction process and include new or innovative ideas implemented in the construction of the mold and canoe and their impacts on budget, schedule, and safety.

Include, at a minimum, material selection, form construction, methodology of mixing and placement of concrete and reinforcement, layering scheme, curing, form removal, concrete finishing, and aesthetics.

5.4.5. Production Proposal (7 pages maximum)

The overall Production Proposal section is limited to 7 pages maximum. Unless otherwise stated in the subheaders below, there is no restriction on the length of any subsection.

5.4.5.1. Value

Merriam-Webster defines value as *“the monetary worth of something.”* By the same source, it can also be described as *“relative worth, utility, or importance.”*

For this section, one or both of these definitions may be used to aid the team in presenting the value their prototype design brings to the client, C4.

The team will highlight processes or design features where value can be provided and discuss how their innovations relate to C4’s stated needs. The team is expected to understand and demonstrate that while innovation and value are often perceived as synonymous, they are not identical. Thus, innovation does not always provide value.

The team should frame this section toward the external value (i.e., the Client (C4)) rather than internal (i.e., the team).

5.4.5.2. Sustainability

Using at least one of the three pillars of sustainability – social, economic, and environmental impacts – outline, in detail, sustainability processes the team used and their direct or indirect impact. State which pillar(s) these processes were tied to.

5.4.5.3. Improvements

Throughout any project process, a team learns best practices to improve the prototype, process, or procedure. C4 requests that the teams provide descriptions of their best practices related to the team’s approach, design, and/or materials.

5.4.5.4. Manufacturing Cost Estimate

C4 intends to mass-produce the winning prototype for general use. To aid C4 in projecting manufacturing costs, the team shall discuss the cost of mass-producing 100 canoes. Assumptions can be made on the unit rate for the bulk buying power of materials. No preference will be given to a school’s location or potential fabrication facility. Shipping and delivery costs, taxes, and necessities (water, electricity, etc) on each fabricated canoe do not need to be included. These will be the responsibility of the individual buyer or C4.

The actual cost of the canoe is less important for this competition than proper accounting and explanation of prices.

Contextual Comment: The cost estimate presented by the team should be substantiated by the actual material costs and hours it took to fabricate their prototype canoe. This section aims to have teams consider the materials they use and how they might affect mass production and to think more broadly about construction processes. For example, would using a mold that costs more to sustain over multiple iterations be considered sustainable? Would that still be a selling point or a cause of concern for the client?

5.4.5.5. Manufacturing Cost Estimate - Fee Schedule (1 page)

Based on the written explanation provided, please prepare a one-page itemized fee summary sheet for the manufacturing of 100 canoes using the template available in the Reference Materials. Include the following details:

Costs Breakdown:

- Labor costs
- Costs of mixture materials
- Costs of all construction materials used for each canoe

Mold Fabrication Costs:

- Costs associated with fabricating and re-using molds. Indicate the number of canoes that can be produced with a single mold before it needs replacement.
- Pro-rate the mold fabrication cost based on the number of uses and apply this pro-rated cost to the per-canoe fabrication cost.

Rates and Multipliers:

- Refer to *Exhibit 8 – Detailed Cost Estimate* for hourly rates, material costs, and applicable multipliers.

Outsourcing:

- If any part of the canoe fabrication or final display is outsourced, clearly note this in the fee summary as outsourced labor. Be aware that outsourcing may affect the judges' scores, as it indicates that the team did not complete that portion of the work themselves.

Ensure all costs are itemized and clearly documented in the fee summary sheet.

Contextual Comment: This format for the fee schedule is meant to stimulate new competition analysis by framing the costs as preparation for mass assembly instead of just focusing on the prototype.

Sustainability benefits from material use or mold reuse are substantial and encouraged by C4. However, sustainability has been a vague concept discussed in previous years that until now didn't have a metric to compare against. This section gives all schools a new opportunity to explain how their mix design, construction process, and mold system may perform in a production setting.

5.4.5.6. Construction Drawings (2 pages, 11 in. x 17 in.)

Present isometric, elevation, plan, and typical composite cross-section views of the canoe and mold with applicable dimensions and other details as needed to construct. Additional sections and details may be added to present construction techniques. Provide any relevant specifications as deemed essential by the team.

These drawings should be detailed so that the team's product is reproducible by a future manufacturing company.

Contextual Comment: Construction drawings are a key component of the evaluation as C4 solicits teams to provide a design we can then hand over to a manufacturer to build. These drawings should strive to provide the key features and pertinent information to enable that fabrication to occur with the drawings as the primary source of information.

5.4.5.7. Production Schedule (1 page - 11 in. x 17 in.)

Provide a complete **production** schedule, including key milestone dates and critical path to fabricate 100 canoes for ASCE. Use the following ground rules and assumptions to create your schedule.

- **Contract Award:** June 30th, 2025 (schedule should start on this date)
- **Period of Performance:** 5 years (schedule should end on June 30th, 2030)
- **Facilities:** ASCE will provide all required facilities with basic infrastructure up to 1 million square feet (electricity, water, loading docks, storage, etc.). Teams will need to plan for stand-up and construction of their specific fabrication process (molds, mixing stations, sanding areas). Teams should assume a large empty space that can be adapted to any configuration deemed appropriate.
- **Delivery:** ASCE will accept delivery of the canoes at the facility (transportation planning not required) on the timeline that the team deems most appropriate (i.e. a uniform 20 canoes per year is acceptable as is delivery on other timelines, i.e. 10, 25, 25, 25, 15)

The project schedule should be substantiated, where possible by actual spans experienced during the R&D phase, but teams may modify, based on learning during the R&D phase that can be applied to the Production phase.

***Contextual Comment:** In practice, clients generally care most about when the product/facility/infrastructure can be put into service and used along with the cost to complete the project. Previous RFPs have focused on the schedule to develop the prototype, but in practice clients are less interested in this engineering and design portion of a project. C4 is making this change to focus more attention on what proposals typically have, which is the schedule of **future** work. C4 is excited to see what teams propose and values a low-risk schedule approach (i.e. it is acceptable to propose schedule margin for delivery of the 100 canoes).*

5.4.6. Appendices

5.4.6.1. Appendix A – Bibliography (Page Limit – none)

ASTM and other industry standards, technical software, and any previously published material, including previous design papers for prior RFP submittals and sources referenced when performing calculations, must be properly cited, as applicable. Any professionally acceptable reference style can be used if the reader can use the citation to find original information sources.

5.4.6.2. Appendix B – Hull Thickness/Reinforcement and Percent Open Area Calculations (Page Limit – 2 max.)

Present the measurements and calculations of the reinforcement and hull thickness for the various canoe elements (i.e., walls, ribs, gunwales, thwarts, and bulkheads) and percent open area (POA) as applicable.

5.4.6.3. Appendix C – Supporting Documentation Page Limit – none)

Appendix C is to be included if the team uses *Exhibit 10 – Durability and Repairs (if applicable)* and other documentation as directed by C4. It cannot be used by the team to include any additional information not specifically requested by C4.

5.4.7. Back Cover

A back cover is not required for either PDF and hard copies of the proposal. However, should a team choose to include one:

- For conference competitions, where no hard copies are requested, teams should include the digitized PDF of their back cover as a single page, with no need to include a blank page.
- For society competition, where hard copies are required, the front cover of hard copies shall be single-sided. The front side of the back cover shall be left blank.

5.5. Mix Design Sheets

Each team shall provide **one** Microsoft Excel file with a tab for **each** mix design utilizing the template located in the link provided in section 5.0. Mixtures that differ in only color will be considered as one mixture, and one tab shall be provided. In this case, it should be clearly noted on the table or tab name that the color of the mix varies.

No rows, columns, or text in cells with no background color shall be deleted or altered from this provided format. Failure to adhere to this will result in penalties. The team is only to input values in the blue cells and only equations in the orange cells as noted in the legend.

Contextual Comment: Proficiency in Excel and other Microsoft tools is crucial for engineers, who use these skills daily for tasks like cost estimates and schedules required by various agencies and developers. To foster this skill and streamline the judging process, C4 provides an Excel file without pre-built formulas. Teams must apply their knowledge of Excel functions and formatting to correctly input equations and calculations, simulating the real-world process of project submission and reducing discrepancies.

5.6. Materials Notebook

The Materials Notebook is used to provide detailed information about the materials used in the canoe prototype. It is separate from the Project Proposal and must include all materials' specifications for compliance verification by judges and C4.

5.6.1. Notebook Components

- Front Cover
- MTDS Summary Table
- Technical Data Sheets for Each Material

5.6.2. Submission Guidelines

- No Electronic Formats: Weblinks and QR codes are not accepted.
- Separate Document: The Materials Notebook is a document separate from the Project Proposal.

5.6.3. MTDS Summary Table

- List each material used, including brand name, type (e.g., Water Reducer, Reinforcing Mesh), and industry standard.

5.6.4. Material Technical Data Sheets

- Provide a data sheet for each material, ordered as listed in the MTDS Summary Table.
- Sheets should offer technical details, not promotional content.
- Safety Data Sheets (SDS) are not a substitute for Technical Data Sheets.

5.6.5. Materials with Prescribed Specifications

- The MTDS must verify compliance with specific standards (e.g., ASTM). Highlight the relevant ASTM standard on the datasheet.
- If no Technical Data Sheet is available from the manufacturer, provide a certification letter on company letterhead.

5.6.6. Materials without Prescribed Specifications

- Include basic technical information for materials lacking specific requirements. For example, printouts from store websites or packaging showing material properties are acceptable.

For questions about datasheets or products, submit an RFI to C4 or refer to *Exhibit 7 - MTDS Summary Table Example* for additional information.

– End of Section –

6. CANOE HULL DESIGN PROTOTYPE

Teams shall propose a canoe hull and conduct a structural analysis on their proposed designs to establish the concrete properties needed. After research and testing, the team will construct a full-scale canoe prototype of their proposed design ahead of their Student Symposium.

6.1. Dimensional Constraints

There are no length, width, or depth constraints for the canoe.

6.2. Canoe Material Components

The Final Product Prototype shall be constructed with components that are categorized under and comply with **Concrete**, **Reinforcement**, or **Flotation** requirements presented herein. All flotation and reinforcement must be encased in concrete.

Exclusions: lettering, sealers, stains, damage repairs (tape), and flotation needed to pass flotation test.

6.3. Gunwale

The gunwale will be finished to prevent injury to the paddlers (i.e., no exposed reinforcement or sharp edges.) Foam pipe insulation foam may be used as gunwale protection and may be secured with tape.

6.4. Concrete Materials, Mixtures, and Reinforcement

Concrete mixtures shall comply with the specification in *Exhibit 5 – Technical Specifications for Concrete and Reinforcement*. Teams should consider a research and testing regime that allows for testing individual materials, concrete mixtures, and composite elements.

6.5. Flotation

In the event a canoe becomes submerged, canoes should be designed and constructed to pass the flotation test by the buoyant design of the canoe. Flotation material shall be limited to within 3 feet of the bow and stern sections and encased in concrete. The 3 feet restriction is measured from the outermost tip of the bow and stern to the innermost concrete plane of the bulkhead as visible at the competition site.

6.5.1. Flotation Test

The canoe must pass a flotation test where it should float generally horizontal near the water's surface within 2 minutes after being filled with water. The test focuses on the canoe's ability to stay buoyant, not the exact depth it floats at. The goal is to ensure the canoe doesn't sink and can be easily retrieved if submerged, ensuring safety before the race. Teams are responsible for handling and submerging the canoe by any means (e.g., filling it with water, tilting it, or pushing it down). Gunwale caps are not allowed during the test but can be added afterward. If the canoe doesn't pass the test on the first try, it will receive a deduction on the Final Product Prototype score.

6.5.2. Additional Flotation

If a canoe does not pass the flotation test, teams shall be required to add additional flotation materials until the canoe does pass the test to the satisfaction of the judges and/or C4. Any added flotation shall be below the gunwale line. Gunwale caps shall not be permitted to serve as flotation material. If flotation is added at the Student Symposium Competition, it shall be removed for the Society-wide Competition. At the Society-wide Competition, the canoe will be evaluated in the flotation test as if it was the first time undergoing the flotation test.

Contextual Comment: If a team fails the flotation test at a Student Symposium Competition, they will be re-assessed at the Society-wide competition if they qualify. This is a re-testing of the canoe as it was designed and intended to be delivered at the Student Symposium Competition and does not allow teams to “repair” their canoe to pass the flotation test before the Society-wide Competition.

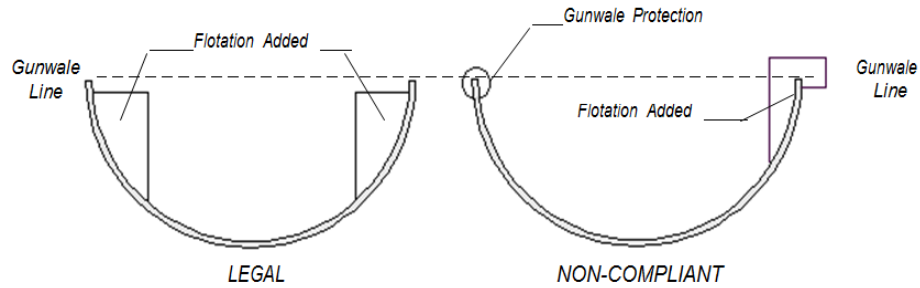


Figure 2: Gunwale Example

Any gunwale caps and coverings shall be removed at the time of judging. Aesthetics judging may occur before or after the canoe has been certified to pass the flotation test. If judging takes place after the flotation test, teams that require additional flotation to pass the test may temporarily remove the added flotation to be judged. After judging, the teams shall place the flotation back in its original position.

6.6. Finishing & Aesthetics

6.6.1. Canoe & School Name

The school and canoe names must be clearly displayed on both sides of the canoe, above the waterline, with individual letters between 4 and 6 inches high. Recognized abbreviations from the school's official website are acceptable, but the name must be at least 5 characters long.

The method for creating the names must follow the graphics guidelines in Section 6.6.2, except for adhesive lettering. Adhesive lettering is allowed, but only for the school and canoe names.

6.6.2. Graphics

Graphics created with coloring agents or pigments mixed into the concrete can be of any size and used as desired, provided they meet ASTM C979. Transparent stains for concrete are permitted if they have a VOC content of 350 g/L or less, as shown in the Materials Notebook.

Acid stains may include thickeners if they meet the VOC limit, but glitter and other additives are prohibited, and stains cannot be diluted with water, acetone, or other mediums.

Powdered dyes mixed with water or other liquids are allowed, following the manufacturer's instructions, with up to two coats recommended.

Stains can be applied to either the inside or outside of the canoe, but not both, and should not form a coating on the concrete.

6.6.3. Concrete Sealers

Only clear, non-pigmented concrete sealers may be applied to the canoe. The sealer may be either:

- silane- or siloxane-based penetrating sealer with a VOC of less than or equal to 350 g/L,
OR
- liquid membrane-forming compound for curing and sealing compliant with ASTM C1315 requirements (there are no VOC requirements with this option)

Post-manufacturer additives such as glitter or other particulate material are not permitted. The application of sealer to any portion of the canoe shall be limited to a maximum of two (2) coats, following the manufacturer's recommended procedure for application and thickness.

Contextual Comment: For the purpose of this competition, There are two main types of sealers, which C4 presents above. It's imperative that the team understand what they are using to ensure compliance. While there are many resources, the link below provides a neatly organized table to aid in selecting appropriate sealers. <https://www.concretenetwork.com/products-sealer/comparison.html>

6.7. Durability and Repairs

Canoes should be durable enough to survive the rigors of the Symposium Competition, the Society-wide Competition, and transportation to and from the various events. Following the completion of the slalom races and the preliminary sprint races, all canoes shall be removed from the water, assembled in a commonplace or a location specified by the head judge, and inspected by the judges and/or C4 members for durability (judges score) and use of tape as a repair (deduction). *Exhibit 10 – Durability & Repairs*, discusses in detail the criteria for assessing durability.

6.8. Official Weigh-In

At the Society-wide event, canoes are subject to an official weigh-in with the measured weight compared to the weight reported in their *Project Proposal* infographic.

– End of Section –

7. PROTOTYPE DISPLAY REQUIREMENTS

7.1. General

Teams will have the opportunity to showcase their canoe on display, alongside a Project Display highlighting the processes, materials, and a cross-section of the canoe representing its construction (canoe and mold). This prototype display enables teams to present their results to the judges and share their insights with other teams, fostering a collaborative environment aligned with ASCE values. Non-compliance with the following requirements may result in penalties.

7.2. Restrictions

- **Project Display Dimensions:** The display must fit within a 4 ft (W) x 8 ft (L) x 7 ft (H) space.
- **Display Design:** Displays must be designed for judging from the front only (not a walk-around).
- **Self-Supporting:** Displays must be self-supporting. Nothing can be taped, mounted, or attached to surrounding trees, walls, doors, floors, etc.
- **No Electronic Devices:** Displays cannot include electronic devices such as laptops, lighting, sound or video equipment, radios, loudspeakers, or any noise-creating devices.
- **No Sponsor-Related Items:** Sponsor lists, logos, or related items are not allowed in the display.
- **No Scents:** Using scents from humidifiers or open-flamed candles is prohibited.

Contextual Comment: The entire project display is intended to fit inside the dimensions listed above. Consider those dimensions an invisible box that the team cannot exceed. It will be within the judge's purview to either not judge anything outside the box or dock overall product display points as they deem fit should the team not contain the product display within limits.

7.3. Requirements

Alongside the canoe prototype, the Project Display is where a team will showcase their approach to the design, research, testing, and construction. At a minimum, teams must include the following:

7.3.1. Design Process

Teams should present information and data that highlight their Proposal's strengths. This includes elements of the hull design process, research, testing methods and results, and construction techniques and details. Use imagery (photos, graphs, sketches), tabular formats, or physical elements where appropriate. The information cannot be from elements required in 7.3.4 and should fully convey the design's strengths.

Contextual Comment: While the product display table can be themed with the rest of the final product display pieces, its purpose is to inform. Think of this space as an additional canvas to tell the story of your design that may not have made it into your proposal or your presentation. Remember that you have these three methods to convince the judging panel that you have the most thought out, thoroughly designed, and appropriately functioning canoe for their use.

7.3.2. Canoe Cross-Section

A full-scale model cross-section of the canoe, representing both raw and finished stages, must be displayed alongside the canoe. The cross-section should illustrate the concrete casting, finishing, and reinforcement techniques, and must include the mold. All elements must be labeled. The cross-section, including any stand, should fit within a 4 ft (W) x 4 ft (L) x 7 ft (H) space, separate from the main product display.

Contextual Comment: The entire cross-section display is intended to fit inside the dimensions listed above. Consider those dimensions to be an invisible box that the team cannot exceed. It will be within the judge's purview to either not judge anything outside of the box or dock overall product display points as they deem fit should the team not contain the product display within limits.

7.3.3. Canoe Stands

The canoe should be displayed on stands that raise it approximately 4 feet off the ground. The underside of the canoe must be visible for inspection. The ends of the canoe do not need to be at the same height, but the 4-foot height is approximate to ensure judges can inspect all areas of the canoe. If judges cannot see the inside of outside of the canoe without the use of a stand, they are not required to include those elements in their scoring.

Contextual Comment: The height requirement intends to allow judging to occur from a generally upright standing position. The judges shouldn't be required to climb a step stool or kneel to get a full view of the entire canoe. The 4' list height is an approximate value to aid the students in planning their display to accomplish this intent. It will be up to the judges if this intent is achieved.

7.3.4. Required Information and Samples

As part of the display, the following items should be included:

- **Samples of aggregates, cementitious materials, and fibers** in transparent, labeled containers. The samples should be large enough to clearly showcase the materials.
- **Individual sample(s) of each aggregate and composite sample(s) of aggregates** blended in the same proportions as used in the concrete mixtures. Composite blends should only include aggregate.
- **Concrete cylinders** from each mixture (3 or 4 inches in diameter), split into two halves.
- **Raw reinforcement samples**, including mesh, grids, strips, tendons, and bars, representative of the materials used in the canoe.
- **Individual sample(s) of each cementitious material** and any fibers used in the concrete mixtures.
- **One hard copy** each of the Project Proposal, Mix Design Sheets, and Material Notebook.
- **Infographic** from the Project Proposal, displayed for viewers.

Additionally, the following items should be readily available for compliance checking:

- **Seats/Mats** for measurement verification.
- **Life jackets and paddles.**
- **[Society-wide Only] Concrete cylinders** (unbroken, 3 or 4 inches in diameter) for each concrete mixture used, prepared according to ASTM C39. These cylinders should be oven-dried and represent the in-place density, color, consistency, and composition of the concrete used in the canoe.

– End of Section –

8. TECHNICAL PRESENTATION

8.1. Time Limit

Each team will deliver a 5-minute presentation, followed by a 7-minute Q&A session with a panel of judges. The judges will evaluate the presentation based on the content presented during this timeframe.

8.2. Presentation Focus

The presentation should emphasize the key aspects of the canoe's design, construction, and technical features. It should succinctly summarize the major elements of the project, with the goal of convincing the judges why your team's design and prototype are the best choice.

Contextual comment: Recall this is a hypothetical scenario to provide an end goal for the RFP and the competition. The presentation intends to go beyond simply informing the audience of what you did and how you did it. Ultimately, the presentation should persuade the judging panel why they should select your prototype. The presentation is not intended to be a word-for-word regurgitation of either the research and development section or the proposal section of the report.

8.3. Language

All presentations are to be presented in English.

8.4. Presentation Order

The order of presentations will be randomly selected and provided to teams by the host school at the time of on-site registration. Presentations, including the Q&A session, will be open to the public.

8.5. Equipment

The host school will provide access to electrical outlets, a projection screen, and a projector. Teams must bring any additional equipment they need.

8.6. Presenters

Any registered team members signed in at registration may participate in the presentation, including speakers and those managing the computer or projector. At least two team members must speak during the presentation. Any registered team member may take part in the Q&A session.

The presentation must be live, though videos may be used as long as there are no pre-recorded speaking parts.

Handouts or other materials cannot be given to the judges.

8.7. Question and Answer Session

After the presentation, teams will differentiate themselves by answering questions from the judges, demonstrating their knowledge of the presentation and project proposal.

– End of Section –

9. CANOE PROTOTYPE PERFORMANCE DEMONSTRATION

Each team will have the chance to showcase their canoe's racing capabilities, handling performance, seaworthiness, and durability through a series of races. These races will assess straight-line speed and turning abilities under various loading conditions. The events include:

- Women's Slalom (2 persons identifying as she/her/hers)
- Men's Slalom (2 persons identifying as he/him/his)
- Women's Sprint (2 persons identifying as she/her/hers)
- Men's Sprint (2 persons identifying as he/him/his)
- Co-ed Sprint (2 persons identifying as he/him/his and 2 persons identifying as she/her/hers)

9.1. Demonstration Course

9.1.1. General Requirements

The canoe's bow must remain at the front throughout each race, regardless of turns or finish buoys. The racecourse lanes will be marked with different colored buoys. The alignment, distance, spacing, and turns of the Slalom and Sprint courses must adhere to *Exhibit 9 – Race Regulations and Safety*, though adjustments may be made based on site-specific conditions.

9.1.2. Symposia and Society-wide Competition

For all Symposia competitions, all sprint races shall be 200 meters. For the Society-wide competition, the co-ed sprint race will be increased to 400 meters.

9.1.3. Slalom Course (200-meter)

- **Symposia Competitions:**

The course consists of seven buoys, staggered 5 meters apart transversely, with longitudinal spacing of 10 meters and 20 meters between the third and fourth buoys. The course involves slalom turns over the first 100 meters, followed by a 180° turn, and 100 meters straight back.

- **Society-wide Competition:**

The slalom course will be similar, with site-specific adjustments.

9.1.4. Sprint Course (200- and 400-meter)

- **Symposia Competitions:**

The sprint course is a straight 200 meters with 100 meters out, a 180° turn, and 100 meters back. The co-ed sprint race will also be 200 meters.

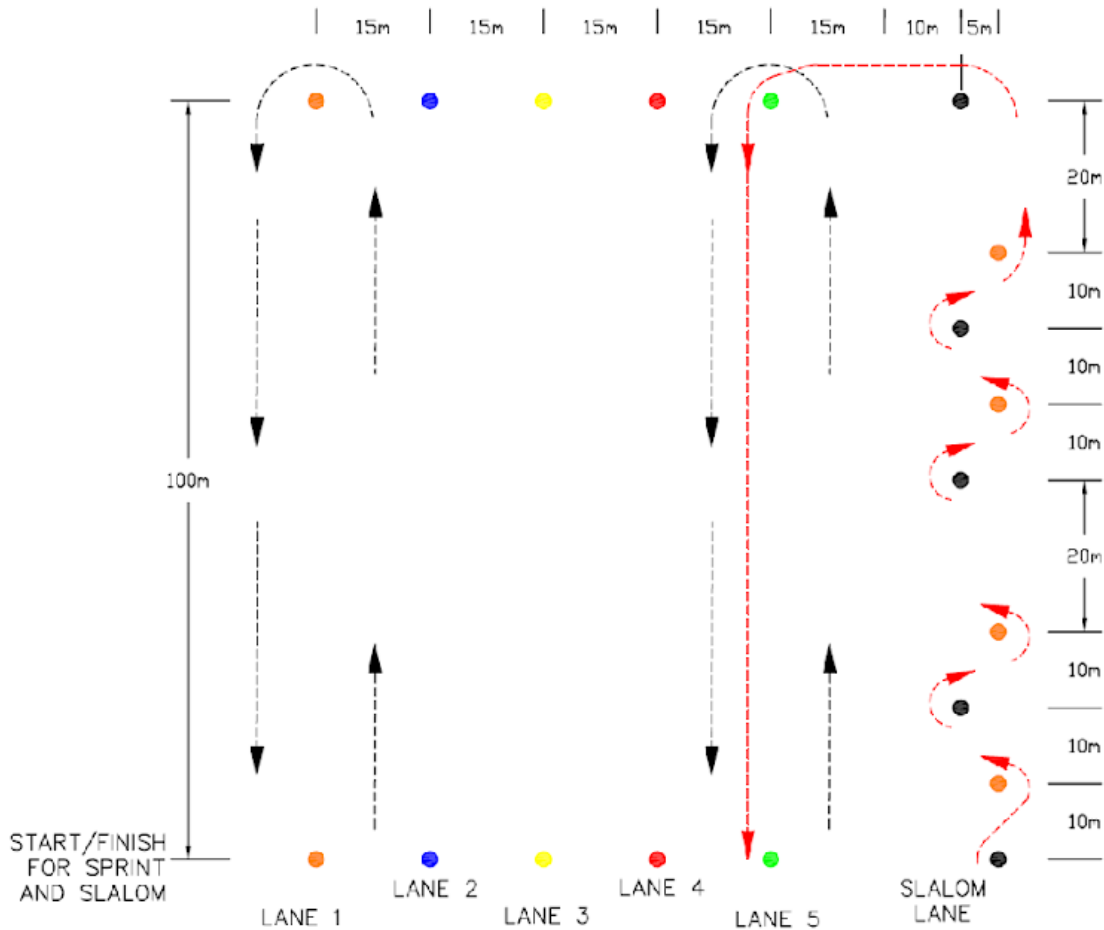
- **Society-wide Competition:**

The co-ed sprint race will be 400 meters, consisting of two laps of the 200-meter sprint course.

9.1.5. Lane Requirements

- Lanes shall be no narrower than 15 meters.

Example Race Course Layout



Note: that the slalom race return path is around the buoy for lane 5. This provides adequate space to prevent interference between a team heading away from the starting line and a team returning to the finish line. This reduces the time it takes to run the slalom race at both regionals and ASCE Student Civil Engineering Championships by allowing the next team to start before the previous team finishes the race. The host school can also choose other layouts for the return path that allow the next team to start before the previous team finishes so long as there is adequate space to prevent interference between a team heading away from the starting line and a team returning to the finish line.

– End of Section –

10. EVALUATION

10.1. General

The evaluation of the teams will be divided into four (4) categories:

Table 5: Point Breakdown by Category

Categories	Maximum Points
Project Proposal	30
Technical Presentation	25
Final Product Prototype	25
Race Demonstrations (5 events)	20
Total Possible	100

If none of the race events take place, the overall competition score will be based solely on the technical components (Project Proposal, Technical Presentation, and Final Product Prototype), with a maximum score of 80 points.

10.2. Evaluation Panel

Each event will be evaluated by a panel of 3 to 5 judges. C4 aims to have the same judges assess all portions of the competition. If different judges evaluate each portion, C4 will consider the competition invalid and will not extend an invitation to the Society-wide Final Competition. In exceptional cases, C4 may request details about the evaluation panel to assess the competition's validity and may still consider inviting the team to the Society-wide Final Competition.

10.3. Evaluation Scoring

Evaluation points will be allotted per placement according to the following table:

Table 6: Point Breakdown for Races

Place	Maximum Points					
	Technical Categories			Race Categories		
	Project Proposal	Technical Presentation	Final Prod. Prototype	Slalom	Tandem Sprints	4-person Sprints
First	30.0	25.0	25.0	4.0	3.0	6.0
Second	27.0	22.5	22.5	3.6	2.7	5.4
Third	24.0	20.0	20.0	3.2	2.4	4.8
Fourth	21.0	18.5	17.5	2.8	2.1	4.2
Fifth	18.0	15.0	15.0	2.4	1.8	3.6
Sixth	15.0	12.5	12.5	2.0	1.5	3.0

Place	Maximum Points					
	Technical Categories			Race Categories		
	Project Proposal	Technical Presentation	Final Prod. Prototype	Slalom	Tandem Sprints	4-person Sprints
Seventh	12.0	10.0	10.0	1.6	1.2	2.4
Eighth	9.0	7.5	7.5	1.2	0.9	1.8
Ninth	6.0	5.0	5.0	0.8	0.6	1.2
Tenth	3.0	2.5	2.5	0.4	0.3	0.6

Competition points for the Project Proposal, Technical Presentation, and Prototype will be awarded according to Exhibit 11 – Evaluation Forms.

Placement in each category is determined by the overall scores, with race events being ranked by overall time. In the event of a tie, the average of the raw scores will determine the final placing. If the tie persists after averaging the raw scores, the tie will stand.

For the Project Proposal, Technical Presentation, and Prototype, each judge will independently rank the entries from 1st to nth place (where n equals the number of competing teams). The average of the judges' independent rankings will determine the overall rank for each entry, and scores will be assigned based on the scoring table for places 1 through 10. Raw scores will be used as a tiebreaker within the categories.

10.4. Summary of Deductions / Disqualification

10.4.1. General

These deductions may also be referenced in other sections of this document and/or the scoring sheets. **It is highly suggested that the judges contact C4 regarding situations that may not be covered to determine the appropriate course of action.**

10.4.2. Deductions

The Deduction Scorecards determine a deduction unit that is entered into the electronic scoresheet to adjust the final scores for each judge for each school. Each deduction unit is calculated as 1% of the difference between the highest and lowest pre-deduction scores given by a judge for that specific portion of the competition. This calculation is done separately for each judge.

10.4.3. Disqualification

Teams may be disqualified (DQ) from the competition for the following:

- Failure to meet student eligibility requirements
- Violations under the *Spirit of the Competition* or under the *Ethics and the Competition*
- Sportsmanship and interference requirements
- Failure to follow safety rules
- Plagiarism

10.5. Deduction Resolution

10.5.1. General

During the competition, judges and/or C4 will notify team captains of any deductions assessed. Team captains may then either address these deductions by resubmitting, if eligible, or appeal them if they believe the deductions were improperly applied, as outlined in sections 10.5.2 and 10.5.3.

Both actions require a written response to the judges for review, and only designated team captains are authorized to revise, resubmit, or appeal deductions.

If a team chooses to appeal or resubmit, the team captains must submit a completed Deduction Scorecard (with signature), Final Product Prototype Revise and Resubmit Form, Appeals Form, and any supporting documentation by the specified deadline to the Head Judge or C4 member. The judges will review the appeal, make a final decision, and inform the team captains. Once the decision is communicated, no further appeals will be permitted.

Sections 10.5.4 and 10.5.5 outline the procedures for handling appeals and deductions, including the responsibilities of team captains, judges, and C4. Judges' decisions after review are final, with no further appeals allowed. Judges may consult with C4 for guidance and to ensure proper deduction procedures are followed. **C4 will not accept any resubmissions or appeals beyond the Symposium Competition, nor will it overturn the deductions decided by Symposium judges.**

10.5.2. Revise and Resubmit

Deductions that are marked "Revise and Resubmit" on the deduction score card are eligible to be reevaluated by the judges using the *Final Product Prototype Revise and Resubmit Form* through the Team Captain. All supporting documentation must be included with the form at the time of resubmission, clearly indicating the revisions made.

***Contextual Comment:** The "Revise and Resubmit" process is designed to simulate the submittal procedures commonly used in industry, offering teams an educational opportunity to correct errors or provide missing materials. However, please note that a "nuisance" deduction will be applied if deductions are rescinded upon resubmittal, to account for the additional time and effort required for reevaluation.*

10.5.3. Appeals

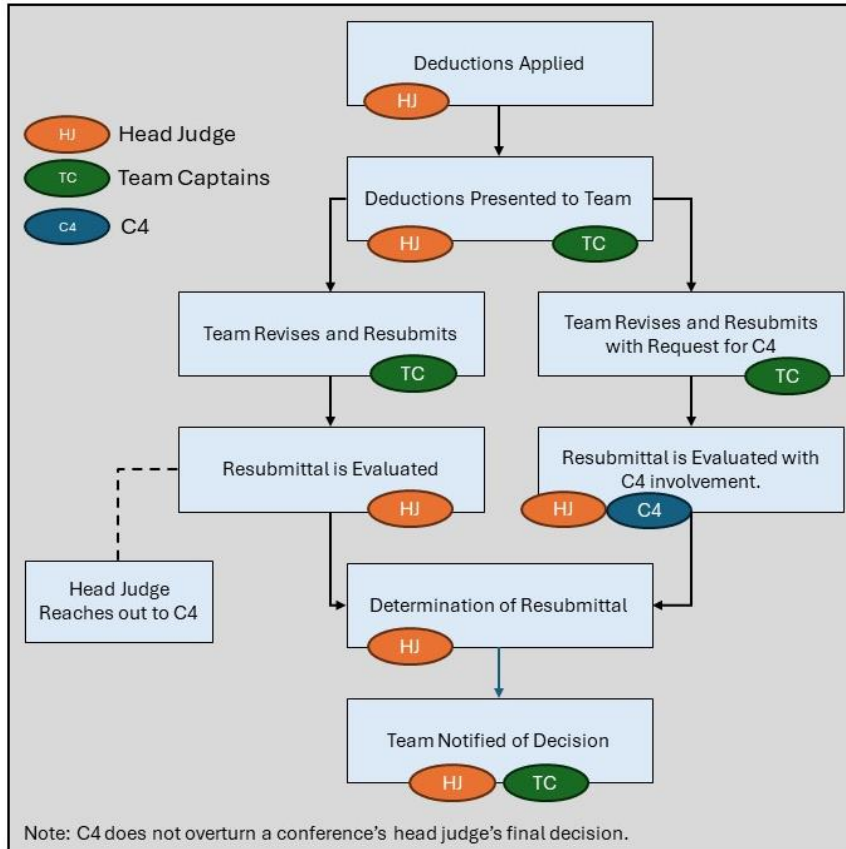
Any deduction may be appealed if a team believes it was applied inappropriately by submitting an *Appeal Form* through the Team Captain. All supporting documentation must be included, clearly indicating the perceived error or explaining any extenuating circumstances.

Any appeals related to eligibility for advancement to Society-wide competition finals must be initiated by a student chapter leader or team captain in disagreement with a ruling related to their own team within 1 week of notification of ineligibility and received through student@asce.org with subject line: ASCE 2025 Competition Eligibility Appeal. This email will initiate a request for an appeals form that is the medium through which to explain the appeal.

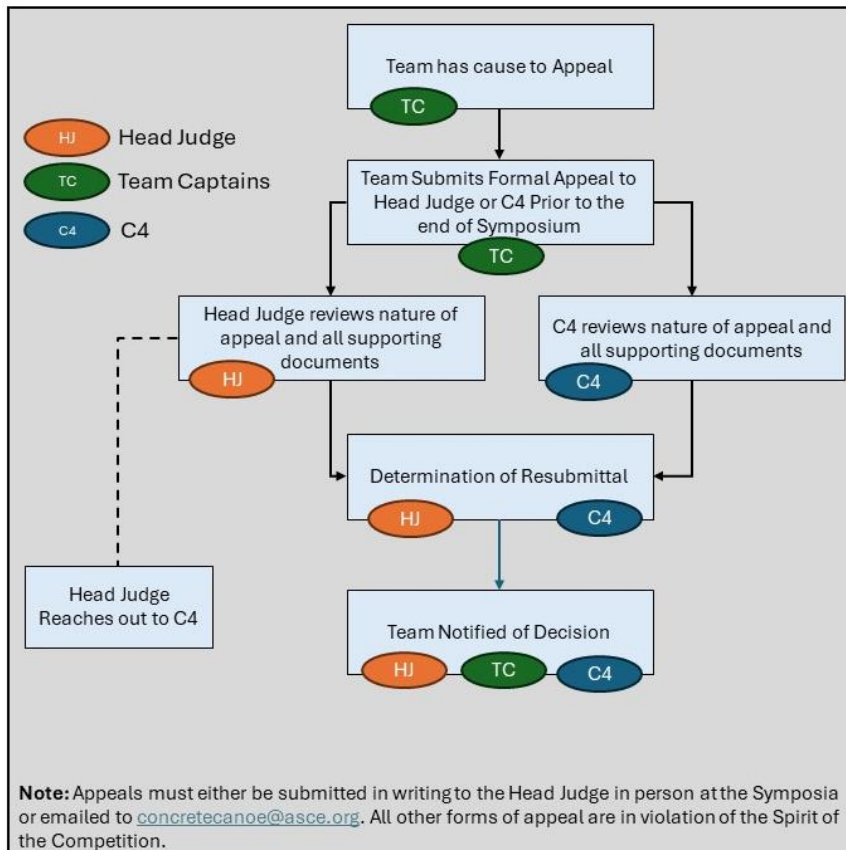
Appeals regarding any other part of the competition should be presented to the conference head judge during competition or emailed to concretecanoe@asce.org prior to the start of the awards banquet.

***Contextual Comment:** The appeal process is designed to address errors in applying deductions or to account for genuine extenuating circumstances. However, the "Revise and Resubmit" process is intended to minimize the need for appeals, as appeals are rare in industry. Please note that appeals based on personal dissatisfaction, misinterpretation of the rules, or claims that contradict objective evidence will not be considered valid grounds for an appeal.*

10.5.4. Revise and Resubmission Process and Assignments



10.5.5. Appeal Process and Assignments



10.5.6. Tiebreaker (Final Overall Standings)

Ties in the final standings for the competition overall shall be broken. In such cases, a tie-breaking score, *TBS*, shall be calculated according to the following formula:

$$TBS = \frac{30}{100} \left(\frac{\sum_{j=1}^{NOJ} DPP}{NOJ} \right) + \frac{25}{100} \left(\frac{\sum_{j=1}^{NOJ} OPP}{NOJ} \right) + \frac{25}{100} \left(\frac{\sum_{j=1}^{NOJ} FPP}{NOJ} \right) + RP$$

Where: *DPP* = Project Proposal event points for a given judge
OPP = Technical Presentation event points for a given judge
FPP = Final Product Prototype event points for a given judge
NOJ = number of judges
RP = unmodified race points

The calculation of the *TBS* shall not change the standings for team placement in any given technical scoring part. Of the teams tied for the overall winner or second place, the team with the highest *TBS* shall be awarded the place in contention.

If a tie still exists for first and/or second place after the tie-breaking scores have been determined, then the judges shall determine the overall winner for the competition position. The judges may base their decision on whatever criteria they deem appropriate.

The judges' criteria and decision shall be final and may not be appealed.

– End of Section –

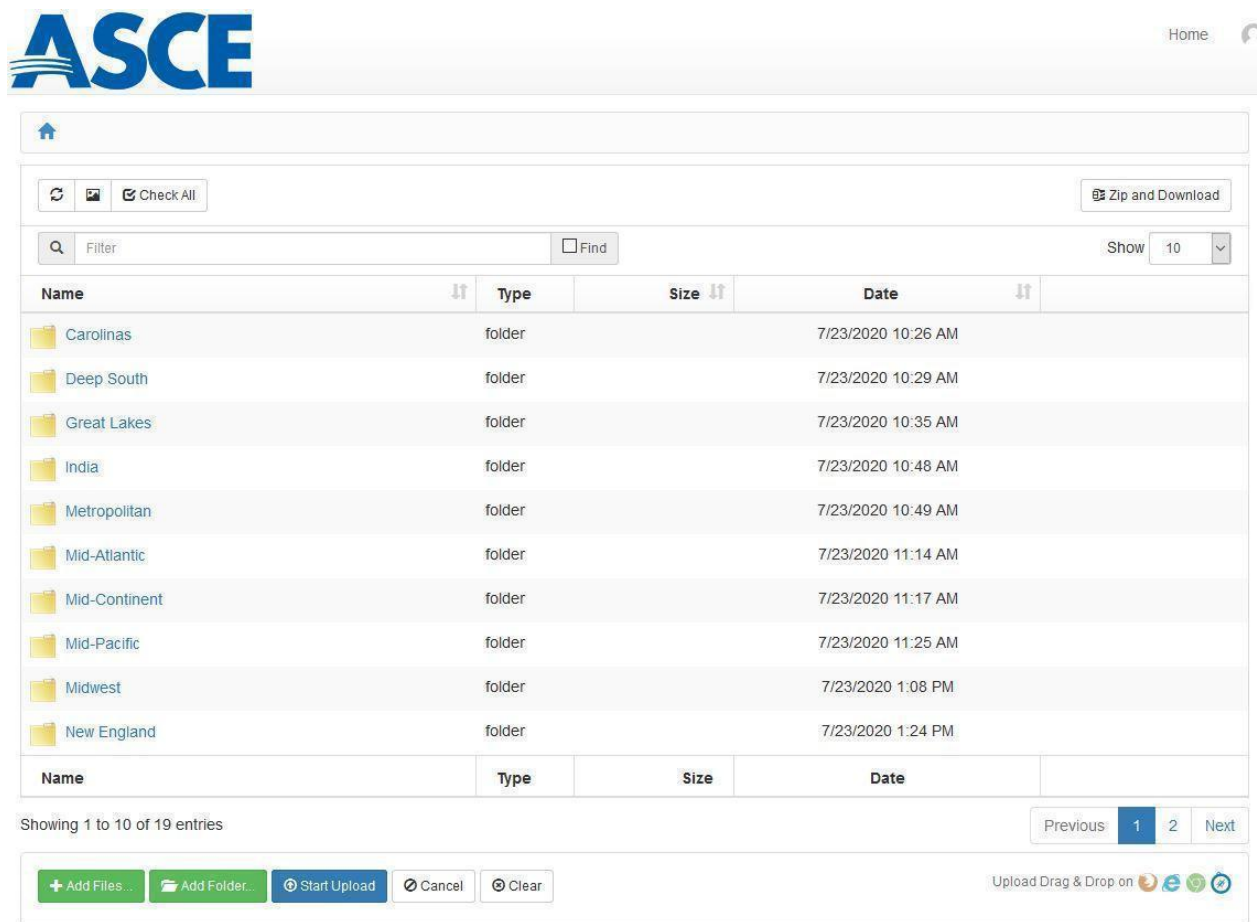
EXHIBIT 1: Summary of Important Dates/Deadlines

Table 7: Summary of Dates & Deadlines

ITEM	DATE
Issuance of 2025 Request for Proposal Solicitation	September 3, 2024
Webinar: Welcome Kick-Off; RFI Overview & MTDS Example	September 19, 2024
Webinar: Concrete Mix Design Calculations	October 17, 2024
Deadline for Submission of Research and Development Schedule, Letter of Intent, and RFQ Pre-Qualification Form	November 1, 2024
Client Scope Change	November 11, 2024
Webinar: Structural Analysis	November 21, 2024
Last Day to Submit RFIs to the C4	January 27, 2025
ASCE Student Chapter Annual Reports/Dues Deadline	February 1, 2025
Issuance of RFI Summary	On or about February 3, 2025
Project Proposal, Mix Design Sheets, and Materials Notebook Deadline (Symposia Competitions)	February 13, 2025
ASCE Student Symposia Competitions	March to Late April 2025
Project Proposal, Mix Design Sheets, and Materials Notebook Deadline (Society-wide Finals)	May 14, 2025
2025 ASCE Society Wide Finals, hosted by California Polytechnic State University, San Luis Obispo	June 26-28, 2025

EXHIBIT 2: How to Navigate Folders and Upload Submissions

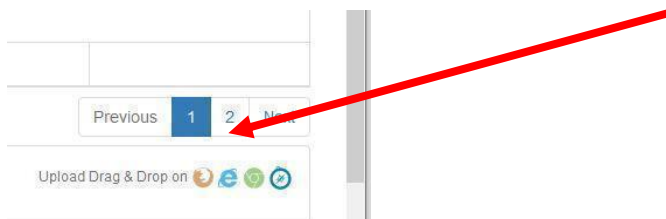
When you first arrive at the upload site, you will see folders labeled for each Student Conference:



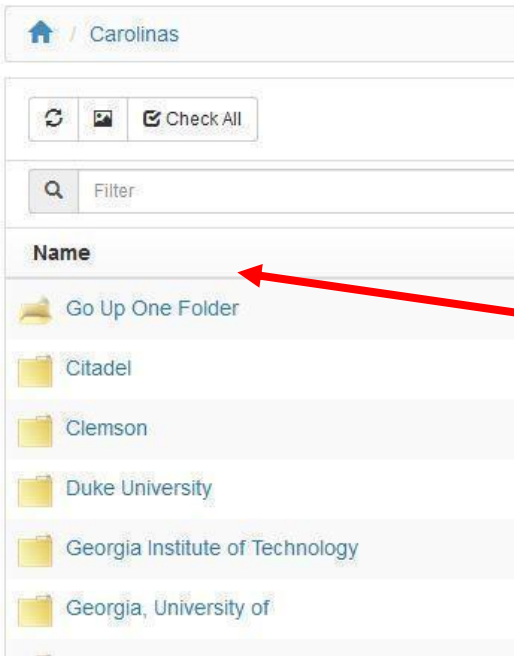
The screenshot shows the ASCE upload site interface. At the top left is the ASCE logo. At the top right is a 'Home' link and a user profile icon. Below the header is a navigation bar with a home icon, a refresh icon, a 'Check All' button, and a 'Zip and Download' button. A search bar with a 'Filter' label and a 'Find' button is present, along with a 'Show 10' dropdown menu. The main content area displays a table of folders for various student conferences. The table has columns for Name, Type, Size, and Date. The folders listed are Carolinas, Deep South, Great Lakes, India, Metropolitan, Mid-Atlantic, Mid-Continent, Mid-Pacific, Midwest, and New England. Below the table, it says 'Showing 1 to 10 of 19 entries' and has 'Previous', '1', '2', and 'Next' navigation buttons. At the bottom, there are buttons for '+ Add Files...', '+ Add Folder...', 'Start Upload', 'Cancel', and 'Clear', along with an 'Upload Drag & Drop on' section with icons for file upload, folder upload, and refresh.

Name	Type	Size	Date
Carolinas	folder		7/23/2020 10:26 AM
Deep South	folder		7/23/2020 10:29 AM
Great Lakes	folder		7/23/2020 10:35 AM
India	folder		7/23/2020 10:48 AM
Metropolitan	folder		7/23/2020 10:49 AM
Mid-Atlantic	folder		7/23/2020 11:14 AM
Mid-Continent	folder		7/23/2020 11:17 AM
Mid-Pacific	folder		7/23/2020 11:25 AM
Midwest	folder		7/23/2020 1:08 PM
New England	folder		7/23/2020 1:24 PM

Locate your Student Conference and click the folder to open it. If you don't see the name of your Student Conference, click the page navigation to move to the second page:

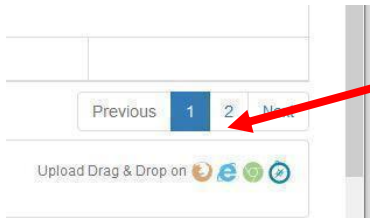


When you click the folder for your Student Conference, you will see a list of the Student Chapters assigned to that Conference:

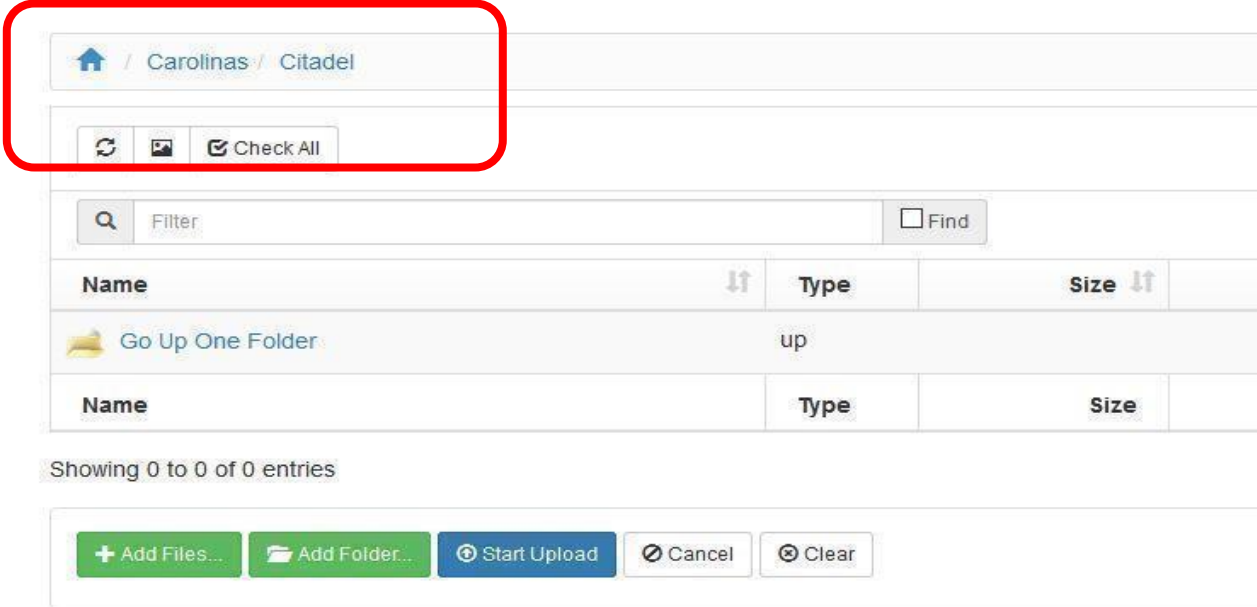


If you accidentally open the wrong folder, you can “back up” by clicking the **Go Up One Folder** folder and navigate correctly.

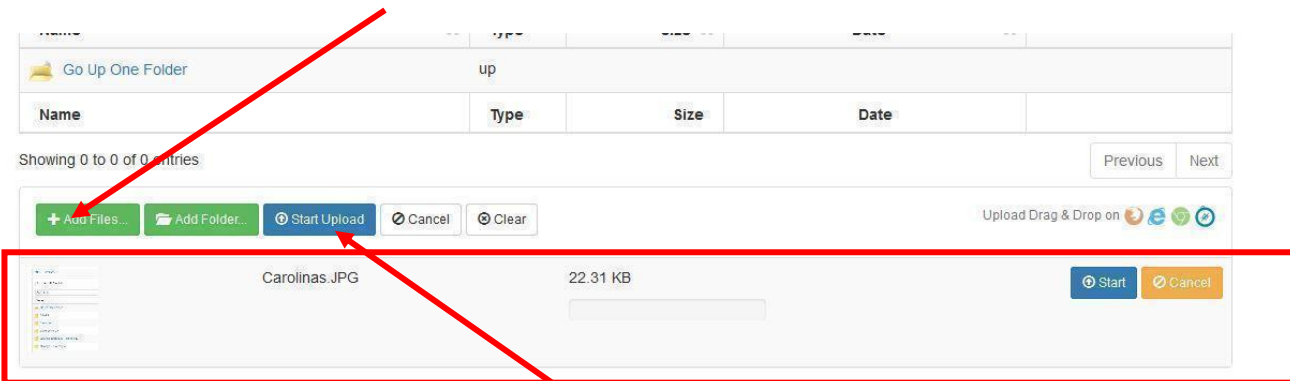
Locate the folder for your Student Chapter and click to open it. If you don't see the name of your Student Chapter, click the page navigation to move to the second or third page:



When you have opened the folder for your Student Conference and Student Chapter, double-check that you are in the correct location before you begin uploading your files (In this case, **The Citadel** – within the **Carolinas Student Conference**):

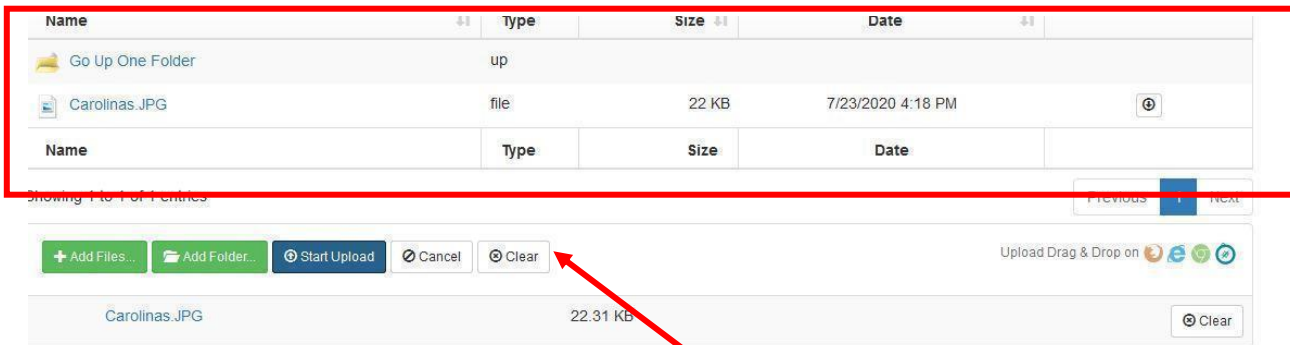


When you have confirmed that you have navigated correctly to the proper folder, you can either click the **+Add Files** button and then browse to find the files to upload or drag and drop files to the area directly below the **+Add Files** button.



The selected (or dragged and dropped) files will appear in the upload area. To upload the file into the folder, click **Start Upload**.

When the file has been successfully uploaded, the name of the file will appear under the **Go Up One Folder** folder



To clear the uploaded file from the upload area, click **Clear**.

Need help?

If you uploaded a file to the wrong folder, or want to replace an uploaded file with a corrected version, send an email to concretecanoe@asce.org and ask that the incorrect file be deleted. Include both the location (folder path) and **exact name** of the file you want deleted. (Files cannot be moved – you will have to upload the file again to the correct folder after it has been deleted).

EXHIBIT 3: Student Chapter and Participant Eligibility

The purpose for student competitions is to provide student members career-enrichment opportunities to gain hands-on, practical experience and leadership skills. Competitions are an important and special opportunity to showcase the engineering and professional skills of student teams. As such, mutual respect is required for all stakeholders, including competitors, judges, hosts, and guests. Invitations to the Student Symposia and the ASCE Student Civil Engineering Championships/Society-wide Competition Finals are a privilege, not a right. Failure to act professionally can result in sanctions, disqualifications, and loss of invitations. Please note that the requirements for eligibility for Society-wide competition finals are more stringent than the requirements for participation at the student symposia competitions.

REGISTERED PARTICIPANTS

Registered participants (for both Symposia and Society-wide Competitions) shall meet all the following requirements:

- a. Be an undergraduate student during the 2024/25 academic year (August 2024 to June 2025). Students do not need to be enrolled during the entire year (e.g., students graduating in December, or students not in school during the fall term but in school for the spring term.) Students that graduate during the academic year and have begun graduate studies during the same academic year are eligible to compete;
- b. Be members of an ASCE Student Organization in good standing;
- c. Be Society Student Members of ASCE. ASCE student membership numbers shall be required upon registration
- d. Have contributed to the design and construction of the concrete canoe during the current academic year.

STUDENT CHAPTER ELIGIBILITY FOR STUDENT SYMPOSIUM COMPETITIONS

The following qualifications are required of all ASCE Student Chapters to compete at the Student Symposia Competitions:

An ASCE Student Chapter must:

1. Be in good standing with ASCE:
 - a. Have paid their annual dues, as received by ASCE, **no later than the start of their Student Symposium.**
 - b. Have submitted their student chapter full Annual Report or EZ Annual Reporting Form **no later than February 1, 11:59 p.m. EST.**

STUDENT CHAPTER ELIGIBILITY FOR SOCIETY-WIDE COMPETITIONS

The following qualifications are required of all ASCE Student Chapters in order to advance to the ASCE Society-wide Competition Finals:

An ASCE Student Chapter must:

1. Be in good standing with ASCE:
 - a. Have paid their annual dues, as received by ASCE, **no later than February 1, 2025 11:59 p.m. EST**
 - b. Have submitted their student chapter's **full Annual Report, no later than February 1, 2025 11:59 p.m. EST and have received a minimum score of 25 points out of a possible 100. Student Chapters that submit an EZ annual reporting form do not qualify** to advance on to competition finals; and
2. Attend and participate in their assigned Student Symposium as shown through their school's:
 - a. On-time attendance and active participation by a member of the ASCE Student Chapter at the Student Symposium Business Meeting.

- b. Participation in the Student Symposium Paper Competition, including submission and presentation by a member of the ASCE Student Chapter. Note that any papers/presentations created for any other competition do not count as an entry into the Student Symposium Paper Competition.

Note: Invitations to Student Symposia and ASCE Student Civil Engineering Championships/Society-wide Competition Finals are a privilege, not a right. Failure to act professionally can result in letters of reprimand, mandatory behavior management plans, and loss of invitations to further competition for individual institutions and/or entire conferences.

Questions regarding eligibility should be directed to student@asce.org.

QUALIFIERS

The Society-wide competition host school has the choice of competing in the current year or deferring their entry until the following year. The Society-wide host school must compete at their respective Student Symposium competition the same year they intend to compete in the Society-wide finals.

Student Symposia competitions are required to meet certain standards. To earn an invitation to the Society-wide ASCE Concrete Canoe Competition, a student team shall qualify through participation in its assigned Student Symposium competition. There must be at least three (3) eligible ASCE Student Chapters that are official members of the Conference participating in the concrete canoe competition to constitute a qualified Student Symposium competition. In addition, the Student Symposium competition must be hosted by a school that is an official member of the Conference. Only one (1) team from any given school can compete in a Student Symposium competition.

ASCE student chapters hosting Symposia may invite Official Guest teams, which are teams from Region 10 that have an official ASCE student chapter that is not yet assigned to any Student Conference. Official Guest teams are eligible (if they meet the other requirements) to be invited to the Society-wide competition. Official Guest teams may compete in only one Student Symposium per year. ASCE Student Programs shall be notified by the Student Symposium Host School of an Official Guest team prior to the start of the Student Symposium.

Notification can be by e-mail to student@asce.org.

Conference assignments are listed in the ASCE Official Registrar at <https://www.asce.org/about-asce/official-register>, and symposium host chapters are listed at <https://www.asce.org/communities/student-members/conferences>.

ETHICS AND THE COMPETITION

According to the ASCE Code of Ethics, Canon 5, "Engineers shall build their professional reputation on the merit of their services and shall not compete unfairly with others."

In the context of this contest, "unfair competition" may include conduct such as the following:

- Failure to provide proper credit for past teams, plagiarism, or any other false statements concerning the source of material used in the contest;
- Taking other people's designs, artwork, or other creative content without permission (for an overview of Intellectual Property Laws, including Trademark and Copyright, visit <http://fairuse.stanford.edu/overview/introduction/intellectual-property-laws/>); and
- Any false or malicious statements about other teams, members, or others involved in the contest.

EXHIBIT 4: MTDS Example

This exhibit demonstrates a simple compliance review using MTDS (Material Technical Data Sheet) documents. According to the RFP, the fibers must meet the criteria specified in *Exhibit 5 - Technical Specifications for Concrete and Reinforcement*. Though this is a simple example, it can be used for all of the team’s submittals to aid the judges and C4 in verifying compliance. Should a team encounter a product data sheet that does not provide the appropriate standard, they should follow the process in section 5.6.6.



PRODUCT DATA SHEET Sika® Fibermesh®-150

MICRO-SYNTHETIC MONOFILAMENT FIBER

PRODUCT DESCRIPTION

Sika® Fibermesh®-150, micro-reinforcement system for concrete—100 percent virgin homopolymer polypropylene multifilament (monofilament) fibers with e3® patented technology containing no reprocessed olefin materials. Specifically engineered and manufactured in an ISO 9001 certified manufacturing facility. Sika® Fibermesh®-150 is designed to control plastic shrinkage and settlement cracking in concrete. Sika® Fibermesh®-150 was previously SikaFiber PPM.

USES

Sika® Fibermesh®-150 act mechanically by supporting the aggregate within the concrete with multidimensional fiber network and developing a uniform bleed system. The fiber does not affect the curing process chemically and does not absorb water. The Sika® Fibermesh®-150 can be used in all types of concrete applications to control plastic shrinkage and settlement cracking. Typical applications include:

- Slabs on ground
- Residential applications: side-walks, driveways, decks, curbs
- Precast elements,
- Overlays / toppings
- Stucco
- Shotcrete
- Roads / Pavements
- Bridge Decks

CHARACTERISTICS / ADVANTAGES

- Reduces plastic shrinkage cracking
- Reduces plastic settlement cracking
- Improves impact, shatter and abrasion resistance
- Enhances durability
- Promotes uniform bleed and reduces bleed water
- Inhibits and controls the formation of intrinsic cracking in concrete
- Increases cohesion and reduces segregation
- Reinforces against abrasion
- Reduces freeze/thaw damage

APPROVALS / STANDARDS

- Sika® Fibermesh®-150 is UL/ULc certified and approved for usage in floor-ceiling D700, D800, D900, G229, G243, G256 & G514 series designs.
- Complies with European Standard EN 14889-2:2006 Fibres for Concrete Part 2: Class Ia and carries the CE marking
- Complies with ASTM C1116/C1116M, Type III fiber reinforced concrete and therefore ASTM D7508

Product Data Sheet
Sika® Fibermesh®-150
November 2019, Version 01.01
021408021010000056

Contextual Comment: On this product data sheet, the required standard is clearly defined by the manufacturer. Highlighting the required specification, as shown, helps the reviewer, the team's client, to easily verify compliance.

EXHIBIT 5: Technical Specifications for Concrete and Reinforcement

GENERAL

Each concrete mixture developed shall comply with this section's requirements. The use of pre-packaged or pre-mixed concrete, mortar, or grout is not permitted. Bondo®, epoxy or similar materials are not permitted as materials in the concrete mix, reinforcement installation, placements or connection and shall not be in any way present in or on the canoe before, during, or after casting.

Teams shall develop a reinforcement scheme using materials that meet percent open area (POA) requirements with the total thickness of the reinforcing layers is equal to or less than 50% of the total thickness of the reinforced composite, and the reinforcing materials do not have post-manufacturer applied coatings that enhance the properties of the reinforcement.

REQUIREMENTS

Composite Thickness – the ratio of the total measured thicknesses of the primary reinforcement to the total thickness of the canoe wall or structural element at any point in the canoe shall not exceed 50%. All canoe elements, including but not limited to, the hull, ribs, gunwales, thwarts, bulkheads, etc., and the connections of structural elements to the canoe wall are subject to this rule.

Number of Concrete Mixtures – limited to a total of three (3) concrete mixture designs, while any given mixture(s) can be produced in a multitude of colors.

Primary Reinforcement – All primary reinforcement shall be covered in concrete. All materials not part of a concrete mixture or a flotation material shall be classified as reinforcing material and shall comply with the specifications outlined below.

MATERIALS

Cementitious Materials, Alternative Supplementary Cementitious Materials (ASCM), and Pozzolans

Any commercially available inorganic cementitious binder—whether hydraulic, non-hydraulic, or a combination of both—is permitted. These materials must comply with the relevant ASTM standards as indicated in the submitted MTDS documentation.

Material Specifications:

- The maximum amount of hydraulic cement (c) in any concrete mixture must not exceed 50% (by mass) of the total cementitious materials (cm) content (i.e., the c/cm ratio must be less than 0.50 for any concrete mixture).
- Hydrated lime may be used but is limited to 15% (by mass), and the combined total of hydraulic cement and hydrated lime must not exceed 50%. While hydrated lime is permitted, quicklime is not allowed in the canoe's construction.
- Any type (or combination) of hydraulic cement may be used, provided it meets the following ASTM standards:

Cementitious Materials	ASTM
<i>Hydraulic Cement (c)</i>	C150, C595, C1157, or C845
<i>Coal Ash</i>	C618 (Class C or F)
<i>Metakaolin or Calcined Clay</i>	C618 (Class N)
<i>Slag Cement</i>	C989 (Grade 80 minimum)
<i>Silica Fume</i>	C1240
<i>Hydrated Lime</i>	C207 (Type S or N) or C821
<i>Ground-Glass Pozzolan</i>	C1866
<i>Ground Pumice, Pumicite, or Volcanic Ash Natural Pozzolan</i>	C618 (Class N)

Alternative Cementitious Materials and Pozzolans: Alternative cementitious materials and pozzolans evaluated under ASTM C1709 provisions are also allowed.

Aggregates: Any natural, manufactured, or recycled aggregate is permitted, provided the proportioning meets the following requirements:

- The total aggregate volume must constitute at least 35% of the total volume of any concrete mixture, regardless of the source.

Aggregate Gradation Requirements: While no specific limits are imposed on gradation, it must be reported.

- Teams must conduct a sieve analysis and provide a particle size distribution table for each individual aggregate as received, as well as for the composite aggregate used in each mix, following ASTM C136.
- If aggregates are sieved and recombined into a specific distribution, this must be clearly stated in the report, along with the original gradation as received and the final composite aggregate from all sources.
- The particle size distribution and table must be tested and created by the team (not provided by the aggregate supplier) and included in the team's aggregate product information in their Materials Notebook.

Fibers: Fibers shall meet the requirements of ASTM C1116 and be considered as secondary reinforcement and dispersed within the concrete matrix. Other fibers may be considered if approved by the C4 prior to use.

Admixtures: Admixtures must comply with the following ASTM standards, as specified in the submitted MTDS documentation:

Admixtures	ASTM
<i>Water-Reducing & Set-Control</i>	C494
<i>Air-Entraining</i>	C260
<i>Coloring Admixture/Agents & Concrete Pigments</i>	C979
<i>Specialty Admixtures</i>	C494 (Type S)
<i>Latex Emulsions</i>	C1438

Latex Emulsions: Latex emulsions can be used in either re-dispersible powder form or as a liquid formulated for use with hydraulic cements that meet ASTM C1438 Type II requirements. They must be accounted for in mass and volume calculations during mixture proportioning to ensure proper concrete yield. While latex emulsions can be added to concrete mixtures, they cannot be used as bonding adhesives. Other bonding adhesives (ASTM C1059) are prohibited. When used, latex emulsions are limited to a solid powder or dehydrated liquid equivalent of no more than 50 lb/yd³ of concrete.

Prohibited Materials: Epoxy resins, curing agents, asphalt emulsions, or similar materials are not considered specialty admixtures and are strictly prohibited.

Solids Content: The solids content of dyes and powder admixtures must be included in the determination of total solids content. Contributions from other admixtures can be disregarded.

Curing Compounds – concrete may be cured using a liquid membrane-forming compound (ASTM C309 and/or ASTM C1315) or a C4-approved equivalent. Any curing compound applied is limited to a maximum of two coats following the manufacturer’s procedure for application and thickness.

Concrete Sealers – See section 6.6.3 for Concrete Sealers

Integrally Colored Concrete and Stains – See section 6.6.2 for concrete coloring agents, pigments, and use of concrete stains

Mesh and Grids: All materials used as primary reinforcement must have sufficient open space to allow for mechanical bonding with the concrete composite, as measured by their percent open area (POA). Solid mats or plates used for reinforcement are not allowed. Pre-impregnated (pre-preg) materials containing resins that require heat for polymerization are also prohibited. Solid mats and plates are defined as materials needing additional bonding agents or post-manufacturing perforations to prevent delamination due to insufficient open space for mechanical bonding.

The minimum percent open area (POA) of any layer of reinforcing material is 40%. The determination of the POA is obtained by the following equation:

$$POA = \frac{\sum Area_{open}}{Area_{total}} \times 100\%$$

where: $Area_{open}$ is the total open area (i.e., the area of the apertures)
 $Area_{total}$ is the total area of the reinforcement specimen

Modification and Fabrication: Teams may modify a mesh by removing strands as needed to achieve the required POA. Teams are also permitted to fabricate meshes or grids by placing (weaving, tying) materials in their “as-received” condition. Once fabricated, materials cannot be treated (e.g., by applying coatings or heat).

As-Received Condition: "As-received" refers to commercially available, off-the-shelf products directly accessible to consumers without modification by a third party. For example, fiberglass can be used in its original form, but having a third party modify it into a grid and then considering it "as-received" is not allowed.

Strands, Tendons, and Bars – are materials less than ½ inch wide used to make a reinforcement grid or used in pre- or post-tensioning. When used individually, they must meet thickness requirements but are not subject to percent open area. Grids consisting of strands, tendons, and bars are subject to thickness and percent open area requirements.

Bearing Plates and Fasteners – used for pre- or post-tensioning of tendons are permitted and are not subject to the thickness or percent open area requirements. The location of the bearing plates is limited to within 2 feet from the bow and stern sections. The thickness of any bearing plate itself is limited to ¼ inch.

EXHIBIT 6: General Guidelines for Concrete Mix Design

General Comments: This exhibit offers guidelines and tips to help teams understand how to complete the concrete mix design table accurately.

- Under the categories “Cementitious Materials,” “Aggregates,” “Fibers,” and “Admixtures,” specify the names of the constituents used. Use commercial (trade) names if they clearly identify the product.
- Provide absorption and moisture content values for aggregates, to the nearest 0.1%.
- In the “Specific Gravity” column, list the specific gravity (dimensionless) for the cementitious materials, aggregates, fibers, and water. For aggregates, include both Oven Dried (OD) and Saturated, Surface Dry (SSD) values. Two or three decimal places are sufficient.
- Report the weight of liquid admixtures in lb/gal.
- The values in these tables are provided for mathematical example purposes only.
- Do not use the mixture proportions shown as a basis for achieving the required fresh (e.g., slump, air content) and hardened (e.g., strength) concrete characteristics for the competition.
- Specific gravity values are generalized and should not be referenced for your design calculations. This document is not intended as a reference for your mix design values.

Example Reporting: The following is a step-by-step example for reporting final concrete mixture proportions and verifying their theoretical and mathematical correctness.

Ensure that the reported unit weight is measured and that the values consider the relative yield (Ry).

Proposed Mixture Proportions

Type I/II Cement	400 lb, SG = 3.15
Fly Ash (Class C)	250 lb, SG = 2.93
Blast Furnace Slag	250 lb, SG = 2.85
Fibers, Nylon	5 lb, SG = 0.92
Fibers, PVA	3 lb, SG = 1.40
w/cm ratio	0.50
Expanded Shale, aggregate	600 lbs (dry), Abs = 13%, SG _{dry} = 1.55 (ASTM C330 compliant)
Pumice, aggregate	600 lbs (dry), Abs = 17%, SG _{dry} = 1.59 (ASTM C330 compliant)
Admixtures:	6 fl oz/cwt HRWR Admixture (47% solids by weight, 8.5 lb/gal) 20 fl oz/cwt Liquid Dye (50% solids by weight, 10.0 lb/gal)
Design Unit Weight (wet)	99.55 lb/ft ³
Design Air Content	11.3%

ABSOLUTE VOLUME METHOD

The absolute volume of a given material is computed by dividing the mass of the material by its absolute density, which is the specific gravity (SG) times the density of water (62.4 lb/ft³), as shown by:

$$\text{Absolute Volume} = \text{mass} / (\text{SG} \times 62.4)$$

Example : How much volume does 400 lbs of portland cement occupy given that SG = 3.15?

$$\begin{aligned} \text{Volume}_{\text{cement}} &= \text{Mass}_{\text{cement}} / (\text{SG}_{\text{cement}} \times 62.4) \\ &= 400 / (3.15 \times 62.4) = 2.04 \text{ ft}^3 \end{aligned}$$

In a batch of concrete, the sum of the absolute volumes of cementitious materials, aggregate, fibers, water, solids from admixtures and air, gives the volume of concrete produced per batch. The above equation can be used to determine the volumes of the various constituents and populate the table.

Please note that there are several specific gravities reported for aggregate, depending on the condition that they are in, such as dry (SG_{OD}) and saturated, surface dry (SG_{SSD}). **The values are different** as one is obviously in the dry state and the other considers the water that is required to bring the aggregate to the SSD condition, and it can be shown that it is a function of absorption. For example, it can be shown that for the shale ($\text{SG}_{\text{SSD}} = 1.55$; $A = 13\%$), the SG_{OD} is 1.75.

The volume that the aggregate occupies between the conditions, however, can be shown to be the same. That is, the volume of aggregate in the OD condition determined by taking the amount of aggregate in the OD condition divided by SG_{OD} is equal to the volume of aggregate in the SSD condition as determined by taking the amount of aggregate in the SSD condition divided by SG_{SSD} .

WATER

Based on the final w/cm ratio, the amount of water is simply computed using the total amount of cementitious material in the mixture

$$\text{Water} = w/cm \times cm$$

Example: How much water is needed for 900 lbs of cm using a w/cm of 0.50?

$$\text{Water} = w/cm \times cm$$

$$\text{Water} = 0.50 \times 900 \text{ lb} = 450 \text{ lb}$$

The water that is computed from the w/cm ratio is the water that is needed to hydrate the cementitious materials (cm). It is not used to condition the aggregate to the SSD condition.

The water (w) comes from three sources – water from the aggregate (if there is “free” water then the value of this is positive; if the aggregate is drier than the SSD condition, then the value is negative), water from the admixtures, and additional batch water, and is expressed as (or a rearrangement of this equation):

$$w_{\text{batch}} = w - (w_{\text{free}} + \sum w_{\text{admx}})$$

Compute Free Water from Aggregates

With the values previously obtained for the aggregates, the total moisture content, free moisture content and the amount of moisture available, can be computed for each aggregate using the following three equations:

$$MC_{\text{total}} = \frac{W_{\text{stk}} - W_{\text{od}}}{W_{\text{od}}} \times 100\%$$

$$MC_{free} = MC_{total} - A$$

$$w_{free} = W_{OD} \times \left(\frac{MC_{free}}{100\%} \right)$$

Aggregate	W _{OD} (lb)	Abs (%)	W _{SSD} (lb)	MC _{total} (%)	MC _{free} (%)	W _{free} (lb)
Aggregate #1	600	13	678	8	-5	-30
Aggregate #2	550	17	643.50	12	-5	-27.5

Combined, the aggregates have -57.50 lb of free water

What does this mean? In this case it means that the aggregates are drier than the SSD condition. So, if you added the amount of water computed above (450 lbs to get your 0.5 w/cm ratio), the aggregate would want to soak up 57.5 lbs of it to get to the SSD condition. So, in the end, your w/cm ratio is no longer 0.5. However, we must deal with water from other sources as well. See below.

Compute Water from Admixtures

The water in the various admixtures can be found from the following equation:

$$\text{Water in admixture} = \text{dosage} \times \text{cwt of cm} \times \text{water content} \times (1 \text{ gal}/128 \text{ fl oz}) \times (\text{lbs}/\text{gal of admixture})$$

From liquid dye

$$[20 \text{ fl oz}/\text{cwt} \times 8.30 \text{ cwt}] \times [(100\% - 50\% \text{ solids})/100] \times (1 \text{ gal}/128 \text{ fl oz}) \times (10 \text{ lb}/\text{gal}) = \underline{6.48 \text{ lb}}$$

From HRWR

$$[6 \text{ fl oz}/\text{cwt} \times 8.30 \text{ cwt}] \times [(100\% - 47\% \text{ solids})/100] \times (1 \text{ gal}/128 \text{ fl oz}) \times (8.5 \text{ lb}/\text{gal}) = \underline{1.75 \text{ lb}}$$

Total water from all the admixtures is then 8.93 lb.

Compute Batch Water

We have computed water from two of the three sources – the aggregate and the admixtures. Based on this example, we ended up having no “free” water from the aggregate (if fact, you were in a deficit).

Since we know the amount of water needed to hydrate the cm (450 lb) based on the w/cm ratio chosen, the batch water can be computed by:

$$w_{batch} = W - (w_{free} + \sum w_{admx})$$

$$= 450 \text{ lbs} - (-57.5 + 10.34) = 497.16 \text{ lb}$$

The volume of water, to hydrate cm only, (SG_{water} = 1) is then

$$Volume_{water} = Mass_{water} / (62.4)$$

$$= 450 / 62.4 = 7.21 \text{ ft}^3$$

SOLIDS (from liquid admixtures)

Typically, the proportional volume of the solids included in the liquid admixture is so small in relation to the size of the batch that it can be neglected. The exclusion to this includes latex admixtures and dyes (both liquid and in powder form) which can have substantial volumes.

- For the competition, only dye solids (in the liquid medium) are to be accounted for.
- Disregard the contribution of solids from other admixtures.
- If you have a powdered admixture (i.e., it is not in a liquid medium), then use the absolute volume method as previously shown.

The solids content can be computed in a fashion like the water content from admixtures

$$\text{Solids in admixture} = \text{dosage} \times \text{cwt of cm} \times \text{solid content} \times (1 \text{ gal}/128 \text{ fl oz}) \times (\text{lb}/\text{gal of admixture})$$

Based on the weight of the admixture (in lb/gal) and the percentages of water and solids within it, one can determine the SG of the solid particles (SG of water is taken as 1.0) as follows:

- If the liquid dye is 50% water by weight, the weight of water is 6 lb (0.50 x 12 lb)
- The weight of the solids is 6 lb (in a gal of admixture).
- The volume of water is then (6 / 62.4) to obtain 0.0962 ft³.
- Solids volume is 0.0375 ft³. Note: 1 gal = 0.13368 ft³.
- The unit weight of solids is then 6 lb / 0.0375 ft³ = 160 lb/ft³ and therefore its SG is determined to be 2.56.

From liquid dye

$$[20 \text{ fl oz}/\text{cwt} \times 9 \text{ cwt}] \times [(50\% \text{ solids})/100] \times (1 \text{ gal}/128 \text{ fl oz}) \times (12 \text{ lb}/\text{gal}) = 8.44 \text{ lb}$$

From HRWR

$$[6 \text{ fl oz}/\text{cwt} \times 9 \text{ cwt}] \times [(47\% \text{ solids})/100] \times (1 \text{ gal}/128 \text{ fl oz}) \times (8.5 \text{ lb}/\text{gal}) = 1.90 \text{ lb}$$

DENSITIES, AIR CONTENT, SLUMP and RATIOS

Now that all the amounts have been determined, the respective volumes can be computed so that theoretical densities and air content can be found.

Mass of Concrete (M) – The mass of concrete is the sum of all masses of the constituents in the mixture – cm, fiber, aggregate, water and admixture solids:

$$M = Amount_{cm} + Amount_{fibers} + Amount_{aggregate} + Amount_{water} + Amount_{solids}$$

$$M = 900.00 + 8.0 + 1321.50 + 450 + 8.44 = \underline{2687.84 \text{ lb}}$$

Absolute Volume of Concrete (V) – The absolute volume of concrete is the sum of all the constituents in the mixture. This is based on zero air content. **This value has to be less than 27 ft³ (1 yd³):**

$$V = Volume_{cm} + Volume_{fibers} + Volume_{aggregate} + Volume_{water} + Volume_{solids}$$

$$V = 4.81 + 0.12 + 11.75 + 7.21 + 0.05 = \underline{23.941 \text{ ft}^3}$$

Theoretical Density (T) – is the density of concrete with no air in it and is the mass of concrete (M) divided by the absolute volume of concrete (V):

$$T = M / V$$

$$T = 2687.84 \text{ lb} / 23.91 \text{ ft}^3 = 112.27 \text{ lb/ft}^3$$

Measured, or Anticipated, Density (D) – the density of concrete obtained from cylinders, cubes, etc. in the plastic (wet) state (i.e., immediately after casting). 99.55 lb/ft³

Air Content – The air content is computed by comparing the theoretical density (no air) to the measured density (D) or using the absolute volume methods:

Air content from theoretical density:

$$Air \text{ content} = (T - D) / T \times 100$$

$$Air \text{ content} = (112.27 - 99.55) / 112.27 \times 100 = 11.3\%$$

Air content from a absolute volume method:

$$Air \text{ content} = (27 - V) / 27 \times 100$$

$$Air \text{ content} = (27 - 23.941) / 27 \times 100 = 11.3\% \text{ (check)}$$

The value of the air content should be checked using the absolute volume method (you should come up with the same answer. If you do not, then there is an error someplace).

Note: If the measured density is higher than the theoretical density, the result would be a negative air content. This is not possible.

Cement-Cementitious Materials Ratio

The c/cm ratio is a calculated value: 400 lb c / 900 lb cm = 0.444

Water-Cementitious Materials Ratio

The w/cm ratio is a calculated value: 450 lb / 900 lb cm = 0.50

Slump – measured value (in inches).

AGGREGATE PROPORTIONING

Aggregate - Concrete Ratio (Volumetric) – Per EXHIBIT 5 – Technical Specifications for Concrete and Reinforcement, “Regardless of source, the total aggregate volume shall be 30% (min.) of the total volume of any concrete mixture.”

$$Aggregate \text{ Ratio (\%)} = V_{aggregate} / 27 \times 100\%$$

$$(11.75 / 27) \times 100\% = \underline{43.5\% > 30\% \text{ (OK!)}$$

EXHIBIT 7: MTDS Summary Table Example

Note, the format can differ from the below example, as long as the minimum required information is included. See Section 5.6 for further details on the required information for the *Materials Notebook*.

Product Name	Type	Applicable Standard
CEMENTITIOUS MATERIALS AND POZZOLANS		
Cemex Type I Cement	Type I	ASTM C150
AGGREGATES		
Utelite Structural Fines	Expanded Shale	C330
FIBERS		
NYCON-PVA RECS100	PVA Fiber	C1116
ADMIXTURES		
Euclid – Pastol 5000	Water Reducer	C494 Type A & F
REINFORCING MATERIALS		
1/16" 7x7 Galvanized Aircraft Cable	Steel Tendon	n/a
CURING & SEALING COMPOUNDS		
BASF MasterKure CC 1315WB	Curing and Sealing Compound	ASTM C1315
OTHER/MISCELLANEOUS		
Closed-cell extruded polystyrene foam	Bulkhead flotation	n/a

EXHIBIT 8: Detailed Cost Estimate

GENERAL

In addition to the breakdown below, teams will have access to an example Excel file to serve as a template, located at the link provided in Section 5.0. It is expected that teams only use this template as a reference. Teams should update the template to match current market costs, their specific labor hours, and materials. For the sections below, teams shall include hours, as applicable, for each of the project sections listed below:

- Project Management
- Hull Design
- Structural Analysis
- Mix Design & Testing
- Mold Construction
- Canoe Construction
- Project Proposal Preparation
- Presentation Preparation
- Display Preparation

LABOR COSTS

Total billable Direct Labor (DL) shall be calculated using the Raw Labor Rates (RLR). Labor Hours spent on the project (HRS), and the multipliers for Direct Employee Costs (DEC), and Profit (P).

The formula for Direct Labor (DL) is as follows:

$$DL = [\Sigma(RLR*HRS)]*(DEC)*(1+P)$$

Each team shall develop a Table of Billable Direct Labor Rates for the classifications of personnel used in the project.

- **Direct Employee Costs (DEC)** are those costs associated with employee taxes, benefits, insurance, and vacation. A multiplier of 1.50 shall be used to calculate the Direct Employee Costs.
- A **Profit Multiplier (P)** of eighteen percent (18%) shall be applied to labor.

EXPENSES

Expenses (E) shall include both materials costs and other project direct expenses not specifically covered. Total expenses shall be calculated using the Materials Costs (MC), Direct Expenses (DE) and Markup (M).

The formula for Expenses (E) is as follows:

$$E = (\Sigma MC + \Sigma DE)*(1+M)$$

- **Materials Costs (MC)** shall be determined using current materials rates.
- **Direct Expenses (DE)** shall include, but are not limited to, costs of outside consultants and other direct expenses related to the fabrication of 100 canoes
- A **Markup (M)** of ten percent (10%) shall be applied to both material costs and direct expenses.

LABOR AND MATERIAL RATES

Raw Labor Rates (RLR)

Role	Rate
Principal Design Engineer	\$50/hour
Design Manager	\$45/hour
Project Construction Manager	\$40/hour
Construction Superintendent	\$40/hour
Project Design Engineer (P.E.)	\$35/hour
Quality Manager	\$35/hour
Graduate Field Engineer (EIT)	\$25/hour
Technician/Drafter	\$25/hour
Laborer/Technician	\$25/hour
Clerk/Office Admin	\$20/hour

In the situation where one person acts to serve in multiple functions, raw labor rates shall be applied according to the task being performed.

Outside Labor Costs

Role	Rate
Outside Consultants	\$200/hour

An outside consultant shall be defined as anyone contributing to the project that is not a student as previously defined.

EXHIBIT 9: Race Regulations and Safety

GENERAL

The race demonstration of canoe prototypes will consist of five types of races:

1. Women's Slalom (2 persons identifying as she/her/hers)
2. Men's Slalom (2 persons identifying as he/him/his)
3. Women's Sprint (2 persons identifying as she/her/hers)
4. Men's Sprint (2 persons identifying as he/him/his)
5. Co-ed Sprint (2 persons identifying as he/him/his and 2 persons identifying as she/her/hers)

RACE RULES

Race Commitment: Teams must make good faith efforts to start and finish all races. Should issues arise that compromise the canoe's structural integrity or paddlers' safety, teams should use sound judgment to determine the safest course of action.

Consistent Participation: The same registered individuals must participate in both the preliminary and final heats of any race.

Injury and Substitution: If a paddler is injured after the preliminary race, a substitute must replace them. The substitute must be one of the original 5 registered team members of the same gender and cannot paddle. If the required number of paddlers of the required gender cannot be provided, substitutes of another gender may be used but cannot paddle.

Safety Gear: Closed-toed water shoes are highly encouraged as a safety precaution.

Race Formats:

- **Slalom Races:** Timed single event against the clock.
- **All Other Races:** Include timed preliminaries and finals. The top five canoes advance to the grand final, and the next five advance to the petite final based on preliminary times. Points are awarded based on final race times. If finals cannot be conducted or the host school decides before the competition starts that separate finals heats will not be run, preliminary times will be used as final times.

Sprint Races:

- If a team qualifies for a final but cannot start, the team does not receive points, and their slot is given to the team with the next best preliminary sprint time.
- If a team starts a final sprint race in a canoe deemed race-worthy by the judges but does not complete the race, they receive points for finishing last in that final event.

Incomplete Events: If all race events cannot be completed (e.g., slalom races completed but sprint races not), only the scores from completed races will be counted in the overall competition score. Scores will not be adjusted to account for any races that were not held or completed.

SYMPOSIUM EVENTS

Race Setup: Depending on the number of entrants, host schools may decide to have grand and/or petite finals for the various sprint races. The host school shall inform all teams of the race setup prior to the competition.

Lane Position and Heat Assignments: Lane positions and heat assignments will be randomly selected before the competition begins and provided at on-site registration. A diagram or map of the course layout will be provided to participants. Sprint course turn direction (left/right) will be determined before the races.

Interference: If lane interference or collisions occur, paddlers must immediately STOP, hold paddles above their heads, and discontinue racing. The team captain should communicate the interference claim to the head judge.

- Affected teams may be allowed to rerun the heat after a minimum of 10 minutes, and times from the rerun will be used as the official time for the heat.
- Teams that willfully interfere with another team or fail to adhere to course boundaries resulting in interference may be disqualified.
- Teams that do not stop, raise paddles, and continue to race immediately cannot claim interference and will not be granted a rerun opportunity.

EQUIPMENT

Paddles: Single-bladed paddles are required and may be straight-bladed or bent. Spare paddles are permitted in the canoe during the race demonstration.

Seats and Mats: Seats must not exceed 20" x 20" x 20". Mats must not exceed 20" x 30" x ½" thick. Seats and mats can be used together by one paddler, or knee pads may be used.

Fixed Paddler Restraints: Straps, seatbelts, Velcro®, suction cups, or any items that attach the paddler to the canoe or interfere with safe egress are not permitted. The judges or C4 may prohibit any restraints deemed unsafe.

Slip-Resistant Materials: Non-skid tape or other slip-resistant materials are not permitted.

Spray Skirts: Post-construction devices that prevent water from entering the canoe, such as spray skirts, are not permitted.

RACE POINTS & PENALTIES

Buoy Negotiation: To successfully complete a race, the bow of the canoe must cross the finish line with the same number of paddlers (in or touching the canoe) as when the race started. Teams may swim their canoe to the finish line and receive a time only if they have navigated the final turn of the race.

Did Not Finish (DNF): If a canoe cannot complete a race but is seaworthy enough to continue, the team receives a DNF (zero points). If other circumstances arise, judges will contact C4 to determine if a DNF is applicable.

Description of Infraction	Penalty
Canoe crosses the finish line in wrong lane	30 seconds
Sprint: Turn buoy(s) not properly negotiated	DNF
Slalom: Missed buoy	30 seconds per buoy
Slalom: Bypass buoys to save time	DNF

SAFETY

Powered Rescue Boats: At least one, preferably two, powered rescue boats must be on the water during all races. If unavailable, races will not occur. The rescue boat must cover the entire perimeter of the paddling area before races begin.

Weather and Water Conditions: Races will not occur if sustained winds exceed 25 mph, wave heights exceed 1 foot, or water temperature is $\leq 35^{\circ}\text{F}$ and/or combined air and water temperatures $\leq 85^{\circ}\text{F}$. If temperatures are between 85°F and 120°F , races may proceed at the discretion of the safety director, provided there is a warming area within 200 feet of the canoe/boat loading zone with a temperature $> 75^{\circ}\text{F}$ and two powered rescue boats are present.

Lightning: If lightning is detected within 15 miles, races will be suspended until 30 minutes have elapsed since the last recorded strike.

Unsafe Entries: Any entry deemed unsafe by the judges will not be allowed to race unless corrective measures are taken. If repairs are needed, the judges may allow rescheduling for a later heat, but before the next event.

Safety Director: A safety director will oversee activities, especially near the starting and docking areas, and is responsible for stopping activities involving safety rule violations. They will also brief paddlers on hazards before and during the competition.

Paddler Safety: All paddlers must be competent swimmers and wear a US Coast Guard-approved Type I, II, or III Personal Flotation Device (life jacket) at all times during competition or practice. Wetsuit buoyancy pads are not substitutes for Coast Guard-approved life jackets.

ADDITIONAL SAFETY REFERENCES

Following are a couple references to documents from the American Canoe Association (www.americancanoe.org) for further reading and planning race day safety.

American Canoe Association. Best Practices for Paddlers and Paddlesport Programs [PDF document] URL: www.americancanoe.org/resource/resmgr/sei-educational_resources/best_practices.pdf

American Canoe Association. Cold Water Survival [PDF document]: https://www.usps.org/eddept/files/cold_water_survival_aca.pdf

EXHIBIT 10: Durability & Repairs

GENERAL

The Canoe Prototype's durability will be assessed based on its performance during competition events, transportation, and general handling. This evaluation will occur after the slalom and preliminary sprint races. Canoes will be removed from the water for durability inspection by the judges. Team captains must be present and provide any Damage/Accident Report and written permission from the Judges/C4 for any tape already applied. Unauthorized tape will incur a 25-unit deduction. Tape used for securing gunwale protective caps/coverings or additional flotation material for flotation tests is exempt. Team captains will be notified verbally of any deductions. Judges' and C4 members' decisions are final and not subject to appeal.

Judging Criteria: Judges will score each canoe from 0 to 10 for durability on the Final Product Prototype Score Card. Considerations include the frequency and severity of microcracks, structural cracks, tape repairs, seaworthiness, and damage to aesthetic elements. Damage from race collisions will not affect the durability score.

REPAIRS

During Competition: Repairs during the competition can only be made with tape. Any type of tape is allowed, but using tape for repairs will result in an automatic deduction. Tape used for securing gunwale protective caps/coverings or additional flotation material does not incur a deduction. If damage occurs due to a collision, tape repair deductions do not apply. Teams must file a Damage/Accident Report with the judges or C4 and receive written approval before applying tape. Each instance of tape application requires separate permission.

Between Competitions: If the Canoe Prototype is damaged between the Student Symposium and Society-wide Finals, teams may patch, repair, or refinish it after submitting and receiving approval for a Repair Procedures Report. For extensive damage, a Reconstruction Request must be submitted. The Repair/Reconstruction request, C4 decision, and supporting documentation must be included in Appendix C in the Project Proposal.

To request a Repair Procedures Report or Reconstruction Request, email concretecanoe@asce.org. The report or request must be completed and signed by the team captain(s) and ASCE Student Chapter Faculty Advisor, and received by the C4 within 7 business days of the damage.

The report or request must include details on the cause and extent of damage, proposed repairs (methodology, materials, and damage area), enabling the C4 to decide on approval. Repairs must use the original construction materials and methods, and reconstruction must match the original design, materials, and concrete mixture. Repairs or reconstruction cannot begin until written approval is received from the C4.

Refinishing, including sanding, minor repairs, and sealers, is considered a repair. Reapplication of letters is not considered a repair.

If damage is due to poor design or construction, the Reconstruction Request will be denied. If repairs or reconstruction are not allowed, the team must decide whether to compete with an unrepaired canoe in "good faith" or forfeit to the alternate concrete canoe team within their Student Symposium.

Teams granted permission to repair will receive a 25-unit deduction at the ASCE Student Civil Engineering Championships, and those permitted to reconstruct will receive a 50-unit deduction. The C4 reserves the right to waive these deductions on a case-by-case basis.

DAMAGE / ACCIDENT REPORT

School Name:

Canoe Name:

Date of Accident:

Location of Accident:

Type of Accident:

Collision with other canoe Paddler fell out of canoe

Collision with inanimate object Other: _____

Briefly Describe Circumstances of Accident:

Describe in Detail the Extent of Damage:

Team Captain's Signature: _____

Team Captain's Signature: _____

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Damage is due to accident outside the control of the paddlers? (Circle one) YES NO

Comments:

Deduct 25 units from Final Product _____

Do Not Deduct 25 units from Final Product _____

Head Judge _____

REPAIR PROCEDURE REPORT

School Name:

Prototype Name:

Team Captain(s):

Date of Request:

Description of Cause:

Description of Repair:

Materials used in Repair:

Description of Supporting Documentation:

Provide a list of Supporting Documentation attached to this report

C4 Disposition		
Date:		
Request to Repair Canoe:	<input type="checkbox"/> Granted	<input type="checkbox"/> Declined
Reason for Disposition:		

Filing this report does not guarantee the school will be granted permission to conduct repairs to their canoe. The ability to do so is a function of the reason for the request and the supporting documentation. Under no circumstances should a school consider a verbal disposition permission to repair their canoe. If the school is permitted to conduct repairs, that school will receive a 25-unit penalty for doing so. The maximum final product points will be reduced to 75 out of 100 units. This penalty may be waived at the discretion of the C4 on a case by case basis.

RECONSTRUCTION REQUEST

School Name:

Prototype Name:

Team Captain(s):

Date of Request:

Reason for Request:

Description of Supporting Documentation:

Provide a list of Supporting Documentation attached to this report

C4 Disposition		
Date:		
Request to Reconstruct Canoe:	<input type="checkbox"/> Granted	<input type="checkbox"/> Declined
Reason for Disposition:		

Filing this report does not guarantee the school listed above will be granted a Reconstruction Request. The ability to do so is a function of the reason for the request and the supporting documentation. Under no circumstances should a school consider a verbal disposition permission to rebuild their canoe.

If the school is permitted to reconstruct, that school will receive a 50-unit penalty for doing so. The maximum final product points will be reduced to 50 out of 100 units. This penalty may be waived at the discretion of the C4 on a case by case basis.

EXHIBIT 11: Evaluation Forms

GENERAL

The judges will fill out the scoresheets individually. The individual judges' scoresheets shall not be requested or given out during the competition. The judges will come to a consensus on the deductions applicable to each team and complete 1 deduction score sheet to be given to each team. See *Exhibit 10 - Durability & Repairs for Damage/Accident, Repair, and Reconstruction Request Forms*.

The following in this attachment include the evaluation forms to be used by the judges.

INSTRUCTIONS - DEDUCTION SCORECARDS

- 1) The Symposium/Society-wide Final Judges will reach a consensus to determine any infractions committed by a team during the competition event.
- 2) Judges will record the unit value of each deduction in the "Deduction" column. The units for these deductions are standardized and cannot deviate from the prescribed values.
- 3) The Head Judge will tally the deductions and initial the tally. During the Final Competition, a C4 member may tally the deductions in place of the Head Judge; however, the determination of infractions will remain with the judges.
- 4) The total deductions may exceed 200 units.
- 5) The Head Judge (or C4 member) will provide all team captains with forms detailing the deductions assessed against their teams. Teams with no deductions will also receive these forms to maintain transparency.
- 6) Team captains must sign the form to indicate whether they agree with the infractions and deductions or wish to revise, resubmit, or appeal any of them. Teams that wish to revise, resubmit, or appeal will be given a reasonable period to review the rules, gather supporting documentation, and submit their responses. Teams should be prepared to substantiate their revisions or appeals.
- 7) The Head Judge (or C4 member) will specify the deadline for submitting the completed and signed form.
- 8) Upon receiving the form, the judges will re-evaluate any revised or appealed infractions based on the supporting documentation and make a final decision. The Head Judge will record the final total deduction, sign the form, and inform the team captains of the decision. Once communicated, no further revisions or appeals will be accepted.
- 9) All revisions and appeals must be completed before the Awards Ceremony. The final deduction tally will be recorded on both the paper and electronic score sheets, and will be ratified by the Head Judge. The Head Judge and the C4 will finalize and ratify the scores at the Final Competition.

Members of the C4 will be on-call and are available to provide guidance, clarification, and interpretation of the rules and regulations for the judges. During the competitions, teams can request that the judges contact C4 for rule interpretation via the appropriate Revise and Resubmit or Appeal form.

Project Proposal	30% of Overall Score	
School Name: Canoe Name:	Possible Points	Score (whole numbers)
Infographic All required information presented (5 Points) Clarity of graphics, illustrations, pictures, etc (5 Points) Clear navigation of data (5 Points) Presentation enhances understanding and experience (10 Points)	25	
Preliminary Design Report (Project Management) Key Team Roles & Organization Chart (5 points) Project Scope (5 points) Health and Safety (5 points) Hull Design (10 Points) Structural Analysis (10 Points) Mix Design (10 Points) Construction (10 Points)	55	
Production Proposal Value (20 points) Sustainability (10 points) Cost Estimate (5 Points) Cost Estimate - Fee Schedule (10 Points) Improvements with Substantiating Data (10 Points) Production Schedule (11x17) (15 points)	70	
Construction Drawings & Specifications (11x17) - Clarity & Ease of Understanding	15	
Concrete Mixture Materials and Proportions General Compliance of Mixture to Proposal Specifications and completeness of Mixture Design Excel File (10 points) Correct Equation Inputs (all mixtures) (5 points)	15	
Overall Conciseness and Clarity (5 points) Presentation of Information (5 points) Overall Layout and Format (5 points) Quality of Writing (5 points)	20	
Subtotal	200	
Academic Judging – Project Proposal Total		

Technical Presentation	25% of Overall Score	
School Name: Canoe Name:	Possible Points	Score (whole numbers)
Presenters Preparation Level (10 points) Confidence/Voice Projection (6 points) Overall Demeanor (4 points)	20	
Presentation Quality of Audio/Visuals (10 points) Content (20 points) Professionalism (10 points)	40	
Judges' Questions Preparation/Expertise in Answers (20 points) Confidence Level (10 points) Conciseness of Answers (10 points)	40	
Comments: 		
Subtotal	100	
Deductions: A. Failure to observe time limit: A penalty shall be assessed when the official time exceeds 5 minutes 5 seconds (5:05). 15 units B. Sponsorship or commercialism violation: 15 units C. Less than two (2) speakers: 15 units D. Failure to adhere to live presentation format: No Presentation Points	Circle All that Apply A B C D	
Academic Judging - Technical Presentation Total		

FINAL PRODUCT PROTOTYPE SCORE CARD

Evaluation Sheet from Judge:

Enter a numeric value (whole numbers) in category and tally the total score.

	Name of School	Canoe Workmanship (25 pts max)	Exterior and Interior Finish (25 pts max)	Cross-Section Workmanship (15 pts max)	Product Display (25 pts max)	Durability (10 pts max)	Total (100 pts. max)
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
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16							
17							
18							
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21							
22							
23							
24							
25							

FINAL PRODUCT PROTOTYPE

Below is a list of descriptions, guidelines, and things to consider while judging the Final Product Prototype. Note that these are not to be considered an “all-inclusive list.” Ultimately, it is up to each individual judge to provide a score for each category and provide consistent scoring from school to school.

Canoe Workmanship – The intent of Canoe Workmanship is to evaluate the build quality of a canoe. Most items in this category are related to the construction of the canoe itself. Some things to consider include, but are not limited to:

- are there noticeable cold joints in the concrete;
- the “lumpiness” of the concrete;
- the consistency of the wall thickness;
- the consistency of concrete color(s);
- the consistency of concrete materials (i.e. are there clumps of fibers visible, are there other areas the concrete was clearly not mixed well, etc.);
- is there any cracking or micro-cracking;
- is any reinforcement mesh visible;
- if there is any concrete chipped off (either due to poor construction or mishandling of the finished canoe);
- are there any other general quality control issues

Exterior and Interior Finish – The intent of the Exterior and Interior Finish is to evaluate the post-construction processes and general aesthetics. Some things to consider include, but are not limited to:

- the smoothness of the finish;
- if there are noticeable voids/ “bug holes” in the concrete;
- the intricacy of graphics;
- how ‘clean’ the edges of the graphics are;
- the execution of various techniques used for creating the aesthetics (i.e. colored concrete, sandblasting, 3-D elements, etc.);
- evaluation of the overall theme and how it fits with the aesthetics/graphics

Cross-Section Workmanship – The intent of the Cross-Section Workmanship is to evaluate how well the cross-section represents all the processes and materials used to fabricate the canoe. Some things to consider include, but are not limited to:

- is the cross-section full scale and is the mold shown
- is the cross-section representative of the construction process actually used;
- are all the layers of concrete shown and demonstrate the concrete casting process;
- are all the materials used shown (i.e. reinforcement, mold, graphics application, sealer, etc);
- are all the processes clearly labeled;
- if applicable, are there any components highlighting new or innovative processes;
- is the entire process from start to finish easy to follow

Product Display – The intent of the Product Display is to evaluate how creatively and effectively the display showcases the overall “big picture” of the entire canoe/cross-section/table display setup while incorporating all the required display items. Some things to consider include, but are not limited to:

- how the product display is organized and is it easy to find various components;
- are all the required sample items present and of representative size;
- are the items labeled and easy to read;
- if applicable, are there any components highlighting new or innovative processes;
- if there are more than the required items on the product display, do they help to provide insight to various tests or research performed during the project;
- are the product display, cross-section, and canoe stands effectively integrating the canoe theme
- is sustainability highlighted as relevant

Durability – ‘Surviving the rigors of the competition and races’ – See section 6.7 Durability and Repairs and *Exhibit 10*.

PROJECT PROPOSAL DEDUCTION SCORE CARD

School: _____

Infraction	Deduction
	<i>(Circle those that apply)</i>
A. Use of plagiarized material	Disqualification
B. Project Proposal over specified number of pages (____ page(s)) x 10 units/page	_____ Units
C. Project Proposal/Mix Design Sheets/Materials Notebook received late (<= 7 cal. days)	30 Units
D. Project Proposal/Mix Design Sheets/Materials Notebook received late (> 7 cal. days)	No Proposal Points
E. Failure to submit a <i>Research and Development Schedule, Pre-Qualification Form, and/or Letter of Intent</i> by deadline	10 Units
F. Failure to include all required sections and elements specified in the RFP, in order	10 Units
Total Deductions (Project Proposal)	_____Units

Please provide information on the infraction(s) being applied:

Teams shall have until (day/time) _____ to either agree with the deductions listed above or to appeal and submit rationale.

FOR TEAM CAPTAINS ONLY

- We agree with the deductions applied to the Project Proposal
- We are submitting an appeal (see attached form)

Team Captain

Team Captain

FOR COMPETITION OFFICIAL USE ONLY

Upon review of the revised submission and any supporting documentation provided by the team captain:

- The deductions originally determined by the judges shall stand.
- The appeal was accepted

The total deduction for the Project Proposal is _____ Points.

Head Judge

FINAL PRODUCT PROTOTYPE DEDUCTION SCORE CARD

School: _____

Infraction	Deduction
	<i>(Circle those that apply)</i>
A. Canoe not built within current academic year; cannot race due to design or safety issues, or cannot complete preliminary sprint and endurance events	No Final Product Points
B. Use of Bondo®, epoxy, or similar materials for construction or repairs	No Final Product Points
C. Use of prohibited materials	No Final Product Points
D. Use of more than 3 concrete mixtures	No Final Product Points
E. Flotation not within 3 ft of bow and/or stern or flotation not encased in concrete	10 Units
F. Product display does not adequately show design process (7.3.1)	5 Units
G. Product display does not include all required display components (7.3.4)	5 Units
H. Flotation Test: PASS / FAIL	50 Units
Society-wide Only	
I. Reported concrete oven dry unit weight compared to measured unit weight >5 lb/ft ³	5 Units
J. Measured weight of canoe not within the max of ±10 lbs or ±5% of the reported weight	15 Units
K. School granted permission to repair / reconstruct canoe	25 / 50 Units
Revise and Resubmit Allowed	
L. Reinforcement thickness exceeds 50% of canoe thickness	No Final Product Points
M. Non-compliant or non-approved concrete mix, materials, admixtures, or finishing materials	15 Units
N. Reinforcement does not meet Percent Open Area requirements	15 Units
O. Nuisance Deduction: If Infraction L or M or N is rescinded by resubmittal	5 Units

Total Deductions (Final Product Prototype) _____ Units

Please provide information on the infraction(s) being applied:

Teams shall have until (day/time) _____ to either agree with the deductions listed above or to revise and submit or appeal with supportive documentation.

- We agree with the deductions applied to the Project Proposal
- We are submitting an appeal (see attached form)
- We wish to revise and resubmit the following deduction (*circle those that apply*): L M N

Team Captain

Team Captain

Upon review of the appeal/revised submission and any supporting documentation provided by the team captain:

- The deductions originally determined by the judges shall stand
- The appeal was accepted
- The following deductions shall be rescinded (*circle those that apply*): L M N

The total deduction for the Final Product Prototype is _____ Points.

Head Judge

FINAL PRODUCT PROTOTYPE REVISE AND RESUBMIT FORM

Instructions: Completed forms must be submitted by a Team Captain to the Head Judge. Requests will not be considered once the competition has concluded. All decisions of the judges are final.

School Name:

Team Captain(s):

We wish to revise and resubmit the following deduction (*circle those that apply*): L M N

Briefly Describe Revision Presented for Resubmission: (Continue on reverse side if more space is needed).

[Symposium Only] We formally request that the C4 member on-call be contacted in order to obtain an official interpretation regarding this matter.

Rules & Regulations Section(s) Referenced:

Team Captain's Signature: _____

Team Captain's Signature: _____

EXHIBIT 12: Pre-Competition Submittals

Pre-Qualification Form (Page 1 of X)

(school name)

We acknowledge that we have read the 2025 ASCE Society-wide Concrete Canoe Competition Request for Proposal and understand the following (initialed by 1 team captain and ASCE Faculty Advisor):

Statements of Agreement	Captain Initials	Advisor Initials
The requirements of all teams to qualify as a participant in the ASCE Student Symposium and Society-wide Competitions as outlined in Section 3.0 and <i>Exhibit 3 - Student Chapter and Participant Eligibility</i> .		
The deadline for the submission of <i>Letter of Intent, Preliminary Project Delivery Schedule and Pre-Qualification Form</i> (uploaded to ASCE server) is November 1, 2024; 5:00 p.m. Eastern.		
The deadline to submit ASCE Student Chapter Annual Reports for eligibility in Society-Wide advancement is February 1, 2025.		
The last day to submit a <i>Request for Information</i> (RFI) to the C4 is January 27, 2025.		
If the team incorporates a theme, it has been discussed (or will be discussed if not yet chosen) with the team’s Faculty Advisor about potential trademark or copyright issues.		
Teams are responsible for all information provided in this Request for Proposal, including any subsequent RFP addendums and general questions and answers posted on the ASCE Concrete Canoe Facebook Page, starting from the release date of the information. The team is responsible for the deadlines presented in this RFP including by not limited to submissions of the Project Proposal, Mix Design Sheets, and Materials Notebook for the Student Symposium Competition and the Society-Wide Finals		

Team Captain

(date)

ASCE Student Chapter Faculty Advisor

(date)

(signature)

(signature)

Pre-Qualification Form (Page 2 of X)

(school name)

In 250 words or less, provide a high-level overview of the team's Health & Safety (H&S) Program. If there is currently not one in place, what does the team envision their H&S program will entail?

In 150 words or less, provide a high-level overview of the team's current QA/QC Program. If there is currently not one in place, what does the team envision their QA/QC program will entail?

Has the team reviewed the Department and/or University safety policies regarding material research, material lab testing, construction, or other applicable areas for the project?

In 150 words or less, provide your team's perspective on the use of ChatGPT and other AI/NLP algorithms in the competition. Do you intend to use it? If so, in what areas? (Note: C4 neither encourages or discourages the use of AI/NLP algorithms, but is interested in collecting data on student usage in the competition.)

The core project team is made up of ____ number of people.