ASCE Sustainable Solutions Competition

Parks and Recreation Challenge
2021 Rules

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Section 1: Mission

The American Society of Civil Engineers (ASCE) Sustainable Solutions Competition challenges students to develop a stronger understanding of sustainability and learn to incorporate sustainable solutions into everyday problems that engineers incur. Students are encouraged to be creative in their solutions and use all resources available.

Section 2: Problem Statement

As the COVID-19 Pandemic continues to impact the globe, the need for outdoor, socially-distant activities continues to grow. ASCE's 2021 Sustainable Solutions Competition asks teams to design an outdoor recreation area that educates users on sustainable construction and allows for a variety of socially-distant activities in an outdoor setting.

The fictional ASCE University is redeveloping a section of its campus and is making a request for proposals for a conceptual site design. The design should accommodate existing site conditions while facilitating campus commuters (walking and biking), accounting for proper drainage, encouraging social distancing practices, and showcasing sustainable features. Design teams will participate in an interview with the ASCE University Planning Council and create a poster to facilitate public outreach. Though not located at their home campus, the overall site design should reflect the unique character of the proposing team's school.

Client Requests:

1. Site design strives to meet Envision standards.
2. 20% of the site area should be designed specifically for engaging in socially-distanced group activities.
3. The existing sidewalk on the south end of the site needs to connect to those on the north end allowing students to walk and/or bike to class.
4. All stormwater runoff generated by the design storm must be contained within the site boundaries.

The rules are intended to simulate a request for proposal that responds to a real-world challenge. The sustainability goals for the competition are an integral part of these rules. The purpose of this rules document is to provide students with intentionally general guidelines and encourage teams to rely heavily on their engineering judgment and creativity. Each section in these rules is intended to guide the student teams in the development of their proposal submission. Student teams should read these rules thoroughly and seek clarifications as necessary.

This document is also available on the ASCE Student Conferences page of the ASCE Website.

Section 3: Eligibility

Only one entry per student chapter may compete in the competition and may compete in only one ASCE student conference. The teams shall consist of undergraduate students enrolled during all or part of the current competition academic year. Graduate students may serve as advisors. Each team must have at least one captain. Students must be members of an ASCE Student Chapter in good standing and be Society Student Members of ASCE. Conference assignments are listed in the ASCE Official Register, and student conference hosts are listed here.

3.1 Levels of Competition

There are two levels of competition: ASCE annual student conferences and a Society-wide Finals level. The Society-wide Finals level will be conducted at a common location in conjunction with other Society-wide Finals student competitions. Winning teams from the student conferences may be invited to a Society Wide Finals event. To advance to Society-wide competition, teams must meet ASCE eligibility standards.

The student conference host student chapter shall promptly submit the completed official scoring spreadsheet for the conference competition to Student@ASCE.Org. Teams will not be invited to Society Wide Finals event until this spreadsheet is received and eligibility is confirmed.

3.2 Awards and Recognition

The winners of the Society-wide Finals Sustainable Solutions Competition shall be determined by compiling a team's total number of points. ASCE shall award $3,000 in cash prizes to the Society-wide Finals winning teams' ASCE Student Chapter. To be eligible to receive a prize, the entrant school must be a recognized ASCE Student Chapter in good standing.

Total prizes shall be distributed as follows:

- 1st place overall winner: $1,500 and trophy
- 2nd place overall winner: $1,000 and trophy
- 3rd place overall winner: $500 and trophy

Section 4: Ethics

This competition is to be conducted in the highest ethical standard. Students are referred to ASCE's Code of Ethics, which sets the standards of professional practice by all members of the Society. 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:

- 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 this website).
- Any false or malicious statements about other teams, members, or others involved in the competition.

Section 5: Safety

Safety is the highest priority and risk of personal injury will not be tolerated. Judges and student conference hosts are empowered to prohibit any activity which is deemed to be hazardous. Teams are required to follow the latest guidance and restrictions provided by Centers for Disease Control and Preventions (CDC), their school, and/or student conference host.

Section 6: Judging

The student conference host shall recruit judges. Three to five judges are recommended. The judging panel shall include educators and professionals and have at least one member experienced in site design and well-versed in sustainability. Local support for the Sustainable Solutions Competition is an essential element for the ongoing development of the contest and the development of an innovative community.

Student conference hosts shall provide access to the online submissions for judges at least two weeks prior to the competition. Judges will be expected to conduct an initial review of the submitted content and be prepared to complete all scoring within the time provided during the contest. Judges have authority over conduct of the competition as well as interpretation of the rules. The student conference host will ensure all judges are fully informed of the rules and procedures and are fully equipped to complete their tasks. Judges should consider the innovative nature and completeness of the presentation of the ideas.

Section 7: Request for Information (RFI)

Requests for information (RFI) should be sent to Student@ASCE.org with the subject line "**SSC RFI**". Clarifications will be posted on the Sustainable Solutions Competition Collaborate Site every other Friday starting October 9, 2020 until February 12, 2021. Each post will address the questions received from the previous two weeks through the Wednesday before 11:59 PM Eastern Time.

Section 8: Competition Components

The competition is divided into three major components and scoring of each are:

- Sustainability (40%)
- Design Proposal (35%)
- Interview (25%)

Descriptions of each component and what judges will score for each are in the following sections.

Section 9: Sustainability

9.1 Envision Checklist

Teams will use the ASCE Envision Checklist (Appendix A) to guide them in the development of the site design. The Envision categories break major themes of sustainable design into action items. Each item on the checklist corresponds to a point value and will be used to calculate the design's overall sustainability score. Teams should strive to incorporate as many Envision criteria as they can. The minimum point requirement teams must meet for each category of the checklist is provided below:

Category	Minimum Point Value
Quality of Life	12
Leadership	11
Resource Allocation	15
Natural World	7
Climate	6

9.2 Envision Documentation

To document the Envision criteria incorporated into the site design, teams will complete the form in Appendix B for each item included in their self-reported evaluation. Recreate the table provided in Appendix B for each criterion used; then compile all tables into a single PDF following the order each item appears in the Envision Checklist. Teams should clearly and specifically describe how they would fulfill these Envision requirements if the project were to be approved and constructed. Teams will self-assign a point value for each item used in the Checklist. Judges will review each description to verify that the proposed design does fit the selected criterion and award points accordingly.

Section 10: Design Proposal

10.1 Public Outreach Poster

Teams must create a 24 in. x 36 in. poster intended to inform the public of the different aspects of the proposed design. The poster must be printed and will be displayed at the competition location. A plan view of the entire site should be featured prominently. On the poster, vignettes of important aspects of the site should include but are not limited to:

- Detail and cross section of stormwater retention system
- Detail and cross section of walking and biking paths
- Team organization and project management strategies
- Source of inspiration for the overall design

Posters will be scored on inclusion of the items in this section, clarity of information, and overall aesthetics.

Virtual Scenario: Poster will be presented remotely according to student conference host guidelines.

10.2 Technical Summary

A technical summary must be submitted by each team. This technical summary must include the following:

1. Executive Summary (1 page maximum)
2. Project Management Plan (2 page maximum)
3. Design Calculations
4. Cost Estimate

Technical Summaries must be written in English with at least 11 point size font. Margins must be at least 0.50 in. on all sides. Submissions must have a cover page that includes the team's school name, team member names, and member grade levels. This document must be submitted as a PDF at least two weeks before the competition. Deadlines are determined and distributed by the student conference host. Technical summaries will be scored on the inclusion of all items in this section, thoroughness of design considerations, and justification of design decisions.

10.3 Executive Summary

The executive summary should include the overall design process and choices made to determine the final design. This document should include methodologies and analysis used during the project.

10.4 Project Management Plan

The project management plan should showcase how the design project is executed, monitored, and controlled. This should also include the team members, their contributions, and how success on the project is measured. Visual aids may be used.

10.5 Design Calculations

Following the Executive Summary and Project Management Plan, teams must include all of the design calculations used to complete the project. These must be clearly labeled and may be represented as typed or hand-written legibly and scanned.

10.6 Cost Estimate

Teams will calculate a total construction cost estimate for the proposed design. Unit prices should be investigated and based on general standards and guidelines local to each team. A reference for each line item cost is required. Teams must include a PDF version of Appendix E, Cost Estimate Template, with the submission of the Technical Summary. Teams are encouraged to seek out guidance from their local practitioners to determine the appropriate sources of cost information in the region. Cost estimates must be in US dollars ($) and will be scored on completeness and thoroughness of source research.

Section 11: Interview

11.1 Presentation

A presentation not to exceed seven minutes shall be required for each participating team. All presentations shall be conducted in a professional manner (defined as a presentation that a professional engineer would give to a prospective client or community group). Oral presentations shall be presented in English. The presentation order of the teams shall be randomly selected before the competition begins and shall be provided no later than the beginning of the conference. All presentations will be stopped at the seven-minute mark, regardless of where the team stands in the presentation. Immediately following the presentation, judges will be given five minutes to ask questions to the presentation team. Teams can have a minimum of three and a maximum of five presenters. Teams will be scored on presentation skills, quality and integration of the 3D site walkthrough, and responses to judges' questions.

Virtual Scenario: Interview will be presented remotely according to student conference host guidelines.

11.2 3D Site Walkthrough

As part of the presentation, teams are required to include a video showing a walkthrough generated from a 3D model of their site. Videos can be up to two minutes in length. At a minimum, videos should include:

- A bird's eye view of the entire site
- A first person view from at least 4 different locations of interest on the site

Models must be created using a version of Trimble SketchUp: 3D Modeling Software. Free versions of this software are available.

Section 12: Submittals

Prior to the competition, teams will submit the following materials per instructions provided by the student conference host:

1. Technical Summary (PDF)
2. Envision Checklist Documentation (PDF)
3. Public Outreach Poster (PDF)

During the competition, teams will present to judges the:

1. Public Outreach Poster
2. Interview Presentation (including 3D Site Walkthrough)

Section 13: Site Constraints

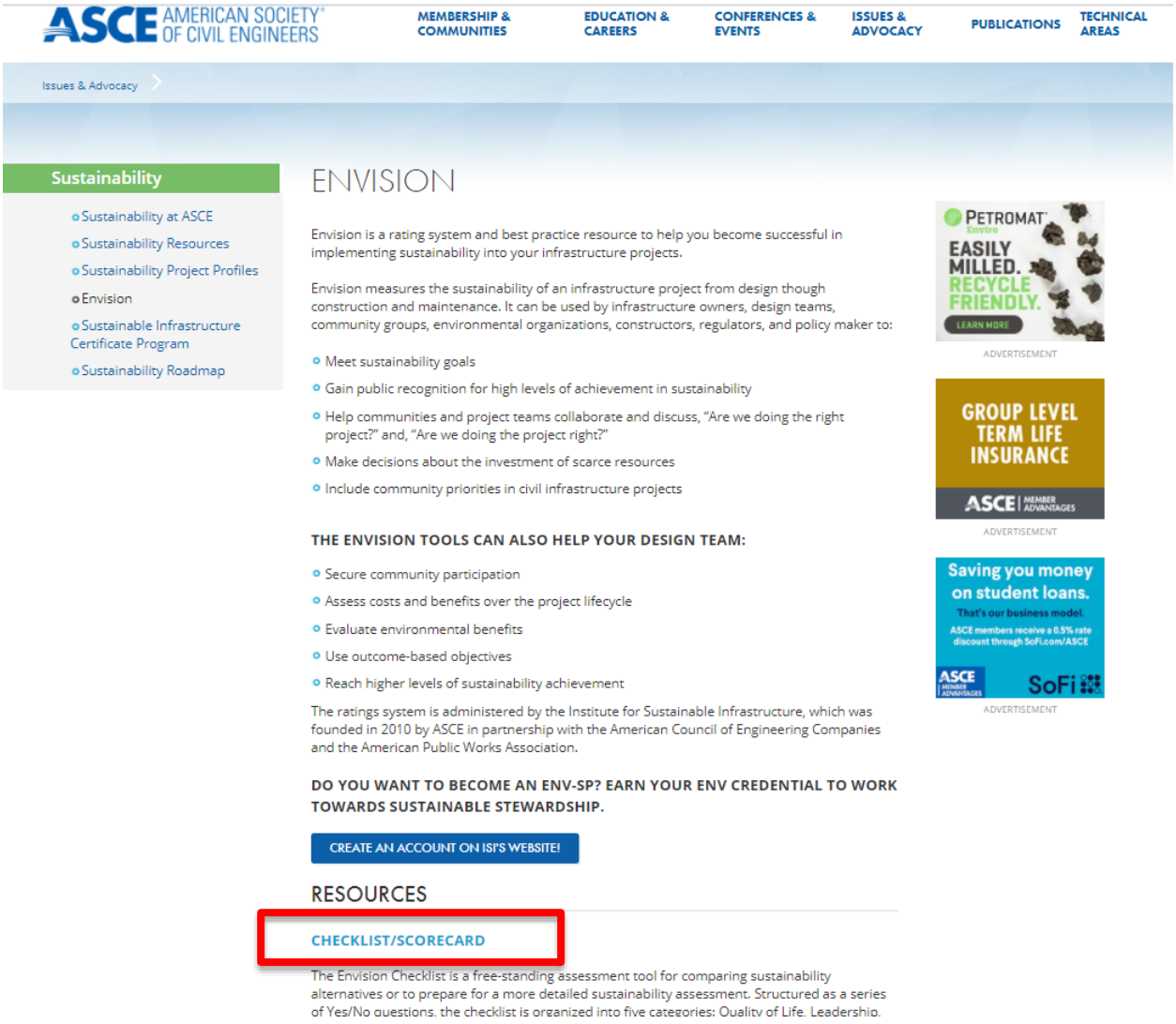
The existing site conditions are reflected in the Site Plan View (Appendix C) and Existing Conditions Report (Appendix D). The parameters provided are intended to be general and provide students with a starting point for their design. Students are expected to use their engineering judgment to make reasonable assumptions for any additional parameters. Additional site parameters will not be provided by the Rules Committee and should not be requested via RFI's. Students have the latitude and are highly encouraged to make informed, reasonable assumptions in the development of their designs.

Section 14: Student Conference Host Information

The student conference host will facilitate submissions and communication with judges prior to the competition date. The student conference host will also coordinate presentations (whether in person or virtual).

Appendix A: Envision Checklist

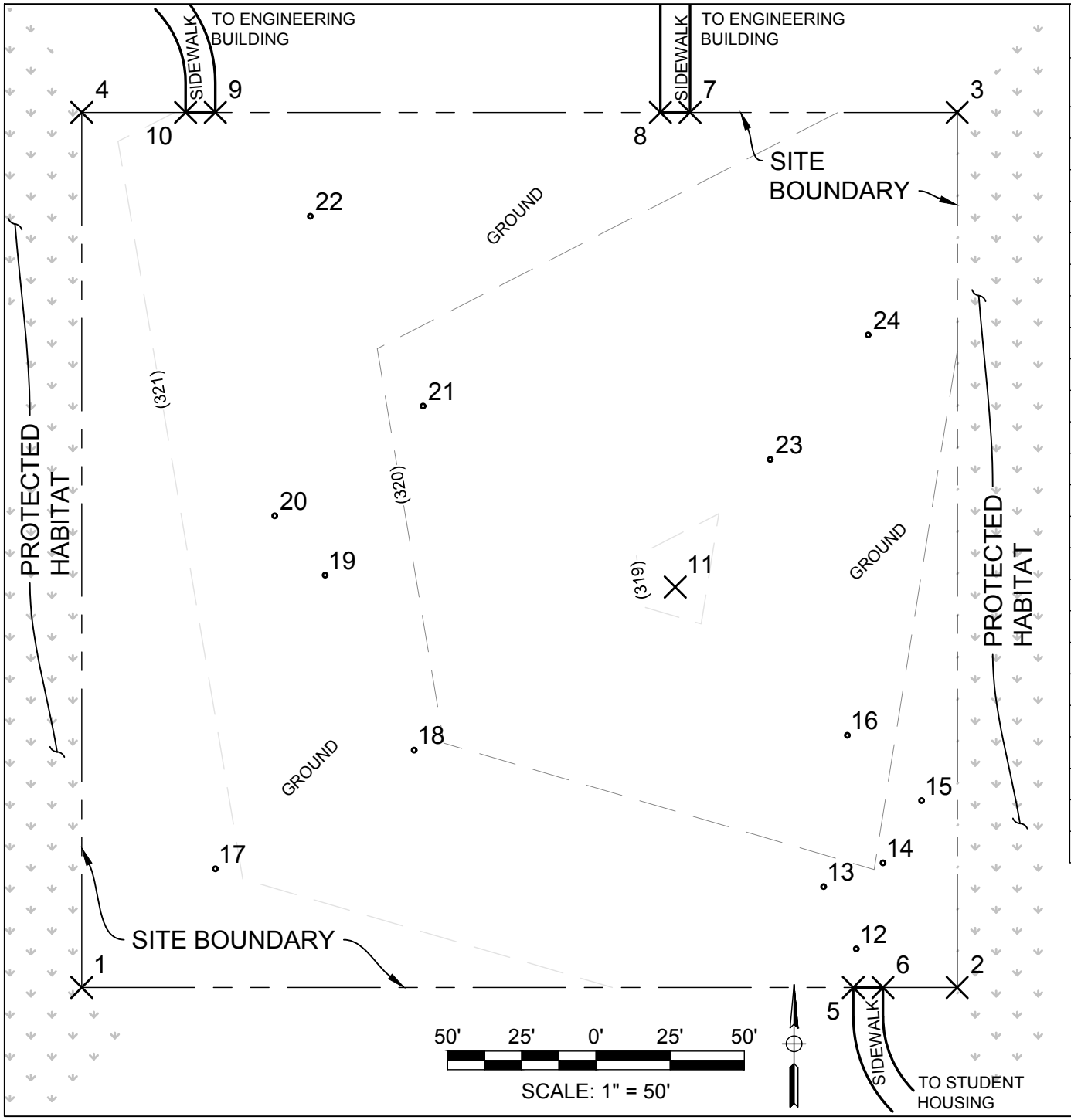
Download the Envision Checklist/Scorecard from the [ASCE Envision website] under the "Resources" heading. The checklist is also available for direct download [here].



Appendix B: Envision Criteria Documentation Example

Identification Number	Category	Subcategory	Criterion	Self-Reported Point Value	Maximum Point Value
QL1.1	*Quality of Life*	*Purpose*	*Improve Community Quality of Life*	*2*	*3*
Project Criterion Justification (Maximum 250 words)					
Description of how project qualifies for this Envision criterion.					

Appendix C: Site Plan View



POINT TABLE

Point #	Description	Elevation	Northing	Easting
1	BOUNDARY	321.80	1000	1000
2	BOUNDARY	320.48	1000	1295
3	BOUNDARY	319.82	1295	1295
4	BOUNDARY	321.14	1295	1000
5	SIDEWALK END	320.64	1000	1260
6	SIDEWALK END	320.59	1000	1270
7	SIDEWALK END	320.22	1295	1205
8	SIDEWALK END	320.27	1295	1195
9	SIDEWALK END	320.94	1295	1045
10	SIDEWALK END	320.98	1295	1035
11	LOW POINT	318.85	1135	1200
12	TREE #12	320.43	1013	1261
13	TREE #13	320.16	1034	1250
14	TREE #11	320.04	1042	1270
15	TREE #10	320.17	1063	1283
16	TREE #9	319.77	1085	1258
17	TREE #1	321.11	1040	1045
18	TREE #2	320.14	1080	1112
19	TREE #3	320.40	1139	1082
20	TREE #4	320.58	1159	1065
21	TREE #5	319.84	1196	1115
22	TREE #6	320.49	1260	1077
23	TREE #8	319.20	1178	1232
24	TREE #7	319.57	1220	1265

Appendix D: Existing Conditions Report

The site (approximately 2 acres) is relatively flat and covered in overgrown grass and brush. There is a low point near the center of the site as noted in Appendix C. The site is bounded on the east and west by a protected natural habitat, and on the north and south by ASCE University's campus (See Appendix C for northing and easting). The north end of the site leads to the engineering buildings, and the south end of the site connects to student housing.

There are 13 mature, 18 in. diameter trees on the site. The location of the center-point of each tree is shown in Appendix C. ASCE University requests that the proposed design preserve as many of the existing trees as is feasible. Paths, sidewalks, or other structures may not be built within 5 ft of the center of each tree. The ASCE University is subject to a local-tree protection ordinance that requires an in-kind replacement of every tree removed. The replacement must be located somewhere within the site boundaries. An environmental impact study showed that there are no protected species present.

Geotechnical reports show that the site consists of well-draining soil (i.e. USDA Group A soil). The site is considered a closed basin, and the regional standard design storm is a 24-hour 5 in. rainfall event with a rainfall intensity of 0.50 inches/hour. ASCE University does not require any sort of permitting for this project. The seasonal-high groundwater table is at elevation 310.50. The lowest elevation of the site must be at least 1 ft above the seasonal-high groundwater table. ASCE University requires that all drainage ponds on campus have 1 ft of free board above the design storm volume and have a maximum side slope of 4:1 to allow for ease of maintenance.

ASCE University has specified the following requirements for the proposed site design:

- 20% of the site area should be designed specifically for engaging in socially-distanced group activities.
- The existing sidewalk on the south end of the site needs to connect to those on the north end allowing students to walk and/or bike to class.
- All stormwater runoff generated by the design storm must be contained within the site boundaries.

Appendix E: Cost Estimate Table Template

No.	Line Item	Quantity	Unit	Cost/Unit	Total	Source
1						
2						
...						
				Total Cost		

Appendix F: Appeals

Request for Clarifications and Appeals

Instructions: Please provide completed form to head judge. Requests will not be considered once the competition has ended and a winner has been awarded. Appeals must only involve your own team.

School Name:_____

Team Captain(s):_____

Contact Information:_____

Briefly describe nature of clarification or appeal:

Head Judge Response: