



---

# **Solar Decathlon China 2018**

## **RULES V2.1**

Last Updated: 11 August 2017

---

# Contents

<b>SECTION I: DEFINITIONS.....</b>	<b>1</b>
<b>SECTION II: GENERAL RULES .....</b>	<b>5</b>
Rule 1: Authority .....	5
1-1. Chairman.....	5
1-2. Competition Manager.....	5
1-3. Rules Officials.....	5
1-4. Organizers.....	5
1-5. Staff and Volunteers.....	5
Rule 2: Administration.....	5
2-1. Precedence.....	5
2-2. Violations of Intent.....	5
2-3. Effective Date .....	5
2-4. Official Communications .....	5
2-5. Decisions on the Rules .....	6
2-6. Self-Reporting.....	6
2-7. Penalties.....	6
2-8. Protests.....	6
Rule 3: Participation.....	7
3-1. Entry .....	7
3-2. Contact Information .....	7
3-3. Safety.....	8
3-4. Conduct.....	8
3-5. Use of Likeness, Content, and Images.....	8
3-6. Withdrawals.....	8
Rule 4: Site Operation.....	9
4-1. Damage Liability.....	9
4-2. Construction Equipment.....	9
4-3. Spill Containment.....	9
4-4. Lot Conditions.....	9
4-5. Electric Vehicles.....	9
Rule 5: The Solar Envelope.....	9
5-1. Lot Size.....	9
5-2. Solar Envelope Dimensions .....	9
Rule 6: The Competition House .....	10
6-1. Competition Prototype Requirements .....	10
6-2. Structural Design Approval.....	10
6-3. Finished Area .....	11
6-4. Entrance and Exit Routes.....	11
6-5. Competition Prototype Alternates .....	11
Rule 7: Vegetation .....	11
7-1. Placement.....	11
7-2. Watering Restrictions.....	12
Rule 8: Energy.....	12
8-1. Energy Sources.....	12
8-2. Batteries.....	12
8-3. Desiccant Systems.....	12
8-4. Village Grid.....	12
8-5. Net Metering Rules .....	13
Rule 9: Liquids .....	13
9-1. Container Locations .....	13

9-2.	Water Supply.....	13
9-3.	Greywater Reuse .....	13
9-4.	Rainwater Collection.....	13
9-5.	Evaporation .....	13
9-6.	Thermal Mass.....	13
9-7.	Greywater Heat Recovery.....	13
9-8.	Water Removal.....	13
Rule 10:	The Event.....	14
10-1.	Registration .....	14
10-2.	Event Sponsor Recognition.....	14
10-3.	Team Sponsor Recognition .....	14
10-4.	Logistics.....	14
10-5.	Inspections.....	15
10-6.	Communications Materials .....	15
Rule 11:	Contest Week .....	15
11-1.	House Occupancy .....	15
11-2.	House Operators.....	15
11-3.	Late Design Changes .....	15
11-4.	Public Exhibit.....	16
11-5.	Team Uniforms.....	16
11-6.	Impound.....	16
Rule 12:	Cost.....	16
12-1.	Construction Cost.....	16
12-2.	Project Cost.....	17
<b>SECTION III: CONTEST CRITERIA .....</b>		<b>18</b>
Contest 1.	Architecture.....	19
Contest 2.	Market Appeal.....	20
Contest 3.	Engineering.....	21
Contest 4.	Communications.....	21
Contest 5.	Innovation .....	22
Contest 6.	Comfort Zone.....	23
6-1.	Temperature .....	23
6-2.	Humidity .....	23
6-3.	CO <sub>2</sub> Level.....	24
6-4.	PM2.5 Level.....	24
Contest 7.	Appliances .....	25
7-1.	Refrigerator .....	25
7-2.	Freezer.....	25
7-3.	Clothes Washer .....	25
7-4.	Clothes Drying .....	26
7-5.	Dishwasher .....	26
7-6.	Cooking.....	27
Contest 8.	Home Life.....	27
8-1.	Lighting.....	27
8-2.	Hot Water .....	27
8-3.	Home Electronics .....	28
8-4.	Dinner Party .....	28
8-5.	Movie Night.....	29
Contest 9.	Commuting.....	29
Contest 10.	Energy Performance .....	30
10-1.	Energy Balance.....	30
10-2.	Generating Capacity .....	30

<b>Appendix A</b>	<b>Event Schedules.....</b>	<b>31</b>
A-1.	Overview Event Calendar .....	31
A-2.	Contest Chronology .....	32
A-3.	Detailed Event Schedule.....	33
<b>Appendix B</b>	<b>Juried Subcontest Guidelines.....</b>	<b>34</b>
B-1.	Juror Guidelines .....	34
B-2.	Team Guidelines .....	35
B-3.	Public Exhibit Requirements .....	36
<b>Appendix C</b>	<b>Measured Subcontest Guidelines .....</b>	<b>37</b>
C-1.	Monitored Performance Subcontests .....	37
C-2.	Task Completion Subcontests.....	37
<b>Appendix D</b>	<b>Competition Deliverables .....</b>	<b>38</b>
D-1.	Team Short Description & Project Management Plan.....	38
D-2.	Schematic Design Summary.....	38
D-3.	Team Overview .....	39
D-4.	Design Development Documentation Submission .....	39
D-5.	Digital Project Representation.....	41
D-6.	Final Construction Documentation Submission .....	41
D-7.	Project Summary & Public Exhibit Materials.....	42
D-8.	Jury Deliverables .....	44
D-9.	Final Report.....	46
D-10.	Content Requirements for Solar Decathlon China Rules Compliance Check.....	46
<b>Appendix E</b>	<b>Communications Deliverables .....</b>	<b>48</b>
E-1.	Web Site .....	48
E-2.	Computer-Animated Walkthrough .....	49
E-3.	Video Walkthrough.....	50
E-4.	Scale Model .....	50
E-5.	Project Summary .....	50
E-6.	Public Exhibit Materials.....	52
E-7.	Final Report.....	52
<b>Appendix F</b>	<b>Health and Safety Plan .....</b>	<b>54</b>
F-1.	Plan Development.....	54
F-2.	Required Training.....	54
F-3.	Submission and Approval.....	54
<b>Appendix G</b>	<b>Deliverable Submission Instructions.....</b>	<b>55</b>
G-1.	Web Site URL.....	55
G-2.	PDF Requirements.....	55
G-3.	Electronic File-Naming Instructions .....	55
G-4.	Electronic File Submission Options.....	55

## **SECTION I: DEFINITIONS**

### **Assembly**

The period of time between the arrival of trucks and the beginning of the [contests](#) on the [competition](#) site

### **Chairman**

The [organizer](#) with final decision-making authority regarding all aspects of the [project](#)

### **Communications manager/officer**

The [organizer](#) responsible for the [project's](#) public outreach and communications activities

### **Communications materials**

All printed or electronic publications designed to convey information to the public

### **Competition**

All aspects of the Solar Decathlon China related to the [contests](#) and the scoring of those [contests](#)

### **Competition language**

The official language of the Solar Decathlon China 2017 competition will be English. Teams will be expected to provide guided tours and communications materials in both English and Mandarin, Chinese

### **Competition manager/officer**

The [organizer](#) responsible for writing and enforcing the [rules](#) and conducting a fair and compelling [competition](#)

### **Competition prototype**

The complete assembly of physical components installed on the competition site

### **Contest**

The Solar Decathlon China [competition](#) consists of 10 separately scored contests, each containing one or more [subcontests](#)

### **Contest official**

An individual selected by the [competition manager](#) to officiate one or more of the [contests](#); a contest official is only authorized to interpret the [rules](#) of the [contest\(s\)](#) to which he or she is assigned

### **Contest week**

The 12-day period on the [competition](#) site when some or all [contests](#) are in progress

### **Decathlete**

A [team member](#) who meets the decathlete eligibility rules that will be outlined in the file posted on the official website

### **Decision**

The [rules officials'](#) interpretation or clarification of a [rule](#)

### **Decisions on Solar Decathlon China Rules**

The compilation of all [decisions](#) made by the [rules officials](#) during the [project](#)

### **Disassembly**

The period of time between the closing of the public exhibit and the completion of [competition](#) site cleanup; rule 8-1 does not apply during disassembly

### **Event**

The activities that take place on the [competition](#) site including, but not limited to, registration, [assembly](#), inspections, [contests](#), special events, public exhibits, and [disassembly](#)

## **Event production manager/officer**

The [organizer](#) responsible for the [project's](#) special events and volunteer activities

## **Event sponsor**

An entity selected to support the Solar Decathlon China to help ensure the success of the [project](#)

## **Executive Committee**

A committee composed of NEA, DOE, China Overseas Development Association, Applied Materials and selected stakeholder representatives with overall approval and decision-making responsibility

## **Faculty advisor**

A [team member](#) who is the lead faculty member and primary representative of a participating school in the [project](#); also provides guidance to the team on an as-needed basis throughout the [project](#)

## **Grid-tie assembly**

The period of time during [assembly](#) after the house has been connected to the village grid (interconnected); rule 8-1 applies during grid-tie assembly

## **Hosting City**

The city selected to host the Solar Decathlon China competition. SD China 2017 will be held in Dezhou, Shandong Province.

## **Interconnection application**

Submitted in the project manual by the team's [electrical engineer](#), this form provides the technical details needed to determine the suitability of the team's electrical system for interconnection to the [village grid](#)

## **Juried subcontest**

A [subcontest](#) based on a [jury](#) evaluation

## **Juror**

An individual selected by the [organizers](#) to make subjective evaluations of the [projects](#)

## **Jury**

A group of [jurors](#) evaluating a specific aspect of each team's [project](#)

## **Measured subcontest**

A [subcontest](#) based on task completion or monitored performance

## **Observer**

Assigned by the [competition manager](#) to observe team activities during [contest week](#), an [observer](#) reports observed [rules](#) infractions to the [rules officials](#) and records the results of specific [contest](#) tasks, but does not provide interpretations of the Solar Decathlon China Rules

## **Organizer**

A NEA or China Overseas Development Association employee, or [observer](#) working on the [project](#) and having the authority described in rule 1-4

## **Organizing Committee**

The team composed of NEA or China Overseas Development Association employees, or observers, responsible for the implementation of the Solar Decathlon China program and having the authority described in rule 1-4

## **Project**

All activities related to Solar Decathlon China 2017 – from the issuance of the request for proposals through the closing of contracts

## **Protest resolution committee**

A group of individuals selected by the [organizers](#) to resolve team protests during the [competition](#)

## **Public exhibit**

Areas of the competition site open to the public during designated hours

## **Rule**

A principle or regulation governing conduct, action, procedure, arrangement, etc., for the duration of the [project](#)

## **Rules official**

An [organizer](#) authorized to interpret the [rules](#); the [competition manager](#) is the lead rules official

## **Safety officer**

An organizer whose primary responsibilities are to review the teams' construction documents and evaluate the teams' competition site activities for compliance with rule 3-3

## **Scored period**

Any 15-minute period beginning at 0, 15, 30, or 45 minutes after the hour, during which a particular monitored [contest](#) is in progress

## **Scorekeeper**

The individual selected by the [organizers](#) to operate the [scoring server](#) during the [competition](#)

## **Scoring server**

A server that collects data from the central data logger server; includes forms for manually entering juried and task-based measured [contest](#) results, and calculates composite scores

## **Site operations manager/officer**

The [organizer](#) responsible for all [event](#) site operations except those listed as responsibilities of the [competition manager/officer](#) and [event production manager/officer](#)

## **Solar Decathlon China Building Code**

The International Building Code (IBC) 2015 and the International Residential Code (IRC) 2015 will be applied and enforced as the design and construction standard for all competition entries. IBC and IRC will be enforced by the [Solar Decathlon China building official](#) for the protection of public health and safety during the [event](#)

## **Solar Decathlon China Building Code official**

The [rules official](#) responsible for writing, interpreting, and enforcing the [Solar Decathlon China Building Code](#)

## **Staff**

Individuals working for the [organizers](#) on the [project](#)

## **Stand-alone Assembly**

The period of time before the house has been interconnected to the village grid

## **Subcontest**

An individually scored element within a [contest](#)

## **Team crew**

A person who is integrally involved with a team's [project](#) but is unaffiliated with a participating school; contractors, volunteers, and sponsors represent team crew examples.

## **Team member**

An enrolled student, recent graduate, faculty member, or other person who is affiliated with one of the participating

schools and is integrally involved with a team's [project](#) activities; [decathletes](#), [faculty advisors](#), and involved staff from a participating school are all considered team members

### **Village grid**

The bi-directional, AC electrical network on the [competition](#) site to which each house has an individually metered connection



## SECTION II: GENERAL RULES

### *Rule 1: Authority*

#### **1-1. Chairman**

The organizer with the final decision-making authority in all aspects of the project.

#### **1-2. Competition Manager**

The competition manager is the only rules official authorized to write and modify the rules.

#### **1-3. Rules Officials**

The rules officials are the only organizers authorized to interpret the rule, revise the project schedule, change a team's score, or enforce the rules as required for the fair and efficient operation or safety of the competition.

- a. If there is any doubt or ambiguity as to the wording or intent of these rules, the decision of the rules officials shall prevail.
- b. Printed, electronic, and verbal communications from the rules officials shall be considered part of, and shall have the same validity as these rules.

#### **1-4. Organizers**

Occasionally, a rules official may not be immediately available to make an extremely time-sensitive decision. In these rare cases, organizers are authorized to revise the project schedule, change a team's score, or enforce the rules in any manner that is, in their sole judgment, required for the fair and efficient operation or safety of the competition.

#### **1-5. Staff and Volunteers**

Solar Decathlon China staff and volunteers are not authorized to revise the project schedule, change a team's score, or enforce the rules under any circumstances.

### *Rule 2: Administration*

#### **2-1. Precedence**

If there is a conflict between two or more rules, the rule having the later date takes precedence.

#### **2-2. Violations of Intent**

A violation of the intent of a rule is considered a violation of the rule itself.

#### **2-3. Effective Date**

The latest version of the Rules will be posted on the official website and dated for the year of the event represents the Rules in effect.

#### **2-4. Official Communications**

It is the team's responsibility to stay current with official project communications. Official communications between the teams and the organizers occur through, but are not limited to, one or more of the following:

- a. **The Solar Decathlon China Website:** Official communications suitable for viewing by all teams are posted on the official Solar Decathlon China website.
- b. **Competition officials' e-mail ([support@sdchina.org.cn](mailto:support@sdchina.org.cn)):** For confidential communications or the transfer of small (<5 MB), confidential files, teams may e-mail the competition manager. The content of communications sent to this email address remains confidential, unless the team grants permission to the competition manager to divulge the content of these communications to the other teams. See the exception in rule 2-5 for more information about confidentiality.

- c. **E-mail:** For expediency and to protect confidentiality, the organizers may choose to communicate with teams via team members' e-mail addresses.
- d. **Conference calls:** Teams are strongly encouraged to participate in regularly scheduled conference calls with the organizers. Invitations and instructions for participation in conference calls are provided via email.
- e. **Meetings:** Before the event, the teams and organizers have one or more in-person meetings. Notification of the date(s) and agenda(s) for this meeting(s) is made via email. During the event, a meeting is held the day before assembly begins. Meetings are also held on a daily basis throughout the event.
- f. **WeChat Group:** Official group for competition-related media sharing, conversations, frequently asked questions and fast communication between teams and organizers.
- g. **Time Zone:** For the purposes of this competition, the official time-zone is "Beijing". All times, unless stated otherwise, should be assumed to be for the "Beijing" time zone.

## 2-5. Decisions on the Rules

- a. The Decisions on the Solar Decathlon China Rules offers interpretations of the rules contained in this document, the Solar Decathlon China Rules.
- b. After the rules officials make a decision that may, in their opinion, directly or indirectly affect the strategies of all teams, the rules officials add the decision to the Decisions on the Solar Decathlon China Rules and notify the teams of the addition via email.

**Exception:** If such a notification would unfairly reveal the strategies of one or more individual teams, the organizers may, depending on the circumstances, refrain from notifying all teams of the decision.

## 2-6. Self-Reporting

Teams shall self-report obvious or suspected rules infractions that have occurred or may occur.

- a. The Solar Decathlon China Rules do not address every possible scenario that may arise during the competition. Therefore, a team considering an action that is not explicitly permitted by the rules should ask the rules officials for a decision before proceeding with the action. If the team does not ask for an official decision, it puts itself at risk of incurring a penalty.
- b. The rules officials and chairman exercise discretion when determining the penalty for a rules infraction. Rules infractions observed by rules officials, organizers, or other teams, i.e., not self-reported by the team committing the infraction, may be subject to more severe penalties than self-reported rules infractions.

## 2-7. Penalties

Teams committing rules infractions are subject to one or more of the following penalties, depending on the severity of the infraction: 1) point penalty applied to one or more contests; 2) disqualification from part, or all, of one or more subcontests; or 3) disqualification from the competition.

- a. The rules officials shall determine the severity of rules infractions and classify them as **minor** or **major**.
- b. The rules officials are authorized to apply point penalties and disqualify a team from part, or all, of one or more subcontests as a consequence of **minor** rules infractions.
- c. The rules officials shall report to the chairman all **major** rules infractions. The chairman is solely authorized to apply point penalties or disqualify a team from the competition or from part, or all, of one or more subcontests for **major** rules infractions.
- d. Disqualification from the competition requires prior notice to the team and an opportunity for the team to make an oral or written statement on its behalf.
- e. The competition officials shall notify all teams via the scoring server when a penalty has been assessed against any team. The notification shall include the identity of the team receiving the penalty; a brief description of the infraction, including its severity, i.e., minor or major; and a brief description of the penalty.

## 2-8. Protests

Official written protests may be filed by a team for any reason. A filing fee of up to 10 points may be assessed to the team filing the protest if the protest is deemed by the protest resolution committee to be frivolous.

- a. Teams are encouraged to communicate with the rules officials to resolve issues and complaints before resorting to the protest process. Protests should be filed only if a) the team and the rules officials are unable to resolve the dispute themselves; or b) the team or the rules officials are too busy to engage in discussions that may result in

resolution of the dispute without a protest.

- b. Protests shall be submitted between 8 a.m. and 6 p.m., and within 24 hours of the action being protested. The final opportunity to file a protest is 30 minutes following the conclusion of the final subcontest on the final day of contest week.

**Exception:** The results of one or more subcontests may be announced during the final awards ceremony. The results of subcontests announced during the final awards ceremony may not be protested.

- c. The protest shall be submitted to the competition manager in a sealed envelope. It shall include the name and signature of a decathlete, the date of the protest submission, an acknowledgment that a 10-point filing fee may be assessed, and a clear description of the action being protested.
- d. The protest resolution procedure follows:
- The competition manager convenes the protest resolution committee.
  - The competition manager submits the sealed envelope containing the team's written protest to the committee. Unless the competition manager is called by the committee to testify, he is not permitted to read the protest until after the protest resolution committee has submitted its written decision.
  - The committee opens the envelope and reads the protest in private. No appearance by organizers or team members is authorized during the committee's private deliberations. No right to counsel by organizers or team members is authorized.
  - The committee notifies the competition manager if it would like to call any individuals for testimony. The competition manager notifies individuals called for testimony. The committee may call the competition manager/officer for testimony.
  - Testimony is provided by individuals called by the committee.
  - The committee notifies the competition manager of its decision in writing and indicates how many points shall be assessed as a filing fee. The decision of the committee is final and no further appeals are allowed.
  - If the decision involves changes to a team's score or the assessment of a filing fee, the competition manager notifies the scorekeeper of the changes, and the scorekeeper applies the changes to the scoring server.
  - The competition manager posts a copy of the written protest and decision on the WeChat Group.

### ***Rule 3: Participation***

#### **3-1. Entry**

The project is open to colleges, universities, and other post-secondary educational institutions. Entry is determined through a proposal process. All proposals are reviewed, scored, and ranked. Subject to the quantity and quality of proposals, a limited number of teams will be selected for entry.

#### **3-2. Contact Information**

Each team shall provide contact information for the team officers listed in Table 1 and shall keep the contact information current for the duration of the project.

- If a team's internal officer titles do not exactly match those listed in Table 1, each team shall still provide the contact information for the person fulfilling each of the areas of responsibility described in the second column.
- Teams shall provide the contact information for one and only one person in each officer position; these individuals are responsible for forwarding information to any "co-officers," as necessary.
- An individual may have multiple officer titles.
- Faculty members are only eligible to fill the "faculty advisor" team officer position. Eligible decathletes must fill all other team officer positions.

**Table 1** Team officers

<b>Title</b>	<b>Responsibilities</b>
Primary student contact	Ensures that official communications from the organizers are routed to the appropriate team member(s)
Project manager	Responsible for planning and executing the project
Public relations contact	Works in conjunction with SD China's communications manager to coordinate the team's interactions

	with the media
Construction manager	Responsible for planning and executing the construction, transport, assembly, and disassembly of the house
Architecture project manager	Responsible for the architectural design effort; license not required
Project engineer	Responsible for the engineering design effort; license not required
Measured contest captain	Serves as the primary strategist and coordinator of tasks in Contests 6 through 10; is responsible for demonstrating the compliance of appliances with the SDC2017 Rules
Health & safety officer	Responsible for developing and enforcing the team's Health & Safety Plan
Fire watch captain	Responsible for the team's life safety during the event
Instrumentation contact	Collaborates with the organizers' instrumentation team and the team's construction manager to accommodate the organizer's equipment
Electrical engineer	Completes the Interconnection Application and works in conjunction with the site operations manager to interconnect the house to the micro-grid on the competition site; license not required
Faculty advisor	Serves as the lead faculty member and primary representative of a participating school in the project; also provides guidance to the team throughout the project
Sponsorship manager	Responsible for recruiting team sponsors and for ensuring that the team complies with Rule <a href="#">10-3</a>

### 3-3. Safety

Each team is responsible for the safety of its operations.

- Each team member and team crew member shall work in a safe manner at all times during the project.
- Each team shall supply all necessary personal protective equipment (PPE) and safety equipment for all of the team's workers during the project.
- During assembly and disassembly, a minimum level of PPE – hard hat (ANSI Z89.1 or equivalent, Type I, Class G or better), safety glasses with side shields (ANSI Z87.1 or equivalent), shirt with sleeves at least 3 in. (7.6 cm) long, long pants (the bottoms of the pant legs shall, at a minimum, touch the top of the boots when standing), and safety boots (ANSI Z41 PT99 or equivalent) with ankle support – shall be used by each team member and team crew member. Additional PPE or safety equipment shall be used if required for the task being performed.
- Children under the age of 18 are not permitted to be on the teams' sites during assembly and disassembly.
- Organizers may issue a stop work order at any time during the project if a hazardous condition is identified.

### 3-4. Conduct

Improper conduct or the use of alcohol or illegal substances will not be tolerated. Improper conduct may include, but is not limited to, improper language, unsportsmanlike conduct, unsafe behavior, distribution of inappropriate media, or cheating.

### 3-5. Use of Likeness, Content, and Images

Team members and crew agree to the use of their names, likenesses, content, graphics, and photos in any communications materials issued by the organizers and event sponsors.

- Content and images (graphics and photos), and any publications in which the content and images appear, may be viewable and made available to the general public via NEA's, China Overseas Development Association's, and the event sponsors' Web sites with unrestricted use.
- The organizers and event sponsors will make all reasonable efforts to credit the sources of content and images, although they may be published without credit. To ensure proper usage of and credit for images, teams should submit photos and graphics by following the instructions for submitting images located in Appendix G.

**Exception:** The deliverables status sheet will be delivered to teams via email in order to indicate which deliverables will remain confidential through the completion of the project. All other competition and contract deliverables may be made publicly available any time after their receipt by the organizers.

### 3-6. Withdrawals

Any team wishing to withdraw from the project must notify the competition manager in writing. All written withdrawals signed by a faculty advisor are final.

## ***Rule 4: Site Operation***

### **4-1. Damage Liability**

Each team is financially responsible for any damage it causes to the competition site.

### **4-2. Construction Equipment**

- a. Truck-mounted cranes, trailers, semi-trailer trucks necessary for assembly and disassembly will be provided by the organizers for on-site construction purposes. The participant teams will only have to submit requests by the end of 2016 upon notice. The organization will administer the use of the crane to guarantee its maximum efficiency, attending to the needs of each team. The participants will have to bring the auxiliary resources for the elevation and movement of the houses and their constitutive elements. They will also have to bring the components for the anchoring and supporting of their auxiliary resources.
- b. Truck-mounted cranes, trailers, semi-trailer trucks, etc., are generally limited to the gravel paths. However, under special circumstances approved by the site operations manager, trailers and semi-trailers may be driven on the Competition Site.
- c. Teams will have to respect internal circulations which will be laid out for vehicles. Only one truck per team will be permitted at a time in the Solar Village. The rest of the trucks will have to wait for the previous truck to leave the solar village.
- d. Construction Power: Construction power will be provided for each team on the competition site.

### **4-3. Spill Containment**

Water or other liquids must be released to the designated disposal areas.

### **4-4. Lot Conditions**

Up to 10 cm of vertical elevation change may exist across a lot. Design and plan accordingly.

### **4-5. Electric Vehicles**

Teams are expected to locate an electric vehicle within their solar envelopes during contest week.

- a. The vehicle must be electric. Hybrid vehicles and non-electric vehicles are not permitted.
- b. The minimum range of the electric vehicle is required to be 100 km. The maximum velocity of the electric vehicle should be no less than 100 km/hr.
- c. Movement of the vehicle on and off the competition site is prohibited one half hour prior to, one half hour after, and throughout all public exhibit periods.
- d. The competition prototype house must include the infrastructure required to charge the vehicle.
- e. Any vehicle used must be commercially available to all teams at the beginning of contest week.
- f. The vehicle must have four wheels and, at a minimum, seat two individuals side by side.
- g. The vehicle must be licensed, registered, and insured as required for operation on Dezhou, Shandong roadways.

## ***Rule 5: The Solar Envelope***

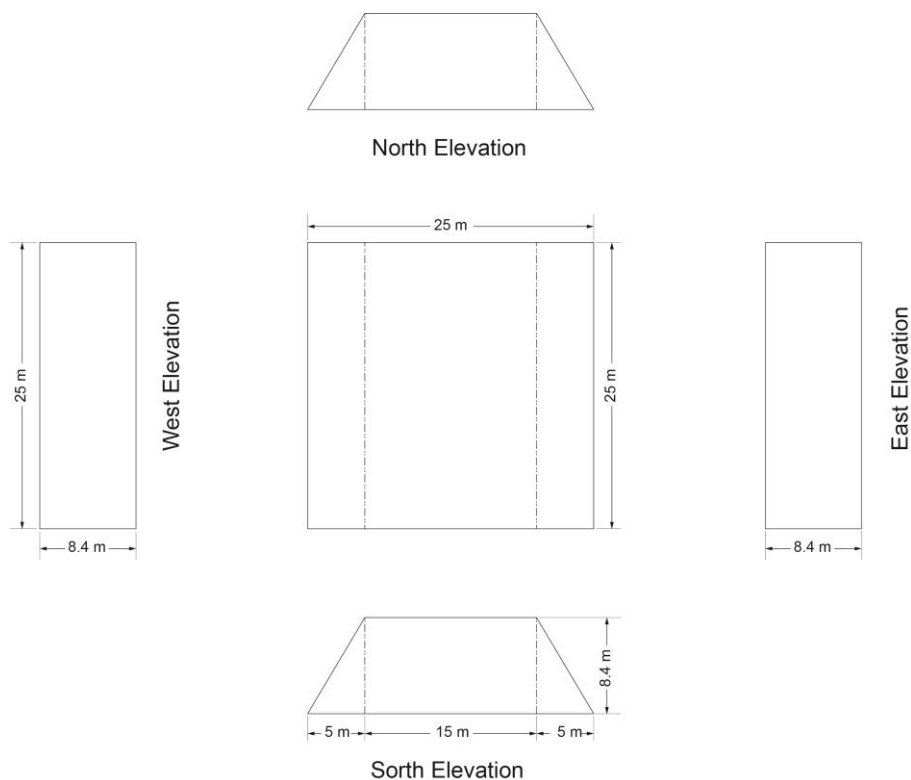
### **5-1. Lot Size**

Lots are 25 meters east to west by 25 meters north to south.

### **5-2. Solar Envelope Dimensions**

The house and all site components on a team's lot must stay within the 8.4-meter-high solar envelope, with the first story set least 0.3 meters above grade, as shown in Figure 1.

- a. The official height of a site component or set of contiguous site components is the vertical distance from the point of highest grade along the outside perimeter of the site component(s) to the highest point of the site component(s).
- b. Small weather stations, antennas, air vents, and other similar components may be specifically exempted from Rule 5-2 if all of the following conditions are met:
  - (i). The team makes a request to the competition official for an exemption.
  - (ii). The team can prove to the competition official's satisfaction that the component is not significantly restricting a neighbor's right to the sun.
  - (iii). The competition official determines that the component is sufficiently unique in function and small in size to warrant an exemption.
- c. Moveable or convertible house or site components shall not extend beyond the solar envelope during live demonstrations or in printed or electronic media presented by the team during jury visits, public exhibit hours, or contests.



**Figure 1** Solar envelope dimensions (meter)

## ***Rule 6: The Competition House***

### **6-1. Competition Prototype Requirements**

All competition entries shall be designed and built for permanent purpose. Each competition prototype must be 1-2 stories with the finished area as indicated in Rule 6-2.

- a. Residential Category: Teams may define the type of the designed residential projects to be the following two options:
 

**Option 1:** Detached Single Family house: a freestanding residential building that accommodates the dwelling of one family;

**Option 2:** An attached home (a structure that shares a common wall or walls with another unit) that accommodates one family, or one unit of a larger urban dwelling structure that accommodates the dwelling of one family.
- b. Construction: OCSDC will provide concrete building pad for teams to build the projects on site. No construction below grade is permitted on site.

### **6-2. Structural Design Approval**



Each team shall submit structural drawings and calculations that have been stamped by a qualified, licensed design professional.

- a. By stamping the structural drawings and calculations, the licensed professional certifies that the structural provisions of the Solar Decathlon China Building Code have been met by the design, and that the structure is safe for the public to enter if it has been built as designed.
- b. The licensed professional shall stamp the structural drawings and calculations of the house and all site components that might pose a threat to public safety if they fail.

### **6-3. Finished Area**

The finished area of the house shall be at least 120 m<sup>2</sup>, but shall not exceed 200 m<sup>2</sup>. SD China 2017 adopts the method of calculating the finished area as defined by ANSI Z765-2003, with special notice of the following contents from ANSI Z765-2003.

- a. Finished Area: An enclosed area in a house that is suitable for year-round use, embodying walls, floors and ceilings that are similar to the rest of the house.
- b. Porches, balconies, decks and similar areas that are not enclosed or not suitable for year-round occupancy cannot be included in the Statement of finished area but may be listed separately, measured from the exterior finished surface of the house to the outer edge of the floor surface area or exterior surface, and calculated by using the method referenced in the standard.

### **6-4. Entrance and Exit Routes**

- a. The main house entrance may be placed on any side of the house. However, an accessible route leading from the main street of the solar village to the main house entrance shall be provided.
- b. The house exit route shall lead from the main house exit to the main street of the solar village.

**Possible Exception:** Pending the approval of the site operations manager, teams on “corner lots” may modify the exit route so that it empties onto a “cross street.” Teams requesting this option shall provide an alternate site plan in the construction documents that shows an exit to the cross street. The alternate site plan will be considered if the team ends up on a corner lot. However, the location of corner lots will not be known with certainty until the beginning of assembly.

- c. Teams shall clearly illustrate and label the entrance and exit routes between solar envelope “property lines” and house entrance/exit in the construction drawings. The site operations manager will use these drawings to calculate the quantity of walkway material required by each team.

### **6-5. Competition Prototype Alternates**

Alternates to the competition prototype shall not be proposed in materials intended for consideration by the Architecture, Market Appeal, Engineering and solar application juries. It is permissible to show the competition prototype house in context in renderings, photographs, or other media. Team Web sites and public exhibit communications materials are not subject to this rule.

- a. Teams shall not propose alternates to address local building code provisions and site restrictions at the target client’s site. The juries will be instructed to assume that the Solar Decathlon China Rules and the specified Building Code also apply at the target client’s site.
- b. Public exhibit communications materials are not considered as part of the competition prototype and, therefore, shall not be shown in renderings and other graphical representations.

## ***Rule 7: Vegetation***

The use of potted vegetation is permitted.

### **7-1. Placement**

Vegetation may be moved around the lot until the beginning of contest week, after which it shall remain stationary until the conclusion of contest week unless the drawings clearly show how some or all vegetation is designed to be moved as part of an integrated system.

## 7-2. Watering Restrictions

Greywater that may possibly contain organisms that could go septic shall not be used to water vegetation.

# Rule 8: Energy

## 8-1. Energy Sources

After the conclusion of assembly and until the conclusion of the Energy Balance Contest (see Appendix A for the detailed event schedule), global solar radiation incident upon the lot and the energy in small primary batteries (see rule 8-2 for limitations) are the only sources of energy that may be consumed in the operation of the house without the requirement of subsequent energy offsets.

- All other energy sources, such as AC grid energy, consumed in the operation of the house must be offset by an equal or greater amount of energy produced, or “regenerated,” by the house.
- Fireplaces, fire pits, candles, and other devices using non-solar fuels are not permitted in the designs.

**Exception:** The limited use of batteries is permitted by Rule 8-2.

## 8-2. Batteries

Batteries include most commercially available energy storage devices, such as electrochemical batteries and capacitors. Domestic energy storage equipment may be designed and used in projects.

- The use of batteries as part of the competition prototype design is permitted. Teams who propose to use storage batteries must notify the OCSDC before the submission of Schematic Design Summary and provide specifications of the equipment. The storage batteries shall be integrated with the site grid with monitoring meters.
- The batteries must end the contest week fully charged. The batteries, and associated enclosure(s), must be compliant with the Solar Decathlon China Building Code. The team’s electric vehicle shall end the contest week with a fully charged battery.
- The use of primary (non-rechargeable) batteries (no larger than “9V” size) is limited to smoke detectors, remote controls, thermostats, alarm clock backups, and other small devices that typically use small primary batteries.
- The use of the factory-installed battery within the team’s electric vehicle is permitted. Vehicle-to-grid power flow is only permitted if vehicle-to-grid power flow and associated equipment is approved by the vehicle’s manufacturer.
- “Plug-in” (non-hard-wired) devices with small secondary (rechargeable) batteries that are designed to be recharged by the house’s electrical system (e.g., a laptop computer), shall be connected, or “plugged into,” the house’s electrical system whenever the devices are located in the house or on the house site.

**Exception:** If not used in the operation of the house at any time during contest week, portable electronic devices used for mobile communications, such as cell phones and PDAs, are permitted on site without having to be plugged into the house’s electrical system.

- Stand-alone, PV-powered devices with small secondary batteries are permitted, but the aggregate battery capacity of these devices may not exceed 10 kWh.

## 8-3. Desiccant Systems

If a desiccant system is used, it must be regenerative.

- To ensure that the desiccant has been fully regenerated by the conclusion of the Energy Balance Contest, the desiccant material or device must be easily measurable.
- In most cases, the material or device will be measured prior to and at the conclusion of the Energy Balance Contest. In some cases, a measurement at the conclusion of the Energy Balance Contest may not be necessary.
- At the conclusion of the Energy Balance Contest, the weight of the desiccant material or device shall be less than or equal to its initial weight.
- Some desiccant systems with very low moisture storage capacities may be exempt from this requirement. Exemptions will be granted on a case-by-case basis.

## 8-4. Village Grid



The organizers shall provide the village with an electric power grid that provides AC power to and accepts AC power from the houses.

- a. The organizers shall provide the necessary service conductors and connect the conductors at the utility intertie point.
- b. A team shall notify the organizers if its house operates with an AC service other than 50 Hz, 220 V.
- c. At a date and time specified in Appendix A, teams have the option to switch from stand-alone assembly to grid-tie assembly if all relevant inspections have been passed and the village grid is available. Teams shall not switch back to stand-alone assembly after switching to grid-tie assembly. At a later date and time specified in Appendix A, all teams shall have switched to grid-tie assembly.

## **8-5. Net Metering Rules**

- a. When a team switches from stand-alone assembly to grid-tie assembly, its bidirectional meter resets to zero.
- b. If the meter reading is positive (net energy production) at the start of the Energy Balance Contest, the meter is reset to zero. If the meter reading is negative (net energy consumption) at the start of the Energy Balance Contest, the meter is not reset and the team begins the Energy Balance Contest with an energy deficit.

# ***Rule 9: Liquids***

## **9-1. Container Locations**

- a. Greywater containers shall be located outside of the finished area. These containers may not be mounted to the underside of the house below the finished area.
- b. Solar storage, hot water, or other thermal storage containers may be located within the finished square area.

## **9-2. Water Supply**

Tap water (non-drinkable) and drainage access will be provided for each house on the competition site. Teams should submit application for testing water system when the house is ready during assembly phase.

## **9-3. Greywater Reuse**

A team may reuse greywater for irrigation only.

- a. Greywater reuse systems shall comply with rule 7-2.

## **9-4. Rainwater Collection**

A team may collect rainwater that falls on its site and use it in, or as, any of the following:

- a. Irrigation source
- b. Water feature
- c. Heat sink or heat source

## **9-5. Evaporation**

Water may be used for evaporation purposes.

## **9-6. Thermal Mass**

Teams may use liquids as thermal mass.

## **9-7. Greywater Heat Recovery**

Heat may be recovered from greywater as it flows from the drain to the waste tank.

- d. “Batch”-type greywater heat recovery is prohibited.

## **9-8. Water Removal**

Teams are responsible for removing remaining water from the site through drainage access of each house.

## ***Rule 10: The Event***

### **10-1. Registration**

All Solar Decathlon China event participants must register either through the online registration site, which will be available closer to the event, or on-site.

- a. The following rules apply to **all registrants**:
  - (i). Each event participant must register individually. Group registrations are not allowed.
  - (ii). Online registration is encouraged for organizers, team members and jurors, because on-site registration could cause delays in gaining event access.
  - (iii). When registering, event participants must complete all required information and forms before access to the event is allowed.
- b. **Organizers, team members, and jurors:** You will be required to provide a photo that will be kept on file and used for security purposes. We encourage you to avoid delays by using the online registration site and submitting your completed forms, information, and photos prior to the event. Once we receive all of your information, forms, and photos, you will be issued an event security ID that must be presented upon request or visible at all times. Different categories of participants require different types of access (such as to restricted areas or during restricted times).
- c. **Staff and team crew:** You are not required to submit a photo. Due to safety concerns, site access for team crew may be restricted.
- d. **Visiting media:** You will not be required to submit forms or photos, but you must check in at event headquarters. Due to safety concerns, site access for visiting media may be restricted.

### **10-2. Event Sponsor Recognition**

All communications materials produced by the teams concerning or referring to the project (including team Web sites) shall refer prominently to the project as the “Solar Decathlon China”.

- a. Teams are required to use the Solar Decathlon China logo on all communications materials visible on the competition site.
- b. The Solar Decathlon China logo is the only required graphic elements teams must use.
- c. Team Web sites shall comply with rule 10-2 with the exception of the one-third size rule for team sponsor text and logos.
- d. Team uniforms are exempt from rule 10-2. See rule 11-5 for specifics.

### **10-3. Team Sponsor Recognition**

Team sponsors may be recognized with text, logos, or both, but the text and logos must appear in conjunction with the Solar Decathlon China text and logo and be a maximum of one-third of the size of the Solar Decathlon China text and logo, as outlined in the Solar Decathlon China branding guidelines.

- a. Team Web sites shall comply with rules 10-2 and 10-3, with the exception of the one-third size rule for team sponsor text and logos.
- b. Rule 10-3 applies but is not limited to all communications materials that will be on display or distributed on the competition site.
- c. Communications materials or other products that exist largely for the recognition of sponsors are prohibited. “Other products” include but are not limited to signs, exhibits, posters, plaques, photos, wall art, and furnishings.
- d. For multimedia or audio presentations shown on the competition site, no more than 20% of the total time, 1 minute, or whichever is less may be dedicated to recognition of team sponsors.
- e. Off-the-shelf components that feature a built-in manufacturer’s logo are acceptable and need not be accompanied by the Solar Decathlon China text and logo.
- f. Team uniforms are exempt from rule 10-3. See rule 11-5 for specifics.

### **10-4. Logistics**

- a. Each team is responsible for the transport of its house, the house’s contents, and all necessary tools and equipment, and shall be responsible for any damage to or loss of such items.

- b. Each team is responsible for procuring all necessary equipment, tools, and supplies.
- c. The organizers will provide the following for each team member (number of people designated by the organizers)
  - (i). Free transportation from Dezhou Railway Station to the lodging places or hotels;
  - (ii). Free lodgings throughout the assembly, competition and disassembly periods;
  - (iii). Free food and beverages throughout the assembly, competition and disassembly periods;
  - (iv). Assistance for hotel reservation and other information

## 10-5. Inspections

Each project shall be inspected for compliance with these rules and the Specified Building Code.

- a. A team shall notify the appropriate inspector when it is ready for an inspection. When two or more teams request an inspection simultaneously, the order of inspections shall be determined in a drawing.
- b. Spot checks for compliance shall take place throughout contest week.
- c. The competition official shall check each team's inspection status, as indicated on the team's official inspection card, to determine which houses are eligible to participate in the contests. All final inspections shall be passed by the end of the inspectors' work day for a team to be eligible to participate in the following day's contests, which officially start at midnight.

**Exception:** Jury visits will proceed as scheduled regardless of a team's inspection status. However, jurors may be aware of the team's inspection status and may consider it in their evaluations.

- d. Because open, partially functioning houses are preferable to closed, fully functioning houses, the organizers will direct the inspectors to require that an unsafe condition be corrected so public visits can occur – even if, as a consequence, the house is ineligible for participation in the contests.

## 10-6. Communications Materials

All communications materials shall support the goal of Contest 4: Communications, which is to educate consumers about the project and topics relevant to the project.

# Rule 11: Contest Week

## 11-1. House Occupancy

Under normal circumstances, no more than six people may be located in the house at any one time.

- a. Toward the end of each day of contest week, the competition official shall post a message on the Solar Decathlon China Forum/ Weibo indicating the hours during which rule 11-1 is in effect the following day.
- b. Rule 11-1 is automatically suspended whenever the Comfort Zone Contest measurements are suspended. See Appendix A for the Comfort Zone Contest schedule.

**Exception:** Rule 11-1 is always in effect for a team when a jury is on the team's site.

- c. Jurors, observers, official competition photographers and writers, and others with authority to enter a house as an organizer are not counted toward the number of house occupants.
- d. Up to 10 people may be located in the house during dinner parties. At least six of the people in the house during dinner parties shall be the two decathletes from each of the three guest teams. No more than two of the remaining people in the house may be VIP guests.
- e. Rule 11-1 remains in effect when jury walkthroughs and contest tasks are occurring simultaneously, unless it has been suspended by a. or b. above.

## 11-2. House Operators

Only decathletes are permitted to operate the house and participate in the contests during contest week.

- a. All competition-related communications on the competition site shall be between the organizers and decathletes.
- b. Non-decathlete team members and team crew are not permitted to participate in or listen in on these communications.

## 11-3. Late Design Changes

The final project assembled on the competition site shall be consistent with the design and specifications presented in the as-built drawings and project manual.

- a. If there are known inconsistencies between the final project and the as-built drawings and project manual, the team is strongly encouraged to document these inconsistencies and submit the documentation to the competition official as soon as possible after the inconsistency is known. The competition official will then submit this documentation or a summary of the documented inconsistencies to the respective juries and inspectors at the appropriate time.
- b. If undocumented inconsistencies are discovered during inspections, the competition official will compile a summary of the inconsistencies and submit the summary to the respective juries at the appropriate time.

#### **11-4. Public Exhibit**

- a. Teams are required to provide an accessible route to all areas of the house and site that are available to the public during exhibit hours.
- b. Teams are permitted to produce and distribute only one informational brochure or handout at the competition site.
- c. Teams shall develop signage that complements public exhibit tours by informing visitors about the team project and engaging visitors waiting in line.
- d. Teams are prohibited from selling items to the general public on the competition site.
- e. Only organizer-approved vendors may provide food and beverage to the general public on the competition site.

#### **11-5. Team Uniforms**

- a. During contest week and special events specified by the organizers, all team members present on the competition site or the site of a special event shall wear uniforms representing their team.
- b. Team uniforms are exempt from rules 10-2 and 10-3.
- c. Team sponsor logos are approved to be visible ONLY on the back of the team uniform (jacket, shirt, hat, or other wearable item).
- d. The only information or graphics that are approved to be visible from the front of the team uniform (jacket, shirt, hat, or other wearable item) shall be the institution and its logo, the team name and logo, the Solar Decathlon China logo, and event sponsor logos.
- e. A built-in clothing manufacturer logo may be visible on the front or back of the team uniform, or both.

#### **11-6. Impound**

Each house shall be impounded on specified nights under the direct supervision of the organizers or staff. Team members and team crew shall not occupy the site during impound hours.

There is a 10-minute impound grace period on nights during which Subcontest 9-1 is active.

### ***Rule 12: Cost***

Teams will need to submit construction specifications with estimated construction costs in project manual and project budget and accounting in project summary.

#### **12-1. Construction Cost**

Teams should include construction cost report in construction specifications. It should be able to provide a residential contractor with all the information needed to generate an accurate, detailed cost estimate and to efficiently construct the building as the design team intended it to be built. The construction specifications will be provided to market appeal juries and some of the information will be made available to the public.

The construction cost report should contain construction process and itemized cost information about the house, including but not limited to: floor, wall, and roof construction; insulation; electrical and plumbing systems; HVAC system and duct work; PV system and balance of system; water heating and balance of system; windows; shading (interior and exterior); interior features such as flooring, wall, and ceiling materials and finishes, cabinets, and fixtures; appliances and electronics; lighting (interior and exterior); exterior finishes; roofing materials; and anything else a visitor to the house could see or notice.

## **12-2. Project Cost**

The cost report should provide detailed and itemized cost information about the overall Project, including, but not limited to: fund raising, sponsor solicitation, promotional, advertising, communications and outreach efforts; educational materials; labor (not volunteer labor); travel, accommodation, and travel per diem; space, tool, machinery, and other equipment purchases or rental fees; freight, delivery, and transportation charges. Teams will not be judged on the costs of their Projects.

## SECTION III: CONTEST CRITERIA

The Solar Decathlon China competition consists of 10 separately scored contests, and some contests contain one or more subcontests. For example, Contest 7: Appliances consists of six separately scored subcontests. The team with the highest total points at the end of the competition wins. Table 2 shows the competition structure.

**Table 2** Competition structure

Contest	Subcontest Number	Contest Name	Available	Subcontest Name	Available	Contest or Subcontest Type	Brief Description
1	n/a	Architecture <sup>1</sup>	100	n/a	n/a	Juried	Architecture Jury reviews and evaluates the drawings, construction specifications, audiovisual presentation, architecture narrative, and final constructed project
2	n/a	Market Appeal	100	n/a	n/a	Juried	Market Appeal Jury reviews and evaluates the drawings, construction specifications, audiovisual presentation, market appeal narrative, and final constructed project
3	n/a	Engineering	100	n/a	n/a	Juried	Engineering Jury reviews and evaluates the drawings, construction specs, energy analysis results and discussion, audiovisual presentation, engineering narrative and final constructed project
4	n/a	Communications	100	n/a	n/a	Juried	Communications Jury reviews and evaluates the team website, audiovisual presentation, communications narrative, onsite public exhibit, and public exhibit materials
5	n/a	Innovation	100	n/a	n/a	Juried	Innovation Jury reviews the drawings, construction specifications, and final constructed project to evaluate the innovativeness of the design
6	6-1	Comfort Zone	100	Temperature	40	Measured   Monitored	Keep zone temperature in 22°C to 25°C range
	6-2			Humidity	20	Measured   Monitored	Keep zone relative humidity below 60%
	6-3			CO <sub>2</sub> Level	20	Measured   Monitored	Keep zone CO <sub>2</sub> level below 1000 ppm
	6-4			PM2.5 Level	20	Measured   Monitored	Keep zone PM2.5 level below 35 µg/m <sup>3</sup>
7	7-1	Appliances	100	Refrigerator	10	Measured   Monitored	Keep refrigerator temperature in 1°C to 4°C range
	7-2			Freezer	10	Measured   Monitored	Keep freezer temperature in -30°C to -15°C range
	7-3			Clothes Washer	16	Measured   Task	Successfully wash eight loads of laundry (one load = six bath towels) during contest week
	7-4			Clothes Drying	32	Measured   Task	Return eight loads of laundry to their original weight (one load = six bath towels) during contest week
	7-5			Dishwasher	17	Measured   Task	Successfully wash five loads of dishes (one load = eight place settings) during contest week
	7-6			Cooking	15	Measured   Task	Successfully perform five cooking tasks (one task = vaporize 2 kg of water in less than 2 hours) during contest week
8	8-1	Home Life	100	Lighting	25	Measured   Task	All interior and exterior lights on at full levels at night
	8-2			Hot Water	50	Measured   Task	Successfully conduct 16 water draws during contest week (one water draw = deliver 60 L of water at average 45°C temperature within 10 minutes)
	8-3			Home Electronics	10	Measured   Task	Operate a TV and computer during specified hours
	8-4			Dinner Party	10	Measured   Task	Host two dinner parties for up to eight guests
	8-5			Movie Night	5	Measured   Task	Host neighbors to watch a movie on the home theater system
9	n/a	Commuting	100	n/a	n/a	Measured   Task	Drive an electric vehicle 40 km in no more than 1 hour, four times during contest week. The less amount of electricity consumed, the more points earned
10	10-1	Energy Performance	100	Energy Balance	80	Measured   Monitored	Produce at least as much electrical energy (kWh) as is consumed during contest week
	10-2			Generating Capacity	20	Measured   Monitored	The more electrical energy generated per unit PV area (kWh/m <sup>2</sup> ), the more points earned
TOTALS			1,000	500 total juried points and 500 total measured points from 23 individually scored contest elements			

<sup>1</sup> Lighting quality and lighting control evaluations are conducted by the Architecture, Market Appeal, and Engineering juries.

There are three ways to earn points:

- Jury evaluation
- Task completion
- Monitored performance.

Subcontests based on task completion or monitored performance are called measured subcontests; subcontests based on a jury evaluation are called juried subcontests.

Points for task completion, or measured performance, are awarded as a function of “closeness to completion”. Points for measured performance are either awarded at the end of each scored period throughout contest week or at the conclusion of contest week when performance requirements are met or partially met.

The scoring of the juried contests is more flexible than the scoring of the measured subcontests described above. However, for the sake of fairness, consistency is important. To increase the consistency of the scoring in juried contests, the jurors shall use the evaluation method described in Appendix B-1.

## ***Contest 1. Architecture***

A jury of architects shall assign an overall score for the design’s architectural conceptual coherence, merit, integration and implementation by reviewing the team’s drawings, construction specifications, audiovisual presentation, and architecture narrative (see Appendix D), and by performing an on-site evaluation of the competition prototype (see Appendix B).

The jury shall consider the following specific criteria in its evaluation:

### ***Architectural Concept and Design Approach***

- How well did the team utilize an overall clear concept, idea or ideas to guide the development of the whole design process?
- How well does the competition prototype house demonstrate overall coherence among architectural, structural, mechanical, electrical, plumbing, landscaping, and other related disciplines?
- How effectively will the overall architectural design offer a sense of inspiration and delight to Solar Decathlon China visitors?

### ***Architectural Implementation and Innovation***

- To what degree was the team effective in its use of architectural elements including, but not limited to: scale and proportion, indoor/outdoor connections, composition, and linking of various house elements?
- How effectively did the team create a holistic and integrated design, inclusive of space, structure and building envelope, that will be comfortable for occupants and compatible with the surrounding environment in the target market climate?
- How well does the team integrate both natural and electric lighting into the competition prototype? For instance, are the lighted spaces rich and varied? Do they have adequate light for tasks? Do they have good color rendition? Do the luminaires properly distribute light? Is the admission of direct and diffuse sunlight effectively controlled?
- How well does the competition prototype demonstrate quality design through material selection, well-conceived details, and architectural implementation<sup>2</sup>?
- To what extent does the competition prototype take an innovative approach to addressing residential architecture?

### ***Documentation***

- How effectively did the drawings, construction specifications, audiovisual presentation, and architecture narrative enable the jury to conduct a preliminary evaluation of the design prior to its arrival at the competition site?
- How well do the drawings, construction specifications, and audiovisual presentation accurately reflect the

---

<sup>2</sup> The jury should consider the design, detailing and implementation from the perspective of a professionally constructed house. Student-built or installed elements should be evaluated as if they were professionally built and installed.

constructed project as assembled on the competition site?

## **Contest 2. Market Appeal**

A jury of professionals from the homebuilding industry shall assign an overall score for the house's market appeal by reviewing the team's drawings, construction specifications, audiovisual presentation, and market appeal narrative (see Appendix D), and by performing an on-site evaluation of the competition prototype (see Appendix B).

The jury shall consider the following specific criteria in its evaluation of the responsiveness of the design to the characteristics and requirements of a team-defined target client (see Table 3 for examples of target client characteristics and requirements, which shall be included in the Market Appeal jury narrative and project summary).

Teams shall define their target client with a minimum level of specificity as indicated in Table 3. The target market defined for the competition prototype house must be a primary residence intended for year-round occupancy.

### **Livability**

- How well does the design offer the intended occupant(s) a safe, functional, convenient, comfortable, and enjoyable place to live?
- How appropriate is the operation of the house's lighting, entertainment, and other controls for the target client?
- How successfully does the design meet the unique needs and desires of the target client?

### **Marketability**

- How successfully does the house demonstrate exterior and interior appeal for the target client?
- How appropriate are the material, equipment, and detailing choices to the desires of the target client?
- How effectively does the team use sustainability features and strategies to make a positive contribution to the house's marketability to the target client?
- To what extent does the house offer a good value to the target client?

### **Buildability**

- How effectively do the drawings and construction specifications enable, through sufficient quality and detail, a contractor to generate an accurate, detailed construction cost estimate?
- How effectively do the drawings and construction specifications enable, through sufficient quality and detail, a contractor to construct the building as the design team intended it to be built?

### **Affordability**

- How successfully does the team manage the cost of the house according to the target client's financial capability?

**Table 3** Examples of target client characteristics and requirements

<b>Characteristic or Requirement</b>	<b>Example #1</b>	<b>Example #2</b>	<b>Example #3</b>
Location of permanent site	Minot, ND	Shenyang, China	Marseilles, France
Housing type	Remote worker housing	Unit of Multifamily	Single family
# of occupants	2	3	1
Client demographic	Working professionals	Mid-40s married couple with child	Retired individual
Client annual income	\$85,000	\$20,000 (125,000 RMB)	\$65,000
# of bedrooms	2	3	1

Notes:

1. These examples show the *minimum* required level of detail for the target client characteristics and requirements.
2. The target client characteristics and requirements shall be included in the project manual and project summary (see Appendix D).



### ***Contest 3. Engineering***

A jury of engineers shall assign an overall score for the design's engineering merit and implementation by reviewing the team's drawings, construction specifications, energy analysis, audiovisual presentation, and engineering narrative (see Appendix D), and by performing an on-site evaluation of the competition prototype (see Appendix B).

The jury shall consider the following specific criteria in its evaluation:

#### ***Innovation***

- To what extent were unique approaches used to solve engineering design challenges?
- To what extent do the proposed innovations have true market potential?
- How well does the design demonstrate market-leading technologies and engineering integration?

#### ***Functionality***

- How well do the house systems function to enhance occupant comfort and house performance?
- How well will the HVAC system as designed maintain uniform thermal comfort conditions via temperature control, humidity control, air movement, and a successful distribution system design?
- How effective is the design of the HVAC system and thermal envelope in minimizing energy use while ensuring occupant comfort, including indoor air quality?

#### ***Efficiency***

- To what extent does the team consider energy efficiency and overall system performance as part of the competition prototype design? Relative to conventional systems, how much energy is the design expected to save over the course of an entire year?
- How effectively will house controls facilitate a reduction in energy consumption during an entire year of operation?
- How effective, efficient and practical is the design in its engineering approach?

#### ***Reliability***

- How well does the design address maintenance and owner operation of house systems?
- How long are the systems expected to operate at a high level of performance?

#### ***Documentation***

- How effectively did the drawings, construction specifications, energy analysis results and discussion, and audiovisual presentation enable the jury to conduct a preliminary evaluation of the design prior to its arrival at the competition site?
- How well do the drawings, construction specifications, energy analysis results and discussion, and audiovisual presentation accurately reflect the constructed project as assembled on the competition site?

### ***Contest 4. Communications***

A jury of communications professionals will evaluate and assign an overall score for the team's communications efforts by reviewing the quality, delivery, and innovation of each team's final electronic communications, communication narrative, and audiovisual presentation (see Appendix D), and by evaluating the public exhibit materials, public exhibit, and communications summary presentation onsite (see Appendix B). The Communications Contest is designed to ensure that each team's communications materials educate the public about its project.

The jury will consider the following specific criteria:

#### ***Communications Strategy***

- How well did the team's communications deliverables work together to convey a comprehensive, consistent, and integrated communications strategy?
- How effective are the team's educational and outreach messages about the Solar Decathlon China, the team, and the competition prototype house?

#### ***Electronic Communications (team website and social media)***

- How well does the team communicate its messages to online audiences?
- How well do the website's graphical elements and information architecture support a logical, consistent, enjoyable and successful user experience?
- How well does the team employ social media to achieve comprehensive and successful communications outreach?

#### ***Public Exhibit Materials (on-site signage and handout)***

- How well do the signage and handout communicate the team's messages to visitors?
- How creative, original and informative are the team's public exhibit materials?
- How well does the team's handout align with its communications objectives as stated in the narrative?

#### ***Public Exhibit Presentation***

- How informative, interesting, engaging, and audience-appropriate was the team's comprehensive tour?
- How effective was the team at describing their approach for an informative, interesting, engaging and audience-appropriate fast tour designed to accommodate large crowds and long lines?

#### ***Audiovisual Presentation***

- How interesting and informative was the audiovisual presentation of the team's house?
- How well does the audiovisual presentation explain to viewers what they're seeing and the philosophy behind the house design?
- How effectively does the audiovisual presentation showcase the completed, constructed as-built house as presented on the competition site?

### ***Contest 5. Innovation***

A jury of industry professionals shall assign an overall score for the team's innovation in concept, approach, research, design, implementation and execution. The jury will consider the submitted deliverables (see Appendix D), and perform an on-site evaluation of the competition prototype (see Appendix B). SD China 2017 seeks innovative solutions to crucial environmental problems faced by today's Northern China such as water shortage, air pollution, and space heating. Therefore, the Innovation jury will look for any unique, creative, and effective strategies successfully addressed these issues in the design. Other innovative ideas and advanced technologies are also highly encouraged.

The jury shall consider the following specific criteria in its evaluation:

#### ***Water Usage***

- Did the design take water conservation into consideration?
- To what extent did the design discover and implement creative strategies or methods to achieve water conservation in the house?
- How effective do these novel applications function and contribute to water saving?
- To what extent will these strategies or methods increase public awareness about water conservation?
- To what extent do the proposed innovations have true market potential?

#### ***Air Quality***

- Did the design take air quality into consideration?
- To what extent did the design discover and implement creative strategies or methods to achieve air purification in the house?
- How effective can these novel applications create clean and healthy indoor air quality?
- To what extent do the proposed innovations have true market potential?

#### ***Space heating***

- Did the design take space heating into consideration?
- To what extent did the design discover and implement creative strategies or methods to achieve space heating in the house?

- How effective can these novel applications replace central heating system to satisfy the space heating requirement in winter?
- To what extent do the proposed innovations have true market potential?

#### Others

- To what extent does the design utilize innovations, or innovative approaches, to satisfy an existing market need or desire?
- To what extent does the design utilize new, unique or atypical technologies that improve upon the status-quo?
- To what extent does the team utilize holistic active and passive solutions that could impact the livability of the house or lifestyle of the occupant(s)?
- To what extent do the innovations have immediate and long-term environmental, social, cultural and commercial potential?
- To what extent does the team's approach to innovation relate to the team mission, strategies, or goals?

## Contest 6. Comfort Zone

### 6-1. Temperature

All available points are earned at the conclusion of each scored period by keeping the time-averaged interior dry-bulb temperature between 22°C and 25°C during the scored period. See Appendix A-3 for the schedule of scored periods and for the number of available points per scored period.

- Reduced points are earned if the time-averaged interior dry-bulb temperature is between 19°C and 22°C or between 25°C and 28°C. Reduced point values are scaled linearly, as shown in Figure 2.
- The zone temperature deviating farthest from the target temperature range is the zone temperature of record. The organizers will identify at least two thermal zones in each house and measure the temperature of each zone.

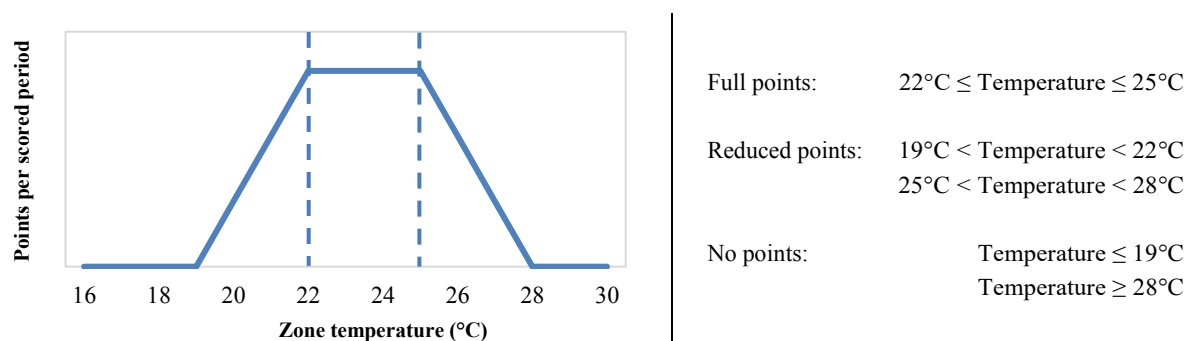
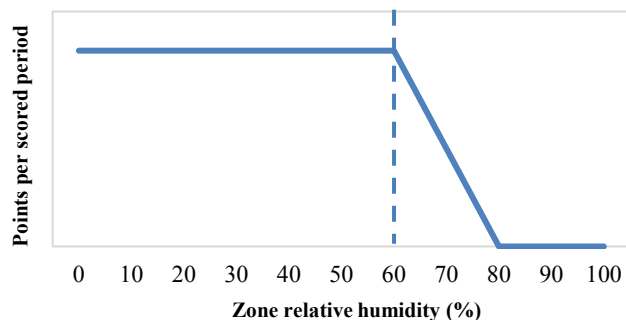


Figure 2 Scoring function for the Temperature Subcontest

### 6-2. Humidity

All available points are earned at the conclusion of each scored period by keeping the time-averaged interior relative humidity below 60.0% during the scored period. See Appendix A-3 for the schedule of scored periods and for the number of available points per scored period.

- Reduced points are earned if the time-averaged interior relative humidity is between 60.0% and 70.0%. Reduced point values are scaled linearly, as shown in Figure 3.
- In multi-zone houses, the zone humidity deviating farthest from the target humidity range is the zone humidity of record.



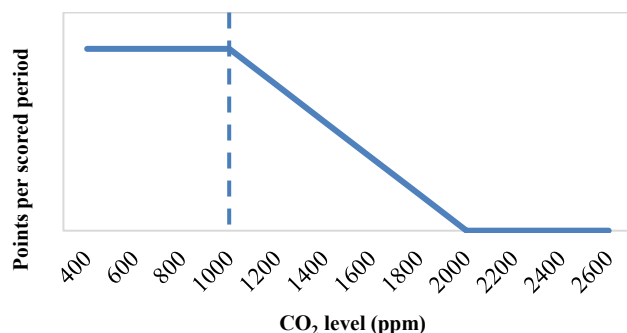
Full points: Relative humidity  $\leq 60\%$   
 Reduced points:  $60\% < \text{Relative humidity} < 70\%$   
 No points: Relative humidity  $\geq 70\%$

**Figure 3** Scoring function for the Humidity Subcontest

### 6-3. CO<sub>2</sub> Level

All available points are earned at the conclusion of each scored period by keeping the time-averaged interior CO<sub>2</sub> level below 1000 ppm during the scored period. See Appendix A-3 for the schedule of scored periods and for the number of available points per scored period.

- Reduced points are earned if the time-averaged CO<sub>2</sub> level is between 1000 ppm and 2000 ppm. Reduced point values are scaled linearly, as shown in Figure 4.
- In multi-zone houses, the zone CO<sub>2</sub> level deviating farthest from the target CO<sub>2</sub> level range is the zone CO<sub>2</sub> level of record.



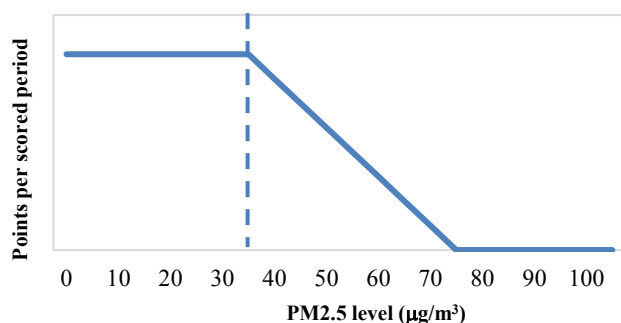
Full points: CO<sub>2</sub> level  $\leq 1000$  ppm  
 Reduced points:  $1000 \text{ ppm} < \text{CO}_2 \text{ level} < 2000$  ppm  
 No points: CO<sub>2</sub> level  $\geq 2000$  ppm

**Figure 4** Scoring function for the CO<sub>2</sub> Level Subcontest

### 6-4. PM<sub>2.5</sub> Level

All available points are earned at the conclusion of each scored period by keeping the time-averaged interior PM<sub>2.5</sub> level below 35  $\mu\text{g}/\text{m}^3$  during the scored period. See Appendix A-3 for the schedule of scored periods and for the number of available points per scored period.

- Reduced points are earned if the time-averaged PM<sub>2.5</sub> level is between 35  $\mu\text{g}/\text{m}^3$  and 75  $\mu\text{g}/\text{m}^3$ . Reduced point values are scaled linearly, as shown in Figure 5.
- In multi-zone houses, the zone PM<sub>2.5</sub> level deviating farthest from the target PM<sub>2.5</sub> level range is the zone PM<sub>2.5</sub> level of record.



Full points: PM<sub>2.5</sub> level  $\leq 35 \mu\text{g}/\text{m}^3$   
 Reduced points:  $35 \mu\text{g}/\text{m}^3 < \text{PM}_{2.5} \text{ level} < 75 \mu\text{g}/\text{m}^3$   
 No points: PM<sub>2.5</sub> level  $\geq 75 \mu\text{g}/\text{m}^3$

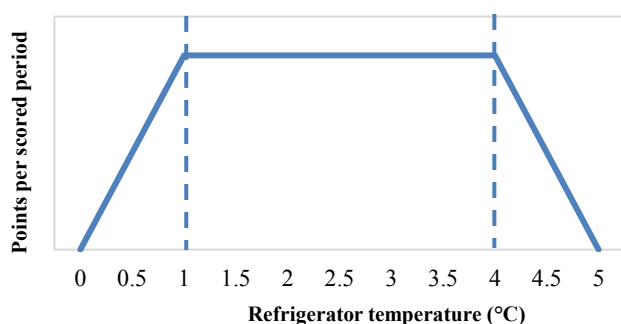
**Figure 5** Scoring function for the PM<sub>2.5</sub> Level Subcontest

## Contest 7. Appliances

### 7-1. Refrigerator

All available points are earned at the conclusion of each scored period by keeping the time-averaged interior temperature of a refrigerator between 1°C and 4°C during the scored period. See Appendix A-3 for the schedule of scored periods and for the number of available points per scored period.

- Reduced points are earned if the time-averaged interior refrigerator temperature is between 0°C and 1°C or between 4°C and 5°C. Reduced point values are scaled linearly, as shown in Figure 6.
- The refrigerator volume published in the manufacturer's specifications shall be a minimum of 170 L.
- The refrigerator may be used to store food and beverages.



Full points:  $1^{\circ}\text{C} \leq \text{Temperature} \leq 4^{\circ}\text{C}$

Reduced points:  $0^{\circ}\text{C} < \text{Temperature} < 1^{\circ}\text{C}$   
 $4^{\circ}\text{C} < \text{Temperature} < 5^{\circ}\text{C}$

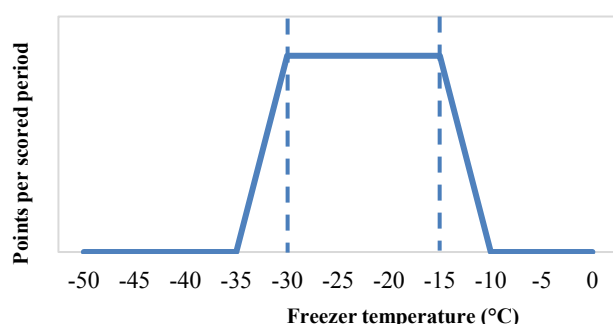
No points:  $\text{Temperature} \leq 0^{\circ}\text{C}$   
 $\text{Temperature} \geq 5^{\circ}\text{C}$

Figure 6 Scoring function for the Refrigerator Subcontest

### 7-2. Freezer

All available points are earned at the conclusion of each scored period by keeping the time-averaged interior temperature of a freezer between -30°C and -15°C during the scored period. See Appendix A-3 for the schedule of scored periods and for the number of available points per scored period.

- Reduced points are earned if the time-averaged interior freezer temperature is between -35°C and -30°C or between -15°C and -10°C. Reduced points are scaled linearly, as shown in Figure 7.
- The freezer volume published in the manufacturer's specifications shall be a minimum of 57 L.
- The automatic defrost function may be disabled.
- The freezer may be used to store food and only enough ice to fill the freezer's ice bin (or equivalent).



Full points:  $-30^{\circ}\text{C} \leq \text{Temperature} \leq -15^{\circ}\text{C}$

Reduced points:  $-35^{\circ}\text{C} < \text{Temperature} < -30^{\circ}\text{C}$   
 $-15^{\circ}\text{C} < \text{Temperature} < -10^{\circ}\text{C}$

No points:  $\text{Temperature} \leq -35^{\circ}\text{C}$   
 $\text{Temperature} \geq -10^{\circ}\text{C}$

Figure 7 Scoring function for the Freezer Subcontest

### 7-3. Clothes Washer

All available points are earned for washing laundry by running a clothes washer through one or more complete, uninterrupted, "normal" (or equivalent) cycles within a specified period of time. See Appendix A-3 for specific details regarding the number of points per clothes-washing task and the time periods designated for clothes-washing tasks.

- A load of laundry is defined as six organizer-supplied bath towels.
- The clothes washer shall operate automatically and have at least one wash and rinse cycle.
- One or more complete, uninterrupted, "normal" (or equivalent) cycles in an automatic clothes washer shall be used to wash the laundry.

- d. On several days during contest week, two loads of laundry are required to be washed. Teams have the option to combine double loads and wash them in one clothes washer cycle.
- e. The drying function in a combination washer/dryer shall be disabled until the observer can verify that the laundry is wet after the completion of the wash and rinse cycle.
- f. Cycle “interruption” includes the adjustment of supply temperature or flow in a manner not anticipated by the manufacturer or addressed in its operation manual.
- g. Cycle completion shall be confirmed by the observance of an audible or visible signal.
- h. The organizers will consult the operation manual to identify appropriate cycle settings. “Normal” or “regular” settings shall be selected, if available. Otherwise, settings most closely resembling typical “normal” or “regular” settings shall be selected.

#### 7-4. Clothes Drying

All available points are earned by returning a load of laundry (defined as six organizer-supplied bath towels) to a total weight less than or equal to the towels’ total weight before washing. Clothes drying shall be completed within a specified period of time. See Appendix A-3 for specific details regarding the number of points per clothes drying task and the time periods designated for laundry tasks.

- a. Reduced points are earned if the “dry” towel weight is between 100.0% and 110.0% of the original towel weight. Reduced point values are scaled linearly, as shown in Figure 8.
- b. A load of laundry is eligible for clothes-drying points only if the load experienced a complete, uninterrupted cycle (see Contest 7-3h for required cycle settings) in an automatic clothes washer.
- c. The drying method may include active drying (e.g., machine drying), passive drying, (e.g., on a clothesline), or any combination of active and passive drying. All drying methods that require the towels to be visible (such as on a clothesline) must be demonstrated to the Architecture and Market Appeal juries as they visit the houses.
- d. On several days during contest week, two loads of laundry are required to be dried. Teams have the option to combine double loads and dry them in one clothes-drying cycle, but each load will be scored separately.

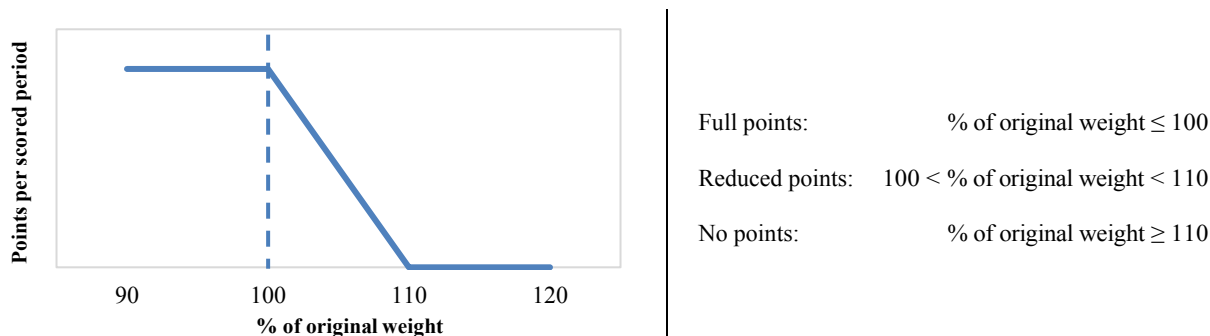


Figure 8 Scoring function for the Clothes Drying Subcontest

#### 7-5. Dishwasher

All available points are earned by running a dishwasher through a complete, uninterrupted, “normal” (or equivalent) cleaning cycle within a specified period of time, during which a temperature sensor placed in the dishwasher must reach 49°C at some point during the cycle. See Appendix A-3 for specific details regarding the number of points per dishwashing task and the time periods designated for dishwashing tasks.

- a. Half of the available points are earned if the temperature sensor reaches 46°C, but does not reach 49°C.
- b. For redundancy, two temperature sensors shall be placed in the dishwasher for each test. The higher of the two readings is the temperature of record, unless it is determined that the sensor with the higher reading is defective, in which case the lower of the two readings is the temperature of record.
- c. The dishwasher shall operate automatically, have at least one wash and rinse cycle, and have a minimum capacity of eight place settings according to the manufacturer’s specifications.
- d. If the dishwasher has a heated drying option, this option shall be disabled.
- e. Cycle “interruption” includes the adjustment of supply temperature or flow in a manner not anticipated by the manufacturer or addressed in its operation manual, including the disruption of an ordinary cycle due to user interaction.
- f. Cycle completion shall be confirmed by the observance of an audible or visible signal.

- g. The teams shall consult the operation manual to identify appropriate cycle settings. The setting chosen shall be a complete wash cycle. “Normal” or “regular” settings shall be selected, if available. Otherwise, settings most closely resembling typical “normal” or “regular” settings shall be selected.
- h. The dishwasher may be run empty, partially loaded, or fully loaded; the load may be soiled or clean.

## 7-6. Cooking

All available points are earned by using a kitchen appliance to vaporize 2 kg of water within a specified period of time. See Appendix A-3 for specific details regarding the number of points per cooking task and the time periods designated for cooking tasks.

- a. Reduced points are earned if between 0.5 kg and 2 kg are vaporized. Reduced point values are scaled linearly, as shown in Figure 9.
- b. Any kitchen appliance may be used, but it must operate in its normal configuration as it is vaporizing the water.
- c. The water shall be vaporized in a single container and the starting water weight shall be at least 3 kg.

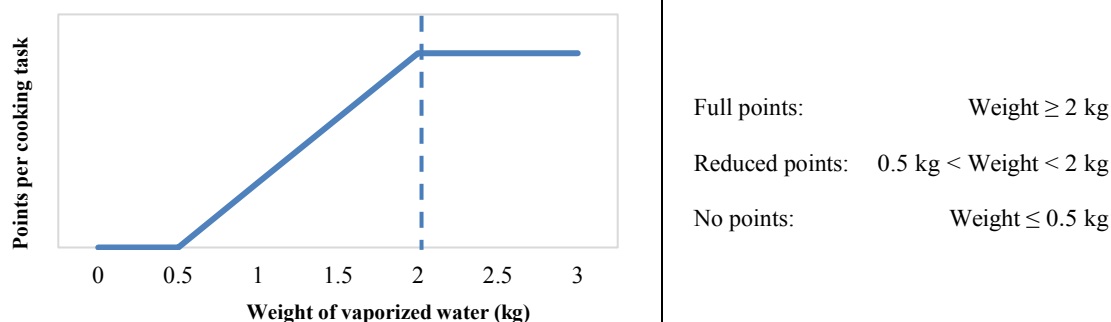


Figure 9 Scoring function for the Cooking Subcontest

## Contest 8. Home Life

### 8-1. Lighting

All available points are earned for keeping all interior and exterior house lights on during specified periods of time. See Appendix A-3 for specific details regarding the number of points per lighting task and the time periods designated for lighting tasks.

**Exception:** Lights located within manufactured residential appliances such as a refrigerator, clothes dryer, microwave, and oven that are intended to illuminate the interior of the appliance are not required to be illuminated. Lights that are not designed to be connected to the house electrical system are not required to be illuminated.

- a. All dimmers shall be adjusted to their highest positions and all other lighting control equipment shall be disabled or overridden so that the controlled lamps are fully and continuously on during the specified periods.
- b. Partial credit will be awarded for partial compliance.

### 8-2. Hot Water

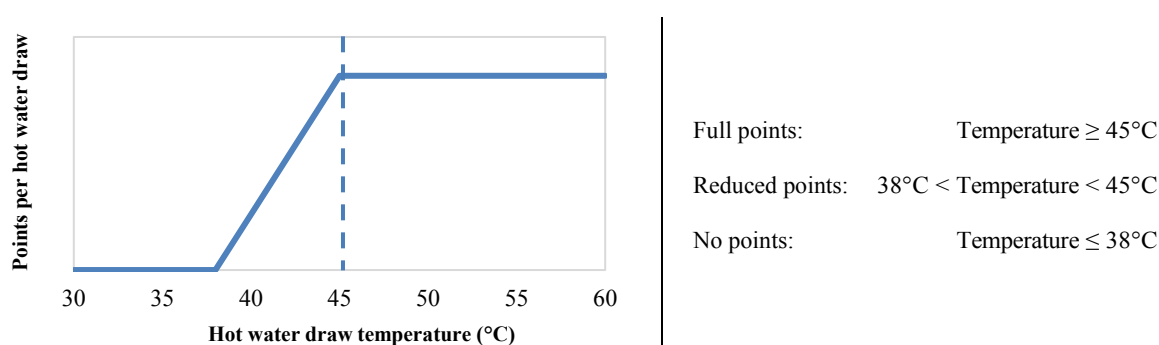
Hot water draws will occur at the approximate times specified in Appendix A-3. For each draw, at least 60 L of hot water shall be delivered in no more than 10 minutes to qualify for points. All available points are earned by delivering an average temperature of at least 45°C. An average temperature below 38°C earns no points. For temperatures between 38°C and 45°C, points are scaled linearly, as shown in Figure 10.

- a. These hot water draws are designed to simulate most of the washing and bathing tasks that would take place in a typical day. *Note: The dishwashing task is not simulated by these hot water draws because it occurs in a different contest.*
- b. The schedule for hot water draws will vary from one day to the next, just as it does in a typical home.
- c. The maximum number of hot water draws for one day will not exceed three, but they may occur consecutively.
- d. For fairness, all teams will be drawing hot water on nearly identical schedules.
- e. Hot water will be drawn from the shower. Teams shall replace their showerhead with an organizer-supplied fitting prior to the start of the contest. If a house has multiple showers, the shower expected to be used most frequently



by the occupants will be used for the hot water draws.

- f. Teams shall provide a male, 1.27 cm (0.5 in.) National Pipe Thread Tapered Thread (NPT) to accept the organizer equipment.



**Figure 10** Scoring function for the Hot Water Subcontest

### 8-3. Home Electronics

All available points are earned for operating a television (TV) and computer during specified periods of time. See Appendix A-3 for specific details regarding the number of points per home electronics task and the time periods designated for home electronics tasks.

- a. The TV display shall be a minimum of 68.6 cm (27 in.) according to the manufacturer's stated display size. The computer display shall be a minimum of 38.1 cm (15 in.) according to the manufacturer's stated display size. The computer may be a laptop or desktop computer. The TV and computer displays shall be able to be operated simultaneously and controlled independently of each other.
- b. The organizers will supply content that must be shown on the TV display during the home electronics tasks. There is no required volume setting, but the brightness of the display shall be set to at least 75% of maximum. Observers will conduct spot checks to verify that the TV is showing the supplied content and that the brightness is at the required level.
- c. The organizers will supply content that must be shown on the computer display during the scored periods. A decathlete may temporarily suspend the supplied content to use the computer for other practical purposes, but the display of supplied content shall be resumed whenever the computer is not being used for other practical purposes. The brightness of the display shall be set to at least 75% of maximum. Observers will conduct spot checks to verify that the computer is either showing the supplied content or is being used by a decathlete, and that the brightness is at the required level.

### 8-4. Dinner Party

Each team shall host two dinner parties for its neighbors during contest week. See Appendix A-3 for the dinner party schedule and the number of available points per dinner party. Dinner parties will feature a pair of guest decathletes from each of three competing teams. To earn full points for the dinner party, teams shall:

- a. Host at least eight individuals for the dinner party – two decathletes from each of three other teams and up to two VIP guests. VIP guests may include organizers, media, government employees, family members, or other individuals approved by the organizers to attend the dinner parties. If VIP guests do not participate, at least two host team decathletes shall participate in the dinner party.
- b. Meet all house occupancy rules described in Rule 11-1c for the dinner party.
- c. Have two decathletes attend each of the assigned houses for the duration of the dinner party period as indicated in Appendix A-3. While in attendance, decathletes shall participate in the meal and act respectfully.
- d. Serve a complete meal with an adequate amount of food for all guests, at appropriate serving temperatures, and in a timely manner within the dinner party period as indicated in Appendix A-3.
- e. Serve a unique meal at each dinner party.
- f. Ensure that team decathletes in the house during the dinner party are performing one or more of the following three functions: 1) eating the meal; 2) cooking/preparing the food; or 3) operating the house during scheduled Contest 6, 7, or 8 activities.
- g. Serve and have guests eat the meal in the finished square footage at the eating area designated in the drawings.
- h. Submit to the organizers detailed dinner party menus, recipes, and ingredient lists that accurately reflect the meal



served for each dinner party.

i. Shall comply with the following safety requirements:

- (i). The use of flames, including candle flames, is prohibited during contest week (see Rule 8-2b).
- (ii). No alcoholic beverages may be stored in the house, used in meal preparation, served, or part of a meal in any way.
- (iii). All water used for cooking and drinking shall be drinking water purchased in sealed containers.
- (iv). Prior to use for the Dinner Party, all dishes and cookware shall be washed with hot water and soap and rinsed prior to use.
- (v). Normal domestic wastewater may go into the wastewater tank.
- (vi). All beverages and food must be stored properly and according to the instructions on the packaging, e.g., beverages and foods marked “refrigerate after opening” must be refrigerated appropriately after opening.
- (vii). To help prevent allergic reactions among dinner party guests, teams shall create a list of ingredients for each of the items being served at each meal. Common food allergies include milk/dairy products, eggs, peanuts, tree nuts (walnuts, cashews, and pecans), fish, shellfish, soy, wheat, and gluten.
- (viii). Outdoor cooking and grilling equipment may be incorporated into the competition prototype, but the use of such equipment is prohibited on the competition site.
- (ix). The use of coolers to store food, beverages, or ice associated with the dinner party on site is not permitted. Coolers may be used for transporting food to the competition site only.

## 8-5. Movie Night

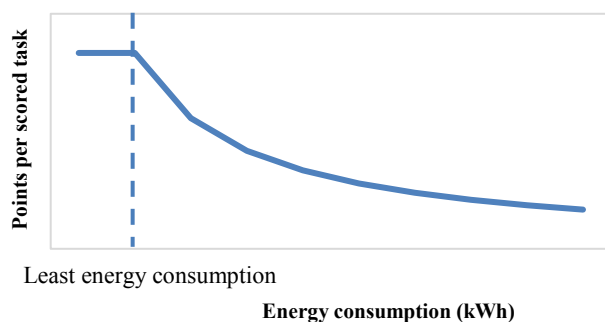
Each team shall host a movie night for its neighbors during contest week. See Appendix A-3 for the movie night schedule and the number of available points for movie night. To earn full points for the movie night, teams shall:

- a. Host at least eight individuals for the movie night – two decathletes from each of three other teams and up to two VIP guests. VIP guests may include organizers, media, government employees, family members, or other individuals approved by the organizers to attend the dinner parties.
- b. Have two decathletes attend each assigned house for the duration of the movie night period as indicated in Appendix A-3. While in attendance, decathletes shall participate and act respectfully.
- c. Vote for one of three movies selected by the organizers via the poll to be sent out via email prior to the event. The movie receiving the most votes shall be provided by the organizers on the day of movie night and shall be the movie shown in all houses on movie night. The selected movie shall be available in several of the most popular video formats, so that each team may request the format most suitable for its home theater system.
- d. Maintain normal audiovisual equipment settings throughout the duration of the subcontest. Observers or a small team of organizers, or both, will verify that these settings are maintained on movie night.

## Contest 9. *Commuting*

Electric vehicle driving tasks will occur at the approximate times specified in Appendix A-3. Teams shall complete 40 kilometers driving in no more than 60 minutes, four times during the contest week, to qualify for points. Electrical energy consumed for the task will be measured at the charging piles. All available points are earned by the team that consumes the least electricity to finish the driving task. Other teams will be scored proportionally based on the electricity consumption, as shown in Figure 11.

- a. These driving tasks are designed to simulate most of the transportation requirements that would take place for a household.
- b. The electric vehicle is required to be fully charged before starting the driving task. After the task, the vehicle will be charged to full again, and the amount of electricity charged is regarded as the energy consumed for commuting.
- c. The schedule for the commuting tasks varies from one day to the next.
- d. The vehicle must meet the requirements of Rule 4-5.
- e. The vehicle must be driven by a decathlete who is licensed to operate a motor vehicle and accompanied by at least one passenger, who shall also be a decathlete.
- f. Both the driver and the passenger must wear a seat belt and follow all applicable driving laws.
- g. The electric vehicle may only be charged from the house electrical system. Any charging from alternate locations is considered a rules violation.



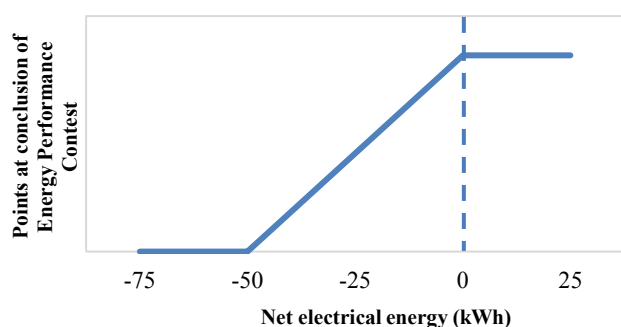
$$\frac{\text{Reduced points}}{\text{Full points}} = \frac{\text{Least energy consumption}}{\text{Team's energy consumption}}$$

**Figure 11** Scoring function for the Commuting Contest

## Contest 10. Energy Performance

### 10-1. Energy Balance

All available points are earned at the conclusion of the specified energy performance period (see Appendix A-3 for the energy balance schedule) for a net electrical energy balance of at least 0 kWh. A positive net electrical energy balance indicates net production; a negative net electrical energy balance indicates net consumption. Reduced points are earned for a net electrical energy balance between -50 kWh and 0 kWh. Reduced points are scaled linearly, as shown in Figure 12.



Full points: Net electrical energy  $\geq 0$  kWh

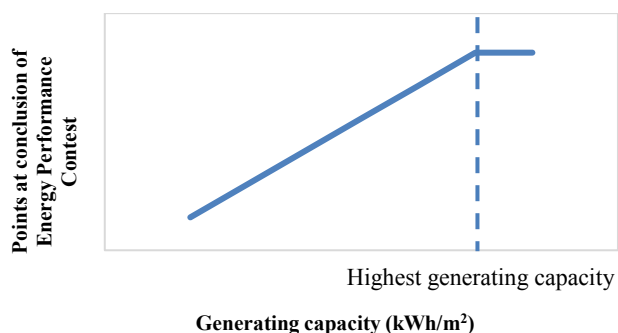
Reduced points:  $-50 \text{ kWh} < \text{Net electrical energy} < 0 \text{ kWh}$

No points: Net electrical energy  $\leq -50 \text{ kWh}$

**Figure 12** Scoring function for the Energy Balance Subcontest

### 10-2. Generating Capacity

Generating capacity will be determined at the conclusion of the specified energy performance period (see Appendix A-3 for the energy balance schedule) by calculating the measured energy production per unit PV area ( $\text{kWh}/\text{m}^2$ ). All available points are earned by the team that has the highest generating capacity. Other teams will be scored proportionally, as shown in Figure 13.



$$\frac{\text{Reduced points}}{\text{Full points}} = \frac{\text{Team's generating capacity}}{\text{Highest generating capacity}}$$

**Figure 13** Scoring function for the Generating Capacity Subcontest

## Appendix A Event Schedules

### A-1. Overview Event Calendar

This calendar provides an overview of daily activities refer to the Detailed Event Schedule (Appendix A-3) for a complete list and schedule of daily activities.

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Day 1 - Jul 9	Day 2 - Jul 10	Day 3 - Jul 11	Day 4 - Jul 12	Day 5 - Jul 13	Day 6 - Jul 14	Day 7 - Jul 15
Registration (12:00 - 20:00)	Registration (12:00 - 20:00) All Team Meeting (14:00 - 16:00)	Stand-Alone Assembly (Begins At 7:00)	Stand-Alone Assembly (7:00 - 24:00)	Stand-Alone Assembly (7:00 - 24:00)	Stand-Alone Assembly (7:00 - 24:00)	Stand-Alone Assembly (7:00 - 24:00)
Day 8 - Jul 16	Day 9 - Jul 17	Day 10 - Jul 18	Day 11 - Jul 19	Day 12 - Jul 20	Day 13 - Jul 21	Day 14 - Jul 22
Stand-Alone or Grid-Tie Assembly (Grid Available At 12:00)	Stand-Alone or Grid-Tie Assembly (7:00 - 24:00)	Stand-Alone or Grid-Tie Assembly (7:00 - 24:00)	Stand-Alone or Grid-Tie Assembly (7:00 - 24:00)	Stand-Alone or Grid-Tie Assembly (7:00 - 24:00)	Stand-Alone or Grid-Tie Assembly (7:00 - 24:00)	Stand-Alone or Grid-Tie Assembly (7:00 - 24:00)
Day 15 - Jul 23	Day 16 - Jul 24	Day 17 - Jul 25	Day 18 - Jul 26	Day 19 - Jul 27	Day 20 - Jul 28	Day 21 - Jul 29
Stand-Alone or Grid-Tie Assembly (7:00 - 24:00)	Stand-Alone or Grid-Tie Assembly (7:00 - 24:00)	Stand-Alone or Grid-Tie Assembly (7:00 - 24:00)	Stand-Alone or Grid-Tie Assembly (7:00 - 24:00)	Stand-Alone or Grid-Tie Assembly (7:00 - 24:00)	Grid-Tie Assembly (7:00 - 24:00)	Grid-Tie Assembly (7:00 - 24:00)
Day 22 - Jul 30	Day 23 - Jul 31	Day 24 - Aug 1	Day 25 - Aug 2	Day 26 - Aug 3	Day 27 - Aug 4	Day 28 - Aug 5
Grid-Tie Assembly (7:00 - 24:00)	Final Site Cleanup, Staging and Signage (7:00 - 12:00)	Rest Day	Contests (24 Hours)	Contests (24 Hours)	Contests (24 Hours)	Contests (24 Hours)
		House Photography (8:00 - 18:00)	Opening Ceremony (8:00 - 10:00)	Public Exhibit (8:00 - 16:00)	Public Exhibit (8:00 - 21:00)	Public Exhibit (8:00 - 21:00)
	Stop Work for Final Inspection (12:00 - 18:00)	Opening Ceremony Rehearsal (10:00 - 11:00)	VIP Tours (10:00 - 16:00)			
Day 29 - Aug 6	Day 30 - Aug 7	Day 31 - Aug 8	Day 32 - Aug 9	Day 33 - Aug 10	Day 34 - Aug 11	Day 35 - Aug 12
Contests (24 Hours)	Contests (24 Hours)	Contests (24 Hours)	Contests (24 Hours)	Contests (24 Hours)	Contests (24 Hours)	Contests (24 Hours)
Public Exhibit (8:00 - 16:00)	Public Exhibit (8:00 - 21:00)	Public Exhibit by Appt. (8:00 - 16:00)	Public Exhibit by Appt. (8:00 - 21:00)	Public Exhibit by Appt. (8:00 - 16:00)	Public Exhibit (8:00 - 21:00)	Public Exhibit (8:00 - 21:00)
		Jury Walkthroughs (7:30 - 12:30, 20:00 - 22:00)	Jury Walkthroughs (7:30 - 12:30, 20:00 - 22:00)	Jury Walkthroughs (7:30 - 12:30, 20:00 - 22:00)		
Day 36 - Aug 13	Day 37 - Aug 14	Day 38 - Aug 15	Day 39 - Aug 16	Day 40 - Aug 17	Day 41 - Aug 18	Day 42 - Aug 19
Contests (24 Hours)	Contests (24 Hours)	Contests (24 Hours)	Contests (24 Hours)	Public Exhibit (8:00 - 16:00)	Site Cleanup (7:00 - 22:00)	Final Inspection (8:00 - 16:00)
Public Exhibit (8:00 - 16:00)	Public Exhibit (8:00 - 16:00)	Public Exhibit (8:00 - 21:00)	Public Exhibit (8:00 - 16:00)	Architecture Result (8:00 - 11:00)		
Innovation Result (10:00 - 11:00)	Communication Result (10:00 - 11:00)	Market Appeal Result (10:00 - 11:00)	Engineering Result (10:00 - 11:00)	Final Award Ceremony (8:00 - 11:00)		

## A-2. Contest Chronology

To be updated later.

### **A-3. Detailed Event Schedule**

To be updated later.

## Appendix B Juried Subcontest Guidelines

### B-1. Juror Guidelines

A jury's evaluation of each team's project consists of the following three phases:

1. Deliverables review
2. On-site walkthroughs
3. Deliberation

**Table 4** Juror time commitments for deliverables review and on-site walkthroughs

Jury	Time Commitment for Deliverables Review (per team)	Relevant Deliverables for Review	Time Commitment for On-site Walkthrough (per team)
Architecture	20 to 30 minutes	<ol style="list-style-type: none"> <li>1. Drawings<sup>3</sup></li> <li>2. Construction specifications<sup>4</sup></li> <li>3. Audiovisual architecture presentation<sup>5</sup></li> </ol>	30 minutes
Market Appeal	1 to 2 hours	<ol style="list-style-type: none"> <li>1. Drawings</li> <li>2. Construction specifications</li> <li>3. Audiovisual sales presentation</li> </ol>	30 minutes
Engineering	1 to 2 hours	<ol style="list-style-type: none"> <li>1. Drawings</li> <li>2. Construction specifications</li> <li>3. Energy analysis results and discussion<sup>6</sup></li> <li>4. Audiovisual engineering presentation</li> </ol>	30 minutes
Communications	1 to 2 hours	<ol style="list-style-type: none"> <li>1. Web site<sup>7</sup></li> <li>2. Video walkthrough<sup>8</sup></li> <li>3. Public exhibit presentation and materials<sup>9</sup></li> </ol>	30 minutes
Innovation	1 to 2 hours	<ol style="list-style-type: none"> <li>1. Drawings</li> <li>2. Construction specifications</li> <li>3. Audiovisual innovation presentation</li> </ol>	30 minutes

#### ***Phase 1: Deliverables Review***

The deliverables review offers each juror an opportunity to explore the relevant details of each team's project via the deliverables outlined in Table 4. If questions arise during the deliverables review phase, jurors may address those questions to the appropriate contest official before or during the event.

#### ***Phase 2: On-site Walkthroughs***

The on-site walkthroughs take place on the competition site and offer the jurors an opportunity to make visual verifications of information presented in the deliverables and to ask the decathletes for clarification of questions that may have arisen during the deliverables review. The logistical details of the on-site walkthroughs will be provided to each juror by the contest official prior to the juror's arrival on the competition site.

#### ***Phase 3: Deliberation***

##### ***STEP #1***

During the deliberation phase, which takes place after the completion of on-site walkthroughs, the jury is encouraged to place each team into one of four classes based on each team's performance relative to the contest criteria. The four

<sup>3</sup> See Appendix D for drawings requirements.

<sup>4</sup> The construction specifications are located in the project manual. See Appendix D for project manual requirements.

<sup>5</sup> See Appendix D for audiovisual presentation requirements.

<sup>6</sup> The energy analysis results and discussion is located in the project manual. See Appendix D for project manual

<sup>7</sup> See Appendix E-1 for Web site requirements.

<sup>8</sup> See Appendix E-3 for video walkthrough requirements.

<sup>9</sup> See Appendix B-3 for public exhibit presentation requirements and Appendix E-6 for public exhibit materials requirements.

classes are:

- Class #1: ECLIPSES contest criteria 91% – 100% of available points
- Class #2: EXCEEDS contest criteria 81% – 90% of available points
- Class #3: EQUALS contest criteria 61% – 80% of available points
- Class #4: APPROACHES contest criteria 0% – 60% of available points

Juries are not required to place a uniform number of teams in all classes or to place at least one team in every class. For example, if a jury determines that no teams are worthy of Class #1, there would be no teams with scores greater than 90%. Note that placing teams into classes (as a first step toward assigning an eventual percentage integer) is encouraged to ease the process of evaluating so many teams at one time.

If it is possible to further separate teams within a particular class, assigning different percentage integers within the allowed range of the particular class is encouraged. The assigned percentage integer may fall anywhere within the range associated with the class. If it is not possible to further separate teams within a particular class, it may be appropriate to assign each team in a particular class the same percentage integer.

#### *STEP #2*

After assigning each team a percentage integer from 0% to 100%, the jury shall submit its percentage integers to the contest official. The contest official will then submit the percentages to the competition official, who will convert them into a score based on the total number of available points for the contest being judged. The competition official will round off any non-integer percentage scores to the nearest integer. Prior to posting scores in the scoring server, the scorekeeper will apply any applicable penalties that may have been incurred.

#### *STEP #3*

The three highest-scoring teams (plus ties) will be given awards during a scheduled media announcement during contest week (see Appendix A for announcement schedule). Pending the jurors' availability, the organizers will invite the jurors to make the announcement. The scores for all of the teams will be posted immediately following the announcement.

#### *STEP #4*

The jury shall submit written or recorded scoring justifications for each team to the contest official. The jury's scoring justifications will be provided as feedback to each team so it might better understand why the jury evaluated the team as it did. The justifications may be posted on the Solar Decathlon China Web site.

## **B-2. Team Guidelines**

- a. It is ultimately the team's responsibility to clear the house of visitors and be otherwise ready for the arrival of juries at the times indicated in the jury walkthrough schedule, which will be made available to the teams via email. A Solar Decathlon China organizer or staff person called a "runner" will deliver a warning 30 to 60 minutes prior to the arrival of the jury and will help the team clear the house of visitors and manage the line of people waiting to visit the house. A team shall not start clearing its house prior to the runner's warning in anticipation of the arrival of a jury.
- b. Teams shall show all possible configurations of the house during the walkthroughs of the Architecture and Market Appeal Juries and, if appropriate, the Engineering, Communications and Innovation Juries. House configurations that could affect the outcome of contests and that were not seen by a jury during its walkthrough are prohibited during contest week. Some examples of reconfigurable features include:
  - A significant moveable component, such as a room, wall, or bed (safety plan must also be in place)
  - Significant shading devices, such as retractable awnings or operable shutters
  - Towel-drying locations
  - Window coverings that may obstruct views or reduce light levels.

If a team does not have time to do a live reconfiguration during the jury walkthroughs, the team must use some other method, such as photographs or video, to show all reconfigurable features in their various configurations. If a team is not planning to actually reconfigure qualifying features at any time during contest week and has not shown or described the reconfiguration in the drawings, project manual, audiovisual presentation, or video walkthrough, that team does not have to show the reconfiguration to the juries.

All plug-in or portable appliances that may be used during contest week must be in their fully deployed locations and configurations during all jury walkthroughs. Also be aware that juries may request plug-in, portable, or hard-wired appliances to be turned on so they can evaluate noise levels or other characteristics of the appliances that may not be apparent when the appliances are off.

- c. Rule 11-1, “House Occupancy,” applies during jury walkthroughs. Non-decathlete team members and team crew shall not be present during the walkthroughs.
- d. The jury walkthroughs will be held to a very strict schedule for each of the houses. The importance of following this schedule is twofold: 1) To ensure each team receives equal visitation time by the juries to maintain a sense of fairness among all the teams; and 2) Any deviation from the schedule will have an immediate effect on other events planned during the days the juries will be evaluating houses. A small deviation in the defined schedule for the juries could result in a very difficult situation to resolve in another component of the competition. If a team is not ready for a jury to begin its evaluation at the scheduled time, then the total time the jury spends in that team’s house will be reduced. With the exception of hot water draws, note that regularly scheduled contest activities will not be suspended or rescheduled to accommodate jury walkthroughs. When there is a scheduling conflict, a hot water draw may be rescheduled to an available 15-minute time period before or after the arrival or departure of the jury.
- e. During daytime jury walkthroughs, the jury will have 30 minutes to visit each house, followed by a 5-minute period to travel to the next house. During the 30-minute walkthrough, 20 minutes will be allocated for the team to lead the jury through the house and answer any questions the jury may have. After 20 minutes, the team shall leave the house so that the jury can hold a private, 10-minute discussion about the house it has just visited.
- f. The Architecture Jury will visit each house a second time at night. During the nighttime walkthrough, the Architecture Jury will have 10 minutes to visit each house followed by a 5-minute period to travel to the next house. During the 10-minute walkthrough, 5 minutes will be allocated for the team to answer any questions the jury may have. After 5 minutes, the team shall leave the house so that the jury can hold a private, 5-minute discussion about the house it has just visited.
- g. Presentation boards or other visual media summarizing information in the “Relevant Deliverables” (see the third column in Table 5) are permitted to be on display during jury walkthroughs. The team Web site, public exhibit handout, and public exhibit materials may only be viewed by the Communications Jury.
- h. One or more of the eligible house occupants (see rule 11-1 and item c above) may audiotape or videotape the jury walkthrough as it is happening, but taping of the private jury discussion period is prohibited.
- i. Areas of the house excluded from the accessible exhibit route may be accessed by the juries and considered in their evaluations.
- j. The organizers will provide all juries with summaries of important rule and code violations for each team so that juries are aware of violations before giving credit for aspects of the project that are not in compliance.
- k. The organizers may provide juries with contents of the organizers’ reviews of relevant deliverables.

### **B-3. Public Exhibit Requirements**

The team shall provide two versions of its public exhibit. Both versions will be evaluated by the Communications Jury.

#### ***Version #1: Personalized Tour***

- The personalized tour is a comprehensive tour that addresses individual visitors’ needs and questions and is appropriate for times when wait lines are short or nonexistent.
- Each team will be allowed 15 minutes to present the personalized tour to the Communications Jury.

#### ***Version #2: Self-Guided Tour***

- The self-guided tour is a fast yet informative tour that allows visitors to move through the house on their own and accommodates large crowds and long lines.
- Each team will be allowed 5 minutes to explain the self-guided tour to the Communications Jury.

#### ***Common Requirements***

- Both versions of the public exhibit shall be informative, interesting, and accessible by people of all abilities.
- While the official language of the Solar Decathlon China 2017 competition is English, teams must be prepared to provide both personalized and Self-Guided tours in both English and Mandarin, Chinese.
- Teams are encouraged to employ effective and creative methods to control wait times and engage visitors waiting in line during public hours.
- Power-consuming devices, such as LCD displays, house lighting, mobile electronics, etc., shall not be used during the Communication Jury walkthrough and shall not be presented to the Communications Jury in any way.
- For additional information, see rule 11-4.



## Appendix C Measured Subcontest Guidelines

### C-1. Monitored Performance Subcontests

Points for monitored performance subcontests are expected to be automatically awarded based on measurements made by sensors communicating with a data logger. Prior to the competition, the organizers will provide a list of sensors expected to be used in the monitored performance contests to enable teams to purchase the necessary products to practice the contests before the competition using the same equipment that will be used by the organizers.

The organizers will also provide details for the central data acquisition equipment and associated accessories that collect sensor readings and transmit the data to the scoring server. Detailed policies and procedures for accommodating competition instruments will be distributed on the project group.

NOTE: Additional information will be provided on equipment used for monitored performance subcontests as it becomes available.

### C-2. Task Completion Subcontests

Within the measured contests, teams earn points in several subcontests by successfully completing a task, the result of which is recorded and consequently entered into the scoring engine. Detailed task completion subcontest policies and procedures will be provided on the project group.

**Table 5** Instruments and sensors used in “task completion” subcontests

Subcontest(s)	Instrument or Sensor Type	Vendor	Model Number	Approx. Price
7-3 Clothes Washer	Visual/audible inspection	n/a	n/a	n/a
7-4 Clothes Drying	Scale	TBD	TBD	TBD
7-5 Dishwasher	Nonreversible temperature label	TBD	TBD	TBD
7-6 Cooking	Kitchen scale	TBD	TBD	TBD
8-1 Lighting	Visual inspection	n/a	n/a	n/a
8-2 Hot Water	TBD	TBD	TBD	TBD
8-3 Home Electronics	Visual inspection	n/a	n/a	n/a

NOTE: Additional information will be provided on procedures used for task completion subcontests as it becomes available.

## Appendix D Competition Deliverables

Throughout the project, the organizers will require teams to submit deliverables necessary for ensuring safety and for generating sufficient interest in the event. These design deliverables serve the following important functions:

- In the **schematic design summary**, the team shall disclose to the organizers all non-standard design features, communications strategies, site operations plans, and health and safety considerations that require further review prior to the continuation of the project into the design development phase.
- The **drawings and project manual** shall demonstrate compliance with the Solar Decathlon China Building Code and the Solar Decathlon China Rules so that the inspectors will be able to grant final on-site approval by verifying that the constructed project on the competition site was accurately represented by the approved drawings and project manual.
- The **drawings and project manual** shall clearly describe a team's proposed assembly and disassembly procedures. The site operations manager will review the teams' procedures to identify and address potential conflicts among the teams.
- The **drawings and project manual** are expected to provide sufficient detail to enable a residential contractor to generate an accurate, detailed cost estimate and to efficiently construct the building as the design team intended it to be built.
- Because the juries have a very limited opportunity to evaluate the constructed projects on the competition site, the **submitted jury deliverables** will provide the only means for a team to provide a detailed presentation of its project to the juries. In the weeks leading up to contest week, each juror shall evaluate the submitted jury deliverables. The primary purpose of the juries' walkthroughs on the competition site is to verify that the project, as assembled on the competition site, was accurately represented in the jury deliverables; and to ask the decathletes any clarifying questions that arose during the evaluation of the design via the jury deliverables.

### D-1. Team Short Description & Project Management Plan

#### *100-word description*

The team shall provide a 100-word description of the team and its goals. This is expected to be used by the organizers for outreach and for placement on the Solar Decathlon China website.

#### *Project Management Plan*

The team shall provide a project management plan that outlines the team's structure, approach to the competition, general work schedule, course integration, and fundraising schedules. The project plan is limited to five (5) pages.

### D-2. Schematic Design Summary

The schematic design proposal will be reviewed by the organizers and feedback will be provided. It will not be reviewed by any juries and will not be made publicly available until after the completion of the competition, with the exception of the renderings, which may be shared on the Solar Decathlon China website.

#### *Format Requirements*

<input type="checkbox"/> Packaged into a single PDF file. Renderings may be submitted separately, if desired
<input type="checkbox"/> Up to 20 pages
<input type="checkbox"/> ISO "A3" (297 mm × 420 mm) sheet size
<input type="checkbox"/> Photographs and images shall be at least 1080 pixels in their shortest dimension and shall be accompanied by information containing the name and affiliation of the photographer or graphic creator and identification of any individuals visible

#### *Content Requirements*

<input type="checkbox"/> Cover page & Design Concept Summary (excluded from page limits)
<input type="checkbox"/> Detailed strategy for the competition, including a contest-by-contest breakdown of features and approaches (1 pages)
<input type="checkbox"/> Design drawings with concise written description of the following systems and components, with identification of any

unique or non-standard systems and components that are being considered (10–15 pages):

- Design Diagrams and Illustrations
- Designed (Temporary) foundations and anchors
- Site Plan, including the competition prototype, tour route, decks, and additional site elements
- Landscaping Plan
- Dimensioned floor plans of all occupied levels with interior design. Include the tour route
- Building sections
- Building Elevations
- Typical wall, floor, and roof sections
- Structural plan and structural system details
- Interior finishes, including a required furniture layout and option details on finishes, cabinetry, and other fixtures
- Plumbing plan and isometric, including fixtures, piping system layout, and on-site water storage tanks. Provide specifications for equipment and fixtures.
- DC electrical plan and one-line diagram. Show integration with PV system.
- AC electrical plan and one-line diagram. Include outlet locations, fixture specifications, control systems, and photovoltaic systems
- Mechanical plans and schedules, indicating duct sizing and layout, equipment locations and specifications (including HVAC and solar mechanical, if any)
- Transportation and on-site assembly approach (modules, cranes, integrated trailers, etc.)

- |   |
|---|
| <input type="checkbox"/> Summary of potential innovations and non-standard elements being pursued (1 pages)   |
| <input type="checkbox"/> Description of public exhibit, communications, and outreach strategy (1 page)  |
| <input type="checkbox"/> Computer-generated renderings of competition prototype design (5+ images excluded from page limits)  |
| <input type="checkbox"/> Health and Safety Plan outline including approach to meeting Occupational Safety and Health Administration (OSHA) training requirement (1 pages) |
| <input type="checkbox"/> Identification of the licensed design professional expected to stamp structural documentation (1 page)   |

### D-3. Team Overview

Teams shall provide updated information on their team strategy, makeup, project design, etc. for use on the China website and for organizer outreach. Teams are encouraged to have developed an online presence (website, social media, blog, etc.) by this time.

#### *Format Requirements*

- |  |
|--|
| <input type="checkbox"/> Packaged into a single PDF file. Renderings and/or audiovisuals may be submitted separately, if desired |
| <input type="checkbox"/> Up to 20 pages  |

#### *Content Requirements*

- |  |
|--|
| <input type="checkbox"/> Updated 100-word description of team and its goals  |
| <input type="checkbox"/> Digital representation (renderings, graphic floor plan, photography of scale model, animation, etc.) of competition prototype design (8-10 images, minimum 1080 pixels in shortest dimension)                 |
| <input type="checkbox"/> Team photograph including as many members of the team as possible and associated file identifying the name of each individual shown and the photographer (1 image, minimum 1080 pixels in shortest dimension) |
| <input type="checkbox"/> Summary of unique project elements, considerations, innovations, research, or technology being considered (1-4 pages)   |
| <input type="checkbox"/> Summary of team's current online presence, including social media accounts and website address, as utilized (1-2 pages)   |
| <input type="checkbox"/> Summary of public outreach conducted and press coverage achieved to-date (1-2 pages)  |

### D-4. Design Development Documentation Submission

The design development submission shall represent 90% complete construction documentation. The documentation shall clearly indicate all design details, house systems, and methodologies expected to be present in the competition prototype on the competition site. While some details may not be fully-complete or finalized,

the design development submission shall provide sufficient information for the organizers to conduct a thorough rules and building code compliance review.

The submission must address the team’s approach to safety, including identification of team-specific concerns and constraints. All major decisions with regard to the project design are expected to be complete. The design development submission will not be reviewed by any juries; however, it may be made publicly available following each submission.

#### **D-4-a. Design Development Drawings**

##### ***Format Requirements***

<input type="checkbox"/> Packaged into a single, bookmarked PDF document
<input type="checkbox"/> Up to 150 pages
<input type="checkbox"/> ISO “A3” (297 mm × 420 mm) sheet size

##### ***Content Requirements***

Design drawings, including at a minimum:

<input type="checkbox"/> General - including solar envelope compliance, accessible tour route, finished square footage, water delivery and removal compliance information, and constructed footprint calculations
<input type="checkbox"/> Site - including temporary footing locations, ground penetrations, and adjustable footings
<input type="checkbox"/> Landscape - including plantings, containers, and watering methodology
<input type="checkbox"/> Structural - including building, decking, and associated structures
<input type="checkbox"/> Architectural - including dimensioned floorplans, building sections, detailed sections, reflected ceiling plans, roof plans, elevations, window and door schedules, and exterior structures
<input type="checkbox"/> Interior - including finishes, furniture layout, and cabinetry
<input type="checkbox"/> Fire Protection - including sprinklers and required detection systems
<input type="checkbox"/> Plumbing - including layout, schedules, diagrams, and solar thermal (if applicable)
<input type="checkbox"/> Mechanical - including layout, schedules, diagrams, and installation requirements
<input type="checkbox"/> Electrical - including AC and DC layout, 1-line diagrams, 3-line diagrams, and sizing calculations
<input type="checkbox"/> Telecommunications - including instrumentation, wiring, and associated elements
<input type="checkbox"/> Operations - including house transportation, assembly methodology, and staging

#### **D-4-b. Design Development Project Manual**

##### ***Format Requirements***

<input type="checkbox"/> Packaged into a single, bookmarked PDF document
<input type="checkbox"/> ISO “A4” (210 mm × 297 mm) sheet size

##### ***Content Requirements***

<input type="checkbox"/> Project Overview
<input type="checkbox"/> Detailed Water Budget
<input type="checkbox"/> Interconnection Application Form, including summary of any unlisted electrical components
<input type="checkbox"/> Summary of reconfigurable features
<input type="checkbox"/> Health and Safety Approach <sup>10</sup>
<input type="checkbox"/> Energy Analysis and Model
<input type="checkbox"/> Structural Professional Acknowledgement Letter, signed by licensed professional indicating acceptance of the Construction Documentation deliverable deadline and support of team

<sup>10</sup> The team must indicate its approach to meeting the requirements for Health and Safety outlined in Appendix F.

- |  |
|--|
| <input type="checkbox"/> Structural Calculations     |
| <input type="checkbox"/> Construction Specifications |

## D-5. Digital Project Representation

The teams shall submit renderings, photographs, graphics, and/or animations representing the competition prototype design and competition entry for use on the China website and in outreach materials generated by the organizers. High quality and varied submissions are expected to lead to greater visibility for the team. This submission can include renderings, photography of scale models or mock-ups, refined graphics, computer-generated walkthroughs, 360-degree virtual tours, or other representations as determined by the team. The organizers will select a subset of submitted documentation for public distribution.

### *Format Requirements*

- |   |
|---|
| <input type="checkbox"/> Packaged into a single, zipped file. If elements are hosted online, a link shall be included in the submission.  |
| <input type="checkbox"/> Photographs shall be at least 1080 pixels in their shortest dimension and shall be accompanied by a file containing the name and affiliation of the photographer or graphic creator and identification of any individuals visible.   |
| <input type="checkbox"/> Videos, if submitted, shall be widescreen format and accompanied by documentation including a verbatim transcript of the audio narrative to meet <a href="#">Section 508 Accessibility</a> standards and identification of the creator and any individuals visible in the video. Closed captioning does not need to be included within the video file. Permission must be provided for any copyrighted content or audio used as part of the video. |

### *Content Requirements*

- |   |
|---|
| <input type="checkbox"/> Minimum of five images, with at least one exterior, one interior, and one birds-eye view   |
| <input type="checkbox"/> Photographs shall be at least 1080 pixels in their shortest dimension and shall be accompanied by a file containing the name and affiliation of the photographer or graphic creator and identification of any individuals visible  |
| <input type="checkbox"/> Videos, if submitted, shall be widescreen format and accompanied by documentation including a verbatim transcript of the audio narrative to meet <a href="#">Section 508 Accessibility</a> standards and identification of the creator and any individuals visible in the video. Closed captioning does not need to be included within the video file. Permission must be provided for any copyrighted content or audio used as part of the video. |

## D-6. Final Construction Documentation Submission

The final construction documentation submission shall represent 100% complete construction documentation, with sufficient detail for a contractor to build the competition prototype house as it is expected to appear on the competition site. The documentation shall include complete and final design details, house system specifications, and construction. While it is recognized that a few minor details may change during construction, the construction documentation submission shall provide sufficient information for the organizers to conduct a final rules and building code compliance verification. The submission must address the team's approach to safety, including identification of team-specific concerns and constraints. The construction documentation submission will not be reviewed by any juries; however, it may be made publicly available following each submission.

### D-6-a. Construction Drawings

#### *Format Requirements*

- |  |
|--|
| <input type="checkbox"/> Packaged into a single, bookmarked PDF document |
| <input type="checkbox"/> Up to 150 pages                                 |
| <input type="checkbox"/> ISO "A3" (297 mm × 420 mm) sheet size           |

#### *Content Requirements*

Complete construction drawings, including at a minimum:

- |   |
|---|
| <input type="checkbox"/> General - including solar envelope compliance, accessible tour route, finished square footage, water delivery and removal compliance information, and constructed footprint calculations |
| <input type="checkbox"/> Site - including temporary footing locations, ground penetrations, and adjustable footings   |
| <input type="checkbox"/> Landscape - including plantings, containers, and watering methodology  |

<input type="checkbox"/> Structural - including building, decking, and associated structures
<input type="checkbox"/> Architectural - including dimensioned floorplans, building sections, detailed sections, reflected ceiling plans, roof plans, elevations, window and door schedules, and exterior structures
<input type="checkbox"/> Interior - including finishes, furniture layout, and cabinetry
<input type="checkbox"/> Fire Protection - including sprinklers and required detection systems
<input type="checkbox"/> Plumbing - including layout, schedules, diagrams, and solar thermal (if applicable)
<input type="checkbox"/> Mechanical - including layout, schedules, diagrams, and installation requirements
<input type="checkbox"/> Electrical - including AC and DC layout, 1-line diagrams, 3-line diagrams, and sizing calculations
<input type="checkbox"/> Telecommunications - including instrumentation, wiring, and associated elements
<input type="checkbox"/> Operations - including house transportation, assembly methodology, and staging

## **D-6-b. Project Manual**

### ***Format Requirements***

<input type="checkbox"/> Packaged into a single, bookmarked PDF document
<input type="checkbox"/> ISO “A4” (210 mm × 297 mm) sheet size

### ***Content Requirements***

<input type="checkbox"/> Project Overview
<input type="checkbox"/> Detailed Water Budget
<input type="checkbox"/> Interconnection Application Form, including summary of any unlisted electrical components
<input type="checkbox"/> Summary of reconfigurable features
<input type="checkbox"/> Complete Energy Analysis and Model
<input type="checkbox"/> Construction Specifications

## **D-6-c. Stamped Structural Submission**

The structural submission shall represent a complete structural design, including structural calculations and specifications. The entire submission shall be stamped by a licensed design professional, such as a structural engineer or architect, licensed to stamp residential structural drawings and calculations in the team’s authority having jurisdiction and with educational and professional qualifications comparable to those required for licensure in China.

### ***Format Requirements***

<input type="checkbox"/> Packaged into a single, bookmarked PDF document
--

### ***Content Requirements***

<input type="checkbox"/> Stamped structural calculations and specifications demonstrating compliance with the Solar Decathlon China building code
---

## **D-6-d. Health and Safety Plan**

### ***Format Requirements***

<input type="checkbox"/> Packaged into a single, bookmarked PDF document
--

### ***Content Requirements***

<input type="checkbox"/> Health and Safety Plan meeting the requirements outlined in Appendix E
---

## **D-7. Project Summary & Public Exhibit Materials**

The team shall submit an updated description of the project team and design approach, renderings, graphic floor plans, logos, and other relevant information for use on the Solar Decathlon China website and for organizer

outreach about the event. The team shall submit all public exhibit materials the team plans to employ on the competition site, for organizer review of proper use of Solar Decathlon China branding, sponsor recognition, content, etc.

### **D-7-a. Project Summary**

#### ***Format Requirements***

- |  |
|--|
| <input type="checkbox"/> Packaged into a single, bookmarked PDF document |
| <input type="checkbox"/> 10 pages maximum                                |

#### ***Content Requirements***

- |  |
|--|
| <input type="checkbox"/> A 100-word or less description of your team house. (1 paragraph)  |
| <input type="checkbox"/> Design philosophy and house design, indicating goals, architectural style, target market, etc. (1 page)       |
| <input type="checkbox"/> Unique house features. What makes the house unlike any other? (1 page)  |
| <input type="checkbox"/> Technological innovations incorporated into your house. (1-2 pages)   |
| <input type="checkbox"/> Define the target client for the team house and how the design responds to this market's needs. (1 paragraph) |
| <input type="checkbox"/> Team organization, number of members, and primary contacts. (1 page)  |
| <input type="checkbox"/> Future plans for the house. Where will it go after the competition? (1 paragraph).                            |

### **D-7-b. Team Photograph**

#### ***Format Requirements***

- |   |
|---|
| <input type="checkbox"/> Photographs shall have be at least 1080 pixels in their shortest dimension and shall be accompanied by a file containing the name and affiliation of the photographer or graphic creator and identification of any individuals visible |
|---|

#### ***Content Requirements***

- |   |
|---|
| <input type="checkbox"/> Include all team members (if possible) and strive for creativity |
|---|

### **D-7-c. Construction Photography**

#### ***Format Requirements***

- |  |
|--|
| <input type="checkbox"/> Photographs shall be at least 1080 pixels in their shortest dimension and shall be accompanied by a file containing the name and affiliation of the photographer(s) and identification of any individuals visible |
|--|

#### ***Content Requirements***

- |  |
|--|
| <input type="checkbox"/> At least 10 photographs showing construction to-date of the competition prototype |
|--|

### **D-7-d. Team Logo**

#### ***Format Requirements***

- |  |
|--|
| <input type="checkbox"/> Vector or high-resolution format appropriate for print; EPS preferred |
|--|

#### ***Content Requirements***

- |  |
|--|
| <input type="checkbox"/> Graphic logo  |
| <input type="checkbox"/> Associated text file containing name, phone number, and email of person submitting logo |

### **D-7-e. Digital Project Representation**

The teams shall submit updated renderings, photographs, graphics, and/or animations representing the competition prototype design and competition entry for use on the Solar Decathlon China website and in outreach materials generated by the organizers. High quality and varied submissions are expected to lead to greater visibility for the team. This submission can include renderings, photography of scale models or mock-ups, refined graphics, computer-generated walkthroughs, 360-degree virtual tours, or other representations as determined by the team. The organizers will select a subset of submitted documentation for public distribution.

### ***Format Requirements***

- |  |
|--|
| <input type="checkbox"/> Packaged into a single, zipped file. If elements are hosted online, a link shall be included in the submission.   |
| <input type="checkbox"/> Photographs shall be at least 1080 pixels in their shortest dimension and shall be accompanied by a file containing the name and affiliation of the photographer or graphic creator and identification of any individuals visible   |
| <input type="checkbox"/> Videos, if submitted, shall be widescreen format and accompanied by a document including a verbatim transcript of the audio narrative to meet <a href="#">Section 508 Accessibility</a> standards and identification of the creator and any individuals visible in the video. Closed captioning does not need to be included within the video file. Permission must be provided for any copyrighted content or audio used as part of the video. |

### ***Content Requirements***

- |  |
|--|
| <input type="checkbox"/> Minimum of five images, with at least one exterior, one interior, and one birds-eye view  |
| <input type="checkbox"/> Photographs shall be at least 1080 pixels in their shortest dimension and shall be accompanied by a file containing the name and affiliation of the photographer or graphic creator and identification of any individuals visible   |
| <input type="checkbox"/> Videos, if submitted, shall be widescreen format and accompanied by a document including a verbatim transcript of the audio narrative to meet Section 508 Accessibility standards and identification of the creator and any individuals visible in the video. Closed captioning does not need to be included within the video file. Permission must be provided for any copyrighted content or audio used as part of the video. |

## **D-7-f. Competition Prototype Graphic Floor Plan**

The graphic floor plan is expected to be posted to the Solar Decathlon China website and used in various communications materials to introduce the public to each competition prototype. The floor plan should be presented in a way to demonstrate the layout of the house, interior furnishings, and all site elements.

### ***Format Requirements***

- |   |
|---|
| <input type="checkbox"/> Natively-generated vector PDF file |
|---|

### ***Content Requirements***

- |  |
|--|
| <input type="checkbox"/> Complete floor plan of competition prototype showing all exterior elements, including landscaping, ramps, decks, and solar envelope and interior elements, including furniture and fixtures |
|--|

## **D-7-g. Dinner Party Menus and Recipes**

### ***Format Requirements***

- |  |
|--|
| <input type="checkbox"/> Packaged into a single, bookmarked PDF file |
|--|

### ***Content Requirements***

- |   |
|---|
| <input type="checkbox"/> Restaurant-style dinner party menu for each dinner party |
| <input type="checkbox"/> Comprehensive ingredient list for each dinner party.     |

## **D-7-h. Public Exhibit Materials**

### ***Format Requirements***

- |   |
|---|
| <input type="checkbox"/> Packaged into a single, bookmarked PDF file  |
| <input type="checkbox"/> Each public exhibit material shall be represented at its full scale within the PDF; therefore, it is expected that the PDF may contain sheets at several different scales. |

### ***Content Requirements***

- |   |
|---|
| <input type="checkbox"/> Design of onsite signage, team handout, digital displays, or other products intended to convey information to the public |
| <input type="checkbox"/> Plan depicting location of all public exhibit materials  |
| <input type="checkbox"/> Team uniform design  |
| <input type="checkbox"/> Links to team website and/or social media accounts   |

## **D-8. Jury Deliverables**



The jury deliverables provide an opportunity for teams to present their projects to each jury prior to arrival on the competition site. The jury deliverables are expected to provide a summary of each team's approach to meeting the contest requirements for each of the juried contests. The narratives may include any combination of text and graphics. The narratives may link to multimedia hosted online, which may be reviewed by jurors as time permits. The narratives will not be made public prior to the release of the respective contest results.

### **D-8-a. Jury Narratives**

#### ***Format Requirements***

- |  |
|--|
| <input type="checkbox"/> Packaged into a single, bookmarked PDF file for each jury |
|--|

#### ***Content Requirements***

- |   |
|---|
| <input type="checkbox"/> Architecture Narrative, including architectural photography of the house (10 pages, maximum + up to 10 photographs)                            |
| <input type="checkbox"/> Market Potential Narrative, including complete cost estimate <sup>11</sup> (10 pages, maximum + cost estimate)                                 |
| <input type="checkbox"/> Engineering Narrative, including energy model and analysis (10 pages, maximum + energy model analysis & results)                               |
| <input type="checkbox"/> Communications Narrative, including links to team website and/or social media properties (10 pages, maximum + onsite public exhibit materials) |
| <input type="checkbox"/> Innovation Narrative (10 pages, maximum)   |
| <input type="checkbox"/> Water Narrative (10 pages, maximum)  |

### **D-8-b. As-Built Drawings**

#### ***Format Requirements***

- |  |
|--|
| <input type="checkbox"/> Packaged into a single, bookmarked PDF document |
| <input type="checkbox"/> Up to 150 pages                                 |
| <input type="checkbox"/> ANSI "D" (22 in. × 34 in.) sheet size           |

#### ***Content Requirements***

- |  |
|--|
| <input type="checkbox"/> Complete construction drawings representing the as-built competition prototype house and with sufficient detail for a residential general contractor to build the house without additional input from the team. |
|--|

### **D-8-c. As-Built Specifications**

#### ***Format Requirements***

- |  |
|--|
| <input type="checkbox"/> Packaged into a single, bookmarked PDF document, of sufficient detail for a residential general contractor to build the house without additional input from the team. |
|--|

#### ***Content Requirements***

- |  |
|--|
| <input type="checkbox"/> Construction Specifications |
|--|

### **D-8-d. Audiovisual Presentation**

#### ***Format Requirements***

- |   |
|---|
| <input type="checkbox"/> Widescreen, high-definition video file (such as .mov, .mp4, etc.)  |
| <input type="checkbox"/> 3-minute maximum length  |
| <input type="checkbox"/> Accompanied by a document including a verbatim transcript of the audio narrative to meet Section 508 Accessibility standards and identification of the creator and any individuals visible in the video. Closed captioning does not need to be included within the video file. Permission must be provided for any copyrighted content or audio used as part of the video. |

#### ***Content Requirements***

---

<sup>11</sup> The construction estimate shall be created in accordance with Appendix G.

<input type="checkbox"/>	Must include video footage of the complete constructed house as built prior to the competition
<input type="checkbox"/>	May contain still photos and graphics
<input type="checkbox"/>	Gives the jurors a realistic preview of what they will experience during the on-site walkthroughs
<input type="checkbox"/>	Includes an audio narrative that explains to viewers what they're seeing and describes the underlying philosophy behind the design and team approach to the competition

## D-9. Final Report

The Final Report shall reflect the results of the team's Solar Decathlon China project. It will be used by the organizers to improve future events and provide lessons-learned opportunities. The final report may be accompanied by a participant survey that shall be completed by all student and faculty team members.

### *Format Requirements*

<input type="checkbox"/>	Packaged into a single, bookmarked PDF document
<input type="checkbox"/>	20 pages maximum

### *Content Requirements*

<input type="checkbox"/>	Summary of fundraising activities – final project budget and lessons learned
<input type="checkbox"/>	Results of media-outreach activities – include statistics
<input type="checkbox"/>	Results of on-site exhibition activities – estimates of the number of visitors; assessment of visitor experiences; and lessons learned – what went well, what didn't, and what you would do differently
<input type="checkbox"/>	Evaluation of the team's online presence, including statistics; lessons learned – what went well, what didn't, and what you would do differently
<input type="checkbox"/>	Team perspective on the effectiveness of the organizers' communications efforts with both the teams and the public
<input type="checkbox"/>	Description of future plans for the house
<input type="checkbox"/>	Short description of each team officer's future plans for employment, continued study, or other endeavors;
<input type="checkbox"/>	Suggested competition improvements
<input type="checkbox"/>	Any other information you feel would be helpful to the organizers or future teams.

## D-10. Content Requirements for Solar Decathlon China Rules Compliance Check

Rule #	Rule Description	Content Requirement(s)
<input type="checkbox"/> 4-2	Construction Equipment	Drawing(s) showing the assembly and disassembly sequences and the movement of heavy machinery on the competition site
<input type="checkbox"/> 4-2	Construction Equipment	Specification for heavy machinery
<input type="checkbox"/> 4-2	Construction Power	Construction power will be provided
<input type="checkbox"/> 4-3	Spill Containment	Drawing(s) showing the locations of all equipment, containers, and pipes that will contain liquids at any point during the event
<input type="checkbox"/> 4-3	Spill Containment	Specifications for all equipment, containers, and pipes that will contain liquids at any point during the event
<input type="checkbox"/> 4-4	Lot Conditions	Calculations showing that the structural design remains compliant even if 10 cm of vertical elevation change exists
<input type="checkbox"/> 4-4	Lot Conditions	Drawing(s) showing shimming methods and materials to be used if 10 cm of vertical elevation change exists on the lot
<input type="checkbox"/> 5-2	Solar Envelope Dimensions	Drawing(s) showing the location of all house and site components relative to the solar envelope
<input type="checkbox"/> 5-2	Solar Envelope Dimensions	List of solar envelope exemption requests accompanied by justifications and drawing references
<input type="checkbox"/> 6-1	Structural Design Approval	List of, or marking on, all drawing and project manual sheets that have been or will be stamped by the qualified, licensed design professional in the stamped structural

		submission; the stamped submission shall consist entirely of sheets that also appear in the drawings and project manual	
<input type="checkbox"/>	6-2	Finished	Drawing(s) showing all information needed by the rules officials to measure the finished square footage electronically
<input type="checkbox"/>	6-2	Finished	Drawing(s) showing all movable components that may increase the finished square footage if operated during contest week
<input type="checkbox"/>	6-3	Entrance and Exit Routes	Drawing(s) showing the accessible public tour route
<input type="checkbox"/>	7-1	Placement	Drawing(s) showing the location of all vegetation and, if applicable, the movement of vegetation designed as part of an integrated mobile system
<input type="checkbox"/>	7-2	Watering Restrictions	Drawing(s) showing the layout and operation of greywater irrigation systems
<input type="checkbox"/>	8-2	Batteries	Drawing(s) showing the location(s) and quantity of all primary and secondary batteries and stand-alone, PV-powered devices
<input type="checkbox"/>	8-2	Batteries	Specifications for all primary and secondary batteries and stand-alone, PV-powered devices
<input type="checkbox"/>	8-3	Desiccant Systems	Drawing(s) describing the operation of the desiccant system
<input type="checkbox"/>	8-3	Desiccant Systems	Specifications for desiccant system components
<input type="checkbox"/>	8-4	Village Grid	Completed interconnection application form
<input type="checkbox"/>	8-4	Village Grid	Drawing(s) showing the locations of the photovoltaics, inverter(s), terminal box, meter housing, service equipment, and grounding means
<input type="checkbox"/>	8-4	Village Grid	Specifications for the photovoltaics, inverter(s), terminal box, meter housing, service equipment, and grounding means
<input type="checkbox"/>	8-4	Village Grid	One-line electrical diagram
<input type="checkbox"/>	8-4	Village Grid	Calculation of service/feeder net computed load per NEC 220
<input type="checkbox"/>	8-4	Village Grid	Site plan showing the house, decks, ramps, tour paths, and terminal box
<input type="checkbox"/>	8-4	Village Grid	Elevation(s) showing the meter housing, main utility disconnect, and other service equipment
<input type="checkbox"/>	9-1	Container Locations	Drawing(s) showing the location of all liquid containers relative to the finished square footage
<input type="checkbox"/>	9-3	Greywater Reuse	Drawing(s) showing the layout and operation of greywater reuse systems
<input type="checkbox"/>	9-4	Rainwater Collection	Drawing(s) showing the layout and operation of rainwater collection systems
<input type="checkbox"/>	9-6	Thermal Mass	Drawing(s) showing the locations of liquid-based thermal mass systems
<input type="checkbox"/>	9-6	Thermal Mass	Specifications for components of liquid-based thermal mass systems
<input type="checkbox"/>	9-7	Greywater Heat Recovery	Drawing(s) showing the layout and operation of greywater heat recovery systems
<input type="checkbox"/>	9-8	Water Removal	Drawing(s) showing the complete sequence of water consolidation and removal events
<input type="checkbox"/>	9-8	Water Removal	Specifications for the containers from which water will be removed
<input type="checkbox"/>	11-4	Public Exhibit	Interior and exterior plans showing entire accessible tour route
<input type="checkbox"/>	12-1	Construction Cost	Construction specifications including detailed and itemized cost information about the house

## Appendix E Communications Deliverables

### E-1. Web Site

A URL to a preliminary Web site consisting of at least three pages shall be evaluated by communications professionals at the SD China Organizing Committee (SD China OC) to ensure compliance with the minimum Web site coding and accessibility standards provided in this appendix.

Each team shall be notified of required changes they must make to achieve site compliance. As team Web sites meet compliance, SD China OC will link to the sites from the Solar Decathlon China Web site. The Communications Jury will only evaluate sites that are linked to the main Solar Decathlon China Web site.

As significant changes (e.g., new features or a complete redesign) are made to the team Web sites between this deadline and the competition, teams are encouraged to request additional compliance reviews from the SD China OC.

#### *Minimum Web Site Coding and Accessibility Standards*

- ☐ All team web sites shall comply with rules 10-2 and 10-3.
- ☐ Common elements:
  - A text or graphical link to the Solar Decathlon China home page is provided on the home page in either the header or the footer.
  - At a minimum, an e-mail contact to the Webmaster is provided as a graphical or text link on the home page of the site.
  - Left or top navigation (or both), if used, link correctly; on and off states work correctly and can be skipped by screen readers.
  - Each page has a meaningful and unique <title> tag.
- ☐ Page layout:
  - Pages must display correctly (e.g., no horizontal scrolling is necessary to view the full width of the page) in 1024 x 768 resolution (800 x 600 resolution is also acceptable).
  - Page information conveyed with color is also available without color, and foreground and background colors provide sufficient contrast.
  - Headers and footers are consistent throughout the site.
- ☐ Directories and files:
  - File names do not contain uppercase letters, spaces, or special characters (e.g., & or \$).
- ☐ HTML syntax:
  - HTML syntax follows HTML 4.01 transitional standards or higher and has been validated by the [W3C Validator](#).
  - Row and column headings have been provided for all data tables.
- ☐ Links:
  - All links work throughout the site.
  - Links are coded relatively on static pages within the site.
  - Hypertext links used in content throughout the site are underlined to indicate they are links.
- ☐ Scripts/applets/dynamic pages (CGI, JavaScript, Java, etc.):
  - Every script works correctly in the standard browser set.
  - Content produced by scripting languages is accessible or has an accessible alternative.
  - Pages requiring applets or plug-ins must provide a link to an accessible page where they can be downloaded.
  - If a timed response is required, the user can request more time to complete an operation.
  - Back button functionality is not impaired.
- ☐ Forms:
  - Forms include text labels that correspond with form controls and markup to associate the two.

☐ Graphics:

- All images are stored in a separate subdirectory.
- Graphics have meaningful “alt” tags. (Use empty alt tags for spacer gifs and other unimportant graphics.)
- Alt descriptions are used with all client-side image maps.

☐ Multimedia:

- All
  - All multimedia files are stored in a separate subdirectory.
  - Equivalent alternatives are provided for all multimedia.
  - Pages requiring an applet or plug-in must provide a link to a page where the applet or plug-in can be downloaded.
- QuickTime VR
  - All QuickTime VRs scroll correctly.
  - All QuickTime hotspots link correctly.
- Flash
  - Animation has been tested on a browser without a plug-in downloaded. (Ensure the download process flows smoothly and that the animation works when loaded.)
  - Check all links within Flash animation. If the user exits Flash animation early, ensure that she will go to an appropriate page.
  - Sound works correctly.
  - If Flash is used as an introductory “splash” screen, there is an option provided to skip it.
  - Provide an accessible equivalent to the Flash animation.
- Video
  - All video shall be accompanied by either synchronous captioning or a text version to meet Section 508 Accessibility standards. For information, visit the [“Make Your Videos, Audio Files, Podcasts, and Other Multimedia Section 508 Compliant and Accessible” feature](#) on the [USA.gov Web site](#).

☐ Documents for downloading and printing:

- PDFs
  - All PDFs are stored in a subdirectory labeled “pdfs.”
  - References to PDFs within the HTML document use a consistent format and link scheme throughout the site (e.g., PDF 54 KB).
  - Every page with a PDF link also includes a link to download Adobe Reader (<http://get.adobe.com/reader/>) with the text “[Download Adobe Reader](#).”
- Native file formats
  - Native file format documents are placed in a separate subdirectory, such as a “docs” subdirectory.
  - References to native files within the HTML document will use the following format and link scheme throughout the site: Title of Document ([Software 54 KB](#)). Examples:
    - The Value of Renewables ([MS Word 54 KB](#))
    - The Value of Renewables ([Excel 54 KB](#))
    - The Value of Renewables ([PowerPoint 54 KB](#))

☐ Testing:

- For quality-control testing, test the site in the standard browser set:

***Final Web Site***

The final Web site URL shall be evaluated by the Communications Jury. The Communications Jury shall begin evaluations of team Web sites at the same time that assembly begins at the competition site.

The final Web site shall consist of considerably more content than the preliminary Web site.

## **E-2. Computer-Animated Walkthrough**

Each team shall provide a computer-animated walkthrough of its house for the following purposes:

1. To be included in a compilation video of all Solar Decathlon China 2017 walkthroughs that will be presented to audiences at the 2016 Design Workshop.

2. To be posted on the Solar Decathlon China Web site as an introduction to each house.

### ***Format Requirements***

<input type="checkbox"/> Packaged into a single Quicktime .mov file (1280 × 720 30fps h.264/mp4 high-definition format)
<input type="checkbox"/> Runtime between 3 and 3.5 minutes
<input type="checkbox"/> Shall be accompanied by either synchronous captioning and a text version. For information, visit the <a href="#">“Make Your Videos, Audio Files, Podcasts, and Other Multimedia Section 508 Compliant and Accessible” feature</a> on the <a href="#">USA.gov Web site</a> .
<input type="checkbox"/> Synchronous captioning is always preferred. See the <a href="#">W3C site</a> for more information on synchronous captioning. For an example of a video with synchronous captioning, see the <a href="#">Super Boiler Overview</a> video.
<input type="checkbox"/> If you cannot caption your video, then you must write a text version. Read about <a href="#">how to write text versions</a> . For an example of a text version script, see the <a href="#">Wind Power Animation (Text Version)</a> .
<input type="checkbox"/> If possible, videos should be accompanied by both synchronous captioning and a separate text version of the audio.

### ***Content Requirements***

<input type="checkbox"/> Composed of animated computer renderings that walk viewers through the house
<input type="checkbox"/> Includes an audio narrative that explains to viewers what they’re seeing and describes the philosophy behind the design
<input type="checkbox"/> Does not include elements that are inherently inaccessible to those with visual disabilities

## **E-3. Video Walkthrough**

Each team is required to provide a video walkthrough of its house for the following purposes:

1. To be posted on the Solar Decathlon China Web site as an update to the computer-animated walkthrough
2. To be evaluated by the Communications Jury.

### ***Format Requirements***

The format requirements for the video walkthrough are the same as the format requirements for the computer-animated walkthrough (see Appendix E-2).

### ***Content Requirements***

<input type="checkbox"/> Composed of video footage of the final constructed house
<input type="checkbox"/> Includes an audio narrative that explains to viewers what they’re seeing and describes the philosophy behind the design
<input type="checkbox"/> Does not include elements that are inherently inaccessible to those with visual disabilities

## **E-4. Scale Model**

Each team shall build a detailed scale model of its project for display at 2017 Design Workshop.

### ***Requirements***

<input type="checkbox"/> Teams are responsible for transporting their models to a designated location.
<input type="checkbox"/> The model shall be built at 1:25 scale.
<input type="checkbox"/> The model shall be built on a 1-m.-by-1-m. base. These dimensions are equivalent to the 25-m-by-25-m lot size at 1: 25 scale.
<input type="checkbox"/> In addition to the primary dwelling units, all exterior construction and site components shall be included in the model.

## **E-5. Project Summary**

Project summary is important to many communications-related aspects of the Solar Decathlon China:

- Provide essential content for the organizers to use while developing various event materials (e.g., the Web site, event program, media kit, and village signage)
- Prepare teams to answer questions from visitors to their construction sites and to the event at the competition site
- Help organizers and teams respond effectively to media inquiries.

All project summary materials (narrative, photograph, and logos) shall be saved in the formats indicated and submitted to organizers in one .zip file.

### **E-5-a. Narrative**

#### ***Format Requirements***

<input type="checkbox"/> Packaged into a single, bookmarked PDF file (see Appendix G for PDF formatting and file-naming requirements)
<input type="checkbox"/> 5 pages maximum
<input type="checkbox"/> 11-pt. type, double spaced, 25mm margins

#### ***Content Requirements***

<input type="checkbox"/> A 100-word description of your team house.
<input type="checkbox"/> The team mission statement, goals, and values. What is the team's "personality"? What does the team want to accomplish? What does the team care about?
<input type="checkbox"/> Design philosophy and house design. What is the team trying to portray or accomplish with this design? What will the house look like? What are some of the key features?
<input type="checkbox"/> Unique house features. What makes the house stand out, or appear unique?
<input type="checkbox"/> Technological innovations. What unique or unusual technologies are incorporated into your house?
<input type="checkbox"/> Market appeal. Who is the target client for the team house? How does the design accommodate the needs and desires of this client?
<input type="checkbox"/> Team organization and contacts. Indicate how your team is organized and approximately how many students, faculty, and others (e.g., sponsors, volunteers, family members) are involved in the project.
<input type="checkbox"/> Future plans for your house. Where will it go after the competition?

### **E-5-b. Team Photograph**

For use in the event program, media kit, and Solar Decathlon China Web site, the team photo is an important conveyance of your team's personality.

#### ***Format Requirements***

<input type="checkbox"/> Native format of the camera, such as JPEG or RAW, if available
<input type="checkbox"/> 2048 × 1080 minimum pixel dimensions
<input type="checkbox"/> RGB, 8-bit color, not black and white
<input type="checkbox"/> Every file conversion or image re-sampling from the original results in image degradation, so keep conversions to a minimum.

#### ***Content Requirements***

<input type="checkbox"/> Include all team members (if possible) and strive for creativity.
<input type="checkbox"/> For a photograph to be properly credited, the following information shall be included in the file's metadata or in a text file accompanying the photograph file: <ul style="list-style-type: none"><li>• Name, phone number, and e-mail of person submitting the photograph</li><li>• Photograph date and location</li><li>• Photographer's name and affiliation.</li></ul>

### **E-5-c. Team Logo**

The team logo is used by organizers in village signage, the event program, media kit, and Solar Decathlon China Web site.

#### ***Format Requirements***

<input type="checkbox"/> Submit two versions of your logo: <ul style="list-style-type: none"><li>• One for Web (GIF or JPG, at least 200 px wide). GIF is preferred for simple flat-color logos. JPG is preferred for complex logos.</li></ul>
--

- One for print (high-resolution EPS or other vector art).

#### Content Requirements

- ☐ Include a text file containing the following additional information:
  - Name, phone number, and e-mail of person submitting the logo
  - A list of all PMS or CMYK numbers used in the logo.

### E-6. Public Exhibit Materials

All team communications materials at the competition site shall support the goal of Contest 4: Communications, which is to educate consumers about the project and topics relevant to the project.

- Teams shall submit all public exhibit materials to organizers for review. Organizers will determine whether materials meet competition and hosting city guidelines.
- Public exhibit materials shall be evaluated by Communications Jury members.

#### Format Requirements

- ☐ Packaged into a single, bookmarked PDF file (see Appendix G for PDF formatting and file-naming requirements)
- ☐ Each public exhibit material shall be represented at its full scale within the PDF. Therefore, it is expected that the PDF may contain sheets at several different scales.

#### Content Requirements

- ☐ Team handout (shall abide by rules 10-2, 10-3, and 11-4b)
- ☐ Signage (shall abide by rules 10-2, 10-3, and 11-4c)
- ☐ Team uniform design (shall abide by rule 11-5)
- ☐ Plan drawing of team site depicting public exhibit material locations and tour route at 1:48 scale

### E-7. Final Report

The Final Report shall reflect the results of the team's Solar Decathlon China project.

#### Format Requirements

- ☐ Packaged into a single PDF file (see Appendix G for PDF formatting and file-naming requirements)
- ☐ Intent of figures shouldn't be lost if printed in black & white
- ☐ ISO "A4" (210 mm × 297 mm) sheet size
- ☐ 20 pages maximum, including figures, tables, and appendices; cover sheet and table of contents do not count toward page limit
- ☐ 11-point body text
- ☐ Maximum 14-point heading text
- ☐ 25mm margins on top, bottom, left, and right
- ☐ Include page numbers and numbered captions for figures and tables for easy navigation through document

#### Content Requirements

- ☐ Results of fundraising activities – final quantity of contributions (cash and in-kind); final project budget and accounting; lessons learned – what went well, what didn't, and what you would do differently.
- ☐ Results of media-outreach activities – include statistics.
- ☐ Results of on-site exhibition activities – estimates of the number of visitors to the house (justify estimates); assessment of visitor experiences (include qualitative data); and lessons learned – what went well, what didn't, and what you would do differently.
- ☐ Evaluation of the team's Web site – number of hits, unique visits, and any other user statistics; lessons learned – what went well, what didn't, and what you would do differently.
- ☐ Team perspective on the effectiveness of the organizers' communications efforts with both the teams and the public.



<input type="checkbox"/> Description of future plans for the house, including a statement indicating whether the participating institution(s) would be interested in partnering with SD China to use the house for follow-up collaborative research and outreach projects.
<input type="checkbox"/> Short description of each team officer's future plans for employment, continued study, or other endeavors. SD China requests this information for possible inclusion in publications and presentations describing how the Solar Decathlon China program serves as an effective workforce development and university research project.
<input type="checkbox"/> Suggested competition improvements.
<input type="checkbox"/> Any other information you feel would be helpful to the organizers or future teams.

## Appendix F Health and Safety Plan

Each team is required to submit a Health and Safety Plan that identifies the following:

- How you will be minimizing risk
- How you will address major hazards that may be encountered during assembly and disassembly activities on the competition site
- How you will control these hazards to prevent injury to team members, volunteers, organizers and the public
- How you will ensure that you are in compliance with applicable regulations.

### F-1. Plan Development

A Health and Safety Plan template will be made available and sent to each team by email. The template identifies major topics to address, the level of detail required, performance expectations, and requirements such as minimum levels of training needed for various team positions. The format of your submitted plan can deviate slightly from the recommended template as long as the information and level of detail is equivalent.

You are encouraged to work or consult with your school's environment, safety and health department during the development process. They can be an excellent resource when developing your Health and Safety Plans, while also ensuring that school-specific requirements are addressed.

### F-2. Required Training

To ensure a minimum knowledge base regarding health and safety issues during construction activities, the team's project manager, construction manager, and health and safety officer are required to complete the OSHA 30-hour Construction Safety Training course. Proof of course completion for the OSHA 30-hour Construction Safety Training shall be included in the Health and Safety Plan.

### F-3. Submission and Approval

Teams are required to submit their Health and Safety Plan to SD China Organizing Committee for acceptance. Once your plan has been accepted, it is your responsibility to make updates if parameters change. For example, if you did not plan to use a crane to place your house when your plan was submitted but later decide that a crane will be necessary, then you are required to update your plan accordingly.

During the event, a current copy of your team's Health and Safety Plan shall be posted on your site. Individuals working on your site shall be briefed on the final, approved plan so they know the expectations regarding safety, hazards, and controls.

## Appendix G Deliverable Submission Instructions

Deliverables are considered to be on time if they are received by the competition official by 5 p.m. China Standard Time (CST) on the respective due date. Refer to the “Deliverables Status Sheet” which will be made available and sent to each team later for deliverable due dates and required file formats for each of the respective deliverables.

### G-1. Web Site URL

Web site URLs shall be e-mailed to the competition official at [support@sdchina.org](mailto:support@sdchina.org).

### G-2. PDF Requirements

- a. Files submitted as a PDF shall meet the following criteria:
  - (i). Embed all fonts.
  - (ii). Maintain a minimum resolution of 300 dpi.
- b. If an application does not support a direct-to-PDF function, create a postscript file by printing to a postscript printer with the “print to file” option selected. Use this postscript (.ps or .prn) file to create a PDF using Acrobat Distiller’s high-resolution job settings.
  - (i). Creating a PDF from scans, or by outputting the content into a raster image format (.jpg, .tiff, .png, .gif, etc.) and then creating a PDF from the images, is NOT ACCEPTABLE.
  - (ii). All-raster PDFs are large files at 300dpi, are of unacceptable quality at lower resolutions, and are not scalable without degradation.

### G-3. Electronic File-Naming Instructions

The required file-naming convention for all electronic files follows:

[LEADING ORGANIZATION]\_[FILE NAME]\_[SUBMISSION DATE (YYYY-MM-DD)].[EXTENSION]

Examples:

- a. Tongji University Schematic Design Summary  
Tongji University\_Schematic Design Summary\_2016-05-05.jpg
- b. UC Davis exterior rendering submitted separately  
UC Davis\_Exterior Rendering\_2016-05-05.jpg

### G-4. Electronic File Submission Options

All electronic files shall be uploaded to the appropriate Solar Decathlon China Website Submission page.