

Engineering Student Technology Committee

<http://www.engr.colostate.edu/ESTC>

**College of Engineering
Colorado State University**

1. Title of Proposal:

ASCE Regional Conference Devices/Instrumentation

2. Proposal Participants:

Primary Contact for Proposal

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Check One: Student

Additional proposal participants

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Department/Major: Dept. of Civil and Enviro. Engr. – Civil Engineering

Check One: Faculty

3. Proposal Abstract (limit to 100 words):

CSU ASCE Student Chapter participates in an annual student conference which brings together engineering students from across the Rocky Mountain region to showcase their efforts throughout the academic year. Several individual events require the use of specialized equipment including the Steel Bridge and Concrete Canoe. The equipment will become an integral part of creating a safe and efficient environment for spectators and competitors but will also be utilized after the conference has concluded as well. All of the discussed items would greatly benefit the largest engineering student organization on campus by enhancing participation and success at the regional conference.

4. Proposal Budget

List of items to purchase and cost of each

Item	Quantity	Estimated Cost	Description/Comments
Safety catchment devices	5	\$1,000	See below for a picture
Laptop computers	2	\$1,500	
Safety Steel Grating	1	McNichols - \$554.26	36" X 240" – Can be cut to size for an additional cost
String Pot/Electronic LVDT	6	\$1,200	
String Pot Controller?	1	\$500	I am not familiar if the string pots/electronic LVDT's needs a controller to compile the raw data before sending it to the computer.
TV	1	\$500	
Misc.		\$400	Computer-TV connecting equipment/steel string pot housing/computer software/surge protectors

Dollar or percentage amount requested from ESTC: ~ \$5,000-\$6,000

5. Full description of proposal:

The CSU ASCE Student Chapter has been tasked with the organization and implementation of the 2014 Rocky Mountain Regional Student Conference. This conference will bring together over 400 students, faculty, and professionals with the intent of showcasing student projects through competitive events directly linked to materials (steel and concrete) utilized in their future careers. One such event is the Steel Bridge Competition which consists of 3 major sections, aesthetics, construction, and loading.

The loading component necessitates the addition of 2400 lbs of load, in 25lb increments, and recording deflection in real time on top of a steel grating surface. If the deflection exceeds a certain threshold, loading ceases and the bridge is disqualified. In order to accurately measure the deflection, an electronic LVDT or string pot is necessary. Since deflections are measured in 3 vertical locations and the CSU ASCE Conference Planning Committee would like to run 2 loading stations simultaneously, there would be a total of 6 electronic LVDT/string pot's linked to a central laptop computer. This laptop would be installed with the necessary software to compile the data and feed it into a spreadsheet. Data will determine where each school ranks compared to other competitors and will be displayed on a TV screen to spectators. Should one of the bridges collapse unexpectedly, safety catchment devices will be located under the bridge to prevent damage to the floor and more importantly, the participants, judges, and spectators who will be standing nearby. All of these components are detailed in pictures below.

Another competition which is held annually is the Concrete Canoe. The canoe is cast during the school year by a group of senior design students and raced at a local reservoir against other competing schools. Judges at this event need to record race times and display them, in real time, to spectators.

I have been told that ENS allows students to check out a laptop however I assume that installing new software on the laptop is forbidden. It is for this reason that I submit a proposal for several items which will be crucial to the implementation of a safe and fun gathering of students, professionals, and advisers.

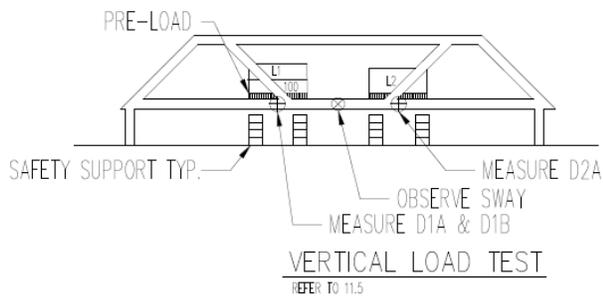
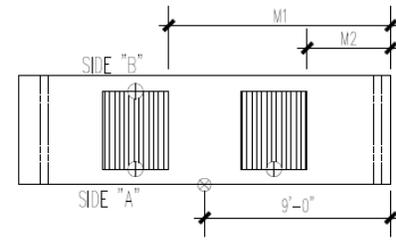
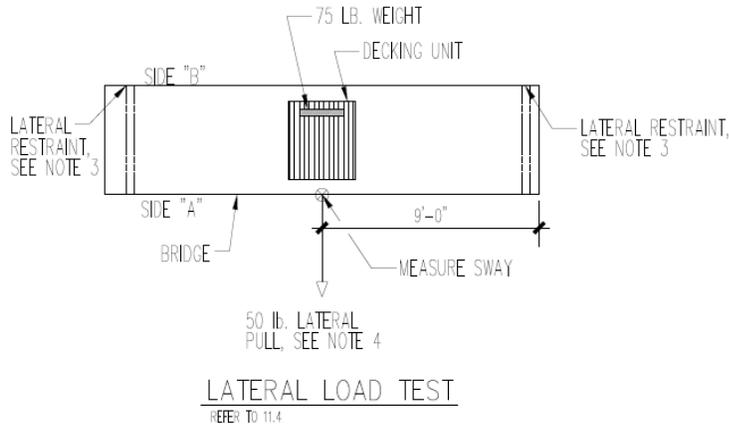
At the termination of the event, CSU ASCE Student Chapter (specifically the Steel Bridge and Concrete Canoe) will retain ownership of the devices and instrumentation aforementioned in order to improve their placement at the regional conference each subsequent year. Because of the cross section of students that will use this equipment continually, it is a valuable investment in the promotion of ASCE activities and student projects. The laptop and TV will be utilized at each of the promotional events in which ASCE participates such as the SLiCE Involvement Fairs, public outreach activities, Webelos Badge Day, or Engineering Exploration Days. The TV could have a permanent home in the display case directly outside of the main Civil Engineering office and run a loop of ways students can become involved.

In order to make the conference as successful as previous years, CSU ASCE students need your help!

Pictures



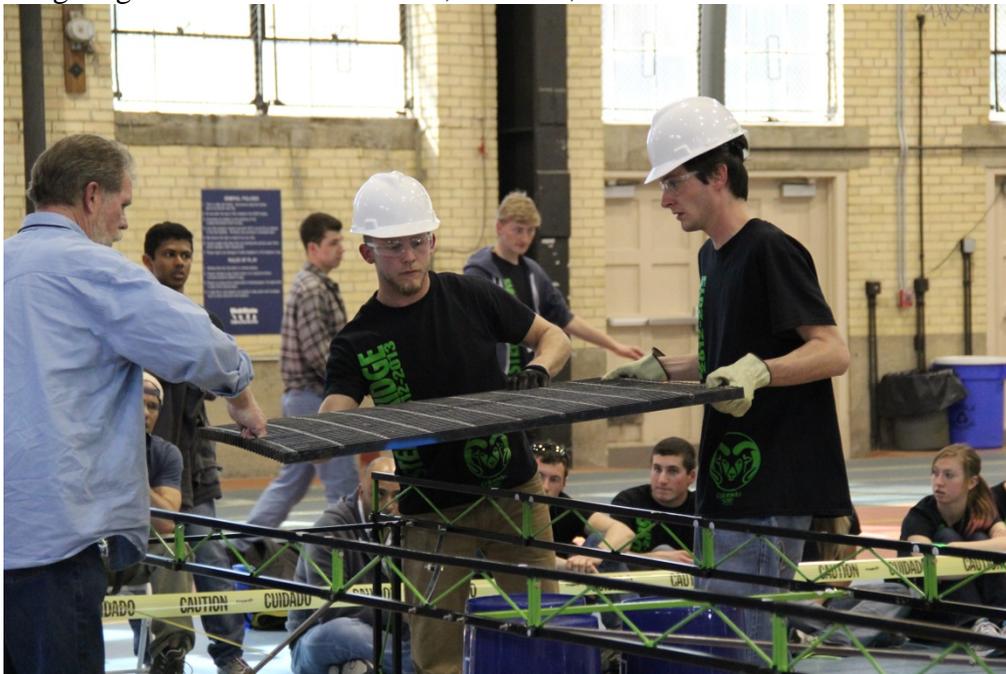
Notice the String Pot and the Safety Load Catchment Devices circled at the bottom. The rules set which accompanies the Steel Bridge has changed significantly since the 2012 competition and now call for additional string pots/LVDT's.



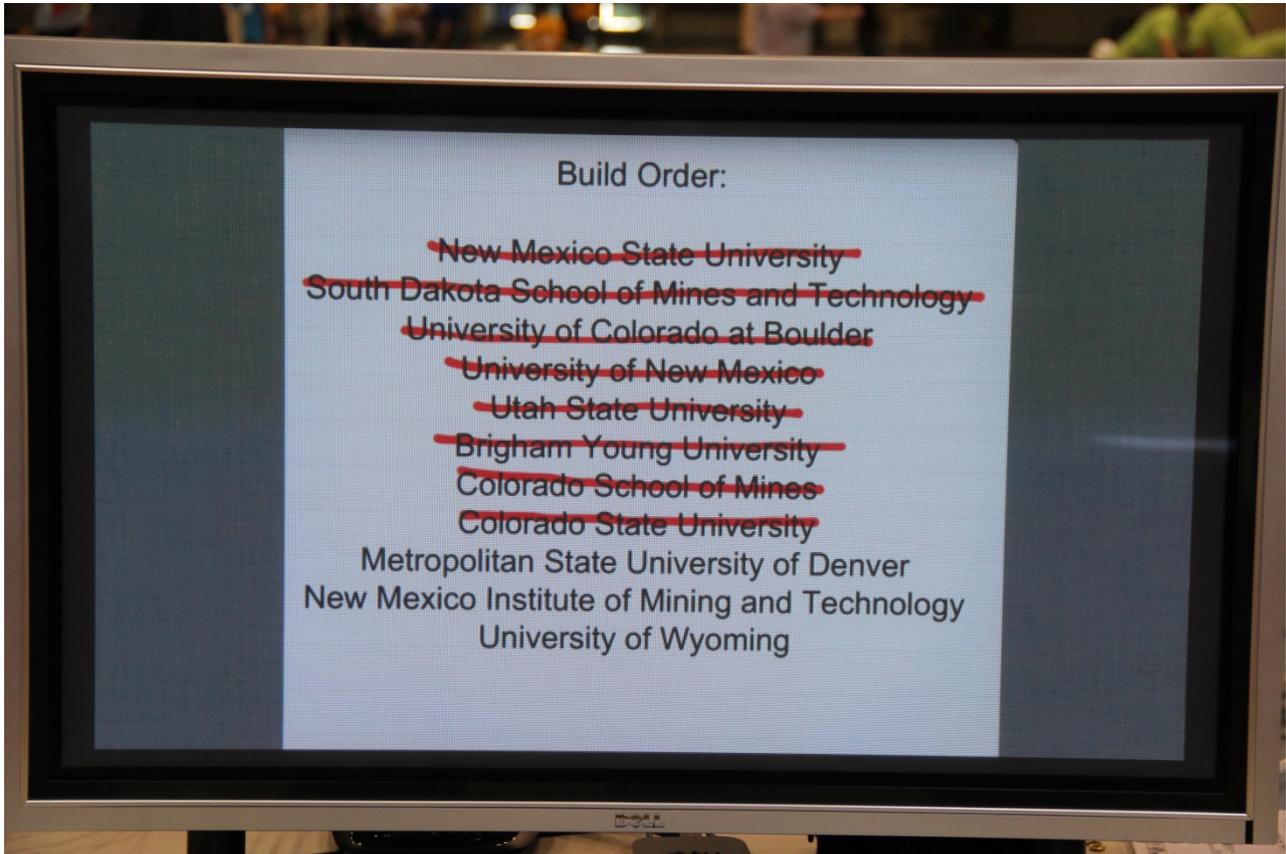
NOTES:

1. SAFETY SUPPORTS TO BE IN PLACE UNDER THE LOAD AND TO REMAIN AT ALL TIMES DURING LOADING.
2. ALL LOADING SAFETY PROCEDURES TO BE FOLLOWED.
3. LATERAL RESTRAINT MUST BE APPLIED CLOSE TO THE GROUND AND MUST NOT RESTRAIN ROTATION, UPLIFT, OR TRANSLATION IN OTHER THAN THE LATERAL DIRECTION.
4. LOCATION OF 50 LB. PULL SHALL NOT EXCEED 4" FROM SWAY TARGET.
5. SWAY TARGET IS TO REMAIN IN PLACE THROUGHOUT LOADING PROCESS.
6. LOADS ARE CENTERED Laterally AND DISTRIBUTED OVER THE DECKING UNIT AS UNIFORMLY AS POSSIBLE DURING LOADING.
7. OBSERVE SWAY AND TERMINATE LOADING IF SWAY EXCEEDS 1 INCH.

The loading diagram which details where, and how, the measurement sensors are to be setup.



Placing the Decking Support Surface (Safety Steel Grating) at one location of the bridge from 2013.



TV on which real time results were displayed to spectators.