

2015-16  
ACSA/AISC STEEL  
STUDENT DESIGN  
COMPETITION

TALL  
BUILD  
INGS

[www.acsa-arch.org/steel](http://www.acsa-arch.org/steel)

Image Credit: Marshall Gerometta

*“As the location’s most endemic factor, climate provides the designer with a legitimate starting point for architectural expression in the endeavour to design in relation to place, because climate is one of the dominant determinants of the local inhabitants’ lifestyle and the landscape’s ecology.”*

– Dr. Ken Yeang, 1996

*“Regionalism is not simply the nostalgic privileging of the vernacular form, but a synthesis of the vernacular with modernism. It is a way of thinking about architecture which is culturally regenerative – not a style, but a search for a cultural continuity..... It implies the embracing of modernism whilst simultaneously maintaining links with traditional forms and practices”*

– Robert Powell, 1993

## INTRODUCTION

The Association of Collegiate Schools of Architecture (ACSA) is pleased to announce the sixteenth annual steel design student competition for the 2015-2016 academic year. Sponsored by the American Institute of Steel Construction (AISC), administered by the Association of Collegiate Schools of Architecture (ACSA) and with the Council on Tall Buildings and Urban Habitat as a promotional partner, the program is intended to challenge students, working individually or in teams, to explore a variety of design issues related to the use of steel in design and construction.

## ADVANTAGES OF STEEL

Structural steel offers a number of benefits in building design including the capacity to bear great loads in tension and compression, high resiliency and performance under harsh and difficult conditions, (e.g., earthquakes and hurricanes) and the ability to span great distances with minimum material. Steel can be shaped by many processes, ranging from standard rolled sections to custom castings and digitally generated components. It can be prefabricated and delivered for site assembly, and it can be erected quickly under almost any weather condition to meet tight construction schedules. Similarly, steel’s wide use for building cladding highlights its durability, technical capabilities and aesthetic versatility.

Steel can be easily modified during the life cycle of a building to accommodate changing occupant requirements. As the most recycled material in the world, steel is an environmentally sound building material choice. Today, structural steel is 97% recycled with the primary source being automobiles. Architects praise the natural beauty of steel and are excited about exposing it in the design of their structures to emphasize grace, slenderness and strength, and in their building envelopes to enhance environmental performance and aesthetic character.

## THE CATEGORIES

The 2015-2016 Steel Design Student Competition will offer architecture students the opportunity to compete in two separate categories:

Category I: TALL BUILDINGS

Category II: OPEN submission design option for any building type, with limited restrictions.

## COMPETITION ORGANIZERS

### SPONSOR

American Institute of Steel Construction (AISC), headquartered in Chicago, is a non-profit technical institute and trade association established in 1921 to serve the structural steel design community and construction industry in the United States. AISC's mission is to make structural steel the material of choice by being the leader in structural-steel-related technical and market-building activities, including: specification and code development, research, education, technical assistance, quality certification, standardization, and market development. AISC has a long tradition of more than 90 years of service to the steel construction industry providing timely and reliable information.

Membership to AISC is free to university faculty and full time students and AISC membership provides valuable benefits. Information can be found at [www.aisc.org/universityprograms](http://www.aisc.org/universityprograms) under memberships.

### ADMINISTRATIVE ORGANIZATION

The Association of Collegiate Schools of Architecture is a nonprofit, membership association founded in 1912 to advance the quality of architectural education. The school membership in ACSA has grown from 10 charter members to over 250 schools in several membership categories. These include full membership for all accredited programs in the United States and government-sanctioned schools in Canada, candidate membership for schools seeking accreditation, and affiliate membership for schools for two-year and international programs. Through these schools, over 5,000 architecture faculty members are represented. In addition, over 500 supporting members composed of architecture firms, product associations and individuals add to the breadth of interest and support of ACSA goals. ACSA provides a major forum for ideas on the leading edge of architectural thought. Issues that will affect the architectural profession in the future are being examined today in ACSA member schools.

### PROMOTIONAL PARTNER

The Council on Tall Buildings and Urban Habitat is the world's leading resource for professionals focused on the inception, design, construction, and operation of tall buildings and future cities. A not-for-profit organization, founded in 1969 and based at Chicago's Illinois Institute of Technology, CTBUH has an Asia Headquarters office at Tongji University, Shanghai, and a Research Office at Iuav University, Venice, Italy. CTBUH facilitates the exchange of the latest knowledge available on tall buildings around the world through publications, research, events, working groups, web resources, and its extensive network of international representatives. The Council's research department is spearheading the investigation of the next generation of tall buildings by aiding original research on sustainability and key development issues. The Council's free database on tall buildings, The Skyscraper Center, is updated daily with detailed information, images, data, and news. The CTBUH also developed the international standards for measuring tall building height and is recognized as the arbiter for bestowing such designations as "The World's Tallest Building."

# CATEGORY I: TALL BUILDINGS

## OVERVIEW

Tall Buildings have enjoyed a resurgence in recent decades unparalleled in human history. They have been built in greater number, greater height, and in more varied locations than at any other juncture. At the same time, from a design perspective, many of these Tall Buildings seem to have been designed as either vertical extrusions of an efficient floor plan, or stand-alone pieces of high-rise urban ‘sculpture’. In both cases the only relationship with the urban setting is a visual one, with the tall building usually dominating. This has led to the syndrome of tall buildings as ‘isolationist’ architecture – stand-alone, non-site specific models that are readily transportable around the cities of the world. This has served to create an alarming homogeneity across global urban centers – a creation of a ‘one size fits all’ skyscraper ‘mush’. This is especially true of cities in developing nations, where the imported, rectilinear, air-conditioned ‘box’ is the standard norm. In addition, tall buildings have become synonymous with the greatest excesses of energy expenditure – in both embodied construction and operation. In short, these tall buildings are often seen to be contributing to the degradation of both the local (cultural) and the global (through climate change).

It does not, however, need to be this way. In the need for denser, more concentrated sustainable cities which reduce the loss of green space and energy-intensive transport and infrastructure networks, tall buildings have an opportunity to reinvent themselves as the typology for a sustainable urban future – focused centers of live, work and play with innovative forms, technologies and environments to face the challenges of the future climate-changed world. This new typology needs to be inspired also by the cultural and vernacular traditions of the location. This is especially important in maintaining the cultural integrity and continuity of any urban domain, but especially in developing countries where the embrace of western models is both enthusiastic and rapid. In short, tall buildings need to be inspired by place – both culturally and environmentally.

## THE DESIGN

This design project seeks to explore the themes outlined above to find alternative design approaches for tall buildings; to create high-rise buildings that are inspired by the cultural, physical and environmental aspects of place. At the same time, the project should embrace the very latest technologies available (including future technologies) to allow advancement in steel structure, building form, skin, function, operation, systems and expression.

## THE SITE

The highrise should be sited on a city lot to be chosen by the faculty sponsor and/or the student. The criteria for site selection include the following:

Size: the site should be no larger than a single city block

Context: the site should be located in an easily reached area of the city

Access: the site should have access to public transportation such as light rail, commuter rail, subway, or bus

It is vitally important that the site is studied and researched in detail, as this should be the springing point for the design. The eventual competition entry should clearly show how the building responds to its “site”, in the widest understanding of that word. It is important that the site study reaches far beyond the aspects of the individual site, in order to determine the context for design, the programmatic brief for the building, and to inform the design process to follow. Site studies thus need to embrace the ‘local’ (the direct site context of the building), the ‘intermediate’ (since a tall building has a physical relationship with places far and wide in a city) and the ‘global’ (the city and local culture as a whole).

## THE PROGRAM

You are free to determine the size, height, function, accommodation and responsibilities of the building, according to your site studies & research. It is likely that the building will be mixed-use in nature. Possible influential factors on the detailed program (in no particular hierarchy) may be: site area, urban grain, neighboring buildings, city requirements, community requirements, the commercial market, social responsibility, sustainability, aesthetics, proportions, plot ratios etc. Students should devise the program to respond to the local physical, climatic, social, cultural and financial conditions.

### Project Aims & Objectives:

- An expressive understanding of steel utilized with maximum innovation.
- To explore and resolve the issues associated with the placing of a tall building in a unique cultural-urban setting.
- To explore how that tall building can be inspired by the cultural, physical and environmental aspects of site.
- To determine the programmatic brief for that building, based on micro and macro site / urban studies.
- To understand the issues involved with designing a multi-level building containing possibly differing functions.
- To understand how considerations of steel structure, environment, servicing etc are as vital to the success of the building as form, materials, aesthetics etc.
- To develop the design of the building in some detail in order to properly investigate and understand the relationship between the design and the making of spaces and places.
- To develop the design of an aspect of the building in technical detail so as to portray at large scale the relationship between steel structure, space, skin etc.
- To explore appropriate oral and graphic presentation skills through the duration of the project so as to communicate ideas to their maximum potential.



Image Credit: Steven Henry

## CATEGORY II: OPEN

### THE CHALLENGE

The ACSA/AISC 2015-2016 Steel Design Student Competition offers architecture students the opportunity to participate in an open competition category with limited restrictions.

This category will allow the students (with the approval of a faculty sponsor) to select a site and building program of anything other than a tall building. Tall buildings, are defined in this competition, as a building that exceeds 12 stories in height. The design should be guided by the principles of innovation, creativity, identity, sustainability, functionality and efficiency.

Students may not enter both categories of the competition.



Image Credit: Terri Meyer-Boake

## DESIGN GUIDELINES (CATEGORY I & CATEGORY II)

### USE OF STEEL

Steel must be used as the primary structural material. Design proposals must contain at least one space/element that requires long-span steel structure, with special emphasis placed on innovation in steel design. The most compelling proposals will inevitably integrate the use of steel into the design of the project at multiple levels, from primary structure to building envelope and tectonic details.

### INTEGRATED DESIGN

Design proposals must reflect a clear conceptual strategy, which is resolved in built form at a detailed level. The project should be developed with an integrative approach to the innovative use of building materials and systems—spatial, structural, environmental and enclosure.

Participants will develop a selected physical area of the project in greater detail considering the building's systems through larger scale drawings showing structure, environmental strategies, building envelope and interior spaces. Through rendered perspectives and elevations, the proposals should demonstrate surface qualities including material, color, texture, and light.

Together with the integrated resolution of structural, tectonic and technical issues, projects should be designed in a socially and environmentally responsible manner. Design proposals should respond to the physical context (geography, topography and latitude), climate (sun, wind, light and water), and culture (patterns of interaction rising from human occupation). Projects should demonstrate reduced dependency on non-renewable resources and the integration of environmental responsibility with the architectural vocabulary of the proposal.

### CODE INFORMATION

Refer to the International Building Code and the local zoning ordinance for information on parking requirements, height restrictions, set backs, easements, flood, egress and fire containment. All proposals must be designed to meet requirements for accessibility; for guidelines, refer to the Americans with Disabilities Act and the principles of Universal Design.

### CRITERIA FOR JUDGING

Submissions must clearly represent the selected program. In addressing the specific issues of the design challenge, submissions must clearly demonstrate the design solution's response to the following requirements:

- An elegant expressive understanding of the material – steel – deployed with maximum innovative potential
- A strong conceptual strategy translated into a coherent integrated design proposal
- An articulate mastery of formal concepts and aesthetic values
- A compelling response to the physical and cultural context of the scheme
- A mature awareness and innovative approach to environmental issues
- A thorough appreciation of human needs and social responsibilities

## REQUIRED SUBMISSION DOCUMENTS

Submissions must include (but are not limited to) the following required drawings:

- Three-dimensional representations in the form of axonometrics, perspectives showing the proposal in its context, montages and/or physical model photographs to illustrate the character of the project
- Site plan showing proposal in its context of surrounding buildings and topography, together with details of access/circulation
- Building/site sections sufficient to show site context and major spatial and program elements
- Floor plans to show program elements, spatial adjacencies and navigation strategies
- Large scale drawing(s), either orthographic or three dimensional, illustrating the use and detailing of steel for building structure and/or envelope and integrated design

Submissions must include:

- Completed online registration including all team members and faculty sponsors
- 4 digital boards at 20" x 20"
- A design essay or abstract (300 words maximum)
- Program summary diagram/text of spaces and areas (300 words maximum)

Incomplete or undocumented entries will be disqualified. All drawings should be presented at a scale appropriate to the design solution and include a graphic scale. The site plan should include a north arrow.

## COMPETITION GUIDELINES (CATEGORY I & CATEGORY II)

### SCHEDULE

<b>March 30, 2016</b>	Registration Deadline (free registration)
<b>May 25, 2016</b>	Submission Deadline
<b>Summer 2016</b>	Winners Announced
<b>Fall 2016</b>	Publication of Summary Book

### AWARDS

First, second, and third prizes will be awarded in each of the two categories, in addition to a selected number of honorable mentions, at the discretion of the jury. Winners and their faculty sponsors will be notified of the competition results directly. A list of winning projects will be posted on the ACSA web site at [www.acsa-arch.org](http://www.acsa-arch.org) and the AISC web site at [www.aisc.org](http://www.aisc.org). A total of \$14,000 will be distributed in the following manner:

#### Category I TALL BUILDINGS

<b>First Prize</b>	Student \$2,500
	Faculty Sponsor \$1,000
<b>Second Prize</b>	Student \$1,500
	Faculty Sponsor \$750
<b>Third Prize</b>	Student \$750
	Faculty Sponsor \$500

#### Category II OPEN

<b>First Prize</b>	Student \$2,500
	Faculty Sponsor \$1,000
<b>Second Prize</b>	Student \$1,500
	Faculty Sponsor \$750
<b>Third Prize</b>	Student \$750
	Faculty Sponsor \$500



## ELIGIBILITY

Because the support of AISC is largely derived from steel companies whose markets are mainly in the U.S., the competition is open to students from ACSA Full and Candidate Member Schools from the U.S. and Canada, as well as ACSA Affiliate Members Schools from the U.S., Canada, and Mexico only.

The competition is open to upper level students (third year or above, including graduate students). All student entrants are required to work under the direction of a faculty sponsor. Entries will be accepted for individual as well as teams. Teams must be limited to a maximum of five students. Submissions should be principally the product of work in a design studio or related class.

## REGISTRATION

A faculty sponsor is required to enroll students online (available at [www.acsa-arch.org](http://www.acsa-arch.org)) by March 30, 2016. Registration can be done for your entire studio or for each individual student or team of students participating. Students or teams wishing to enter the competition on their own must have a faculty sponsor, who should complete the registration. There is no entry or submission fee to participate in the competition. Each registered student and faculty sponsor will receive a confirmation email that will include information on how the student(s) will upload final submissions online. Please add the email address [competitions@acsa-arch.org](mailto:competitions@acsa-arch.org) to your address book to ensure that you receive all emails regarding your submission.

During registration the faculty will have the ability to add students, add teams, assign students to teams, and add additional faculty sponsors. Registration is required by March 30, 2016, but can be changed, edited, and added to until a student starts a final submission; then the registration is no longer editable.

## FACULTY RESPONSIBILITY

The administration of the competition at each institution is left to the discretion of the faculty within the guidelines set forth in this document. Work on the competition should be structured over the course of one semester during the 2015-2016 academic year.

Each faculty sponsor is expected to develop a system to evaluate the students' work using the criteria set forth in this program. The evaluation process should be an integral part of the design process, encouraging students to scrutinize their work in a manner similar to that of the jury.

## DIGITAL SUBMISSION FORMAT

Submissions must be presented on four 20" x 20" digital boards. All boards are required to be uploaded through the ACSA website as Portable Document Format (PDF) or image (JPEG) files. The names of student participants, their schools, or faculty sponsors, must NOT appear on the boards, or in the project title or project title file name(s).

## DESIGN ESSAY / ABSTRACT

A brief essay, 300 words maximum, is required as part of the submission describing the most important concepts of the design project. Keep in mind that the presentation should graphically convey the design solution and context, and not rely on the design essay to convey a basic understanding of the project. The names of student participants, their schools, or faculty sponsors, must NOT appear in the design essay. This abstract is included in the final online submission, completed by the student(s) in a simple copy/paste text box.

## PROGRAM SUMMARY

A program summary diagram/text of spaces and areas is required as part of the submission. All interior and exterior spaces are to be included; total net and gross areas are required.

## ONLINE PROJECT SUBMISSION

The student is required to submit the final entries that must be uploaded through the ACSA Competition website at [www.acsa-arch.org](http://www.acsa-arch.org) by 5:00 pm, Eastern Time, on May 25, 2016. If the submission is from a team of students, all student team members will have the ability to upload the digital files. Once the final submit button is pressed no additional edits, uploads, or changes can be made. Once the final Submission is uploaded and submitted, each student will receive a confirmation email notification. You may “save” your submission and return to complete. Please note: The submission is not complete until the “complete this submission” button has been pressed. For team projects, each member of team projects may submit the final project.

The final submission upload must contain the following:

- Completed online registration including all team members and faculty sponsors
- Each of the four 20”x20” boards uploaded individually as a high resolution PDF or JPEG file
- A design essay or abstract
- A program summary

Winning projects will be required to submit high-resolution original files/images for use in competition publications and exhibit materials. By uploading your files, you agree that the Association of Collegiate Schools of Architecture (ACSA) has the rights to use your winning submission, images and materials in a summary publication, online and in promotional and exhibition resources. ACSA will contribute authorship of the winning design to you, your team, faculty and affiliation. Additionally, you hereby warrant that the submission is original and that you are the author(s) of the submission.

## RESOURCES

An intention of all ACSA competitions is to make students aware that research is a fundamental element of any design solution. Students are encouraged to research material properties and methods of steel construction, as well as precedent projects that demonstrate innovative use of structural steel.

## STEEL CONSTRUCTION REFERENCES

- AISC website: [www.aisc.org](http://www.aisc.org)
- Modern Steel Construction: This authoritative monthly magazine is made available free of charge to architectural students taking steel design courses. This magazine covers the use of fabricated structural steel in the variety of structural types. It presents information on the newest and most advanced applications of structural steel in a wide range of structures. Issues of Modern Steel Construction (1996 - Present) are available online. Visit [www.modernsteel.com](http://www.modernsteel.com) to view them
- Terri Meyer Boake. *Understanding Steel Design: An Architectural Design Manual*. (Birkhäuser 2013)
- John Fernandez. *Material Architecture*. (Spon Press, 2006)
- Victoria Bell and Patrick Rand. *Materials for Design 2*. (Princeton Architectural Press, 2014)
- Shulitz, Habermann, Sobek. *Steel Construction Manual*. (Birkhäuser Basel 2000)
- Annette LeCuyer. *Steel and Beyond*. (Birkhäuser Basel 2003)

## TALL BUILDINGS REFERENCES

- Council on Tall Buildings and Urban Habitat: [www.ctbuh.org](http://www.ctbuh.org)
- Skyscraper Center database: [www.skyscrapercenter.com](http://www.skyscrapercenter.com)
- The CTBUH maintains perhaps the best tall building library / physical resource center internationally. The whole catalogue of several hundred books related to tall buildings and sustainable cities can be downloaded at the following link: [www.ctbuh.org/library.htm](http://www.ctbuh.org/library.htm)

## FOR MORE INFORMATION

Program updates, including information on jury members as they are confirmed, may be found on the ACSA web site at [www.acsa-arch.org/competitions](http://www.acsa-arch.org/competitions).

Additional questions on the competition program and submissions should be addressed to:

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