Tall, Urban and Sustainable
DLR Group/KKE Competition
Department of Architecture and Landscape Architecture
North Dakota State University

**Architecture 471 - Architectural Design V**
**Fall Semester 2011**

**Studio Meets:**
Monday, Wednesday, Friday 1:30 pm to 4:30 pm and as required
Renaissance Hall Fourth Floor

**Studio Critics:**
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Course Description
Fourth year design studio continues to shift responsibility from the faculty onto the students. You are responsible for more and more of the work. This continual shifting of responsibility culminates in your thesis project, next year. This high rise project is designated as your capstone project for the undergraduate Bachelor of Science in Architectural Studies degree. The project is to be a comprehensive design project demonstrating all of the technical, design, historical, and theoretical knowledge that you have amassed during your undergraduate studies. Both the final project presentation and the project book should communicate the comprehensive nature of this project. This shift in responsibility is one of three overarching goals that will focus our efforts in studio this semester. The second overarching goal for the semester is to have each one of you produce significant and meaningful work each and every day that we meet in studio. Architectural design is about the process; exploring, investigating, attempting, solving, producing. To accomplish all that is necessary in the creative resolution of the problems that we immerse ourselves in we must produce things every day. To help us meet this goal there is a schedule of deliverable studio products posted on the course Blackboard site. The due dates for the products are shown in the course schedule. The third overarching goal for our studio is to produce exceptional final products. We will concentrate on presentation graphics, drawing, and communicating at a level that should be competitive with any students anywhere in the world. This is a lofty set of goals, ones we can accomplish.

Academic Dishonesty or Misconduct
Work in this course must adhere to the Code of Academic Responsibility and Conduct as cited in http://www.ndsu.nodak.edu/policy/355.htm

Special Needs
Any student, with disabilities or other special needs, who needs special accommodations in this course, is invited to share these concerns or requests with any of the instructors as soon as possible so that appropriate arrangements can be made.

Course Requirements
Completion of all assigned work, on time. Late work will not be accepted. There are several specific assignments due on specific days throughout the semester. It is very important for each of you to meet the deadlines imposed.

Attendance and participation throughout the class meeting time and at other assigned meeting times may be used in your performance evaluation. Scheduled class times will primarily be used to investigate issues as a group, address semester long topics of concern, and to critique work in a group setting. Studio work requires a substantial commitment of time to successfully investigate and resolve the problems posed. We will expect a minimum of 30 hours of work per week dedicated to studio problems which includes our 10 hours in studio.
Required Reading:
Hanover Principles Available at www.mcdonough.com

Suggested Reading:

Required Software:
Word Processing, Spreadsheet, Presentation such as Microsoft Office
Computer Aided Design & Drafting such as Autocad, Vectorworks, Revit or Sketch-up
Three Dimensional Modeling such as Form Z or 3D Studio Viz
Image Manipulation, Desktop Publishing, Illustration such as the Adobe Creative Suite

All students will be required to demonstrate their competence with each piece of software during the course of the semester.

Statement of Grading Expectations
The following description, borrowed from Arizona State University, establishes a relationship between expectations and grading of studio courses.

“A” This is a project with a strong concept, well developed, thoroughly coordinated, completely and clearly presented. The project must be a thoughtful, creative solution to the problem, going beyond solving the basic requirements of the problem. It evokes the spirit of architecture and inspires the beholder. It demonstrates originality & risk taking-a fresh idea.

“B” This is a project with a concept that responds to more than the basic requirements of the problem, is complete, well coordinated and well presented. Philosophically, however, the project concept does not, as completely as an ‘A’ level project, identify and interpret the essence or spirit of architecture in the project in as creative a manner.

“C” This is a project that solves the basic requirements of the problem, is not totally complete or coordinated and lacks clarity in its presentation. The project, however, does not define, interpret or give meaning to the philosophical aspects of the problem, but relies on solving only the functional needs stated in the problem. An “obvious” solution.

“D” This is a project that solves most but not all of the basic requirements of the problem, is not totally complete or coordinated, and lacks clarity in its presentation. The project does not define, interpret or give meaning to any philosophical aspects of the problem and does not completely solve the functional or contextual aspects of the problem. The project lacks research and development; does not indicate response to feedback given during the progress of the work.

“F” This is a project that does not solve most of the essential requirements of the problem, is generally not complete or coordinated and is not clearly presented.
NAAB Student Criteria related to this studio

In our continual assessment and improvement of the architecture and landscape architecture curricula, we have identified the accreditation criteria that will be addressed in each course. This helps the faculty and administration make sure that we are covering all of the criteria within our curriculum. It also helps you to understand the expectations that are held by our faculty and by NAAB of your work. Your studio work must demonstrate that you have mastered each of the criteria. The accreditation criteria being addressed in this course are as follows:

A.1 – communication skills  Ability to read, write, speak and listen effectively.
A.2 – design thinking skills  Ability to raise clear and precise questions, use abstract ideas to interpret information, consider diverse points of view, reach well-reasoned conclusions, and test alternative outcomes against relevant criteria and standards.
A.3 – visual communication skills  Ability to use appropriate representational media, such as traditional graphic and digital technology skills to convey essential formal elements at each stage of the programming and design process.
A.4 – technical documentation  Ability to make technically clear drawings, write outline specifications, and prepare models illustrating and identifying the assembly of materials, systems, and components appropriate for a building design.
A.5 – investigative skills  Ability to gather, assess, record, apply, and comparatively evaluate relevant information within architectural coursework and design processes.
A.6 – fundamental design skills  Ability to effectively use basic architectural and environmental principles in design.
A.7 – use of precedent  Ability to examine and comprehend the fundamental principles present in relevant precedents and to make choices regarding the incorporation of such principles into architecture and urban design projects.
A.8 – ordering system skills  Understanding of the fundamentals of both natural and formal ordering systems and the capacity of each to inform two- and three-dimensional design.
A.9 – historical traditions and global culture  Understanding of parallel and divergent canons and traditions of architecture, landscape and urban design including examples of indigenous, vernacular, local, regional, national settings from the Eastern, Western, northern, and Southern hemispheres in terms of their climatic, ecological, technological, socioeconomic, public health, and cultural factors.
A.10 – cultural diversity  Understanding of the diverse needs, values, behavioral norms, physical abilities, and social and spatial patterns that characterize different cultures and individuals and the implication of this diversity on the societal roles and responsibilities of architects.
A.11 – applied research  Understanding the role of applied research in determining function, form, and systems and their impact on human conditions and behavior.

B.1 – pre-design  Ability to prepare a comprehensive program for an architectural project, such as preparing an assessment of client and user needs, an inventory of space and equipment requirements, an analysis of site conditions (including existing buildings), a review of the relevant laws and standards and assessment of their implications for the project, and a definition of site selection and design assessment criteria.
B.2 – accessibility  Ability to design sites, facilities, and systems to provide independent and integrated use by individuals with physical (including mobility), sensory, and cognitive disabilities.
B.3 – sustainability  Ability to design projects that optimize, conserve, or reuse natural and built resources, provide healthful environments for occupants/users, and reduce the environmental impacts of building construction and operations on future generations through means such as carbon-neutral design, bioclimatic design, and energy efficiency.
B.4 – site design  Ability to respond to site characteristics such as soil, topography, vegetation, and watershed in the development of a project design.
B.5 – life safety  Ability to apply the basic principles of life-safety systems with an emphasis on egress.
B.6 – comprehensive design  Ability to produce a comprehensive architectural project that demonstrates each student’s capacity to make design decisions across scales while integrating the following SPC:

- A.2. Design Thinking Skills
- A.4. Technical Documentation
- A.5. Investigative Skills
- A.8. Ordering Systems
- A.9. Historical Traditions and Global Culture
- B.2. Accessibility
- B.3. Sustainability
- B.4. Site Design
- B.5. Life Safety
B.8. Environmental Systems

B.9. Structural Systems

B.7 - **financial considerations** Understanding of the fundamentals of building costs, such as acquisition costs, project financing and funding, financial feasibility, operational costs, and construction estimating with an emphasis on life-cycle cost accounting.

B.8 - **environmental systems** Understanding the principles of environmental systems’ design such as embodied energy, active and passive heating and cooling, indoor air quality, solar orientation, daylighting and artificial illumination, and acoustics; including the use of appropriate performance assessment tools.

B.9 - **structural systems** Understanding of the basic principles of structural behavior in withstanding gravity and lateral forces and the evolution, range, and appropriate application of contemporary structural systems.

B.10 - **building envelope systems** Understanding of the basic principles involved in the appropriate application of building envelope systems and associated assemblies relative to fundamental performance, aesthetics, moisture transfer, durability, and energy and material resources.

B.11 - **building service systems** Understanding of the basic principles and appropriate application and performance of building service systems such as plumbing, electrical, vertical transportation, security, and fire protection systems.

B.12 - **building materials and assemblies** Understanding of the basic principles utilized in the appropriate selection of construction materials, products, components, and assemblies, based on their inherent characteristics and performance, including their environmental impact and reuse.

C.1 – **collaboration** Ability to work in collaboration with others and in multidisciplinary teams to successfully complete design projects.

C.2 – **human behavior** Understanding of the relationship between human behavior, the natural environment and the design of the built environment.

C.8 – **ethics and professional judgment** Understanding of the ethical issues involved in the formation of professional judgment regarding social, political and cultural issues in architectural design and practice.

C.9 – **community and social responsibility** Understanding of the architect’s responsibility to work in the public interest, to respect historic resources, and to improve the quality of life for local and global neighbors.
Project Descriptions

Architecture, indeed environmental design of all sorts, must excel in three separate areas; comitas, firmitas and venustas. Comitas or commodity speaks to the solution of the functional problem. The resolution of human and natural needs within its context that serves and protects the public. Firmitas or firmness speaks about our projects standing the test of time. Projects that are able to withstand the forces of nature and to co-exist within our natural environment even beyond the time when the original commodity solution is valid. Venustas or delight speaks to our need for beauty and passion. Architectural design is not valid unless it embodies our emotions, unless it touches our souls. This is the context within which all of our goals and assignments will be conducted during the semester, and hopefully for our lifetimes. We are asking that you bring your passion, your experience, and your willingness to take risks to the resolution of the design problems given you this semester. Look at the essential elements of our cities, of our buildings and design problems given you this semester. Look at the essential elements of our cities, of our buildings and set goals that challenge the status quo. The hybrid, tall building provides us with unique opportunities to address sustainability on multiple levels. Our second problem will challenge you in similar ways at a very different scale.

Studio, this semester, will be divided into two separate problems. The first will be a hybrid, tall building set in San Francisco. The second project will be the DLR Group/KKE Competition which is still to be developed.

Project Number One

Tall, Urban, and Sustainable

Downtown San Francisco is one of the most livable downtowns in the United States. Development opportunities exist today for a new set of tall buildings to be added to the skyline.

Our client is a major developer of mixed use (hybrid) buildings in downtown San Francisco. The client has seized the opportunity to build new buildings more than 30 stories tall in the downtown area that will provide a response to the demand for housing in town and also provide additional uses that will allow the project to be more stable as an investment vehicle. The client is committed to building in a sustainable way and insists on meeting LEED silver certification as a minimum response to market demands for sustainable living and working environments.

This project will be completed by teams of two students. Each team will be totally responsible for the project, its research, goals, site selection and development, project design and presentation.

Hybrid Building Development Program

Each team in studio will have to choose a site on which to work. Each building program will be developed to respond to the specifics of the particular site. All building programs should have the following elements:

- a mix of housing units comprising at least 50% of the total gross square footage
- retail space at the ground level to enliven street life
- the building should attain an FAR consistant with San Francisco zoning ordinances and with any proposed masterplan
- parking shall be provided consistant with San Francisco zoning ordinances.
- entertainment or service uses appropriate for your site should be included
- speculative office space or other uses, such as a hotel, will be required to fill out the building to its FAR

Comprehensive development of this project and its sustainability is very important. We will spend some time introducing the systems necessary to design high rise buildings and we will place emphasis on the sustainable strategies for tall
San Francisco Sketch Problem
Personal observation and analysis via the sketch is an important skill to master for architecture. We will work on sketches while we are in San Francisco. There will be one sketching tour specifically set to help you get a start on the sketch assignment. Sketches not completed during the tour will need to be done on your own. All sketches must be completed on site in San Francisco, live. Sketches done from photographs will not be accepted. Please complete the following sketches in a new sketchbook specifically purchased for the high-rise problem. Please label each sketch with what it is, where it was sketched, which sketch you intend it to be and what date it was sketched.

- Commercial activity at the base of a tall building
- A residential entry into a tall building
- A residential entry into a single unit as a part of a larger complex such as a townhouse, etc.
- An office entry into a tall building
- A receiving dock for a tall building at the ground level
- A great urban open space
- A really poor urban open space
- A human scaled urban environment
- A poorly scaled urban environment
- A unique top of a tall building
- An interesting detail of an historic building
- An interesting detail of a new tall building
- A good urban green space
- A snippet of the skyline exploring the relationships between two or more tall buildings
- A landmark

In addition to the 15 sketches above please complete at least one napkin sketch for display in the architecture building upon our return. The napkin sketch should be completed on a standard 5” x 5” paper cocktail napkin. This will allow you to enter your napkin sketch into the Architectural Record Napkin Sketch Competition this coming year.

The Hybrid Tall Building Project Requirements
The high-rise project must include a final design presentation, physical model and a project book. The project book will include all of the research conducted for the project, documentation of your design process, and the final presentation. The bulk of the project book will be the research conducted for the project.

High Rise Research:
What is design research and why do we do it? Before Design can be realized it is assumed the designer will prepare him/herself for the assignment by understanding the problem. In this case a mixed –use high-rise requires the designer to understand the place, the people, and the technology to make it happen. In addition there are philosophical questions associated with a project like this. A designer might pose several questions that create both an historical understanding and a departure point for a new project, e.g. what type of person is inclined to live in a mixed use high-rise and why? A bigger question might be: Does dense urban high-rise living provide greater opportunities to live sustainably? How? With these types of inquiries does it not create greater opportunities for insight and create more meaningful design? Research then becomes both facts e.g. history of San Francisco, its culture etc. and knowledge of various aspects to the project allowing you to support your design decisions! Each of these types of research should lead the designer to reach beyond the now and towards creative solutions for the future.

The research will be ongoing throughout the design of this project. The form of the project book will be up to your team but it must be able to be submitted multiple times throughout the semester prior to its final publication. The book should contain a table of contents and a complete bibliography and it should utilize APA formatting for citations. All work must be done in Adobe InDesign software.
Hybrid Tall Building Project Book Contents

I. Context, Inventory, Documentation, and Analysis
   Sketches from San Francisco
   Site Inventory/Analysis
   Climate and Analysis
   Zoning Regulations
   Cultural Context
   Context Model Documentation
   Demographics
   Household Size
   Housing Units/acre or people/acre
     % of Public Land
     % of Parks and Green Space
   Crime Statistics
   Education
   Religious & spiritual inclinations
   History of San Francisco
   History of Tall Buildings
   Designing Vertical Communities
   Building Codes/Life Safety/Security
   Residential Living/Service Issues
   Mixed-use issues
   Case Studies

II. Design Intention (Poetics/Space/Form/Human/Community)
   Design Intention Statement
   Design Goals
   Complete Building Program
   Sustainable/Bioclimatic Strategies
   Building/Sidewalk Interface
   Urban Activity Sketches

III. Final Publication of Project Book - add:
   Structural System Description
   Wind and Sun Diagrams
   Internal Organization Diagrams
   Materials
   Vertical Transportation Systems
   Core Plan
   HVAC Systems Descriptions
   LEED Silver Checklist
   Sustainability Alternatives
      Energy
      Water
      Carbon Neutral
   Documentation of Design Process
   Copies of Graphic Presentation
   Bibliography

Include with the project book a CD with original InDesign files, all linked graphic files, and a pdf file of the finished document.

Hybrid Tall Building Graphic Presentation Requirements
The size and style of your graphic presentation is left up to your team. However, you are required to provide the following components within the graphic presentation:
   Well developed and illustrated site plan
   Sufficient floor plans to show major usages
   A wall section showing structure, wall system, mechanical system, etc.
   An illustration showing the urban character at the base of the building
   Other drawings to best communicate your design solution
Project Number Two  

**DLR Group/KKE Competition**  

The DLR Group/KKE Competition is a two week design problem formulated to challenge you as a designer. The project is abstract and requires architectural thinking in the resolution of a non-architectural problem. This is a very quick problem requiring design, construction and display within a two week period of time. The Minneapolis/St. Paul firm DLR Group/KKE has generously contributed prize money for the competition and have committed their time to jury the competition.
Studio Schedule

The general organization for the studio this semester will be to present new material and tasks on Monday, talk about them, about the skills development needed, their relationship to the whole project and set the expectations for the weeks activities. On Friday we will typically have a graded event where you show us the results of the challenges issued on Monday. The basic topics and products are mentioned below in the schedule but other tasks and focus items will be added as necessary to ensure the production of excellent work throughout the studio.

Week 1  Aug 24 Wed  ∆ Introduce studio, establish student teams
  organizing research and analysis, SF problem introductions
     Aug 26 Fri  ∆ Faculty presentation on process and documentation, programming orientation,
       FAR, preparation for San Francisco visit
       • Review of Site Possibilities within each studio section

Week 2  Aug 29 Mon  Preparation for Site Visits in San Francisco
     Aug 31 Wed  ∆ Leave for San Francisco  see separate schedule for trip activities
       (THIS IS A REQUIRED TRIP)
     Sept 1 Thur  ∆ Work on site in San Francisco
     Sept 2 Fri  ∆ Work on site in San Francisco
     Sept 3 Sat  ∆ Free day in San Francisco
     Sept 4 Sun  ∆ Return to Fargo

Week 3  Sept 5 Mon  Holiday - Labor Day, no class
     Sept 7 Wed  Concept ideation through napkin sketches - what does it want to be?
       Individual effort
       Clay models - individual effort - bring clay to studio
       Analysis Activities, start putting program together
     Sept 9 Fri  ∆ Sketch Book due
       Merger and Synthesis - from 2 comes 1 idea
       Research’s Impact on Design - present your research into the various aspects of the
       project, its location, its site, its typology, its history and determine how that
       research changes and impacts the initial design ideas
       Site and Urban Context Analysis - think Kevin Lynch, Christopher Alexander, etc.
       Demonstrate with photos, documents, sketches, diagrams, etc. your completion and
       mastery of the above issues, concepts and proposals, include in Project Book I
     Project Book I - Context, Inventory, Documentation, Research, Analysis,
### Week 4
**Sept 12 Mon**
- Large Scale Physical Context Model - complete wood context model for your project at 1” = 30’
- Large Scale Spatial Order - quantity and adjacencies, complete building program in InDesign
- Urban Spatial Issues - demonstrate the fit of your tower with the urban condition
- Urban Plan through Sketches - determine the building/sidewalk interface, creating life on the street
- Bioclimatic Precedents through Sketches - how to make this project “green”, commit to your sustainable strategies

**Sept 14 Wed**
- Work day - desk crits

**Sept 16 Fri**
- Team newsprint drawings - expressing design intention as a team

### Week 5
**Sept 19 Mon**
- Sectional Development through Sketches - determining height of things and scale
- Evaluate building form, structure, materials, interaction, urban activity level and fit within the context model
- Closing in on the design direction for the project
- Building Skin Systems (Faculty Presentation) - initial development of exterior material pallet

**Sept 21 Wed**
- Work day - desk crits

**Sept 23 Fri**
- Demonstrate your completion and mastery of the above concepts and ideas
  - Project Book II - Design intention, goals, building program, sustainable strategies to be used, street level sketches

### Week 6
**Sept 26 Mon**
- Faculty presentation on structure, earthquake resistance strategies, vertical movement systems, building core, and egress strategies
- Structural Design through Physical Modeling - using wood or other materials model your structure and core, how do we make the project stand-up?
- Vertical Transport Systems - How do we move people? - show in the model

**Sept 28 Wed**
- Work day - desk crits

**Sept 30 Fri**
- Demonstrate your completion and mastery of the week’s challenges
  - Structure and Transport Model Complete
  - Booth et al - 2,3,4 Reaction Paper
Week 7  Oct 3 Mon  DLR Group/KKE Competition introduction
        Oct 5 Wed  Review of initial concepts
        Oct 7 Fri  Work day
              Booth et al - 5, 6, 7  Reaction Paper

Week 8  Oct 10 Mon  Work day
        Oct 12 Wed  Work day
        Oct 14 Fri  DLR Group/KKE Competition due and installed by 5:00 pm

Week 9  Oct 17 Mon  Complete sustainability strategies and specific responses
              Sun and Wind Analysis - effects on people within the building and on the site,
              effects of wind and sun on form
              Interior Spatial Development - mixing things up, moving things around, what needs
              to be solved, what doesn’t
              Conflicts of Plan and Form - Developing neighborhoods
        Oct 19 Wed  Work day - desk crits
        Oct 21 Fri  Demonstrate your completion and mastery of the week’s challenges
              Booth et al - 8, 9, 10  Reaction paper
              LEED Silver Checklist completed

Week 10 Oct 24 Mon  Δ Presentation on tall building mechanical systems.
             Pulling it all together. Finalizing plan and corresponding section elements.
             Service functions, and finalizing mechanical systems.
        Oct 26 Wed  Work day - desk crits
        Oct 28 Fri  Demonstrate your completion and mastery of the week’s challenges
              Completed plans for your building, site plan, sections with structure and
              mechanical, diagrams of mechanical system choices.
              Booth et al - 12, 14, 15, 16  Reaction Paper
              Outside crit all afternoon.
| Week 11 | Oct 31 Mon | Interior Modeling of Public Spaces at street, at podium and in the tower - movement, experience, space, materials |
|         |           | Site and Plan Refinement - site documentation and analysis and its presentation, floor plan buffing |
|         |           | Δ Presentation of development process and project pro-forma |
|         | Nov 2 Wed | Work day - desk crits |
|         | Nov 4 Fri | Demonstrate your completion and mastery of the week’s challenges |
|         |           | Public Space Model due |
| Week 12 | Nov 7 Mon | Refinement of project form and presentation mock-up |
|         |           | Code compliance check |
|         |           | Development of Exterior Skin Materials and Details - specific wall sections |
|         | Nov 9 Wed | Work day - desk crits |
|         | Nov 11 Fri | Veteran’s Day Holiday - No Class |
| Week 13 | Nov 14 Mon | • Hybrid project package review (all design work complete) |
|         | Nov 16 Wed | Full scale presentation mock-up presented |
|         | Nov 18 Fri | Presentation work |
| Week 14 | Nov 21 Mon | Presentation work |
|         | Nov 23 Wed | Presentation work |
|         | Nov 25 Fri | Thanksgiving Recess - No Class |
| Week 15 | Nov 28 Mon | Presentation work |
|         | Nov 30 Wed | Presentation work |
|         | Dec 2 Fri | Presentation work |
| Week 16 | Dec 5 Mon | Presentation work |
|         | Dec 7 Wed | Δ San Francisco Hybrid Highrise Project due and installed at 5:00 pm |
|         |           | Project Book due, include pro-forma |
|         | Dec 9 Fri | Jury and evening celebration |

Δ = lecture or presentation activity for entire 471 studio  
* = lecture or presentation activity for 471 studio section
## List of Deliverables for the Fall Semester

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<td>Sept 9</td>
<td>Sketchbook</td>
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<td>Sept 9</td>
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<td>Sept 14</td>
<td>Context Model Complete</td>
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<td>Team Newsprint Drawing</td>
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<td>Project Book II – Design Intention, Goals, Sustainable Strategies, Street Sketches, Building Program</td>
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<td>Sept 30</td>
<td>Structure and Transport Model Complete</td>
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<td>Oct 7</td>
<td>Booth et al 2, 3, 4 Reaction Paper</td>
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<td>Oct 14</td>
<td>DLR Group/KKE Competition Complete and Installed</td>
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<td>Oct 21</td>
<td>Booth et al 8, 9, 10 Reaction Paper</td>
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<td>Oct 23</td>
<td>LEED Silver Checklist Completed</td>
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<td>Oct 28</td>
<td>Presentation of Complete Plans, Structure, and Mechanical</td>
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<td>Oct 28</td>
<td>Booth et al 12, 14, 15, 16 Reaction Paper</td>
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<td>Nov 4</td>
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<td>Dec 7</td>
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