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STUDIO
SPRING 2019

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ARC+BCS COLLABORATIVE STUDIO SPRING 2019

LEARN.
MAKE.
ACHIEVE.

Collaborating on a Home for Building Construction Science

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Editor: George J. Martin

ISBN 978-0-359-75688-9

Learn. Make. Achieve. Collaborating on a Home for Building Construction Science
is a folio of student work from the Spring 2019 Architecture + Building Construction Science Collaborative Studio at The College of Architecture, Art & Design at Mississippi State University

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INTRODUCTION

ABOUT BCS

The Building Construction Science Program at Mississippi State University prepares graduates to be professional constructors: a competent manager of resources and teams that include manpower, material, equipment, time, and money to meet project expectations of quality, safety, schedule and cost. The Building Construction Science degree program, one of just two studio-based construction programs in the nation, is designed to prepare graduates for careers in construction or construction-related fields through an immersive, integrative, collaborative and transformational education. Graduates will be able to manage both construction projects and also the business of construction. The curriculum is interdisciplinary and provides a broad knowledge base in business, engineering, and construction sciences.

In 2004, Mississippi State University acknowledged the synergy associated with combining like-minded disciplines and created the College of Architecture, Art, and Design. The essential quality these disciplines share is an inquiry into “making” represented by the pedagogy, tools, resources, knowledge, and publicness required of designing and making. These determinants of “making” become common ground for teaching, research, and public service. Multi-layered realms of materials exploration, environmental design, and sustainability form the basis of “making”, and are currently areas of accomplishment and interest across our disciplines.

Art, design, and construction connect humankind to the world. CAAD has enormous potential and responsibility to advance art, design, and building, at the university, in the state of Mississippi, and across the nation. The College supports a broad range of public exhibitions, lectures, scholarship, and service activities in art, design, and building, and establishes a national reputation for excellence through the public dissemination of our work. CAAD has been a significant resource for the University and the regional community. In a college that concentrates on the process of making, all four units have benefited from combined resources, synergistic research and focus areas, and cross-discipline projects.

The mission of the College of Architecture, Art, and Design is to promote and engage students and faculty in the following: conceptualization, craft, media and technology, history and theory, aesthetics, and ethical issues associated with making artifacts in the world.

The newest addition to the College is the Building Construction Science Program (BCS) approved by the IHL Board in 2006. The Program offers a Bachelor of Science in Building Construction Science. The first graduating class was in 2011. In 2014 the program applied for and was granted “candidate status” from the American Council for Construction Education. The program currently has approximately 148 students with 6 fulltime faculty members. The program includes 124 semester credit hours.

By means of a problem-based learning andragogy that uses case studies, precedents, and the integration of multiple subject areas, the Building Construction Science program will prepare graduates with a clearly defined management skill set for careers in construction or construction-related fields where effective decision making, problem solving, and multiple forms and levels of management are required.

The values which guide the BCS Program are; Mutual Respect, Honesty, Integrity, Excellence, Democracy, Accountability, Innovation and Equity.

Dr. George Ford
Director BCS Program

ON STUDIO

At the heart of the College of Architecture, Art and Design (CAAD) at Mississippi State is the ethos of making. This ethos, a culture of making, is evidenced in different manifestations in the various units of the College. From the drawings, paintings and sculpture of the fine arts to the Tiny Houses of Building Construction Science, the students of CAAD are imbued with the traits of a maker – preparing them for achievement in a broad range of disciplines spanning the fine and useful arts.

The Architecture (ARC) + Building Construction Science (BCS) Collaborative Studio is a place in the College where two disciplines within this culture of making come together to learn from, and share with, each other. Currently taking place in two of the ten ARC studios (20%) and two of the eight BCS studios (25%), the commitment to collaborative studio education at MSU is a serious one. That it is a six-credit studio means that not only do the students work together, they also share space together for no less than twelve studio hours per week and much more than that given the reality of the work load. They come to know each other quite well.

To understand the nature of this collaboration it is important to understand the territory within the culture of making that ARC and BCS occupy. In the simplest of ways, it might be said that Architecture concerns itself with the *What* of making, and BCS concerns itself with the *How*. The Architecture curriculum educates individuals to conceptualize a design (a *What*), carry it through a cogent development, and then communicate it to others. The BCS curriculum, on the other hand, prepares individuals to be able to comprehend a design, plan its execution (the *How*) and do so in the most efficient and cost-effective way. When these concerns are carried out in a linear fashion this is referred to, in the parlance of the building industry, as Design, Bid, Build (DBB), one of many project delivery methods.

Axiomatic to the ethos of making at CAAD is the notion that the *what* and the *how* are always in dialogue. This discourse may sometimes be immediate, as with a ceramist considering to either pinch or throw a pot. With Architecture and Building Construction Science, this discourse navigates the territory of established disciplines. The Architect's desire to "complete the design" and the Constructor's need to have a well-defined and communicated design in order to commence on the work, is a byproduct of the predominate delivery method (DBB). The Collaborative Studio seeks to merge these territories by embedding Constructors as full partners into the design process with Architects in an integrated fashion toward a truly Integrated Project Delivery (IPD) model.

An ethos of making cannot be achieved in any other teaching modality other than the studio. The culture of a studio, its unique quality of human interaction, is an essential component of Collaborative Studio. Comprised of formal an informal instruction, group and individual critique, lateral and vertical interactions, the studio is an incubator of ideas. The direct, physically present, human communication and interaction which takes place in the studio allows the digital collaboration that takes place in the (virtual) cloud to achieve a richness it would otherwise not have. While remote virtual collaboration is a reality in practice, in the academic studio, being physically present with one another is, in our opinion, an irreplaceable element.

Facilitating the Spring 2019 ARC+BCS Collaborative Studio were instructors from both the School of Architecture and the Building Construction Science Program. Pictured above from left to right are; Ryan Ashford (ARC), Christopher Hunter (ARC), Briar Jones (BCS), George Martin (BCS) and John Poros (ARC).

What follows in this volume is a description of the studio structure and pedagogy and a synopsis of the student proposals for a new Building Construction Science building as part of a new MSU CAAD campus plan. Variations from the initial research in Master Planning and Program development reflect the individual teams' interpretation of the research and application of the data to the design problem as presented. Variations from the University Master Plan, while discouraged, were permitted given adequately supported arguments for doing so. The existing home of the BCS Program is in MSU's Howell Building. Preservation or adaptive reuse of Howell were options considered by the studio as a whole.

Concept and Tools

The Spring 2019 Third Year Collaborative Studio comprised Architecture students enrolled in ARC 3546 and Building Construction Science students enrolled in BCS 3126. There were a total of seventy-two students; forty-one architecture students and thirty-one BCS students. The studio was fully integrated between ARC and BCS students throughout the entire fifteen-week semester.

The studio commenced with an introduction to concepts (project delivery methods) and tools (*Autodesk BIM 360*, *Revit and Navisworks*). The subject of Project Delivery Methods (PDM) was presented and explored with a role-playing assignment. The studio was divided into teams each assigned one of four PDM's; Design, Bid, Build (DBB), Design-Build (D-B), Construction Management at Risk (CMAR), and Construction Management Multi-Prime (CM-MP). Each team researched a PDM and scripted a short play showing the interaction of the parties to the contract (Owner, Architect, CM, Constructor, etc.) on a fictitious project. The goal of the exercise was to facilitate research into a PDM but also have students evaluate and appreciate the concerns and member interests of parties to an agreement. The skits were performed and video recorded.

The introduction to tools was broad based, understanding that most of the students had little to no familiarity with the programs to be used. In order to establish a base-line of competency among the students with the various programs, we engaged Fiona Pratt with *Applied Software Inc.* (www.asti.com) to provide training. *Applied Software* conducted an on-site two day training seminar by Rick Kremer to introduce *Autodesk's Revit* building information modeling software and *BIM 360, Autodesk's* cloud-based collaborative environment. Students were subsequently trained by Michael Reuter on *Autodesk's Navisworks Manage* in several web-based meeting conferences during the semester after they had gained some competency in the underlying *Revit* modeling.

Following the three week introduction to tools and concepts we were ready to present the semester's studio project. Presented at the outset in only very general terms, the initial work entailed a period of research in four area; Master Planning (MP), Historic Preservation and Code Research (HPC), Programming (PG) and As-Built Survey of the Howell Building (AB). Each student in the studio was assigned to one of these four Research Groups.

Historic Preservation and Code Research

There were two research groups tasked with the subject of the exiting Howell Building. The As-Built Group conducted a field documentation of the existing structure and made an existing-conditions *Revit* model. The Historic Preservation and Code Research Group did background on the history of the building and its additions and also did a building code (IBC) and American's with Disabilities Act (ADA) assessment. The effort of these groups was to serve not only the interest of the broader studio project to design a new CAAD campus, but also to provide valuable information to the University in appraising maintenance priorities in the short term.

There was no clear mandate arising out of the research to suggest an imperative to save the Howell Building. Built in the 1950's to serve the Agriculture curriculum, the building has had an effective lifespan of nearly seventy years. The original Howell Building was L-shaped consisting of the west facing two story entry and a one story south wing housing classrooms and studio space. In 1964 major renovations were undertaken on the building and in 1994 further renovations were undertaken including the addition of the symmetrical north wing which is the current home of the BCS Program. A general analysis concluded that the cost of rehabilitation of the existing structure would be comparable to the cost of new construction.

The determination of preservation or demolition of Howell was weighed considering several factors. Arguments in favor of preservation or adaptive reuse were balanced against considerations of the extent to which the location and arrangement of the existing building are at counter-purpose to the larger CAAD campus plan. The indeterminate nature of this conclusion was presented to the Master Planning Group resulting in the decision to produce two plan approaches maintaining Howell, and two planning for its removal. Based on the information gathered in these two research groups students were also required to prepare a Howell Building Maintenance Plan with schedules of prioritized maintenance and repair/replacement items.

Master Planning Research

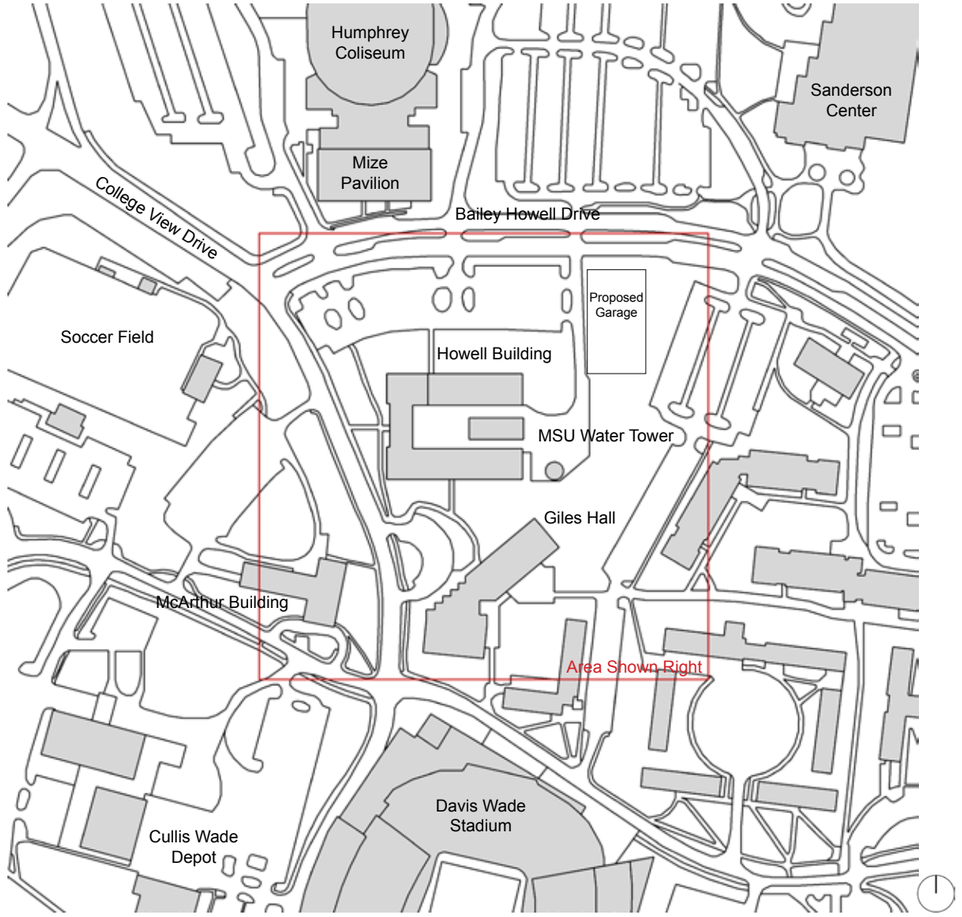
The Master Planning Group was charged with researching the University's updated (2009) Master Plan and offering plan approaches for a new campus plan for the College of Architecture, Art and Design on the site bounded by Giles Hall on the south, Bailey Howell Drive on the north and College View Drive on the west. The directive was to house the various departments of the College, which are currently housed in sundry buildings on the university campus, into one unified plan. The group was advised to work with both the Programming Group on relative size and building needs for the various departments, and with the Historic Preservation Group on the merits of maintaining and preserving the Howell Building, or removing it. As there appeared no clear answer on the relative merits of keeping or removing the Howell Building, the Group established plans with both preserving the structure, or part thereof, and removing it entirely. The MP Group produced four Master Plan approaches to be used as departure points for each of the design teams in that phase of the project (shown on pages 7, 8).

Master Plan Approach 1 preserves and restores the front (west) portion of the Howell Building making the argument that the building's entry has the most impact with regard to campus history and in some ways shares a pride of place with the old live-stock trading building which is likewise now a part of Giles Hall. The main organizing element in this approach is a north-south running pedestrian avenue which would act as spine, linking the various buildings of the college and aligning with the main entry to Architecture on the second level of Giles Hall. The scheme is densely packed – suggesting one to two story buildings and offers outdoor gathering only in that area currently occupied by faculty- staff parking between Giles and Howell.

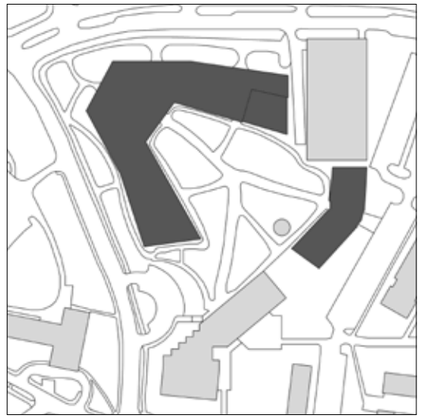
Master Plan Approach 2 is a scheme which includes the complete demolition of the Howell Building. The main concept in this approach is to use building mass to create an interior quad, shielding an interior CAAD outdoor room from the noise and traffic on Bailey Howell and College View Drives. Given the footprint of the buildings, the plan suggests two to three story structures resulting in a quad with a *piazza*-like feel. Suggested also is a small building footprint on the south east edge of the site aligning itself with the newer portion of Giles Hall which encloses the quad at the south east corner. This enclosure includes the Mississippi State water tower within the bounds of the quad allowing it to act as *campanile* to the quad's *piazza*. This is no small gesture as the tower serves as way-finder for CAAD from many locations on campus due to its height and the topography of this portion of the University campus.

Master Plan Approach 3, like 1, maintains the front portion of the Howell Building and also its southern wing which is part of the original building. The driving concept here was to house the various departments of CAAD in one entire, interconnected building mass. The rather limited size of the building's footprint suggests a three to four story structure which presented a variety of interesting options to consider when connecting to the somewhat modest one story Howell Building. As the only unit of CAAD not to be housed in the new complex is the School of Architecture in Giles Hall, another challenge for this approach was making a connection, or establishing a relationship between Giles and the new building. Seeing as the Howell Building sits on a small hill above Giles – this was not an inconsiderable challenge. Understanding that the approach was committed to CAAD unity through shared space, it was an essential one lest Architecture appear and orphaned program.

Master Plan Approach 4 envisioned the complete demolition of the Howell Building. While bounding Bailey Howell and College View with building edge as did group 2, like group 1, this approach uses pedestrian corridors between buildings to make streets instead of rooms. The plan establishes multiple view corridors from the north of the site to the north elevation of Giles Hall. The building footprint suggests two story buildings, rendering interior corridors with a cross section proportion of roughly 1:1. As with all the approaches the water tower is a significant element to deal with. In this case the new building edge mirrors the side of Giles hall and creates an angled open space between the buildings which frames and gives symmetrical prominence to the tower and also suggests a monumental entry point to the campus.

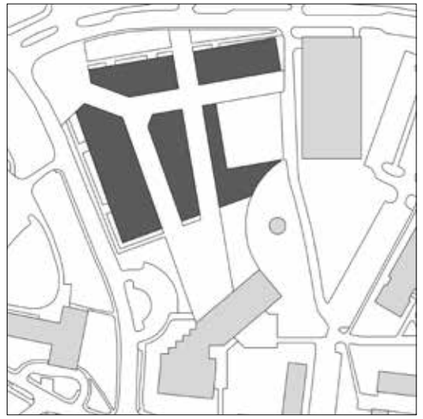


Master Plan Approach 1



Master Plan Approach 2

Master Plan Approach 3



Master Plan Approach 4

Programming Research

The Programming Research Group was tasked with developing a program for the new CAAD campus including new facilities for Art, Building Construction Science and Interior Design. The group took inventory of current facilities and space use and conducted interviews with department heads. Questionnaires were distributed to assess the manner in which the current physical plant supported or inhibited the educational mission of the programs and to solicit ideas for ways in which new facilities could support the mission.

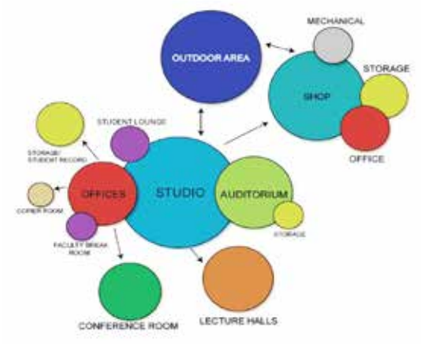
Beyond gathering data for the student design teams to consider, the Programming Group conducted stakeholder analysis to also study the manner in which a new CAAD campus might benefit the University community more broadly. The purpose of this group's work was to provide the studio not only with as much raw data as possible, but also analysis and direction for each of the design teams to serve both the best interests of CAAD and the University as a whole.

From the data collected, the group created adjacency diagrams (shown this page) for Art, BCS and Interior Design. The Architecture School was determined to be well served by Giles Hall for immediate needs with any future expansion or improvement plans being able to be accommodated within the CAAD campus expansion itself. Programs were established for each of the departments with most attention being spent of the BCS Program which would be the specific subject matter for the studio semester's work.

The Programming Group determined that the new CAAD campus will consist of 150,000 square feet of new construction with the following allocation: Art – 96,000 square feet, BCS – 33,000 square feet, Interior Design 21,000 square feet.

The group established the following minimum requirements for a new Building Construction Science Building:

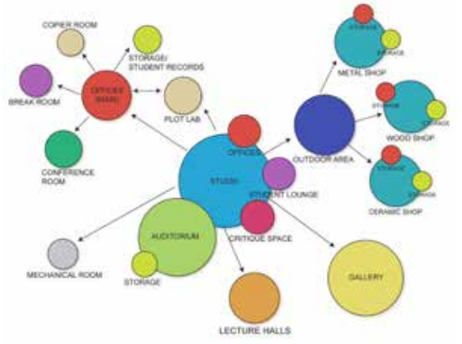
Offices:	12 @ 180 sf/ea	2,160 sq.ft.
Conference:	1 large @ 600 sf	
	2 @ 300 sf/ea	1,200 sq.ft.
Studios:	3 @ 2,500 sf/ea	7,500 sq.ft.



BCS Diagram

Classrooms:	3 @ 900 sf/ea	2,700 sf
Auditorium:	100 capacity	2,200 sf
Shop:	Shop @ 3,000 sf	
	Office @ 500 sf	
	Storage @ 500 sf	4,000 sf
Storage Space:	Multiple rooms	1,000 sf
Break Room:	Faculty-Staff area	200 sf
Student Lounge:	Vending area	500 sf
Copier Room:	Faculty Staff	150 sf
Outdoor Area:	Covered area	4,000 sf
Mechanical:	By system	1,600 sf
Overall Net Area:		27,210 sf
Overall Gross Requirement:		**33,000 sf**

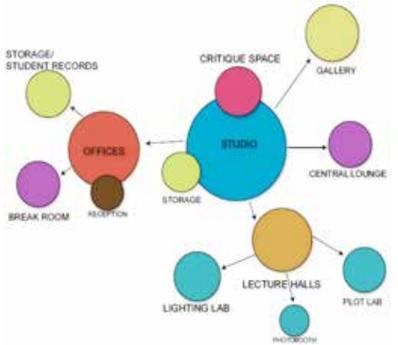
Case studies were an important aspect of the research done by the Programming Group. Not only did these selected projects provide insight into innovative arrangements for like institutions, they also provided baseline examples for cost per foot. The selected case studies included:



Art Diagram

The Black Family Visual Arts Center
Dartmouth College, Hanover NH
Competition: 9/2012
Architect: Machado and Silvetti Associates Inc.
Builder: Suffolk Construction
Cost: $65 million

Seaton Hall Renovation + Expansion - APDesign
Kansas State University, Manhattan KS
Completion: 2017
Architect: Ennead Architects + BNIM
Builder: W.P. Moore Assoc. (Structural)
Henderson Engineers Inc. (MEP)
BG Consultants (Civil)
Confluence (Landscape)
Size: 106,111 gsf Addition
80,000 gsf Renovation
Cost: $75 million



Interior Design Diagram

College of Art and Design Addition + Renovation
University of Michigan, Ann Arbor MI
Completion: 9/2017
Architect: Preston Scott Cohen Inc.
Builder: Integrated Design Solutions
Size: 37,000 gsf Addition
11,000 gsf Renovation
Cost: $34.6 million

Art and Design District Sculpture Studio
University of Arkansas, Fayetteville AR
Completion: 2017
Architect: Modus Studio
Builder: El Dorado Inc.
Size: 33,000 gsf
Part of the Windgate Art and Design District
Size: 150,000 gsf on 3.8 acre site
Cost: $85 million

Visual Arts Building
University of Iowa, Iowa City IA
Completion: 2016
Architect: Steven Holl Architects
Builder: Miron Construction
Size: 126,000 gsf
Cost: $77 million

M. Miller Gorrie Center for Building Science
Auburn University, Auburn AL
Completion: 2006
Architect: CMH Architects
Builder: Brasfield & Gorrie
Parker Brothers Construction
Size: 36,000 gsf
Cost: $6.4 million

Bishop-Favrao Hall – Department of Building Construction
Virginia Tech, Blacksburg VA
Completion: 2007
Architect: Worley Associates Architects
Builder: MB Contractors
Size: 30,145 gsf
Cost: $9 million

John W. Oliver Design Building
University of Massachusetts, Amherst MA
Completion: 1/2017
Architect: Leers Weinzapfel Associates
Builder: Suffolk Construction
Size: 87,500 gsf
Cost: $52 million

For the case studies examined, most of which have been completed within the past five years, the average building cost per square foot was $480 with a low of $177 and a high of $720. Project delivery methods varied from DBB to various forms of Construction Management.

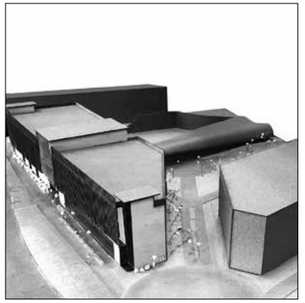
Design Process

The seventy-two students were divided into eighteen design teams of four. Thirteen of the teams were made up of two Architecture students and two BCS students. The remaining five teams consisted of three Architecture students and one BCS student. Each team consisted of a single member of each of the four Research Groups to assure representation in each area of that initial stage of the project.

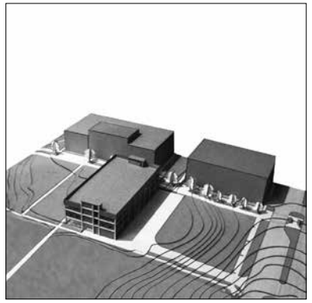
All teams were advised to approach the design of a new Building Construction Science building and CAAD campus master plan as if they were a Design-Build entity responding to an RFP. While each member of the team was tasked differently, the teams were advised to work in an integrated fashion, developing modes of communication to assure concept buy-in across the team. As individual personalities and skill sets are different, each of the eighteen teams had distinct characteristics and unique ways of working together in an integrated manner.

An important issue at the beginning of the design process was the development of a strong concept that could be understood across the team and inform individuals throughout the schematic and design development process. For Building Construction Science students, the understanding and appreciation of the project concept and design intent, informed the contemporaneous value engineering and means and methods evaluations which went on from the very beginning of the project.

Each of the design teams was assigned to the master plan approach worked on by that team's Master Planning Research Group member. The master plan approach provided a working footprint from which the architectural concept could grow. The initial development of the schematic design was, for the most part, carried out in hand drawing and was reviewed in individual and group critiques to the point where *Revit* modeling was appropriate. Both the use of *Revit* and working collaboratively in *BIM 360* was new to many of the students and therefore old work-flow habits were not necessarily obstacles to overcome. Each of the teams developed unique manners of working together, but all established a sequence of physical and virtual collaboration appropriate to their particular chemistry.



Team 11 Site Model



Team 13 Site Model

Team 1 Site Model

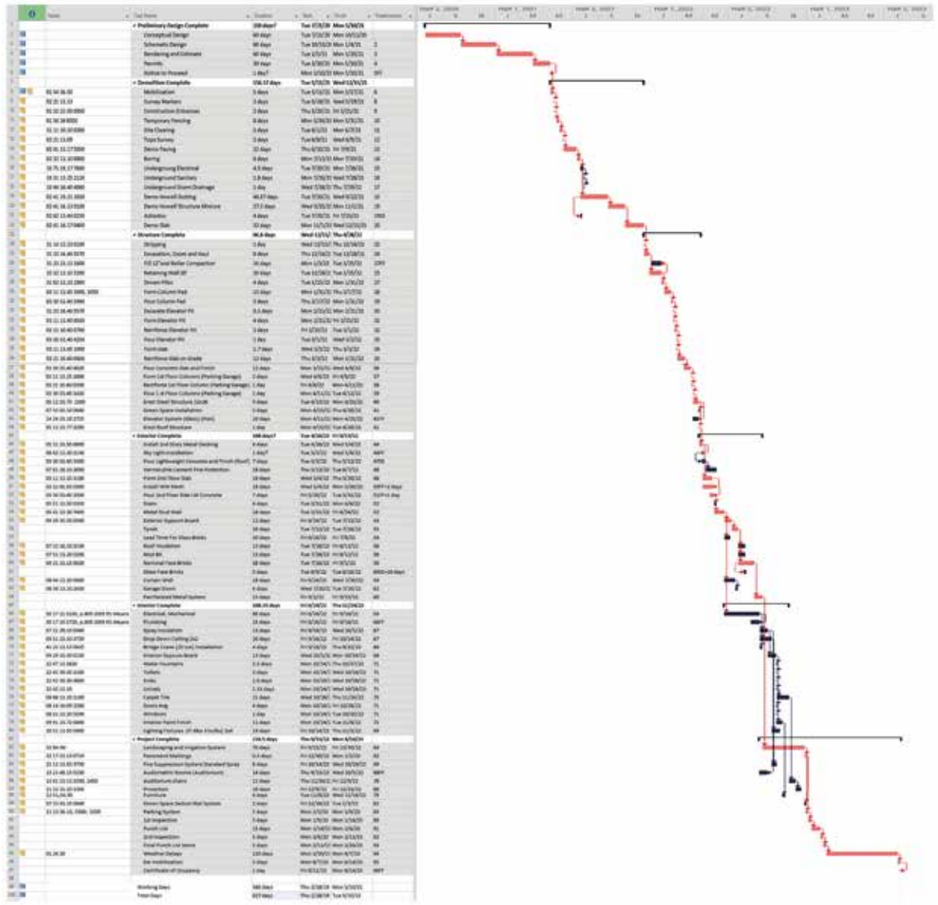
In the spirit of competition between the teams, the balancing of project cost and uniqueness of design solution was of continuous concern. A challenge throughout the project was creating a model flexible enough to allow modification of practically everything. This included superstructure arrangement as well as means and methods of construction. BCS students continuously evaluated costs and schedule impacts as the design progressed. Here again, having a clear underlying concept with team buy-in was essential to prioritizing decisions at any stage of development.

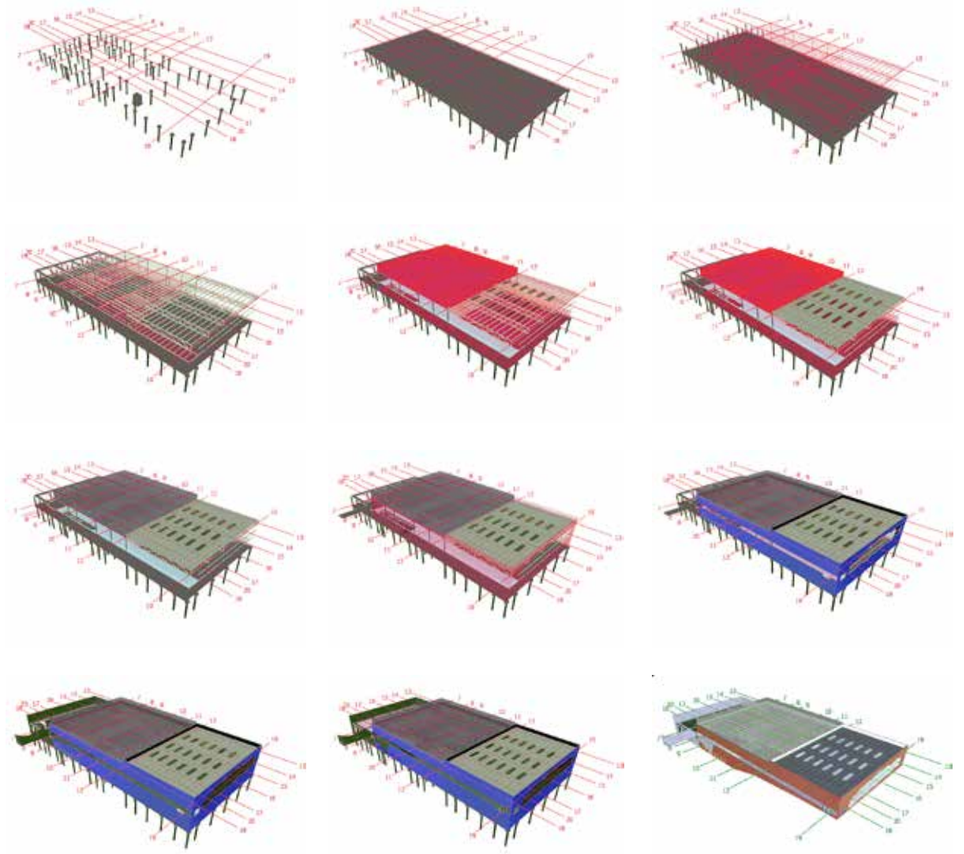
Given the limited time for the project, teams reached different levels of design development. In some cases the teams achieved successful competition of schematic with only limited time for detail development. In other cases, schematic was wrapped up early enough to solidify estimating and scheduling and even providing time to consider alternates, offering the client not only design options but also associated cost packages. Irrespective of the level of development reached, all teams conducted continuous and ongoing cost and schedule analysis, allowing this information to feed back into design decisions.

As with most studios at Mississippi State University, the design process was iterative. Teams were required to develop their designs in *Revit* and at the same time in a series of 1"=20' physical site models (shown above). Beginning with abstract gestural models, students developed the massing and site approach in progressively more refined models as they built the virtual model in *Revit*.

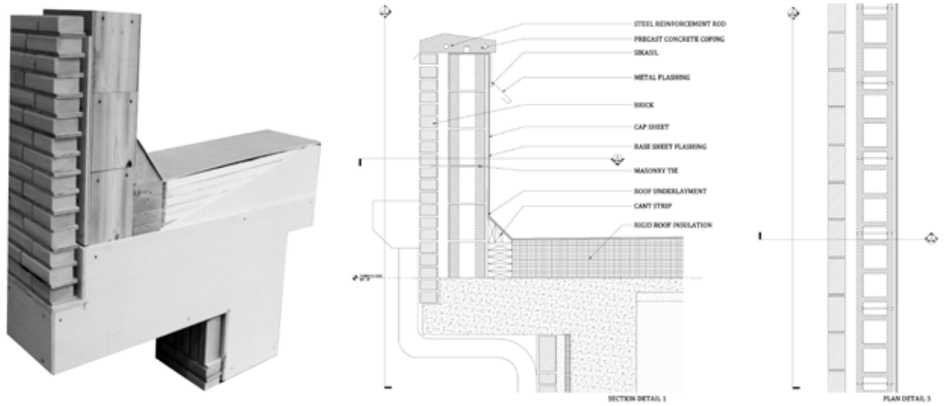
Throughout the course of the semester, teams were in continuous dialogue about the cost and constructibility of the projects being developed. One of the most useful tools for this was *Autodesk's Navisworks Manage*. Although an excellent tool for clash detection in complex multi-disciplinary projects, for the Collaborative Studio it was used mostly for quantifications and scheduling simulation. As each team was challenged to devise a phasing strategy for the overall CAAD campus work, the ability to visualize the construction process was invaluable. *Navisworks 4D Timeliner Simulation* (example shown on page 14) allowed students to see in model form what their Gantt charts entailed. This allowed teams to more thoroughly plan for site storage, staging and lay-down area.

Another valuable tool used in the development of the design was *Autodesk's Insight Building Performance Simulation.* Teams were required to analyze their models with *Insight* in order to meet or exceed ASHRAE Standard 90.1. Teams were also challenged to look at cost related to meeting the AIA 2030 Challenge goals.





Team 7 Macro Schedule (left) and *Navisworks 4D Timeliner Simulations* (above)



Team 9 Parapet Detail and Full Scale Model

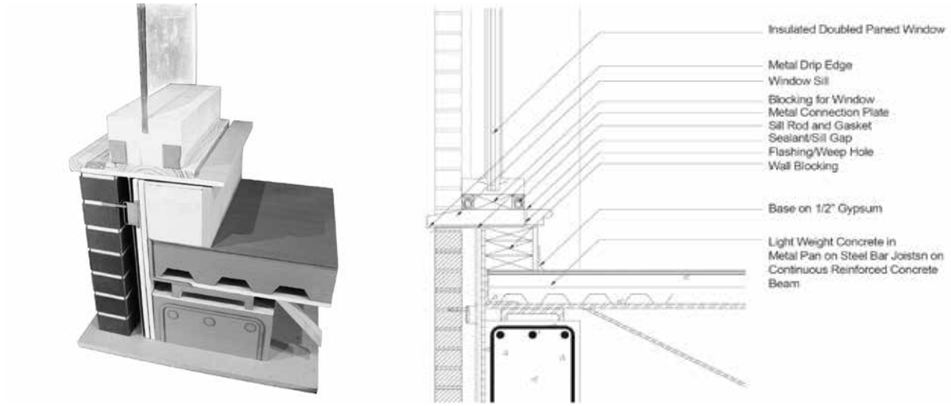
Navisworks and *Insight* provided students with powerful tools for analysis of their work. With the data these tools provided, the teams were able to discuss ways in which the design intent of their project could be realized with greater efficiency, from construction through life cycle performance. The ways in which these programs made visible the issues of construction and energy use allowed for a richer and more informed dialogue among the team and in discussion with faculty.

In addition to digital tools, and also embracing the ethos of CAAD and the pedagogic importance of making, physical modeling was stressed throughout the design process. As a final modeling project, students were required to develop a detail of their design in 1:1 scale mock-up (examples shown above). The detail chosen was required to represent an opportunity to explore not only the finer aspects of the design overall but also the manner in which different building trades need to coordinate in order to execute. The process of creating such a large scale model, while resource intensive, offered an opportunity to discuss means and methods of construction in a way not possible through only drawing. It was also an essential part of the educational process to not only move from virtual to physical, but also and from small to large scales.

Conclusion

The ARC+BCS Collaborative Studio concluded with a formal jury of invited faculty and Architecture and Construction Management professionals. The format of the jury was that of a design-build competition presentation. The jury was one full day in duration with each team having approximately twenty minutes of presentation time.

Teams were required to present architectural drawings, physical models, construction schedules, cost estimates, phasing and construction operations diagrams, materials and product samples, and whatever other exhibits assisted



Team 4 Exterior Wall at Window Sill Detain and Full Scale Model

in supporting their proposals. Teams were further required to submit a proposal document consisting of an executive summary of the project and their qualifications. The purpose of the proposal document being to focus communication skills on expressing the fundamental value the proposal provided to the Owner and stakeholders. In the context of a design-build competition the teams were also operating in a competitive environment. Distinguishing the value of a team's particular project over those of their colleagues, encouraged an awareness of work throughout the studio.

Understanding that the final jury is very much part of the educational process, teams were challenged on design, cost, schedule and construction logic and were required to be in command of the data with respect to their proposals. Teams needed to be prepared to 'think on their feet" in response to any question or challenge presented. As students, however, they understood jury as part of the learning process and were expected to listen, incorporate and adapt their projects from information and observations given in jury prior to submission of final portfolios.

Whether collaborating on a model in the shop or on the computer in *BIM 360* the ARC+BCS Collaborative Studio is a place for working together. Although the disciplines of Architecture and Construction Management are professionally distinct, their end product and purpose is the same. The students of Architecture and BCS understand this.

Integrated project delivery and lean construction are no longer theoretical concepts. They are the reality of contemporary practice in the building industry. Mississippi State CAAD is committed to the education of future AEC professionals who are leaders. Studio education and collaborative opportunities between programs is how it happens. In addition to, and perhaps as important as, the lessons learned are the friendships formed in Collaborative Studio - the beginnings of an invaluable network of makers.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PROPOSALS

TEAM 1

Proposal

Encouraging collaboration and interdisciplinary exchange, Team 1 created a central pedestrian avenue to serve as a spine linking the various departments of the College. Inward facing, each of the buildings will be visually open to the avenue showcasing the work product as well as the general day to day activities of each of the respective departments. Central to this avenue is a shared gallery space nestled into the u-shaped remainder of the existing Howell Building. As an entirely glazed structure this gallery space will serve as a central node of the avenue being located mid-length along the spine and fronting a grand stair descending into the green-way linking the north and south ends of the Mississippi State campus. At night, the gallery would serve as a central beacon to the CAAD campus.

With a distinct hat-tip to industrial mill buildings of the nineteenth century, the new BCS building features an iconic saw-tooth-like folded plate roof configuration which spans both the classroom, studio, and administrative portion of the building (Phase 2) as well as the warehouse-shop (Phase 4). This roof configuration is not only well suited to allowing for large-span interior open spaces but also allows for east-facing skylights which provide a soft, indirect natural daylighting optimal in quality during the afternoon studio hours. The open span in the warehouse area allows for maximum flexibility in machine and equipment configuration which is necessary in the environment of rapidly changing technology in the building and manufacturing sectors.

The team's overall strategy is to use iconic building form and contemporary building technology to speak directly to the purpose and mission of the College. This effort is made to feel gracefully at home in the more traditional brick masonry environment of the Mississippi State University by the artful deployment of brick pavers, brick masonry walls and detailing that engage the occupant on a human scale.

Team

From top left to bottom right:

Jacob Haasl, *Architecture*
Master Planning Research Group

Nicholas Jones, *Architecture*
As-built Research Group

Chip Goza, *Building Construction Science*
Programming Research Group

Mitchell Smith, *Building Construction Science*
Historic Preservation & Code Research Group

Master Plan and Phasing

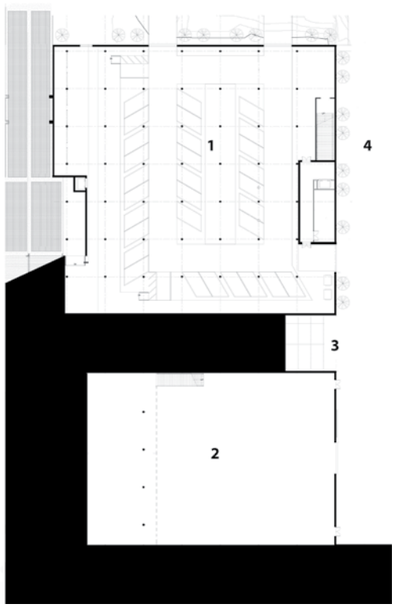
Team 1 started with the Master Plan approach developed in the Master Planning Research Group 1. Proposed execution of the Plan will take place in four phases:

Phase 1: New Parking Garage
126,000 square feet, $7.5 million

Phase 2: Art and BCS Buildings
144,750 square feet, $56.5 million

Phase 3: Partial Demolition of Howell Building
$588,850

Phase 4: Interior Design Building
30,000 square feet, $11.7 million
Warehouse
19,520 square feet, 3.4 million



First Floor Plan

1. Faculty and Staff Parking
2. BCS Warehouse and Shop
3. Breezeway
4. Warehouse Access Road

Second Floor Plan

1. Bridge to Art Building
2. BCS Studios
3. BCS Classrooms
4. Auditorium
5. Faculty and Administrative Offices
6. BCS Workshop
7. BCS Warehouse and Work Floor

BCS Site Plan *(opposite page)*

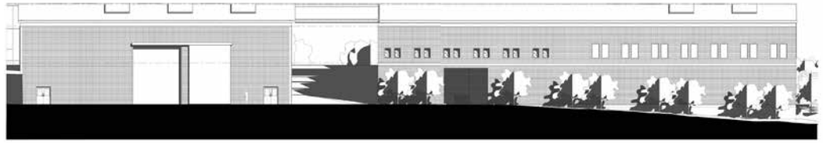
East-West Building Section

North-South Building Section

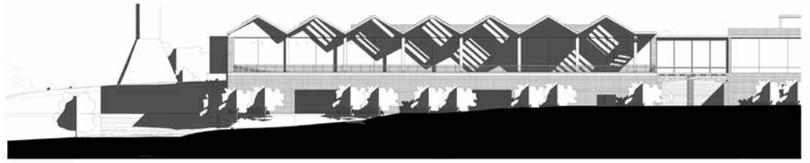
Owing to the desire to have the building itself be an object lesson in building construction technology, Team 1 sought to expose the structural, mechanical/electrical systems wherever possible. Folded plate reinforced concrete construction being capable of long spans, also afforded the opportunity to showcase evidence of the form-making itself in the finished product.

As a important element of the critical path, the team explored various approaches to site casting the repetitive spans seeing as the length of the pieces made off-site casting an impossibility. The approach of site casting the units on the ground and craning them into place not only allowed for greater quality control but also allowed for simultaneous superstructure pours and cure time reducing the overall schedule significantly.

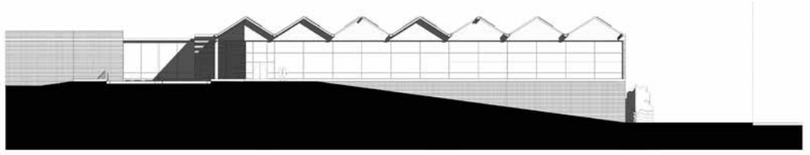
An early design challenge for the team was in achieving the desired taper for the profile of the concrete roof edge while providing insulation and proper roof drainage. A combination of internal roof drains, inset slab and tapered insulation allowed for the appearance of a thin concrete shell for the exterior while providing all of the moisture and thermal protection required.



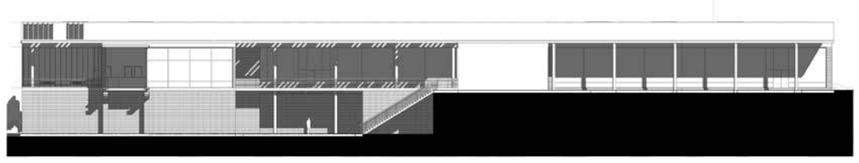
East Elevation



North Elevation



South Elevation



West Elevation

Pedestrian avenue looking north toward Art-BCS bridge

BCS building as seen from under the Art BCS bridge

View from the BCS studio terrace

BCS building as seen from Bailey Howell Drive looking south

BCS studios looking north towards terrace

BCS hallway looking north toward studios

Conference room overlooking breezeway

BCS workshop mezzanine with warehouse below

TEAM 2

Proposal

With a gradually ascending walkway from Bailey Howell Drive on the north end of the CAAD campus culminating with an open fountain at the rear of the renovated portion of the Howell Building, the spot marks a center and meeting point for students and faculty of the College. The presence of water, whether in the tower above or the pool below, is a thematic driver of this design. To further emphasize this centrality both the Building Construction Science building and the Interior Design building have chamfered corners marking entry into these two buildings.

With a mind to fully integrate the departments of the College, Team 2 distributes Art program into the envelope of the front half of the new BCS building. Studio and critique space being similar in some aspects, but largely the same in others, gives this scheme a sense of programmatic flexibility which allows for expansion and contraction of academic programs over time without the need to drastically modify the physical plant. Such integration also seeks to encourage cross-fertilization of ideas from the theoretical to the pragmatic, from the fine arts to the building sciences.

The spatial linchpin of the new BCS building however, is the open work yard. Occupying a place of prominence in the curriculum of BCS, the yard is an initiatory right of passage for first year students and is given a central proscenium-like position in this design. Visually accessible from practically the entire building on both the first and second floors, the large glazed openings into the space present a constant gallery of making - a theater of learning by doing. The faculty offices line the transparent midsection of the structure enjoying prospect into both the work yard and the pedestrian walkway and bridge between BCS and Art. This thoughtful location of faculty and staff encourages social interaction not only amongst the staff of BCS but also with those of other departments and with the student body as a whole.

Team

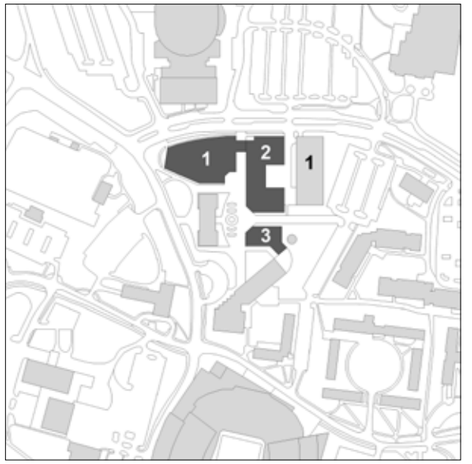
From top left to bottom right:

Steve Dragoo, *Building Construction Science*
As-Built Research Group

Mckenzie Johnson, *Architecture*
Historic Preservation & Code Research Group

Danielle Leclercq, *Architecture*
Programming Research Group

Chester Mitchell, *Architecture*
Master Planning Research Group



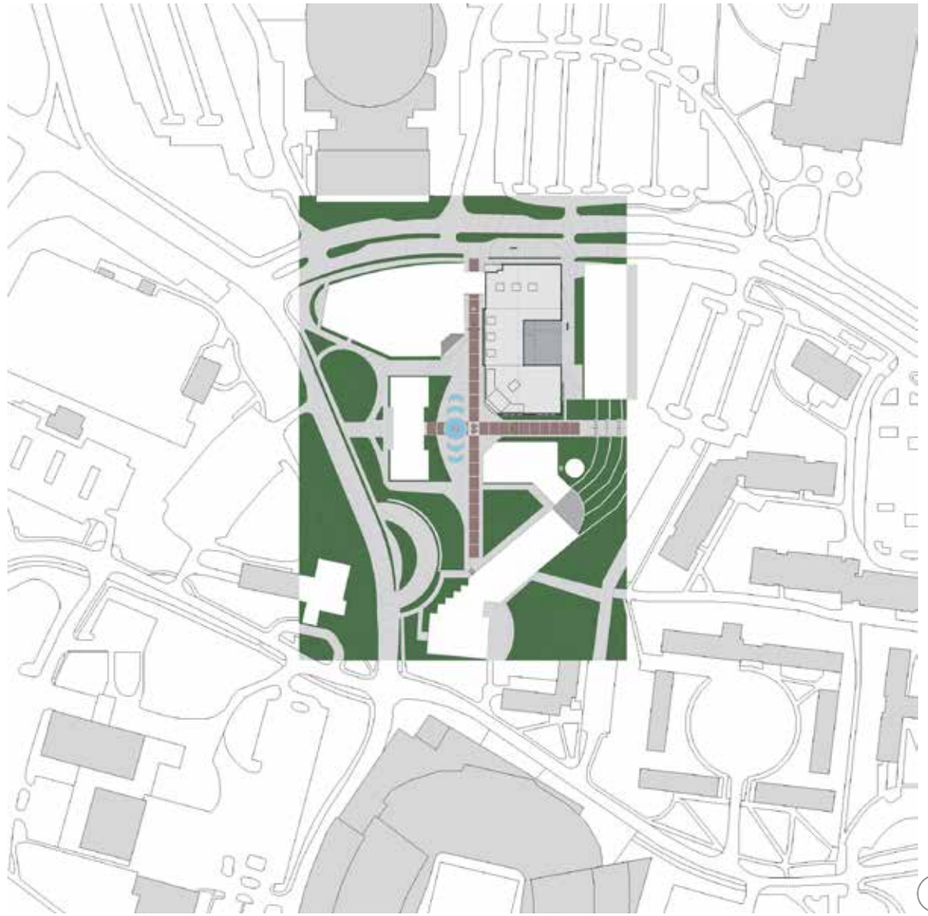
Master Plan and Phasing

Team 2 started with the Master Plan approach developed in the Master Planning Research Group 1. Proposed execution of the Plan will take place in three phases:

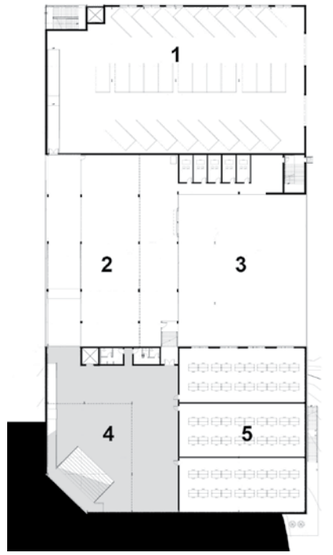
Phase 1: New Parking Garage:
207,360 sq. ft. $13.1 million
New Art Building:
88,410 sq. ft. $39.8 million

Phase 2: Partial (north) Demolition of Howell
$1 million
New BCS Building:
105,325 sq. ft.$36.9 million

Phase 3: Partial (south) Demolition of Howell
$787 thousand
New Interior Design Building:
30,939 sq. ft. $9.4 million
Howell Renovation and Site Work
$4.2 million

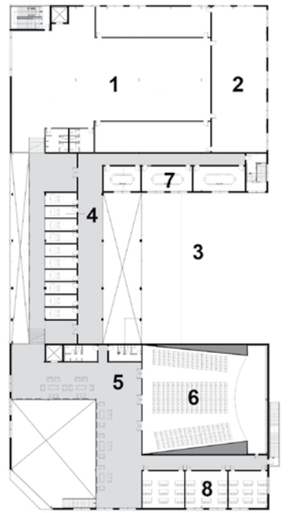


BCS Site Plan *(opposite page)*



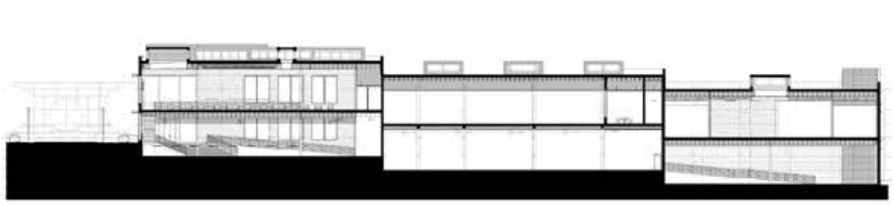
First Floor Plan

1. Faculty and Staff Parking
2. BCS Workshop
3. Outdoor Work Area
4. Main Entry Lobby
5. BCS Studios

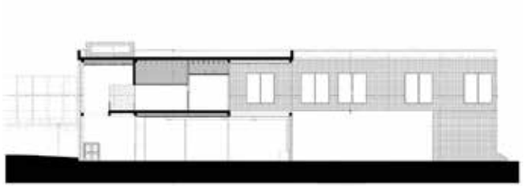


Second Floor Plan

1. Art School Critique Space
2. Art Studio
3. Outdoor Work Area
4. Faculty Offices
5. Lobby Mezzanine
6. Auditorium
7. Conference Rooms
8. Classrooms



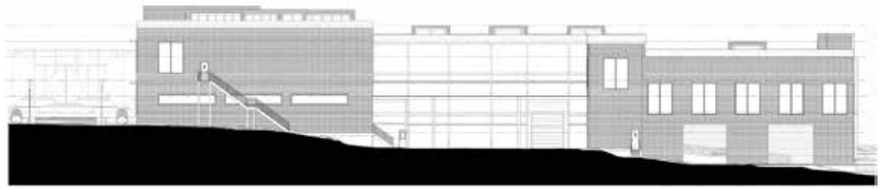
North-South Building Section



East-West Building Section

A driver for Team 2 is speed and efficiency and for that reason steel frame construction was adopted early in the process. With a desire to have one of the shortest overall construction schedules, the focus for the team was on modularity, use of proprietary systems such as storefront window systems and solar screening, and the desire to maximize potential concurrent construction operations. Analysis of the financial impact of disruption to the use of University facilities, especially during the Fall and Spring semesters, encouraged a heavy front end list of pre-construction activities followed by intense off-peak construction activity. Structural steel offered rapid erection potential with quick close-in possibilities so that interior work could commence in short order. With a desire for the building to be didactic, very few interior spaces are enclosed, allowing all building systems; structural, plumbing, electrical, HVAC, lighting, fire suppression, etc. to be clearly visible and expressive of their function as well as easily accessible for repair and maintenance.

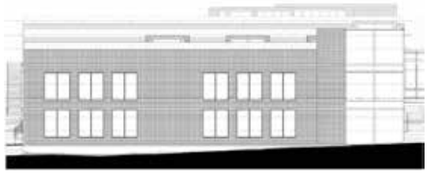
Another laudable aspect of the proposal is the structural arrangement and flexibility of plan. Understanding that an architectural program is a snapshot in time of the needs of an organization, Team 2 delivers the project at a target cost but one which is highly adaptable to future needs. Taking a shell/core approach to the project allows the client's institutional development team to identify build-out opportunities as needs or potential donor interests develop over time.



East Elevation

South Elevation

West Elevation



North Elevation

BCS Building as seen looking south-east from the Art School terrace

View of the BCS Building entrance from the central water feature

View of the BCS Building looking south from Bailey Howell Drive

View of the BCS work yard looking west

View of the promenade along the side of the CAAD campus

View along the side of the BCS Building looking west

View along side faculty offices on the main second floor corridor

BCS lobby hall at main entry

Mezzanine at main lobby hall

TEAM 3

Proposal

An admiration for the integrity of the existing Howell Building and a desire to return it to its original state motivated Team 3 to delve into the Preservation Report to discover the state of the building through its several alterations. The BCS studios and offices as well as the central CAAD administrative functions are housed in the updated and modernized structure. Having attained a pride of place, much like the barn portion of Giles Hall, Howell, and the CAAD campus in general, celebrates growth and change while respecting and preserving its built history.

The Howell Building, while presenting an elegant and well proportioned entry facade on College View Drive, bisects the CAAD campus separating Giles Hall from the north end of the site. Any design proposal that includes maintaining Howell must contend with the difficulties presented in integrating new development on the north end of the site with Architecture (Giles Hall) on the south. Team 3 boldly addresses this situation with the design of a new Interior Design building. The elevated studio level slides over top of the south wing of Howell, dropping down in monumental fashion with a light-filled grand atrium which acts as entry to Interiors, BCS and Art. All of this is in close proximity to the entry of Giles Hall, unmistakably creating a CAAD entry court at the location.

The most intriguing aspect of the design, and the one which presented the most interesting technical challenges, is the sinusoidal east elevation of the Interior Design building. Mindful of acting like a sort of accessory to Howell, the new building plays a graceful counterpoint to the building it embraces. Light, fluid and playful, the energy of the new addition reinforces Howell's groundedness and durability while at the same time bridging Art to Architecture. It does so in such a way as to make Howell's position between the two not so much an imposition as an opportunity - a good and critical supporting actor.

Team

From top left to bottom right:

Sarah Hoing, *Architecture*
As-Built Research Group

Madison Holbrook, *Architecture*
Historic Preservation & Code Research Group

Kacie Lynn James, *Building Construction Science*
Master Planning Research Group

Drue Smith, *Architecture*
Programming Research Group

Master Plan and Phasing

Team 3 started with the Master Plan approach developed in the Master Planning Research Group 3. Proposed execution of the Plan will take place in four phases:

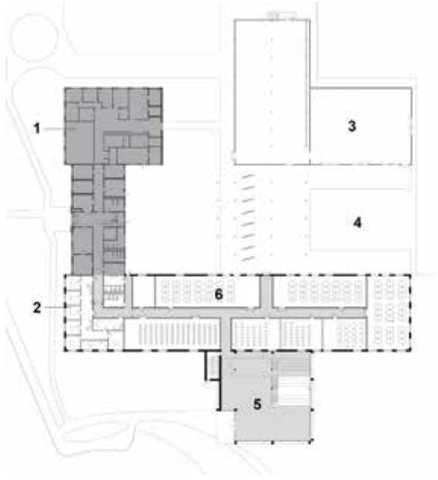
Phase 1: Howell Partial Demolition:
12,400 sq. ft., $434 thousand, 2/23 - 5/23

Phase 2: Howell Renovation for BCS:
27,925 sq. ft., $9 million, 6/23 - 10/23

Phase 3: New Interior Design and BCS Shop:
43,605 sq. ft., $20.5 million, 5/23 - 8/24

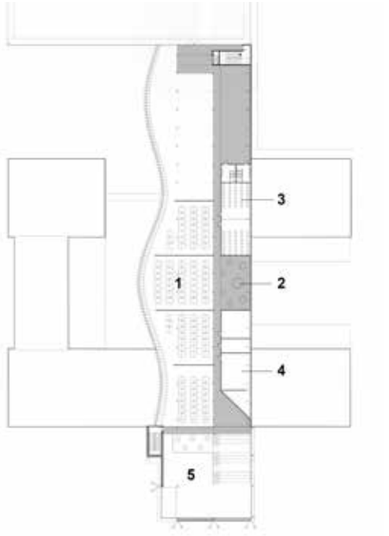
Phase 4: New Art Building
37,435 sq. ft., $4.2 million, 8/24 - 3/25

BCS Site Plan *(opposite page)*



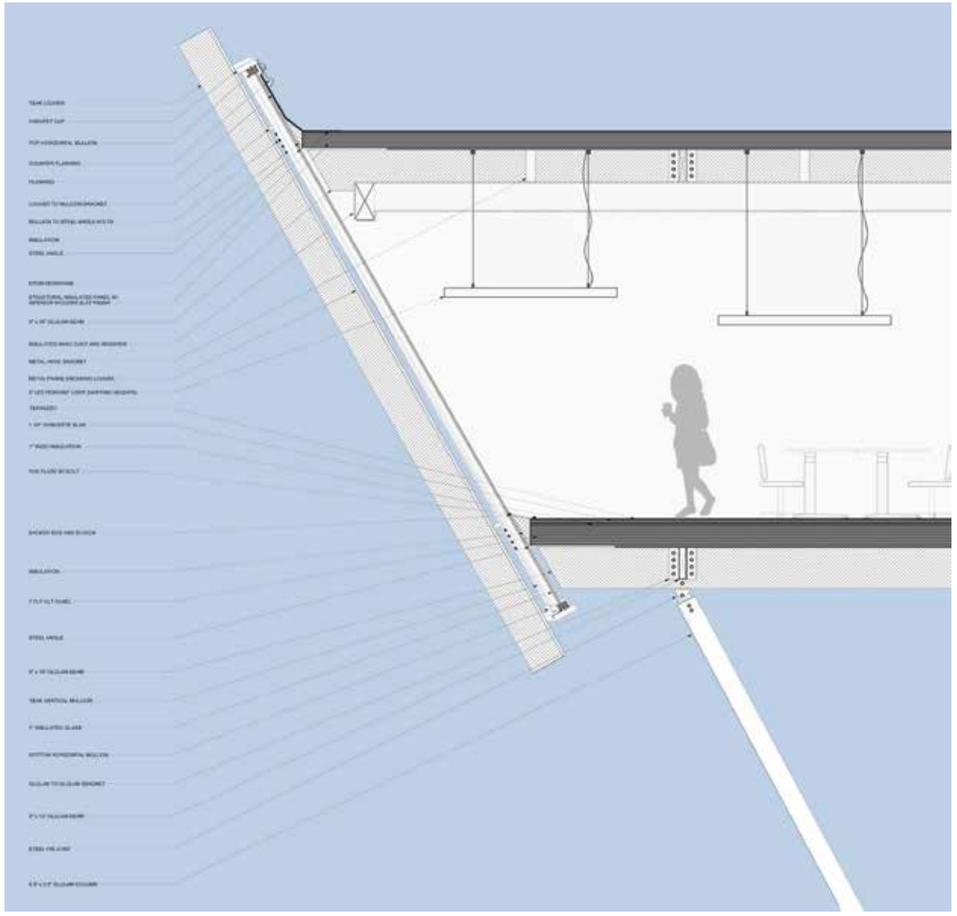
First Floor Plan

1. CAAD Administrative Offices
2. BCS Faculty Offices
3. BCS Workshop
4. BCS Work Yard
5. Grand Atrium
6. BCS Studios and Classrooms

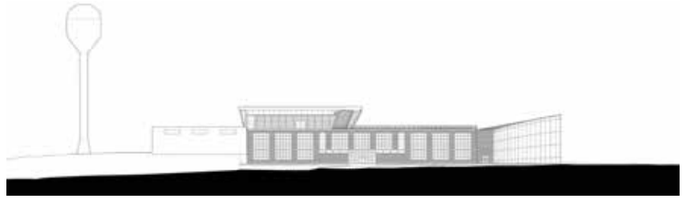


Second Floor Plan

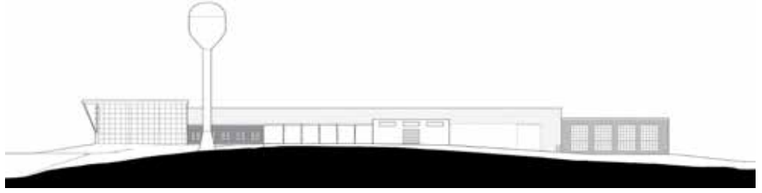
1. Interior Design Studios
2. Critique Space
3. Interior Design Classrooms
4. Print and Phots Labs, Storage
5. Grand Atrium



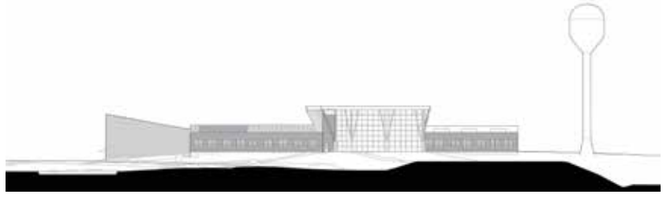
West Elevation



North Elevation



East Elevation



South Elevation

View of the Grand Atrium looking north from Giles Hall

View from the corner of College View and Bailey Howell

View of the Art Building looking south

View of the Grand Atrium from the faculty-staff parking area

View of Howell looking east from College View

View of the Howell courtyard

View from the Interior Design studios

View from the courtyard looking east

View from the courtyard looking north

View of the Grand Atrium interior

TEAM 4

Proposal

Grouping four new buildings to create a minor quad open on the southern end to Giles Hall, Team 4 sought to encourage College community with shared outdoor rooms. The buildings are sited closer to the street on Bailey Howell and College View and define an inside and an outside of the CAAD campus perhaps suggesting a more urban sense of planning. While the interior of the site belongs to CAAD this approach does make for a good neighbor to adjoining University users. Not only are these edge buildings handsomely designed, the building at the intersection of these two streets has a shared use as both the CAAD administrative offices and as a "Bulldog Club." Recognizing the proximity to the athletics-oriented portion of campus, not to mention the critical gateway location of the corner site, the figural building proposed in Phase 5 will announce MSU on the exterior and College of Art, Architecture and Design on the interior. The south east corner of this building, being centered on the interior quad, serves as an ideal location for the administrative functions of the College to take place. The scheme also cleverly places Art and BCS in close proximity with shared access to a work yard.

Of particular note in the design of the BCS building is the generosity of space afforded not only to the work yard but to the BCS warehouse. A single volume of space on the east side of the building, the warehouse can be considered both fabrication plant and gallery. Flanked by a corridor with floor to ceiling safety glass, the work area is on constant display. With an over-designed warehouse roof structure, the building anticipates changes in robotics and other building technology and provides ample infrastructure to accommodate whatever may come. With upper level studios located on the third floor with a commanding view of the warehouse floor, the relationship between theory and praxis is immediate. With a large central light monitor, the workspace feels open and inviting, well suited to lengthy studio days.

Team

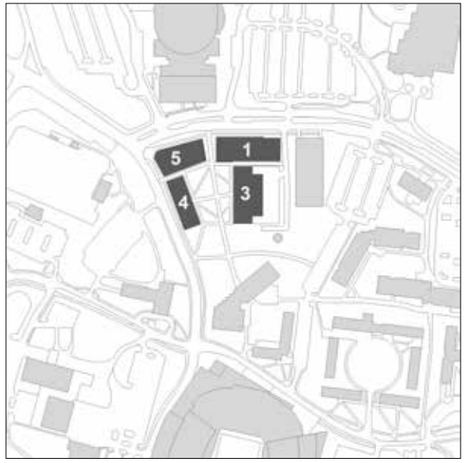
From top left to bottom right:

Davis Beasley, *Architecture*
Programming Research Group

Myles Jeffries, *Architecture*
As-Built Research Group

Garrett Jones, *Building Construction Science*
Historic Preservation & Code Research Group

Chris Sharp, *Building Construction Science*
Master Planning Research Group



Master Plan and Phasing

Team 4 started with the Master Plan approach developed in the Master Planning Research Group 4. Proposed execution of the Plan will take place in five phases:

Phase 1: New Art Building:
64,000 sq. ft., $28.8 million, 5/22 -12/23

Phase 2: Demolition of Howell Building

Phase 3: New BCS Building:
60,000 sq. ft., $30.3 million, 5/24 - 7/25

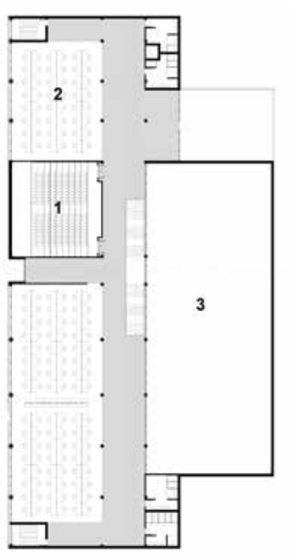
Phase 4: New Interior Design Building:
17,000 sq. ft., $6.8 million, 8/25 - 4/26

Phase 5: New CAAD Admin & Bulldog Club:
51,000 sq. ft., $28 million, 5/26 - 12/27

BCS Site Plan *(opposite page)*

Second Floor Plan

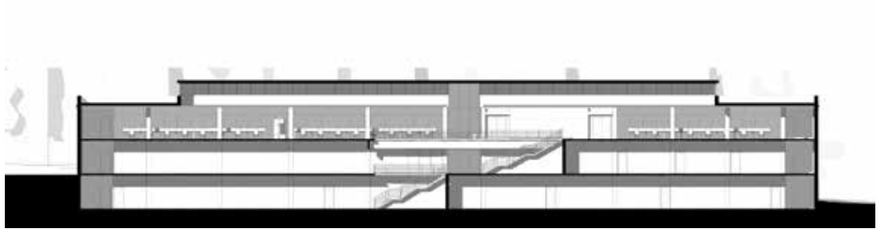
1. Auditorium
2. Classroom
3. BCS Warehouse (open to below)
4. BCS Administrative Suite



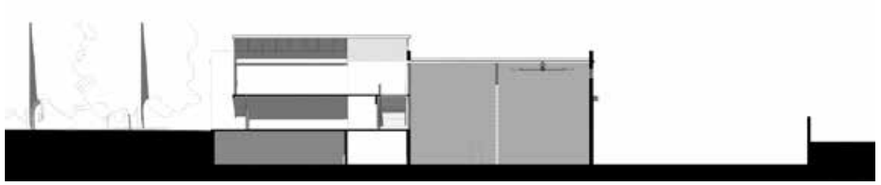
Third Floor Plan

1. Auditorium
2. BCS Studio
3. BCS Warehouse (open to below)

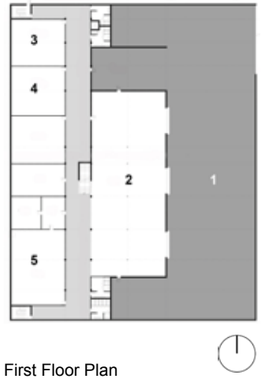
First Floor (Warehouse/Shop) shown next page.



North-South Building Section



East-West Building Section

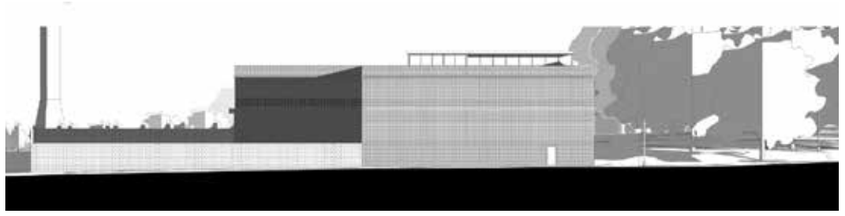


First Floor Plan

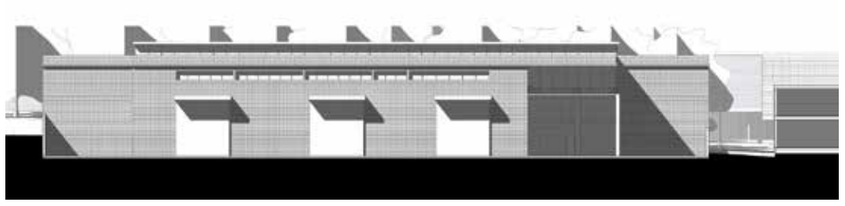
Team 4 made use of a curious combination of reinforced concrete and steel. Seeking to showcase as many different types of construction in the building as possible, the concrete and steel frames are exposed, more often, on the interior. The exterior is clad almost exclusively in brick veneer, but in a manner not to suggest traditional load-bearing construction but in such a way as to reveal the single wythe thickness of the application. Conceptually these are two buildings, a concrete frame on the west and a steel frame on the east, being united throughout with a lightweight concrete floor on steel bar joist system.

1. Work Yard
2. Warehouse
3. Art Shop
4. Metal Shop
5. Wood Shop

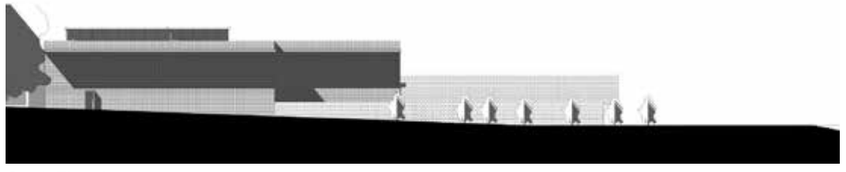
West Elevation



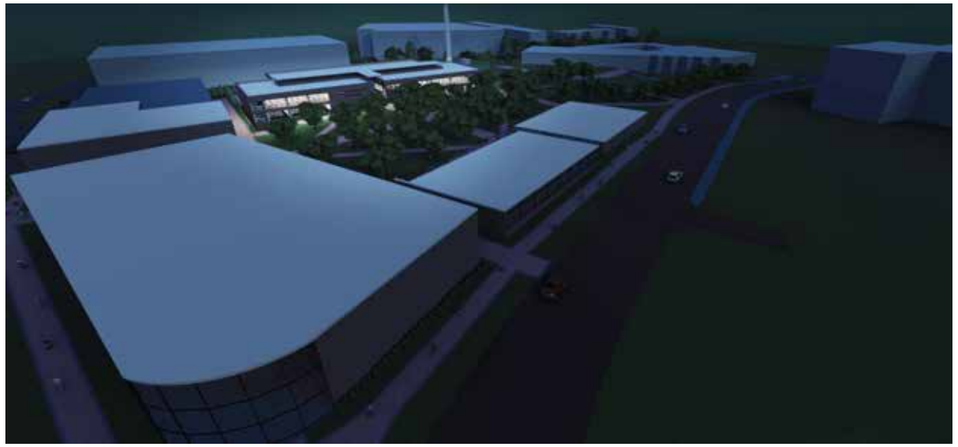
North Elevation



East Elevation



South Elevation



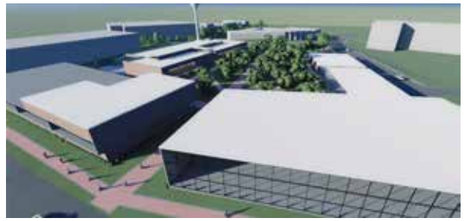
Bird's-eye view of BCS Building from the west

CAAD campus courtyard walkways

View from along side the west elevation of BCS

West (entry) elevation of BCS Building

Bird's-eye view of CAAD campus from south-west



Bird's-eye view of CAAD campus from north-west

View of BCS studio interior

Viewing area into BCS warehouse

View of typical BCS classroom

View of central corridor on third floor

TEAM 5

Proposal

Team 5 entered the project with focused determination and a shared goal - to be the uncontested leader in delivering an ecologically oriented, optimally sustainable CAAD campus. With ethical concerns for environment as a driver, the goal was also to demonstrate how green practices would produce a measurable return on investment in a reasonable time period.

Taking the lead from the University's 2009-10 Master Plan update and, in particular, the vision of a "green corridor," the team set out to make the CAAD campus an extension of the plan. Spanning the distance of the University from the athletics area in the north to the equestrian area in the south, the green corridor bounds the CAAD campus on its easterly edge. As the proposed new parking garage to the east of the site was also a given condition for the project, the primary connection for the CAAD campus and the green corridor occurs in the space behind the garage and in between Giles Hall - a space the center point of which is marked by the elevated flared, *"M State"* emblazoned water tower.

Complimenting the internal north-south pedestrian street from Bailey Howell Drive to the entry to Giles Hall, sweeping curvilinear paths and planting areas wash through the site like meandering streams seemingly eroding the edges of buildings and softening their rectilinear form. Perhaps the generator of this curvilinear geometry is the Art Building, the nexus of its form emanating from the corner condition at Bailey Howell and College View - a fitting moment to announce entry to the University campus. The curves of this building then extend out to form the broad arc of glass across the rear of the existing Howell Building as well as swirling in whirlpool-fashion in front of the BCS Building creating its chamfered-arced entry facade. In all cases these eroded edges are rendered in glass as if to suggest the building skin had been washed away.

Team

From top left to bottom right:

Kaitlyn Breland, *Architecture*
Historic Preservation & Code Research Group

Julvian Cattledge, *Architecture*
As-Built Research Group

Carl Elkins, *Building Construction Science*
Master Planning Research Group

Charlyn King, *Architecture*
Programming Research Group

Master Plan and Phasing

Team 5 started with the Master Plan approach developed in the Master Planning Research Group 1. Proposed execution of the Plan will take place in four phases:

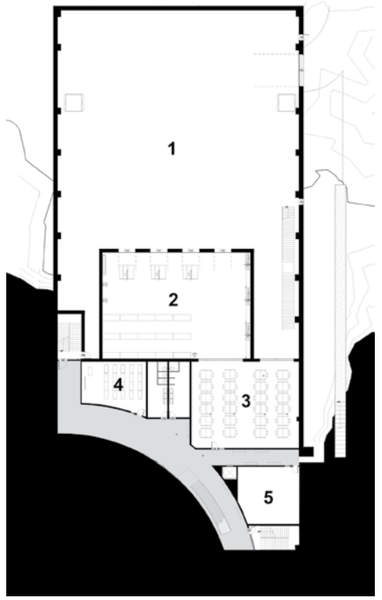
Phase 1: New Art Building:
120,000 sq. ft.

Phase 2: Renovation of Howell:
101,000 sq. ft.$36.9 million

Phase 3: New BCS Building:
43,000 sq. ft.
High-Low Range: $34.4 - $17.2 million

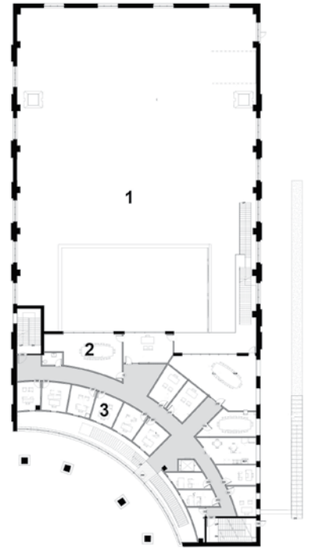
Phase 4: Site-work and campus landscape:

BCS Site Plan *(opposite page)*



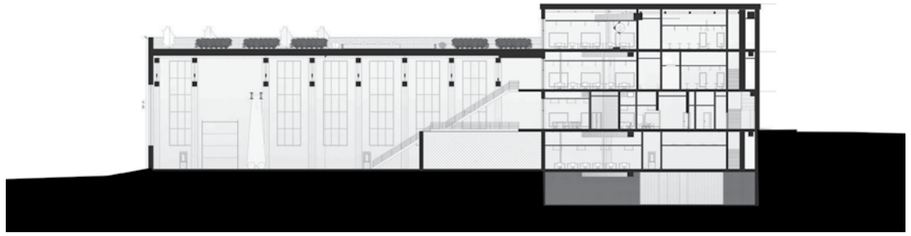
First Floor Plan

1. Warehouse
2. Workshop
3. BCS First Year Studio
4. Classroom
5. Storage

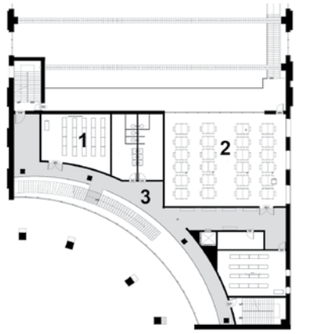


Second Floor Plan

1. Warehouse (open to below)
2. Conference Room
3. Faculty Offices



North-South Building Section



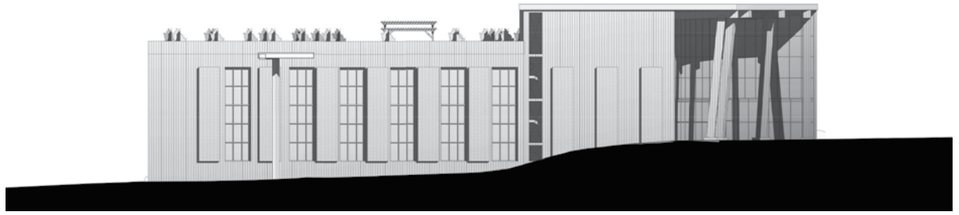
Third Floor Plan

1. Classroom
2. Studio
3. Third Floor Mezzanine

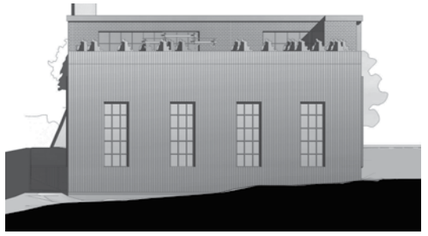
(Fourth Floor Plan not shown)

Mass Timber Construction was the technology of choice for Team 5. With the 2018 opening of the Florida-based *International Beams* Dothan Alabama plant, locally sourced timber products are no longer an option reserved for the Pacific Northwest. Appropriate for a program in Building Sciences, Mass Timber construction is an ancient building tradition (Heavy Timber Construction) which has been revived and rejuvenated in light of contemporary material sciences and means of production. No longer reliant on old-growth forests in order to render substantial long-span members, Glulam (Glue-Laminated Timber) beams and CLT (Cross-Laminated Timber) panels give this building technology capabilities resembling that of steel.

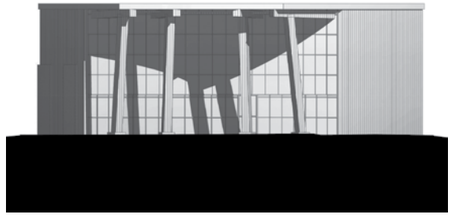
The most challenging aspect of the BCS building is the voluminous warehouse-work space. The long span mass timber trusses oriented east-west along the narrow width of the space had to be designed to accommodate hoisting equipment on the inside and the load of an expansive green roof on the exterior. Although requiring a higher initial capital investment, utilizing mass timber construction on the project reduced overall construction time and ease of assembly. With both the storm water management of the site, and the hygroscopicity of the structure, this design is through and through, an elegant study in environment, and in particular in the management of the element of water.



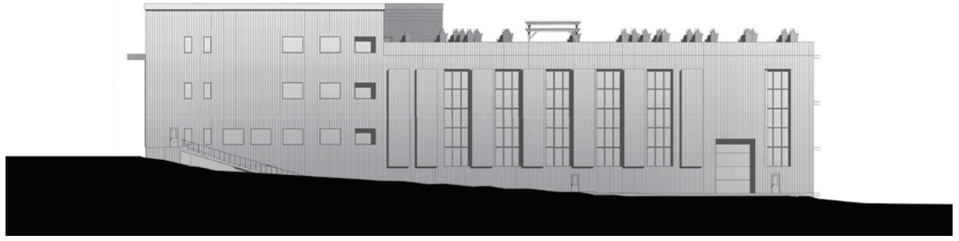
West Elevation



North Elevation



South Elevation



East Elevation

Sketch of the approach to BCS from the Green Corridor

Sketch of the curved entry elevation of the BCS building

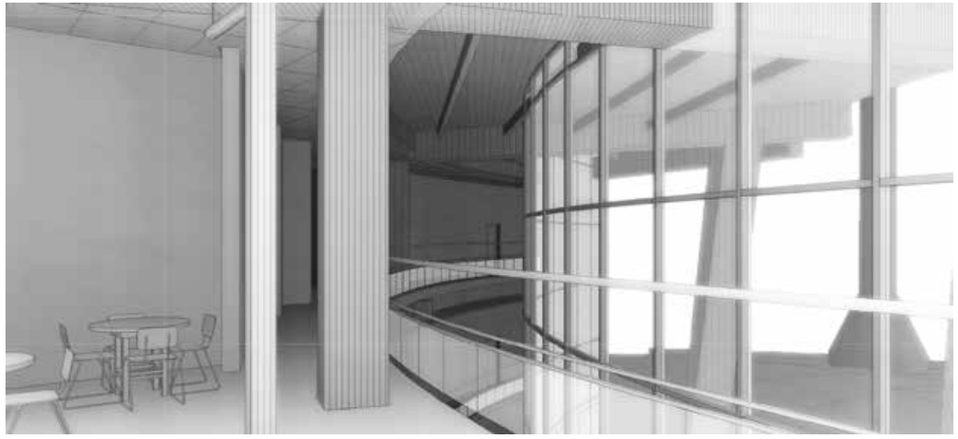
View of BCS from the south

View from the Green Corridor to the CAAD campus

View toward Interior Design from the north

Plaza in front of the BCS Building

View of the BCS roof garden



View from the fourth floor mezzanine looking south east

View from the fourth floor looking out to the roof garden

TEAM 6

Proposal

Mississippi State University has a rich tradition of Beaux-Arts style architecture with such noble examples as Montgomery Hall. Built in 1902, Montgomery Hall was previously known as Scientific Hall due to the classes conducted there. It was also the University library for a time, and following a renovation in 2004, it is now the home of Admissions and Student Support Services. That a building can survive its initial program and live on for other new purposes was a guiding motive for Team 6.

Inspired by recent University projects such as the Old Main Academic Center by Belinda Stewart Architects, the team sought to read the University's built environment as an ongoing architectural conversation - one they wished to join, not interrupt. Following research into the architectural traditions of University buildings as well as a detour into research on Italian Renaissance pallazi, the team set out to site the new home for BCS so as to have a commanding presence on Bailey Howell Drive. The building has a southern entry facade on the newly formed CAAD quad at a scale in conformity with adjoining new buildings to the west (phases 2-4) and at home with the one story northern wing of Giles Hall which forms the southern edge of the new CAAD campus.

The approach to the overall master plan shares some of the formality of the architectural style deployed. With symmetrical wings spanning from a central auditorium/gallery the BCS building is an outgrowth of the Art wing, extending north and south as if to block and buffer the new garage building to the east of the site. The positioning of the buildings establishes a large, well formed, exterior room. Similar to the Italian precedents studied, it has its own campanile - in this case not serving as a bell or clock tower, but as the University's water tower. With the topography sloping abruptly to the south east, one can anticipate the team considering an ascending garden terrace connection to the green corridor.

Team

From top left to bottom right:

Peyton Harlow, *Building Construction Science*
Historic Preservation & Code Research Group

Jose Solorzano, *Architecture*
Programming Research Group

Hannah Strider, *Architecture*
As-Built Research Group

Alex Todd, *Building Construction Science*
Master Planning Research Group

Master Plan and Phasing

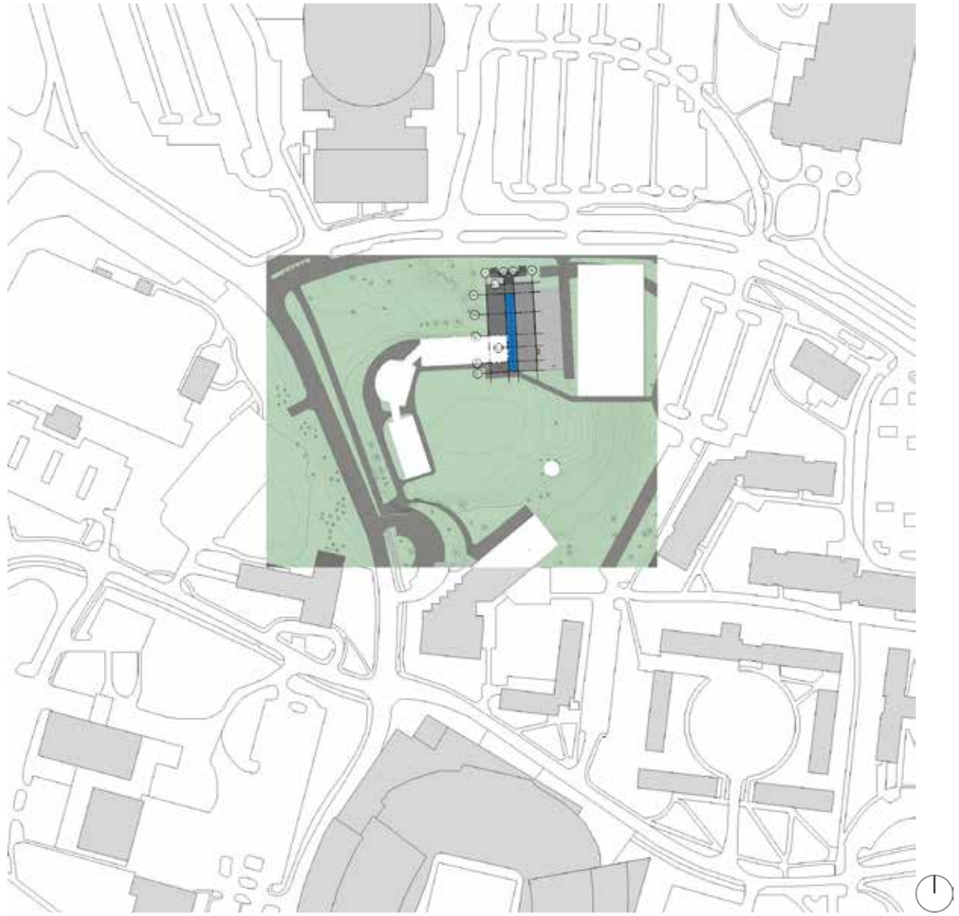
Team 6 started with the Master Plan approach developed in the Master Planning Research Group 2. Proposed execution of the Plan will take place in four phases:

Phase 1: New BCS Building:
63,600 sq. ft., $27 million, 5/25 -1/28

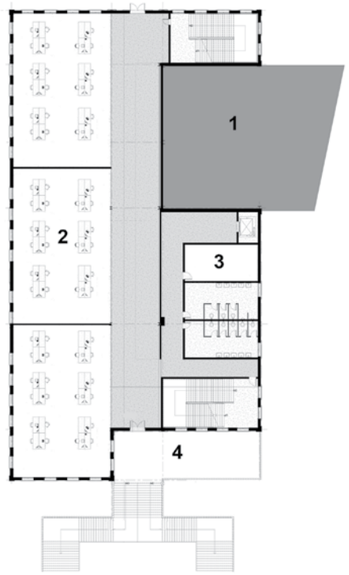
Phase 2: New Art Building:
50,000 sq. ft., $22.5 million

Phase 3: Auditorium/Gallery Building:
22,000 sq. ft., $10.4 million

Phase 4: New Interior Design Building:
50,000 sq. ft., $22.5 million



BCS Site Plan *(opposite page)*

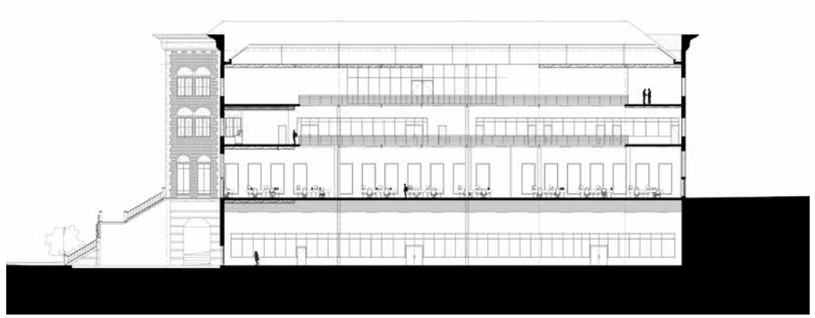


Second (entry) Floor Plan

1. Art Building (Phase 2)
2. BCS Studios
3. Storage/Mechanical
4. BCS Entry Terrace

Third Floor Plan

1. Art Building (Phase 2)
2. Auditorium
3. Classrooms
4. Conference Room
5. Open to Corridor Below

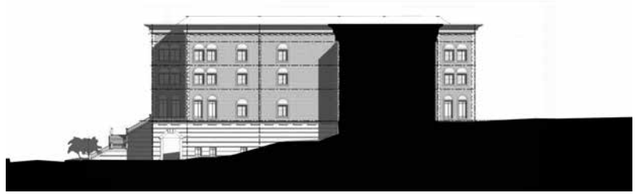


North-South Building Section

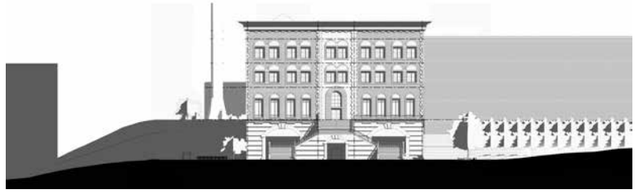
East-West Building Section

While the team deployed an architectural style born in the Italian Renaissance, they were aware that their construction team was not. The beauty of the renaissance palazzo has much to do with its integrity. That integrity is due in part to the fact that its skin is also its bones. As load bearing masonry construction is impractical in the twenty-first century on many levels, the team investigated how to speak this architectural language with a steel frame super structure.

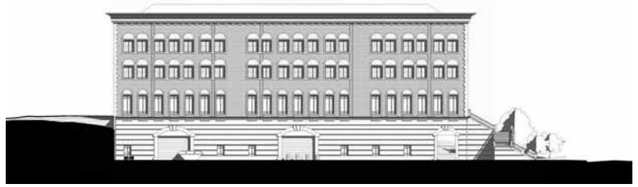
With performative standards exceeding those required for twentieth century beaux- arts structures, those precedents were a guide, but not the answer. The team dealt, as did the architects of the Old Main Academic Center, with issues of expansion joints, window depths, brick lintels and soft joints - lines and details not found in older precedent. The success of the design then rests in the details. The question asked was; how can what was bones be solely skin but do so without losing its integrity?



West Elevation



North Elevation

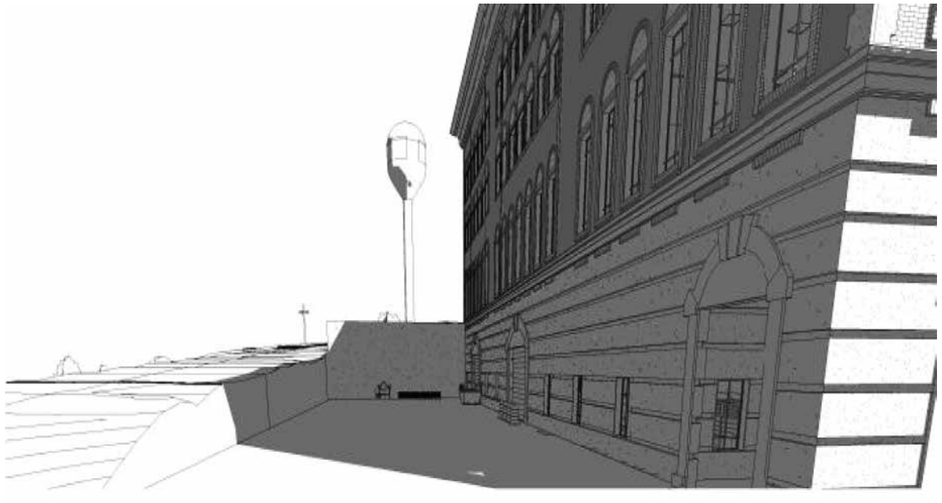


East Elevation

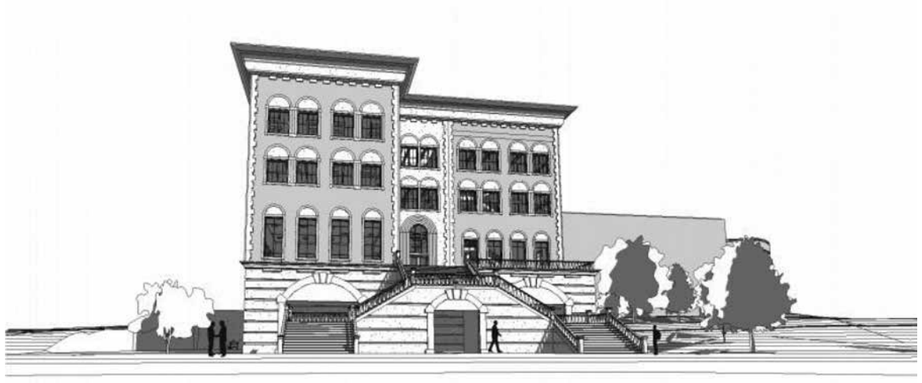
South Elevation

BCS Entry from south

BCS Building as seen from south east

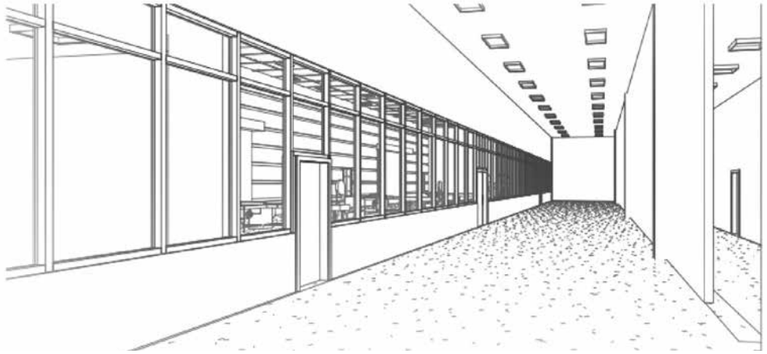


BCS work area off ground floor shops



BCS Building as seen from Bailey Howell Drive

BCS Building from Bailey Howell Drive looking south east



View of ground floor corridor showing shops

View of third floor corridor, classrooms to left

View of typical studio space

View of typical classroom

TEAM 7

Proposal

If construction budgets are a gage, the New Gallery tucked and integrated into a restored and renovated front portion of Howell is set to be the crown jewel of the new CAAD campus envisioned by Team 7. Howell playing the modest but secure setting for the proposed triple volume structural glass clad diamond of a building, the work product for the Art, Architecture, Interior Design and BCS will have a world-class exhibit space. Given its volume and central position in the plan, the Gallery would also be the marquee of the CAAD campus and in the evening hours its night light.

While the New Gallery is somewhat hidden away from any casual vantage points along Bailey Howell and College View, its presence is occasionally revealed as it peaks it head over the front of Howell. Such hiding and revealing is a game played consistently by Team 7. The New BCS Building plays a role in hiding, to the extent it might, the new garage proposed for the east end of the site. The length of the building more than mirroring the length of the garage. The BCS building places its "working side" toward the garage so that a lounge and faculty offices can face the north-south pedestrian corridor shared with the Art Building.

This theme of hiding and revealing is also carried out in the architecture of the buildings themselves. The BCS building is clad with a sort of perforated metallic scrim draped playfully over the more rigidly rectilinear building form. The scrim, perforated as it is, casts the building in one manner in during the day where during the evening hours its presence evaporates revealing a new character. In like fashion, the choice of transparent and translucent brick deployed both in the warehouse walls and the roof garden floor, render opacity and the appearance of being part of the building's structure at one moment only to become transparent, revealing the inner workings of the building the next.

Team

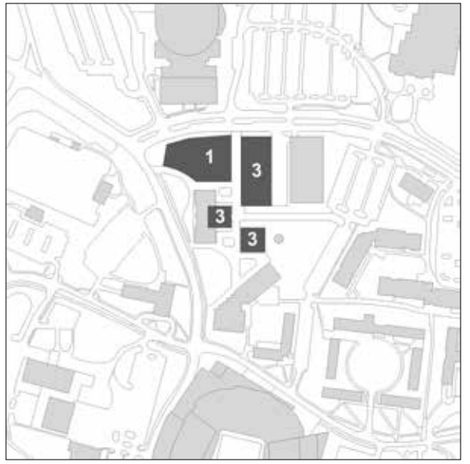
From top left to bottom right:

Olivia Baker, *Architecture*
As-Built Research Group

Jonathon Burton, *Building Construction Science*
Programming Research Group

Joey Deaton, *Building Construction Science*
Historic Preservation & Code Research Group

Amelia King, *Architecture*
Master Planning Research Group



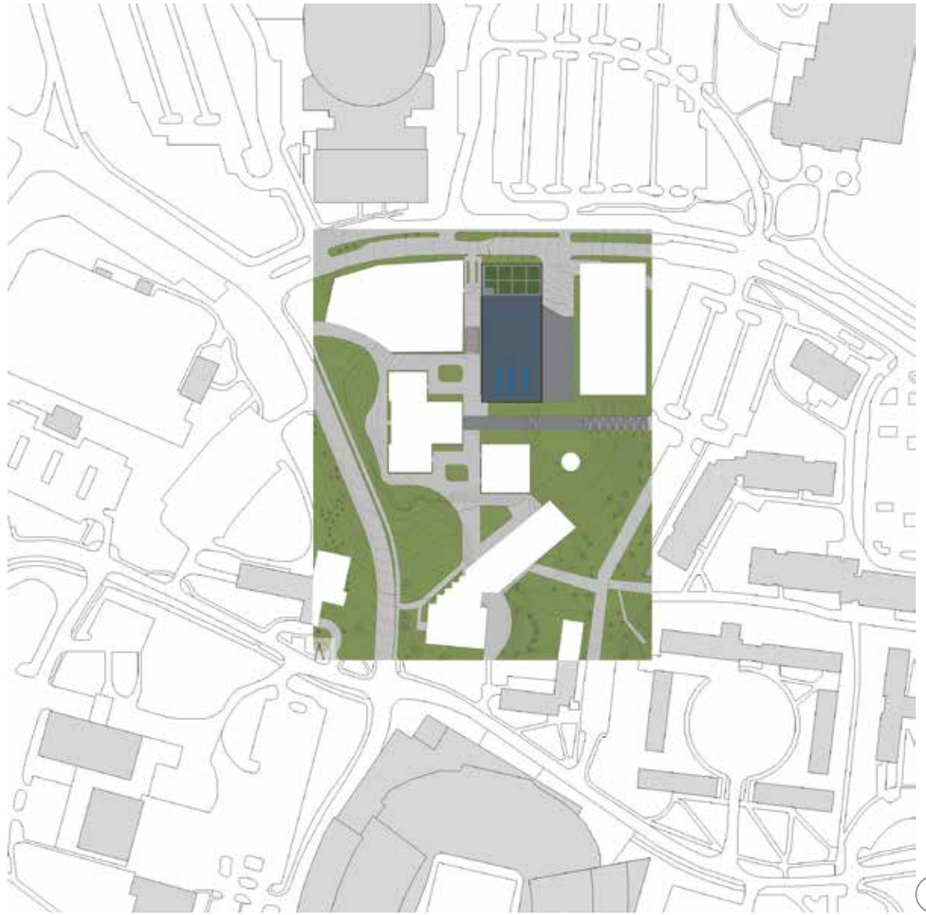
Master Plan and Phasing

Team 7 started with the Master Plan approach developed in the Master Planning Research Group 1. Proposed execution of the Plan will take place in three phases:

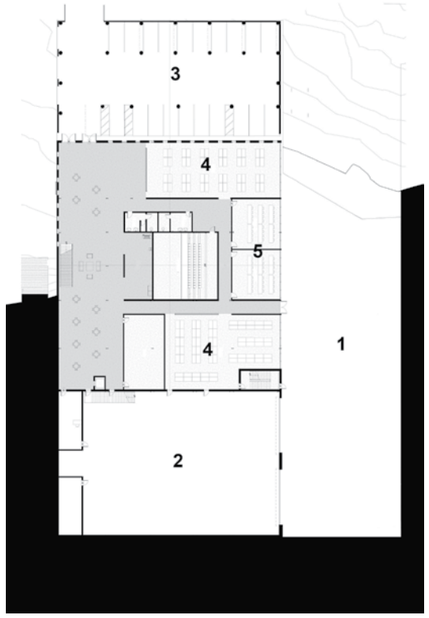
Phase 1: New Art Building:
82,000 sq. ft. $50.2 million

Phase 2: Partial Demolition of Howell
17,600 sq. ft., $324 thousand

Phase 3: New BCS Building:
65,520 sq. ft., $22.4 million
New Interior Design Building:
21,770 sq. ft. $11.4 million
New Art Gallery:
9,800 sq. ft., $9.3 million



BCS Site Plan *(opposite page)*



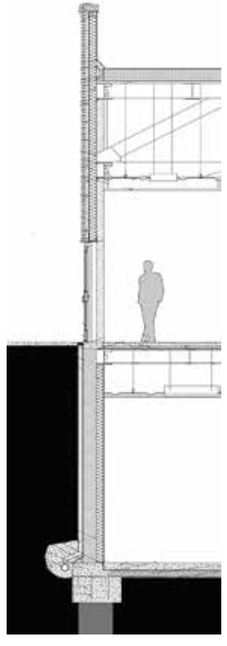
First Floor Plan

1. Work Yard
2. Warehouse
3. Faculty and Staff Parking
4. Studio
5. Classrooms

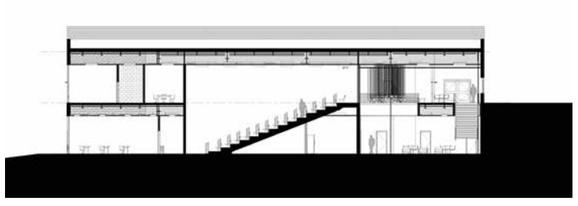
Second Floor Plan

1. Roof Garden
2. Warehouse
3. Auditorium
4. Studio
5. Faculty Offices

North-South Building Section

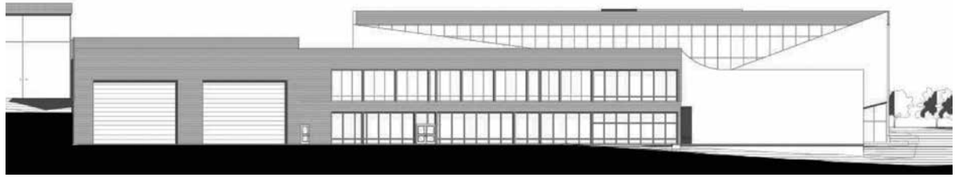


Wall Section

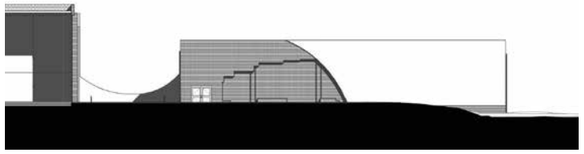


East-West Building Section

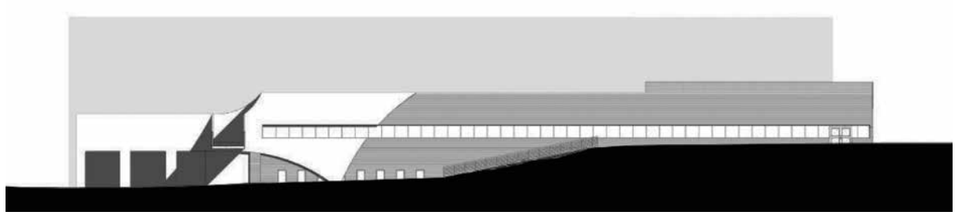
An admirable aspect concerning construction management in Team 7's approach was that of phasing. Asked to consider the impact of facility load due to disruption of existing buildings, the team implemented a Phase One Art Building capable of temporarily accommodating BCS students. A more exhaustive Phase Two and Three see partial demolition of Howell and the construction of BCS, Interior Design and the Gallery. The team understood that the multi-phase approach meant added mobilization costs, the need to protect existing buildings and expending more generally on providing for public safety. This approach sought to limit those expenses. Allowing for a larger, more easily controlled work area and an overall shorter construction schedule was the goal. With an eye to reduce the schedule and realize the cost benefits involved, the team also chose steel frame construction for its quick erection and relative low cost.



East Elevation



South Elevation



West Elevation

North Elevation

View of the work yard looking south

View of the roof garden, Art Building beyond

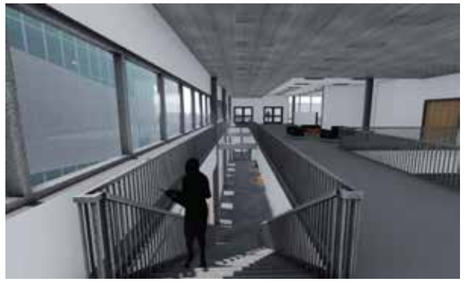
View of the south facade of the BCS building

View between Art and BCS looking south

View of the Gallery looking west from the Green Corridor

View of area outside the Gallery

View of walkway between Art and BCS



View of interior corridor stair

View of first floor lounge area

View of second floor corridor outside the BCS warehouse

TEAM 8

Proposal

Team 8 offers a tight new mini CAAD campus on the north end of the site and links it to Giles Hall with a pedestrian path. A bridge building between Interior Design and BCS frames the entryway between the two segments of the larger CAAD campus. The tight composition suggests a spatial efficiency which also compliments the team's approach to construction logic.

Efficiency, prefabrication, and lean construction were the guiding principles of Team 8. From the steel super structure which makes use of "quick connect" components, to prefabricated *StoPanel* wall assemblies and MEP racks, this project is largely built off-site. Organization of the delivery, temporary off-site storage, and placement of component systems while demanding a high level of sophistication on the construction management side, render an extremely short construction duration and the possibility for a tighter work area. Sophistication was also necessary on the design-side where the standard details of various proprietary systems needed to be coordinated and in some cases altered in order to be sympathetic with the other systems in the project and the design overall.

Another innovative approach taken by Team 8 was that of "shell space." The team proposes a third floor (14,300 sq. ft.) as part of the new BCS building. This space, which can be delivered at $125/sq. ft. unfinished, provides storage space in the short term with the potential for quick and inexpensive finished classroom, lab or administrative space to satisfy future demands. While the decision to include a shell space was driven by solid economic and logistical planning there is also a real architectural benefit. Although not required for BCS in the original programming exercise, the massing benefit to the CAAD campus is significant, and its overall value to the plan suggests that putting away space for a rainy day may not only be prudent, but also beautiful.

Team

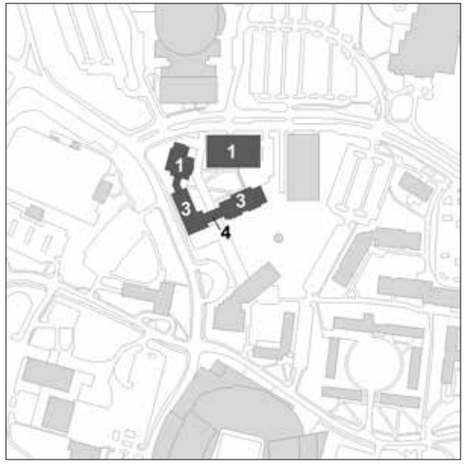
From top left to bottom right:

Hunter Bullock, *Building Construction Science*
As-Built Research Group

Rory Fitzpatrick, *Architecture*
Programming Research Group

Kerry McElroy, *Architecture*
Historic Preservation & Code Research Group

Tyler Seal, *Building Construction Science*
Master Planning Research Group



Master Plan and Phasing

Team 8 started with the Master Plan approach developed in the Master Planning Research Group 4. Proposed execution of the Plan will take place in five phases:

Phase 1: New Auditorium and Art Buildings:
141,065 sq. ft., $54.4 million, 10/19 - 3/21

Phase 2: Demolition/excavation of Howell site

Phase 3: New Interior Design and BCS Building:
85,390 sq. ft., $33.8 million, 8/21 - 6/23

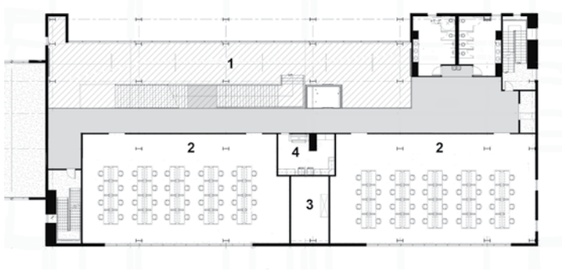
Phase 4: Interior Design - BCS Bridge:
7,400 sq. ft., $8.2 million, 6/23 - 8/23

Phase 5: CAAD Campus site work and landscape
$600 thousand, 6/23 - 8/23

BCS Site Plan *(opposite page)*

First Floor Plan

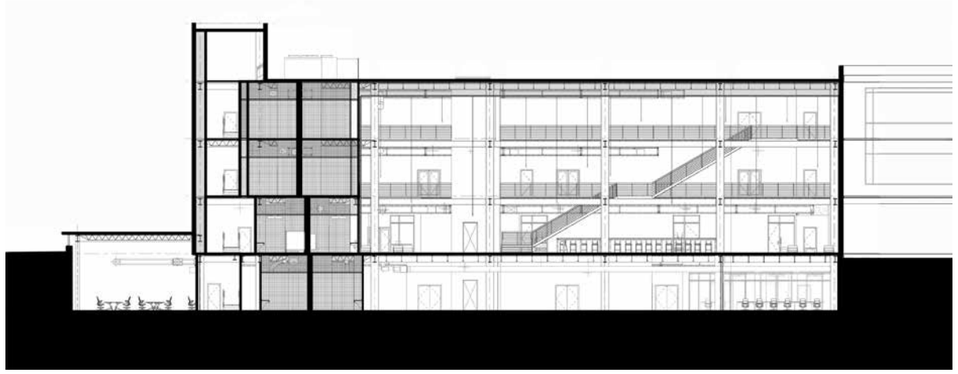
1. BCS Lobby 2. Classroom 3. Faculty Offices 4. Conference Room



Second Floor Plan

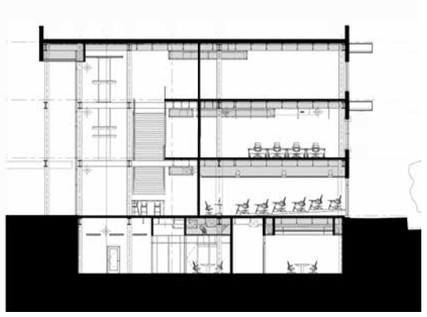
1. Lobby Atrium (open) 2. Studio 3. Chase for Shell 4. Print Lab

Basement Level and Third Floor Shell Plan not shown

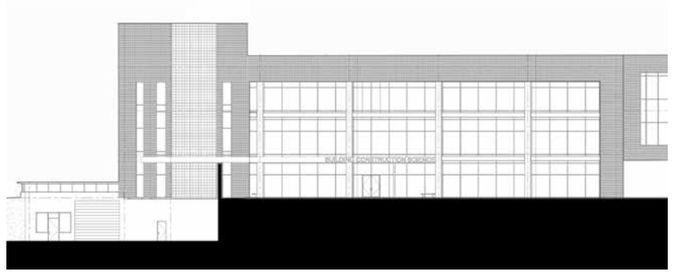


East-West Building Section

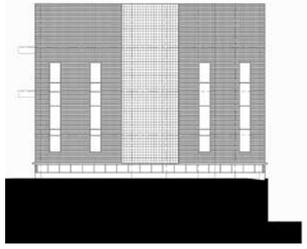
North -South Building Section 1



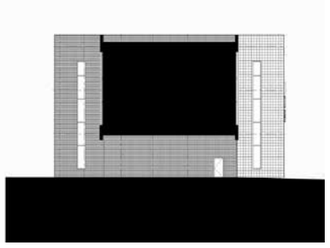
North-South Building Section 2



North Elevation

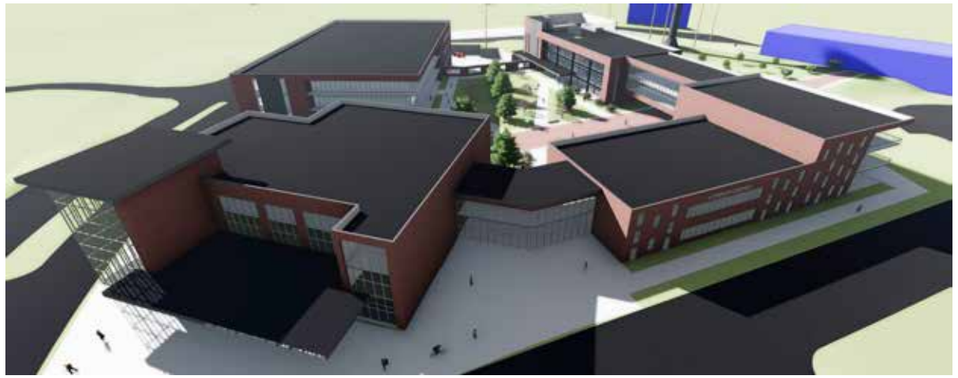


East Elevation



West Elevation

South Elevation



Bird's eye view of the CAAD campus from the north east

View of the Art Building from Bailey Howell Drive

View of the BCS work yard

Front (north) elevation of the BCS Building

Entry detail of BCS atrium

View of BCS office suite area

View of conference room

View of BCS lobby atrium

TEAM 9

Proposal

In the spirit of the Bauhaus Team 9 sought to bring most all of the CAAD students under one roof. Saving and renovating the Howell Building and making it part of a new 260,000 square foot Center for Art, Design and Building Science building, the structure would be at home between the Humphrey Coliseum and the Davis Wade Stadium. With an edge adjoining Bailey Howell Drive only in the northwest corner of the site, the building footprint holds well back from College View Drive allowing the front of Howell to retain its dignity and scale. With such a consolidation of the program in a four story structure, the area at the corner of Bailey Howell and College View is left open to allow for a shaded lawn area for Bulldog Weekend tailgating. The length of the structure spanning north-south divides the site and provides a buffered space between the new garage where the BCS work yard has privacy and noise insulation. Although a massive building, the configuration makes for wonderful pockets of exterior garden space.

As with other teams working from Master Plan 3, the prospect of a single, large footprint building, presents opportunities and obstacles. While integration among the various academic programs and the interdisciplinary synergy that sharing space offers is a beneficial byproduct, large buildings can also be internally load dominated and less than desirable at their deepest points. To mitigate the negative effects of this condition, Team 9 includes a central atrium lined with clerestory windows in the center of the new CAAD building. Open and light-filled, this space not only provides light and an expansive sense of openness, it is also a venue awaiting deployment of the work product of the studios. A building such as this is as much school as museum. A place where truly “the walls will teach,” the interdisciplinary nature of this scheme is not just about human interaction, but for the opportunity to observe others working and to learn from the exhibited displays of their efforts - from charcoal drawings to tiny houses.

Team

From top left to bottom right:

Ashley Casteel, *Architecture*
Master Planning Research Group

Mason Smith, *Building Construction Science*
Historic Preservation & Code Research Group

Pablo Vargas, *Architecture*
As-Built Research Group

Case Woodward, *Building Construction Science*
Programming Research Group

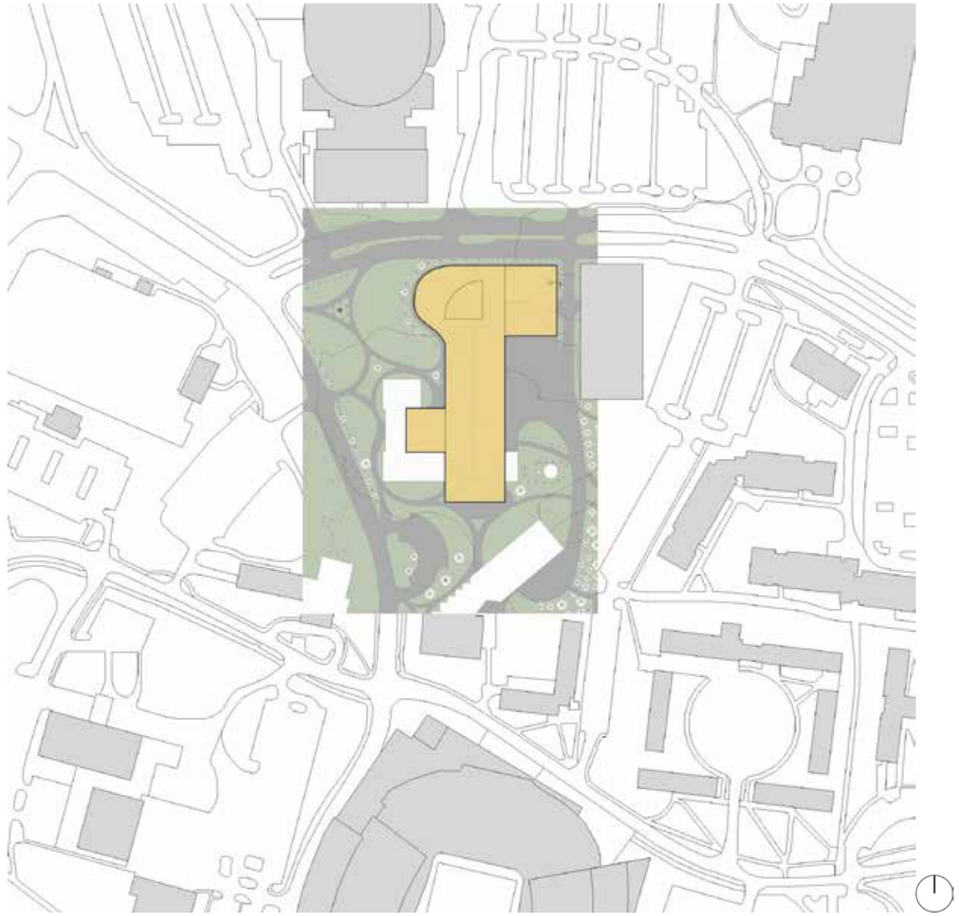
Master Plan and Phasing

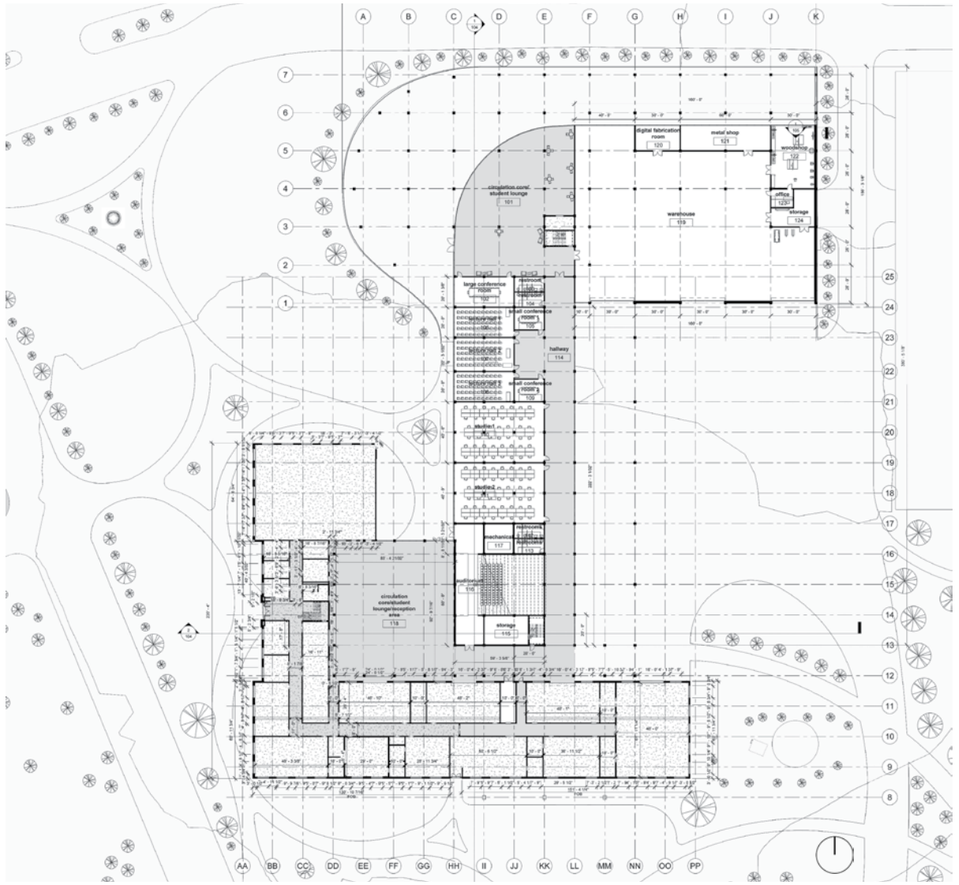
Team 9 started with the Master Plan approach developed in the Master Planning Research Group 3. Proposed execution of the Plan will take place as a single continuous operation with two major elements:

Part A: New Parking Garage
Demolition of Howell
New CAAD Building
260,000 sq. ft., $34 million, 8/19 - 10/20

Part B: Howell Renovation and Addition:
34,537 sq. ft., $20, million, 1/21 - 3/21

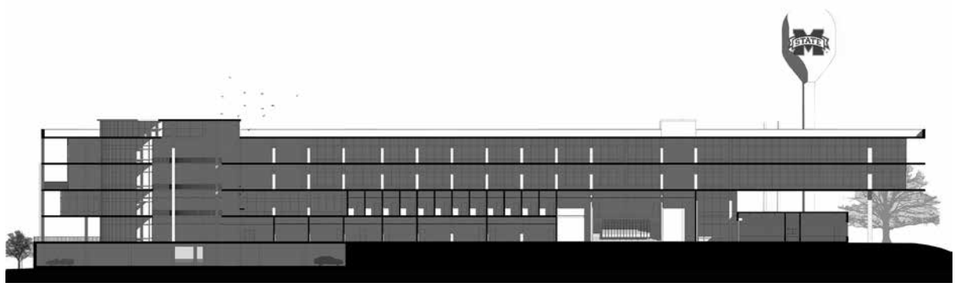
Substantial Completion: 1/22



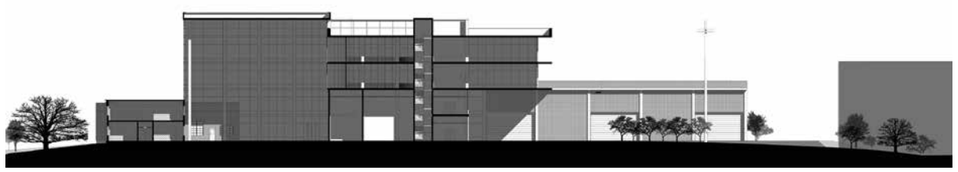


Site Plan *(opposite page)*

First Floor Plan *(above)*



North-South Building Section

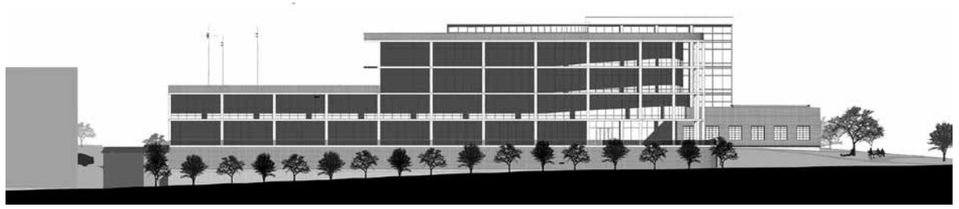


East-West Building Section

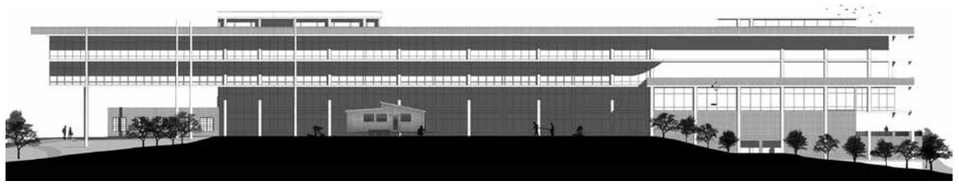
Team 9 developed their architectural plan while considering structural systems at the same time. With little impact envisioned save for differences in floor to floor height, cost and schedule, the architectural effort went on independent of the construction concerns. The final choice of cast-in-place concrete was neither the least expensive nor the quickest to build. In the evaluation of the efficiencies of lean construction approaches such as the use of prefabricated structural steel units or composite systems such as hollow core precast concrete, the team made the argument for cast-in-place concrete for the virtue of durability which it offered more than any other option. Given the demanding requirements of programs such Art and Building Science, the need for the building to withstand the harsh use and the potential vibration of machinery was paramount.

The choice of cast-in-place concrete had profound impact on the construction schedule as it compared to other methods. The advantage of having a shorter pre-construction period for order and review of shop drawings of critical long-lead items, the critical path of the project runs directly through the sequential activities of form, place, cure, of concrete being repeated from foundations through the four floors.

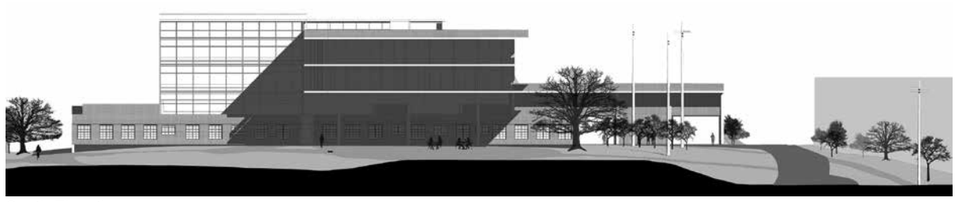
West Elevation



North Elevation



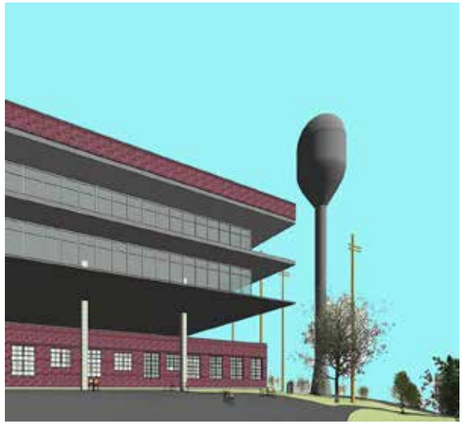
East Elevation



South Elevation

New CAAD Building as seen from the corner of College View and Bailey Howell

View of BCS work yard



View of the new CAAD Building from entry to Giles Hall

Bird's eye view of the new CAAD Building

View from lobby level of the Howell atrium

View of shop area in BCS section

View of the central atrium from second floor level

TEAM 10

Proposal

A new Art building situated at a right angle with the Giles Hall addition so as to be a natural and appropriate extension of that building generates its own triangular quad on the north edge formed also by new Interior Design and BCS buildings. This is the elegant and innovative approach to Master Plan 2 which Team 10 developed and which creates a sense of place while completely integrating Giles Hall into the CAAD campus. Most notably this arrangement allows for a beautiful pedestrian path which stretches from the corner of Bailey Howell and College View, through the quad and finally along the back side of Giles before gradually descending into the proposed new green corridor - a path sure to be a favorite connector between athletics and the Drill Field.

The choice of long and narrow bar-type buildings is ideal for the master planning approach as well as being advantageous for maximizing daylighting benefit. Each of the proposed new buildings makes use of this form but challenges each building's plan to adapt to the different solar orientation unique to the placement of each building.

The new BCS building is oriented east to west along the northern edge of the quad. It suggests a low, streamlined approach to building envelope suggesting the character of the rest of the quad's buildings and reflecting in form, if not material, the qualities of the Giles Hall addition. The length of the building is transected a quarter of the way through on the east side by an entry corridor which connects a first floor Bailey Howell entry on the north with a quad-level second floor entry on the south side. An east-west corridor spans the second floor flanked by a lounge on one side and studios on the other. A gently bowed floor to ceiling wall of glass forms the northern view out of the lounge promising soft indirect light for the studios and an excellent view of the Humphrey Coliseum. This space would be an ideal location for game-day receptions.

Team

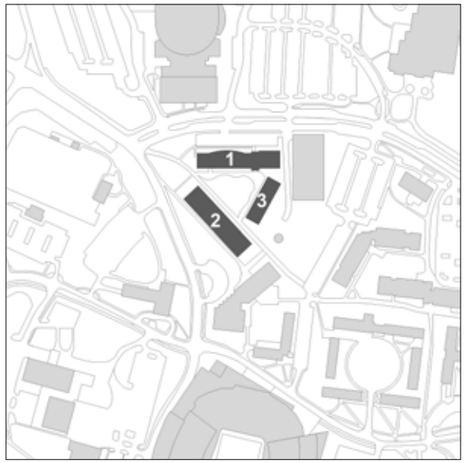
From top left to bottom right:

Blake Guthrie, *Building Construction Science*
Historic Preservation & Code Research Group

Josh Jacobs, *Building Construction Science*
As-Built Research Group

Baron Necaise, *Architecture*
Programming Research Group

Brendon Ward, *Architecture*
Master Planning Research Group



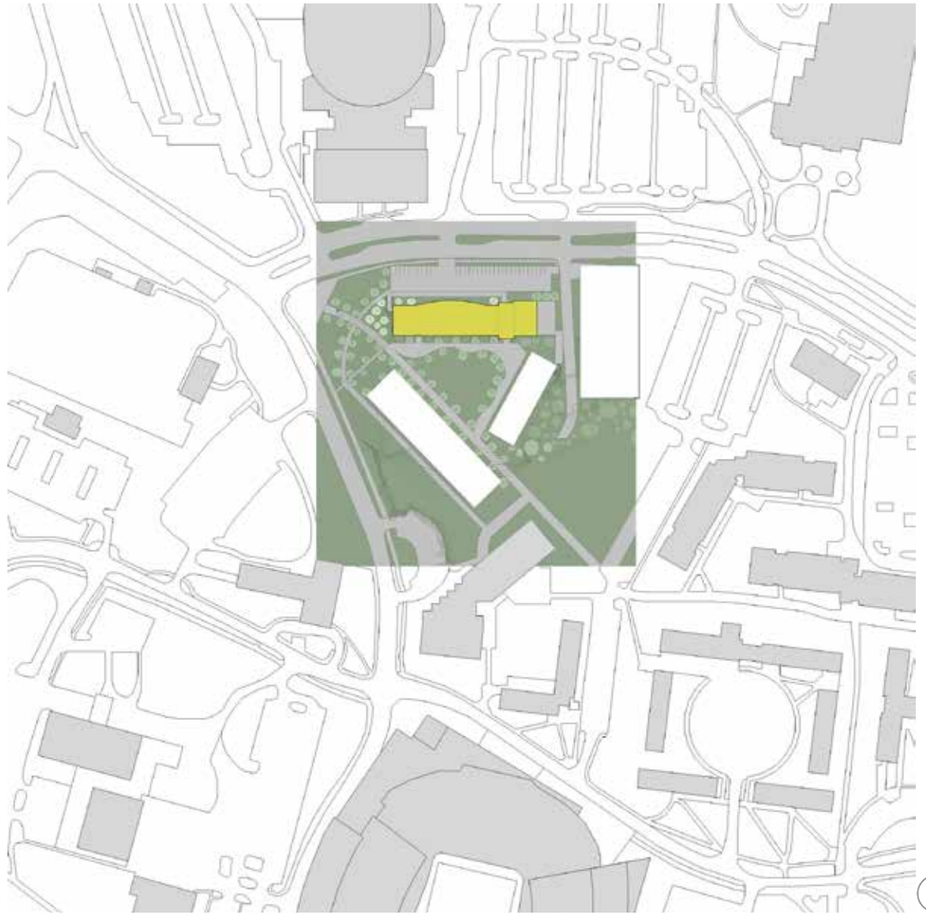
Master Plan and Phasing

Team 10 started with the Master Plan approach developed in the Master Planning Research Group 2. Proposed execution of the Plan will take place in three phases:

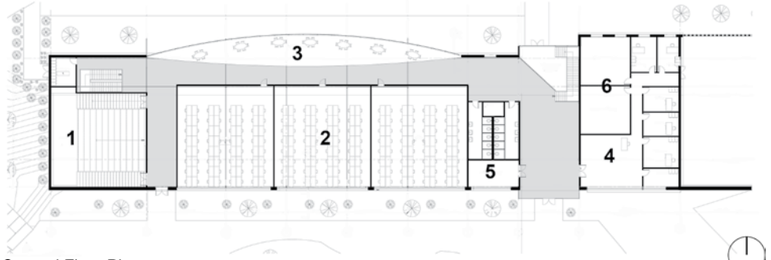
Phase 1: New BCS Building:
40,068 sq. ft., $15.3 million, 3/19 - 10/20

Phase 2: Demolition of Howell
New Art Building
25,000 sq. ft., $11.5 million, 1/21 - 3/22

Phase 3: New Interior Design Building
30,000 sq. ft., $13.4 million, 6/22 -9/23

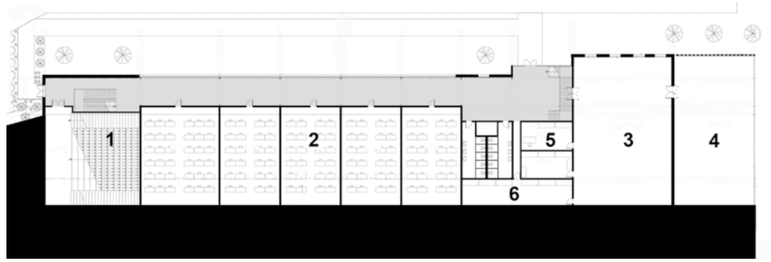


BCS Site Plan *(opposite page)*



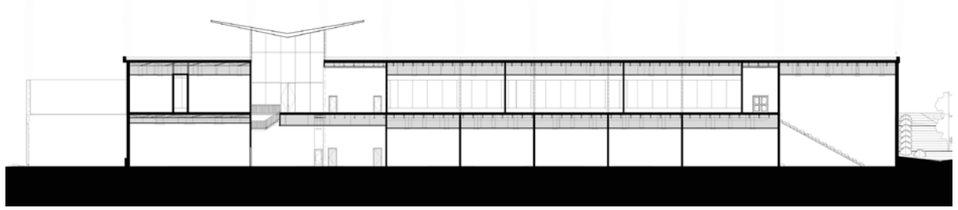
Second Floor Plan

1. Auditorium 2. Studio 3. Lounge Area 4.Faculty Office Suite 5. Print Lab 6. Conference Rooms

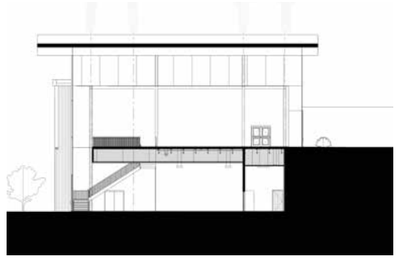


First Floor Plan

1. Auditorium 2. Classroom 3. Shop, Indoor Work Area 4. Outdoor Work Area 5. Shop Office
6. Storage



East-West Building Section

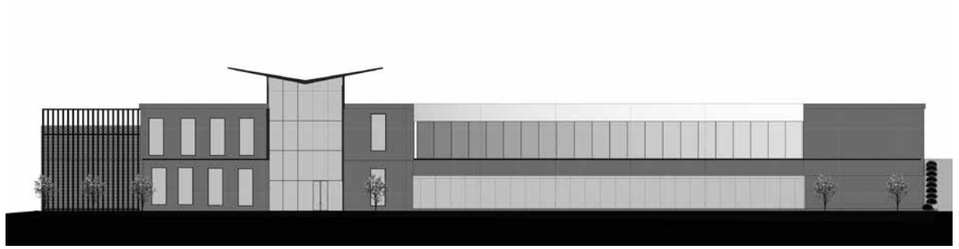


North-South Building Section

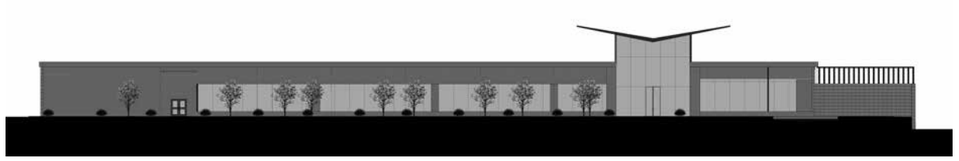
In order to achieve the clean, streamlined building they envisioned, Team 10 chose to use a structural steel frame with light weight concrete in metal pan on bar joist floors. With open web joists and a generous ceiling plenum space they reduced potential conflict between building systems and assured that maintenance and replacement will be less complicated in the future.

The choice of steel has three-fold benefits; its strength and economy of material reduced profile and supported the aesthetic agenda; the quick erection process reduced overall duration of construction, and lastly, steel is a highly recyclable material. It is perhaps this last attribute which rendered the most opportunity for interdisciplinary collaboration of this project. If you know that in some point at the end of a building's life cycle, you may recycle, restore or renovate - will you design the building any differently? While an issue of recent concern in the automobile sector where usable lifespans are considerably shorter, this project offers the an opportunity to explore the idea of an ethical (long term) planned obsolescence for the building sciences.

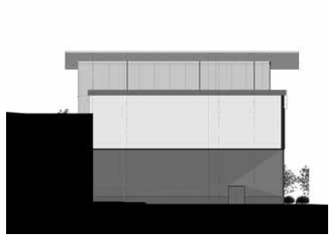
TEAM 10: GUTHRIE, JACOBS, NECAISE & WARD



North Elevation

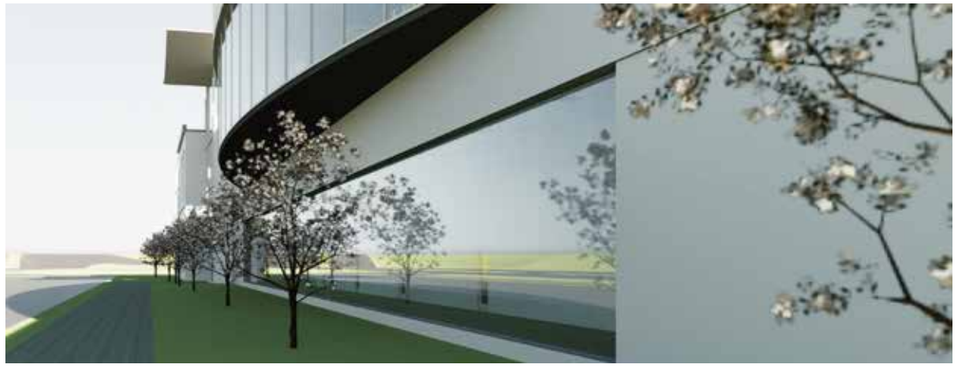


South Elevation

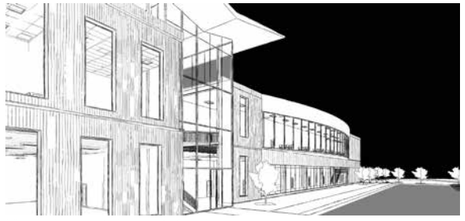


East Elevation

West Elevation



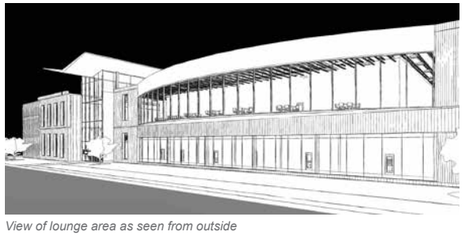
View along the north (entry) facade of BCS looking east



View looking west along north facade

View looking west along south facade

View BCS from Faculty/Staff Parking



View of lounge area as seen from outside

North entry atrium of BCS

View of north entry from second floor

View of north entry from lobby level

View of lounge area on the second floor

TEAM 11

Proposal

Team 11 identified three critical points of entry to the CAAD campus and sought to utilize these points to encourage movement through the broader MSU campus with the CAAD campus as a node. Flanking both Bailey Howell and College View with buildings and creating an opening at the intersection on the corner, the northern and western edges of the site are permeable enough to be inviting, but not so much as to diminish the sense of enclosure when in the quad.

Perhaps the most clever aspect of the master plan, however, is the thoughtful use of water. When entering the quad through either the corner or through the breezeway beneath Interior Design-BCS building, one is led along a water-wall toward Giles Hall. Visually active and in warmer months a source of evaporative cooling, the real genius of this feature is auditory. The pleasant din of water falling and splashing also provides a source of white noise to counter, or buffer, the construction yard beyond, which the wall screens visually as well. Approaching the end of the water wall, one is then aware of another pool of water, a fountain immediately outside Giles Hall. This pool marks a point of intersection of the various paths and when approached from Giles reflects not only the sky but the *M State* water tower above.

In the same way that the fountain pool reflects the sky so do the buildings reflect their context. The new Interior Design-BCS building, for example, has a north facade which faces the Humphrey Coliseum and mimics its large white stone panels. On the south elevation facing Giles Hall, the darker square ceramic of that building is mimicked in gray square units. Instead of seeming a patchwork of different exterior building materials, the overall composition is made into a unified whole with the addition of a vertical wooden louvered screen on the north with that same vertical element becoming a balcony support on the south.

Team

From top left to bottom right:

Bobby Fatheree, *Building Construction Science*
Programming Research Group

Avery Harmon, *Architecture*
Master Planning Research Group

Kenan Morris, *Architecture*
Historic Preservation & Code Research Group

Jackson Warren, *Building Construction Science*
As-Built Research Group

Master Plan and Phasing

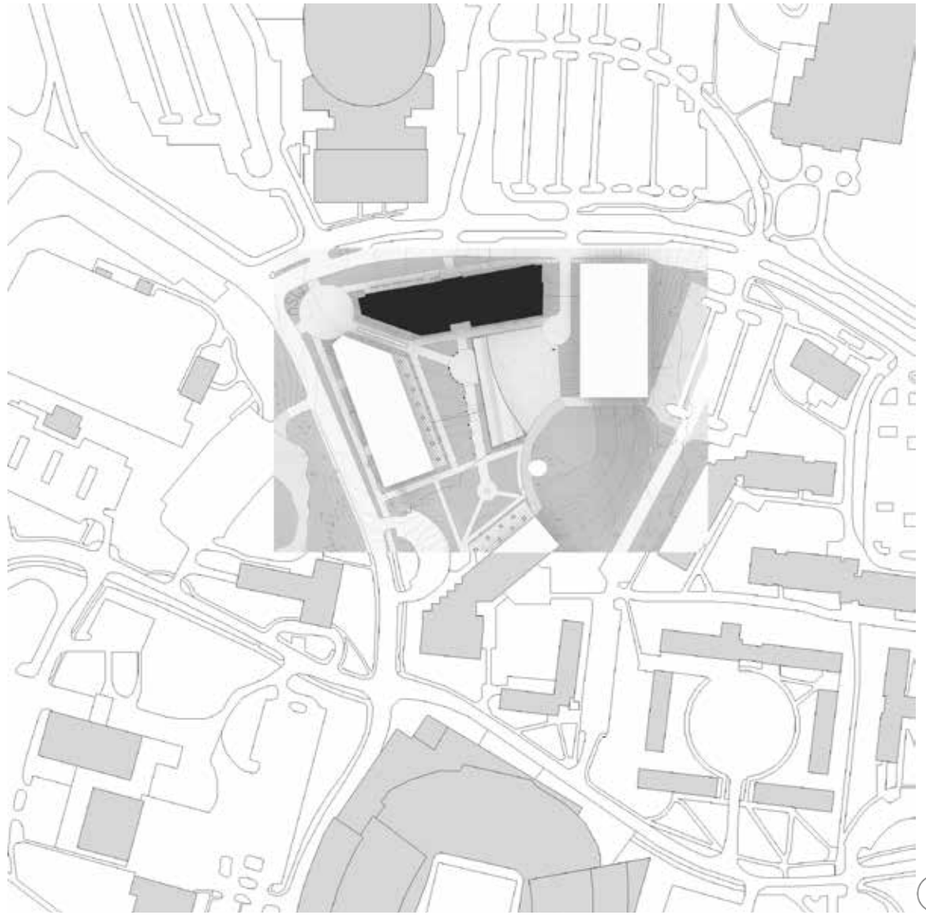
Team 11 started with the Master Plan approach developed in the Master Planning Research Group 4. Proposed execution of the Plan will take place in four phases:

Phase 1: New BCS and Iinterior Design Buildings:
118,056 sq. ft., $53.1 million, 7/19 - 7/20

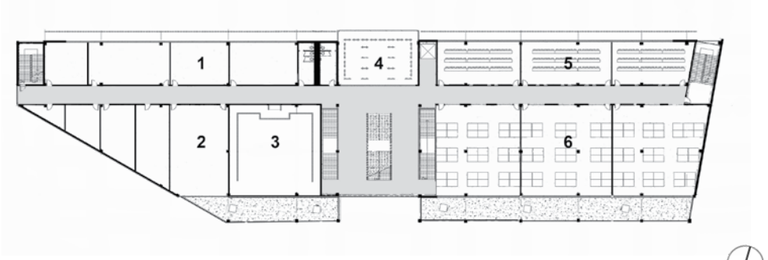
Phase 2: Demolition of Howell, New Art Building:
107,208 sq. ft., $48.7 million, 7/20 - 10/21

Phase 3: Existing Workshop Demo, New BCS Workshop:
34,705 sq. ft., $1 million, 10/21 - 5/22

Phase 4: Campus Site work and Landscaping
$1.6 million

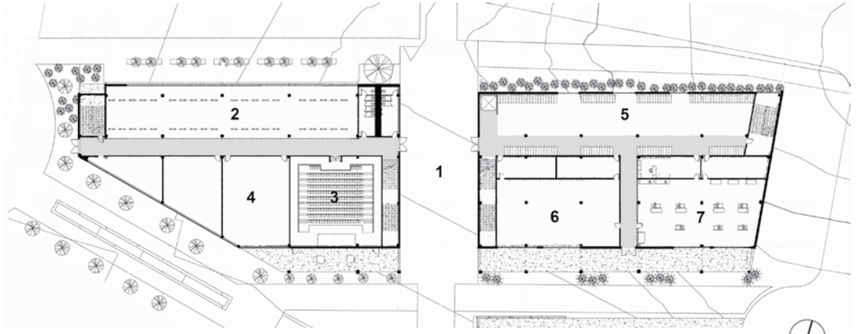


BCS Site Plan *(opposite page)*



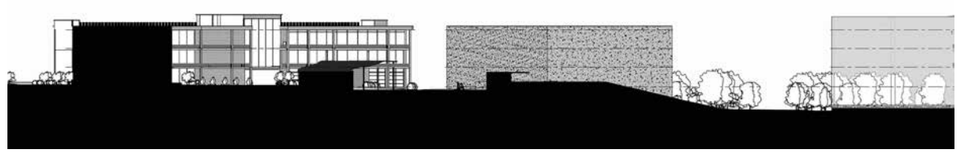
Second Floor Plan

1. Interior Design Classroom 2. Interior Design Studio 3. Auditorium 4. Critique Space
5. BCS Classroom 6. BCS Studio

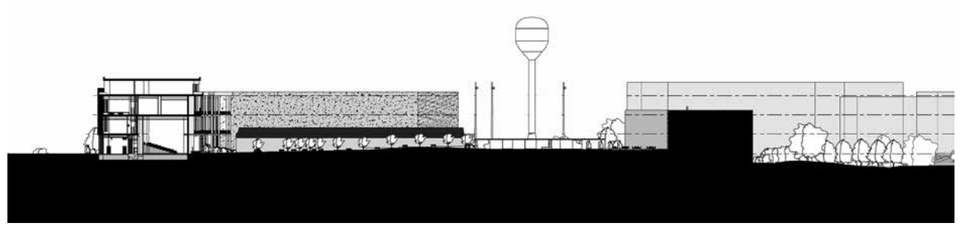


Second Floor Plan

1. Breezeway 2. Gallery 3. Auditorium 4. Studio 5. Student Lockers 6. Art Shop 7. BCS Shop



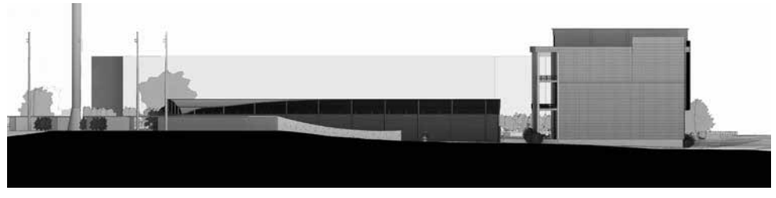
Site Section 1



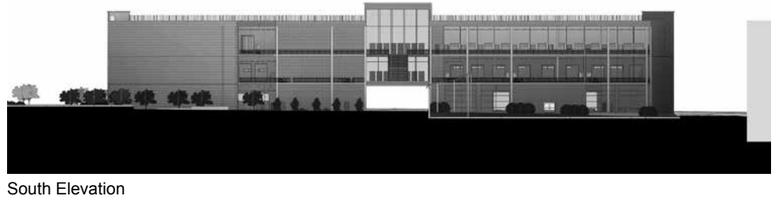
Site Section 2

East - West Building Section

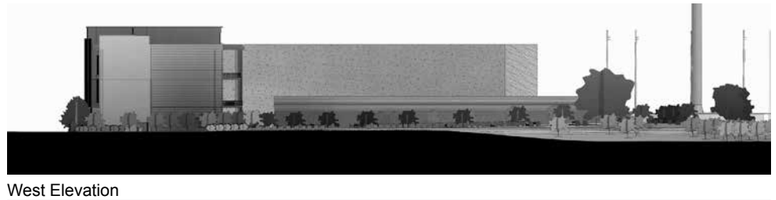
North Elevation



East Elevation



South Elevation



West Elevation

View of the Interior Design - BCS breezeway

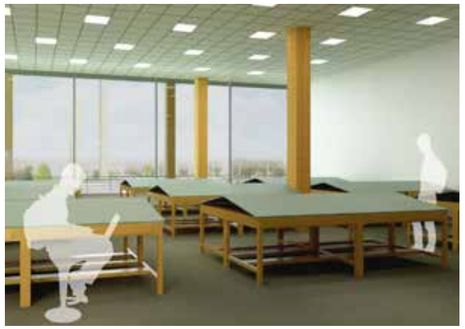
Interior Design - BCS Building as seen from corner entry

Water wall feature in the CAAD quad

Detail of screen, north elevation Interior Design - BCS

Corridor outside the Interior Design - BCS Gallery

View of typical classroom



View of typical studio

TEAM 11: FATHEREE, HARMON, MORRIS & WARREN

View of Interior Design - BCS lobby outside the gallery

TEAM 12

Proposal

As for each of the teams working from Master Plan 3, not only is the preservation and restoration of the Howell Building a requirement but so is the challenge of accommodating the entire CAAD program (save Architecture) in a unified building. Team 12 approached this task by proposing a single building with three interconnect wings socketed into the courtyard on the rear of Howell and in part, extending over top of the south wing of the building facing Giles Hall.

The BCS wing of the building lies in the north-east corner adjacent to the proposed new parking garage. The orientation of the plan is at a forty-five degree angle to Howell and the majority of the remainder of the CAAD building. While having its own dedicated entrance, the BCS wing is also adjacent to the main north entry to the CAAD complex atrium on the second floor and is approached by a significant stair and ramp plaza. The atrium is shared at this level with BCS on the east and Interior Design on the west.

One of the interesting construction related issues with this proposal is its approach to phasing. While an ideal situation would be to control the entire site as a work area and complete the renovation of Howell and construction of the new building in one operation, Team 12 proposes phasing the construction of each wing separately. Confining the construction operations to a more limited footprint and contending with safety concerns for adjacent occupied portions of the building presents cost and logistical concerns. The team argues that these concerns are offset by their ability to deliver portions of the project over to users on a rolling basis thus relieving the cost associated with accommodating students in other buildings, not to mention the disruption to the educational effort as a whole. Such an approach to construction necessitates lean practices such as maximizing off-site fabrication of building components and systems as well as the development of a robust safety and dust control plan.

Team

From top left to bottom right:

Jackson Bates, *Building Construction Science*
Master Planning Research Group

James Campbell, *Architecture*
As-Built Research Group

Casey Pennebaker, *Building Construction Science*
Historic Preservation & Code Research Group

Jesse Stevens, *Architecture*
Programming Research Group

Master Plan and Phasing

Team 12 started with the Master Plan approach developed in the Master Planning Research Group 3. Proposed execution of the Plan will take place in five phases:

Phase 1: New Parking Structure, Demo Howell Parking

Phase 2: New Interior Design Wing:
30,340 sq. ft., $12.8 million

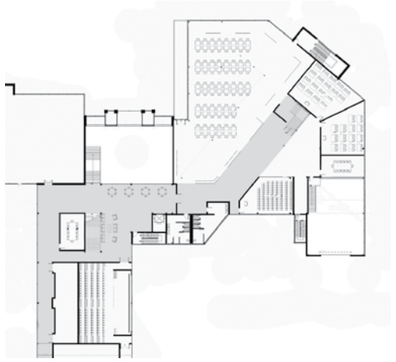
Phase 3: New BCS Wing, Demo North Howell:
73,267 sq. ft., $30.8 million

Phase 4: New Auditorium - Art Wing:
45,457 sq. ft., $19.1 million

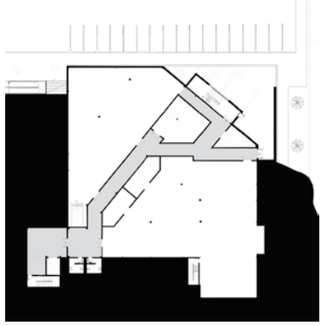
Phase 5: Landscape and Site Work
$1.2 million

BCS Site Plan *(opposite page)*

Third Floor Plan - BCS Wing

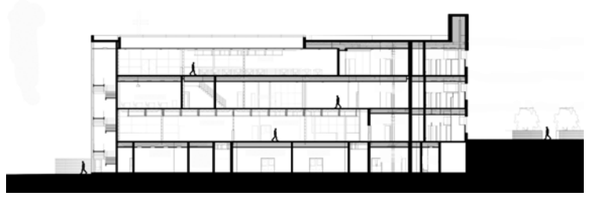


Fourth Floor Plan - BCS Wing

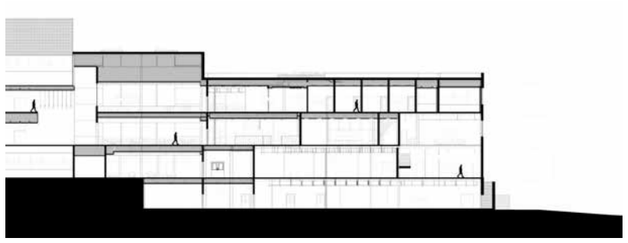


First Floor Plan - BCS Wing

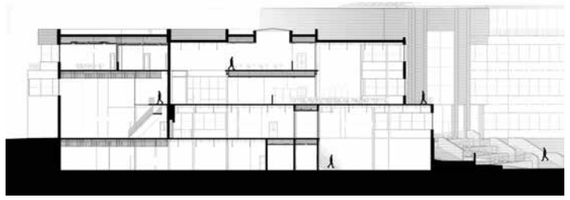
Second Floor Plan - BCS WIng



Cross Building Section

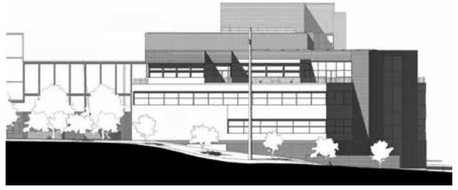


Longitudinal Building Section at Offices



Longitudinal Building Section

North Elevation



East Elevation

West Elevation

South Elevation

North entry of new CAAD Building from Faculty-Staff Parking lot

View of Interior Design wing from north west

Bird's eye view of new CAAD Building from south

Bird's eye view of new CAAD Building from north

View of third floor studio

View of BCS studios

View of BCS shop area

TEAM 12: BATES, CAMPBELL, PENNEBAKER & STEVENS

View of central atrium

TEAM 13

Proposal

Fully and proudly on display, the BCS work yard is showcased in this proposal from Team 13. The team understands and plays off the general public's interest in construction. Watching a project come together from framing to finish has always piqued the curiosity of the public, so much so that construction barriers often have openings in them so that passers-by can peer in and watch the progress. This was the motivation behind Team 13's positioning of the large work yard for BCS on Bailey Howell Drive between the proposed new parking garage and a new Art building. The annual tiny house projects undertaken by the first-year BCS students will now be an object of public observation, taking form out in the open on display in what can only be described as a sculpture garden for Building Construction.

The arc-shaped Art and Interior Design building is sited on the corner of Bailey Howell and College View and somewhat mirrors Humphrey Coliseum. It is placed forward of the front elevation of a restored Howell Building and somewhat brackets it in between Giles Hall. This gives Howell's entry a more dignified presence than adjacency to a parking lot has afforded it up until this point.

The BCS building itself is a study in symmetry and, having fairly deep fields of view on both its north and south elevations, has an almost palatial presence. This aspect of the design was clearly important to the team as is evidenced by the changes in building design from mid-review to final as shown in the presented renderings. During the mid-review the team had an interior structural system with a curtain wall. In order to highlight the geometry of the building, they changed the structural system to concrete frame and moved and exposed it to the outside combined with inset wall panels. While necessitating a quick study in the *dos and don'ts* of construction joints in exposed concrete, the Team resolved the issues nicely and delivered a cost efficient final solution.

Team

From top left to bottom right:

Ryeley Jacobs, *Building Construction Science*
Programming Research Group

Issac Johnson, *Architecture*
As-Built Research Group

William Jordan, *Architecture*
Master Planning Research Group

Jamison McKee, *Building Construction Science*
Historic Preservation & Code Research Group

Master Plan and Phasing

Team 13 started with the Master Plan approach developed in the Master Planning Research Group 1. Proposed execution of the Plan will take place in three phases:

Phase 1: New Art-Interior Design Building:
66,000 sq. ft., $38.3 million, 12/21 - 11/22

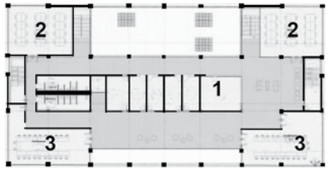
Phase 2: Demolition of Howell:
105,32525,242 sq. ft., $165 thousand
Renovation of Howell:
22,000 sq. ft., $8.8 million, 11/22 - 4/23

Phase 3: New BCS Building:
40,000 sq. ft., $14.5 million, 5/23 - 6/24

BCS Site Plan *(opposite page)*

Third Floor Plan

1. Mezzanine Lounge
2. Open to Below
3. Studio
4. Classroom



Fourth Floor Plan

1. Faculty Offices and Conference
2. Studio
3. Classroom

First Floor Plan

1. First Floor Lobby
2. Studio
3. Work Shop

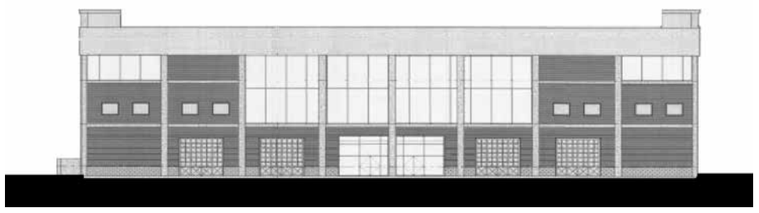
Second Floor Plan

1. Quad Level Lobby
2. Auditorium
3. Lounge Area

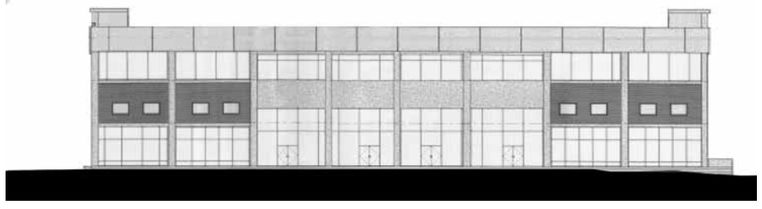
East - West Building Section 1

East - West Building Section 2

North - South Building Section



North Elevation



South Elevation

North Elevation

North Elevation

View of north elevation at work yard (mid-review design)

View of south elevation (final design)

View of walkway along BCS (mid-review design)

View of BCS from quad (final design)

View of BCS lounge area

View of BCS lobby

View of BCS lobby from mezzanine

View of BCS lounge

TEAM 14

Proposal

Implementing an urban feel with tree-lined pedestrian streets between buildings in lieu of a quad, Team 14 fills the north end of the site with narrow, closely placed buildings. Segmenting the site with the various school departments, the campus has a business park quality. One can imagine a busy coffee shop spilling out into these attractive pathways being populated by CAAD students as well as anyone else wanting to spend a pleasant afternoon in a professional environment with a distinctly bohemian edge. The area between the south edge of the new buildings and Giles Hall is only slightly modified as it maintains the existing faculty-staff parking. One can imagine this area becoming a more open quad-type space in order to link Architecture, which is the one school not included, in the new development.

The new BCS building itself is a fairly straight forward two story bar-type building arranged around a central double loaded corridor. The arrangement maximizes daylight potential for the classrooms, studios and offices. Being east-west oriented the southern exposure is skinned in a generous louver shading system which allows light to reflected in indirectly. The central corridor on the second floor is made to feel spacious and also day-lit with a building-length north facing light monitor.

Perhaps the most unique aspect of this design is its gracious trapezoidal auditorium. Spanning both floors as well as the entire length of the east end of the building, the auditorium stage is at the narrow end of the isosceles trapezoid and is completely glazed floor to ceiling. This makes it quite a memorable exterior feature of the building. Facing the interior of the CAAD campus, the opposite end has an ascending seating area and features a retail space below. This would aptly serve the aforementioned coffee shop as a place not only the CAAD students but also visitors to the sporting events taking place across Bailey Howell Drive.

Team

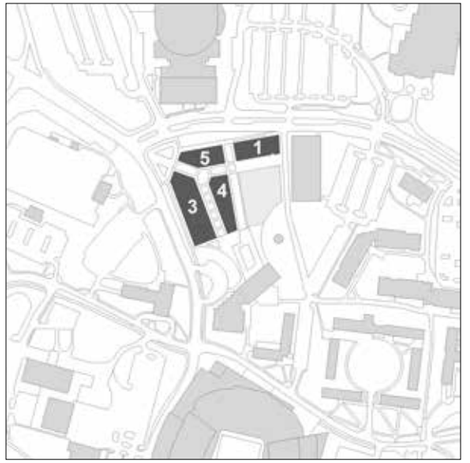
From top left to bottom right:

Alexander Boyd, *Architecture*
Master Planning Research Group

Alex Dean, *Architecture*
Programming Research Group

Robert Montoux, *Building Construction Science*
As-BuiltResearch Group

D'Angelo Oliver, *Architecture*
Historic Preservation & Code Research Group



Master Plan and Phasing

Team 14 started with the Master Plan approach developed in the Master Planning Research Group 4. Proposed execution of the Plan will take place in five phases:

Phase 1: New BCS Building:
32,000 sq. ft., $12.7 million

Phase 2: Demolition of Howell
42,563 sq. ft., $298 thousand

Phase 3: New Art Building:
97,700 sq. ft., $41 million

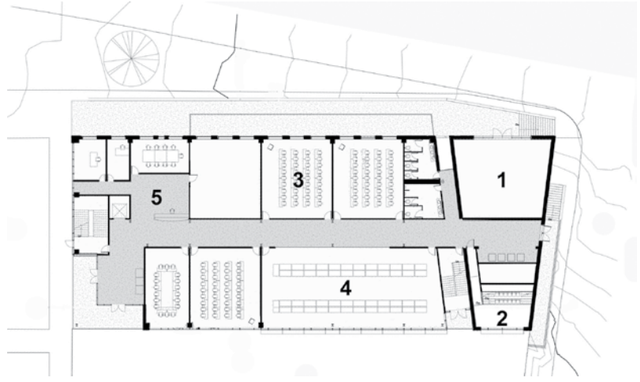
Phase 4: New Interior Design Building:
33,300 sq. ft., $14 million

Phase 5: Bulldog Club:
27,700 sq. ft., $11.6 million

BCS Site Plan *(opposite page)*

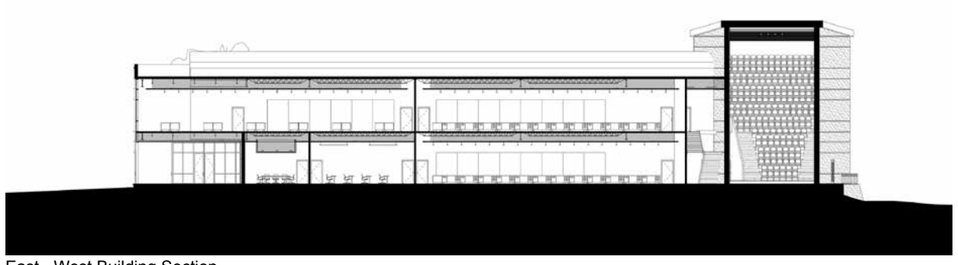
Second Floor Plan

1. Studio 2. Faculty Office Suite 3. Mechanical Room 4. Auditorium

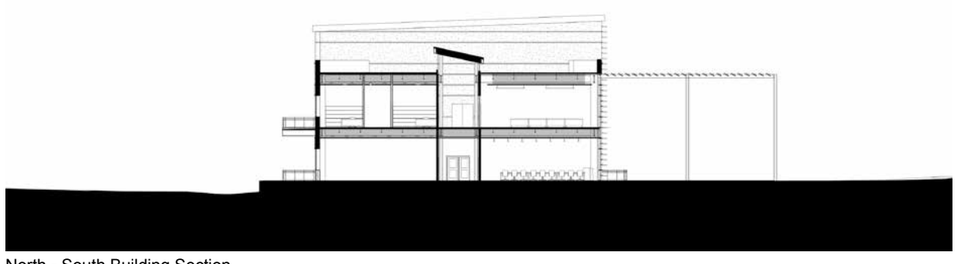


Second Floor Plan

1. Retail 2. Auditorium 3. Classroom 4. Studio 5. Administrative Suite

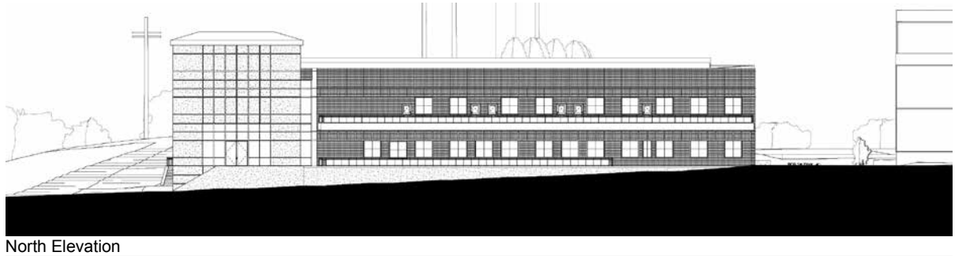


East - West Building Section

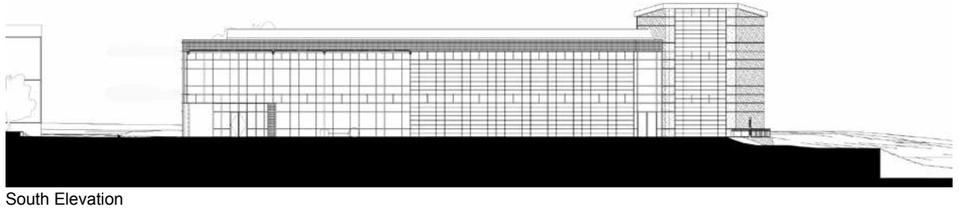


North - South Building Section

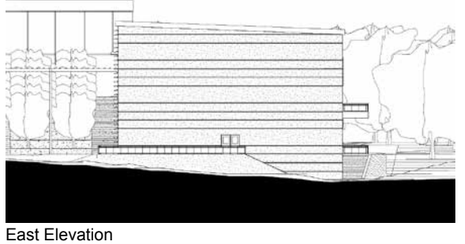
With a construction duration of 449 working days (1/27/20 - 7/19/21), this proposal has one of the more comfortable and realistic schedules having considerable float built in. With the implementation of a steel super structure and a combination of metal panel and brick masonry exterior this project could be executed in considerably less time were many of the building systems optimized for quick turn-around - all while staying within the $420/sq. ft. price point. Given the rather straight forward approach of the design and with some flexibility on the amount of glazing involved, the project is also a good candidate for reasonable value engineering should the budget requirements dictate less expense. Flexibility of time and cost make this an exceptional design-build proposal.



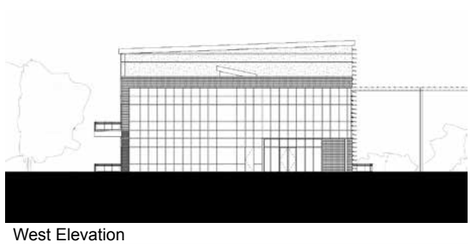
North Elevation



South Elevation

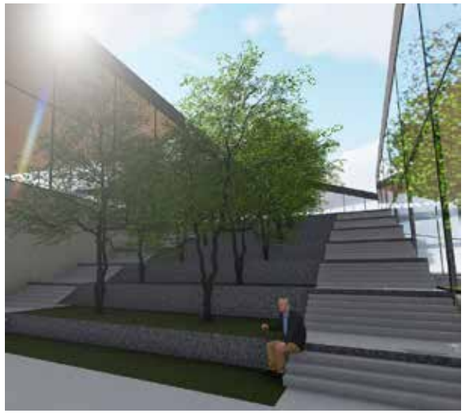


East Elevation

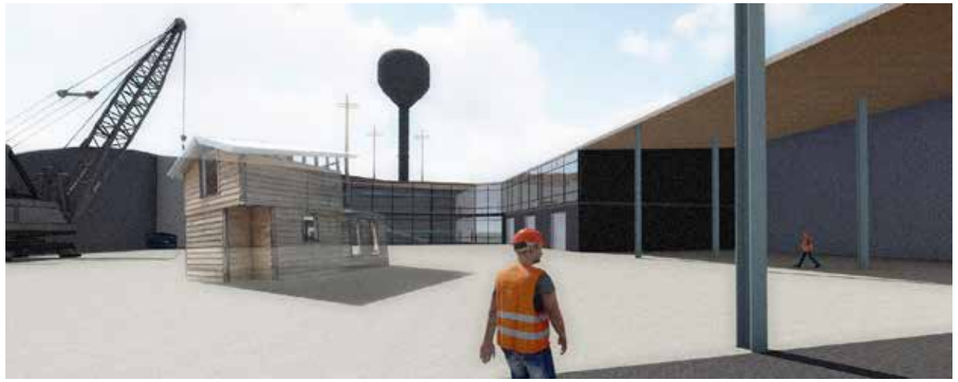


West Elevation

View of south west BCS entry



View of stair between Interior Design and Art



View of the BCS work yard

View of the south elevation of BCS looking west

View of second floor BCS corridor

View of BCS lobby

View of typical BCS studio

View of hallway outside second floor bathrooms

TEAM 14: BOYD, DEAN, MONTOUX & OLIVER

View of BCS auditorium

TEAM 15

Proposal

Architectural eventfulness is a term of art most typically used in relation to sacred architecture, but it is a quality that drives this proposal from Team 15. The notion that a built environment can induce or even encourage activity is the principle at the heart of eventfulness and it is what makes the proposal of a “Grand Plaza” adjoining the CAAD campus so exciting.

Stretching from the corner of Bailey Howell and College View south to the edge of the faculty-staff parking for Giles Hall, this almost four-acre plaza is infrastructure awaiting activation. Whether for game-day rallies, food vending, tailgating, small concerts or just enjoying a book on a shaded bench, this space offers the University CAAD’s “front porch” for major events. With a new Art building as a backdrop for what will no doubt become a popular venue for University events, the identity of Arts and Design at Mississippi State will be front and center.

Creating such a large plaza necessitates moving the proposed new Art, Interior Design and BCS toward the east and results in a tighter composition that we have seen with many of the quad-centered plans. With a U-shaped configuration, the new series of buildings have a BCS work yard at the center offering security as well as some degree of sound buffering. The interior work-area courtyard is accessed at only one point by a path that links each of the new buildings with Architecture via a rear door on the northern-most edge of Giles.

The new BCS building itself is a handsome two-story brick structure which takes many of its architectural cues from the Giles Hall addition which it backs to and shares similar orientation with. Featuring long horizontal openings of glass the building is grounded to the site and gives the impression of either being broken off from, or at least and extension of, the Architecture building - an apt association.

Team

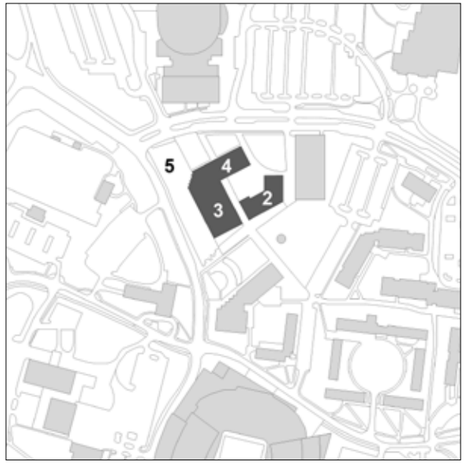
From top left to bottom right:

Colton Cox, *Building Construction Science*
Historic Preservation & Code Research Group

Mariah Green, *Architecture*
As-Built Research Group

Owen McCallum, *Building Construction Science*
Master Planning Research Group

Connor Padgett, *Architecture*
Programming Research Group



Master Plan and Phasing

Team 15 started with the Master Plan approach developed in the Master Planning Research Group 2. Proposed execution of the Plan will take place in five phases:

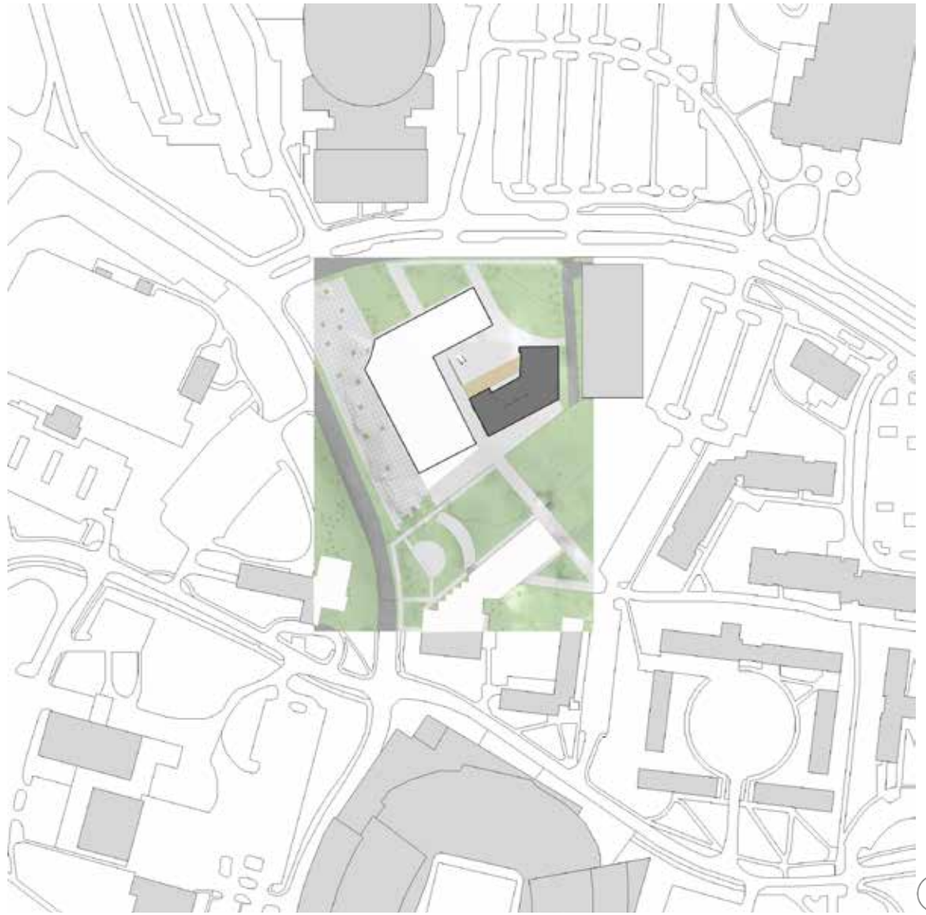
Phase 1: Demolition of Howell:
44,000 sq. ft., $308 thousand

Phase 2: New BCS Building:
31,500 sq. ft.$13.2 million, 4/19 - 10/20

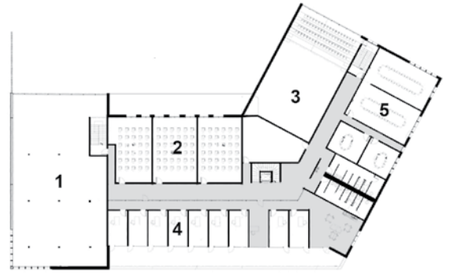
Phase 3: New Art Building
96,188 sq. ft., $42 million, 10/20 - 10/22

Phase 4: New Interior Design Building:
21,000 sq. ft., $10 million, 10/22 - 11/23

Phase 5: Hardscaping of Grand Plaza
120,210 sq. ft., $28.4 million, 12/23 - 4/24

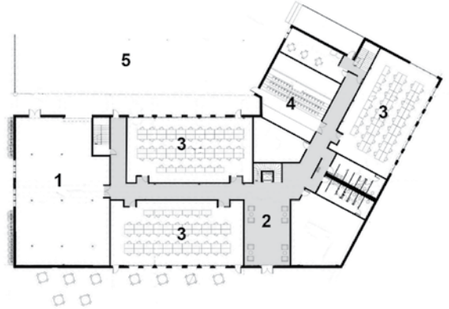


BCS Site Plan *(opposite page)*



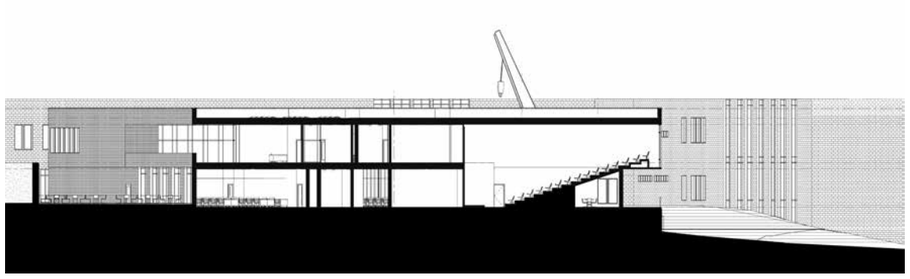
Second Floor Plan

1. Warehouse (open to below) 2. Classroom 3. Auditorium
4. Faculty Offices 5. Conference Room

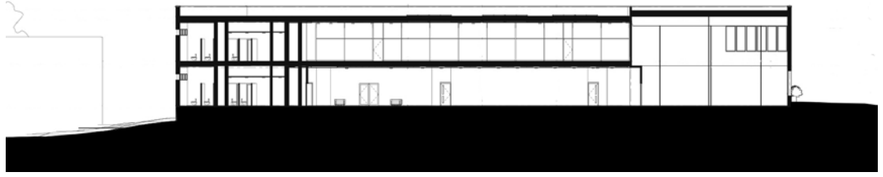


First Floor Plan

1. Warehouse 2. BCS Lobby 3. Studio 4. Auditorium
5. BCS Work Yard



North - South Building Section



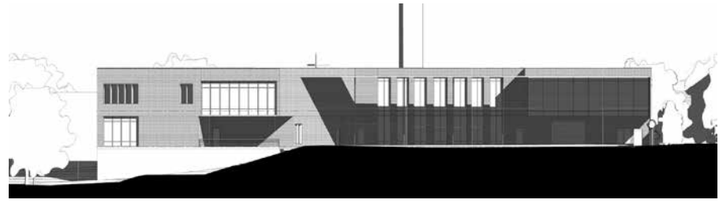
East - West Building Section

Team 15 dealt with an aspect of the project that only a few teams considered in any depth - University funding. As a land grant university, Mississippi State is a unique client. Application and approval for funding through the state legislature is governed by strictures certainly different from private financing in some ways, but very similar in others.

One of the similar aspects between public and private projects is the concept of *leveraging*. Where private investment in say retail and residential might be leveraged by public investment in infrastructure, so at a state university can leveraging occur between different units of the University and by private institutions or donor involvement.

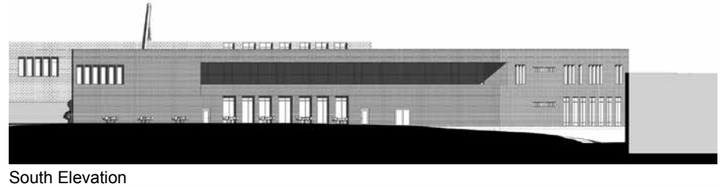
Team 15 in working to create the most value for the College of Architecture, Art and Design leveraged the interests of other (financially successful) members of the university - namely athletics. In proposing a grand plaza the team offered a dual element whose funding sources could be spread among interested parties. When hosting an art exhibition opening the plaza belongs to CAAD, on Bulldog Weekend it belongs to Athletics is the logic in play.

In looking beyond the stated end of the RFP (CAAD Campus), Team 15 asked broader questions concerned with delivering value to the University as a whole. Understanding procurement was an important part of their process.

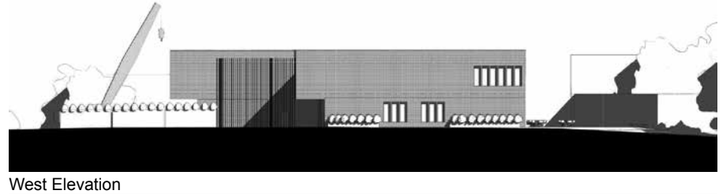


North Elevation

East Elevation



South Elevation



West Elevation

View of BCS south terrace

View of the BCS work yard, Art Building to the right

View of the Grand Plaza looking south

View of typical BCS studio

View of BCS stairway

View of typical BCS corridor

View of BCS warehouse

View of BCS auditorium

TEAM 16

Proposal

A sleek glass and metal building slab floats over the top of the Howell building and aligns itself with Architecture. This is the bold architectural move that seeks to integrate the two existing buildings on the site. Appreciation of this master plan is difficult to achieve from a two-dimensional plan as it is without a doubt a three-dimensional composition. The complex relationship between existing building placement and site topography makes for challenging going. Giles Hall itself is the resolution of such conditions as the north wing addition cuts deeply into the hill behind the existing barn to which it was added, having a two story elevation difference on its two sides. In the case of the new BCS building, instead of cutting into the ground, the choice was to float overhead.

A new Art and Interior Design building sits on the north end of the site connected to Howell's truncated north wing. Having a first floor level at the grade of the existing parking lot, and several feet below the floor level of Howell, the new building seems to anchor Howell more firmly to the site and visually makes Howell act as a fulcrum for the acrobatics being carried out by the BCS building on the opposite side of the courtyard.

One of the outstanding attributes, and a strong argument in favor of the cost involved in the suspension of the BCS addition, is the element of prospect that it provides for the studio spaces. Being perched up above Howell, the south west facing studios will have a commanding view over Giles toward the Depot. On the north east side, the view over the work area will provide a fantastic vantage point from which to watch tiny house construction though the year. The work yard itself is neatly tucked into the back of the buildings, shielded by both BCS and Art, both academic units having easy convenient access to this work and delivery area.

Team

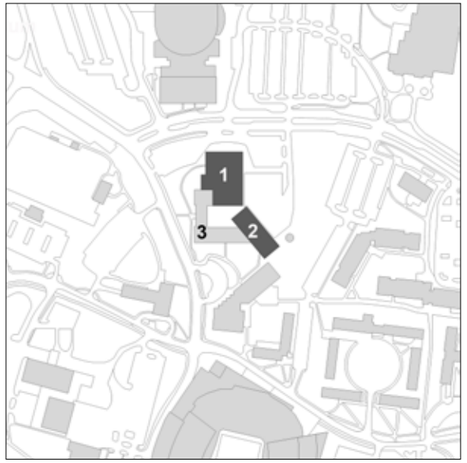
From top left to bottom right:

Calvin Leslie, *Architecture*
As-Built Research Group

Breanna Richeson, *Architecture*
Programming Research Group

Tyler Roch, *Building Construction Science*
Master Planning Research Group

Tori Thompson, *Building Construction Science*
Historic Preservation & Code Research Group



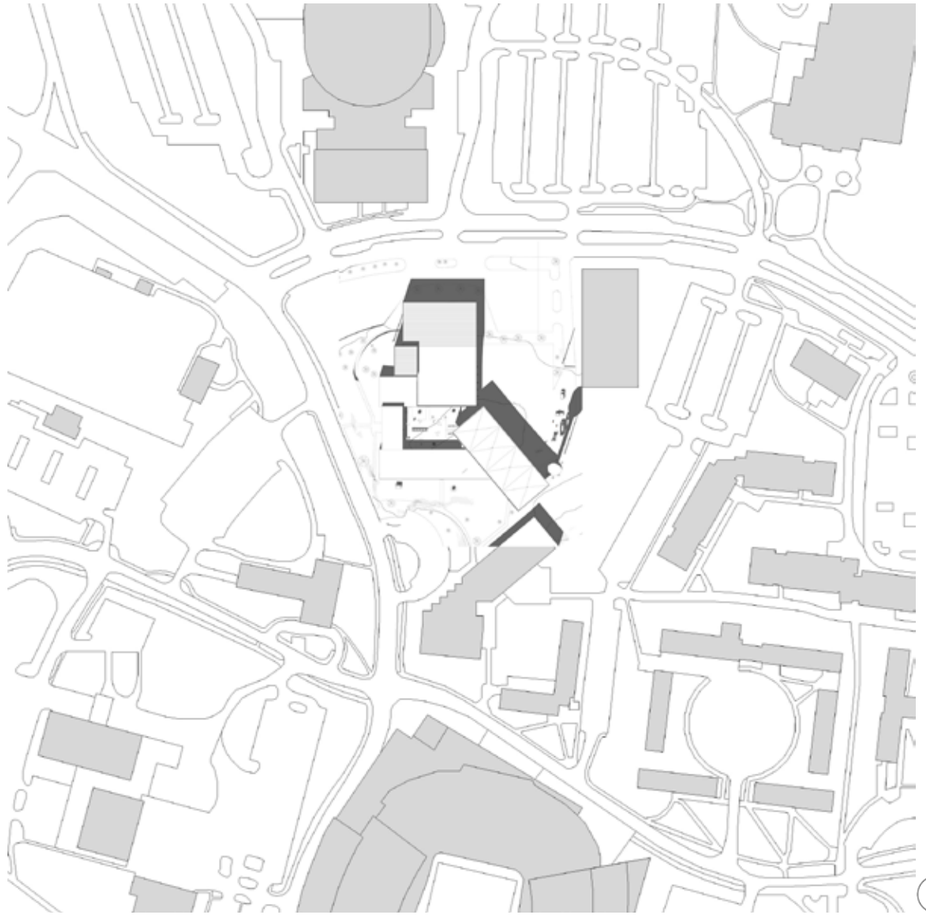
Master Plan and Phasing

Team 16 started with the Master Plan approach developed in the Master Planning Research Group 3. Proposed execution of the Plan will take place in three phases:

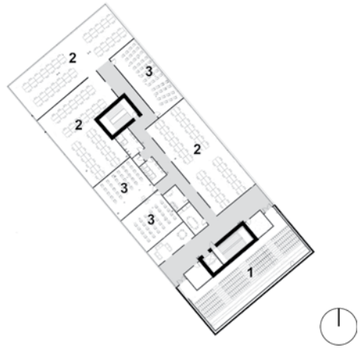
Phase 1: Partial Demolition Howell,
New Art & Interior Design:
99,773 sq. ft., $67.7 million, 5/24 - 8/26

Phase 2: New BCS Building:
21,982 sq. ft., $11 million, 6/25 - 7/27

Phase 3: Howell Renovation, Site Work:
$15.1 million, 5/27 - 6/28

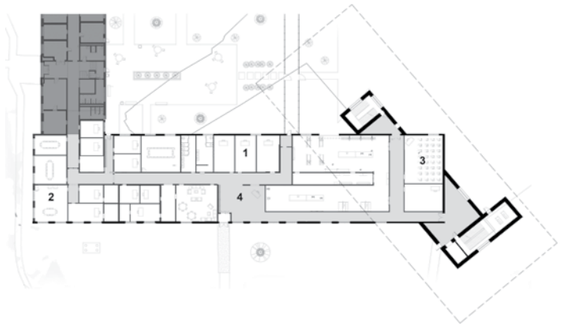


BCS Site Plan *(opposite page)*



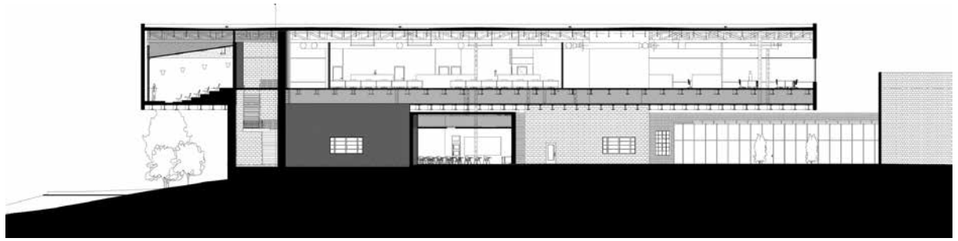
Second Floor Plan

1. Auditorium 2. Studio 3. Classroom

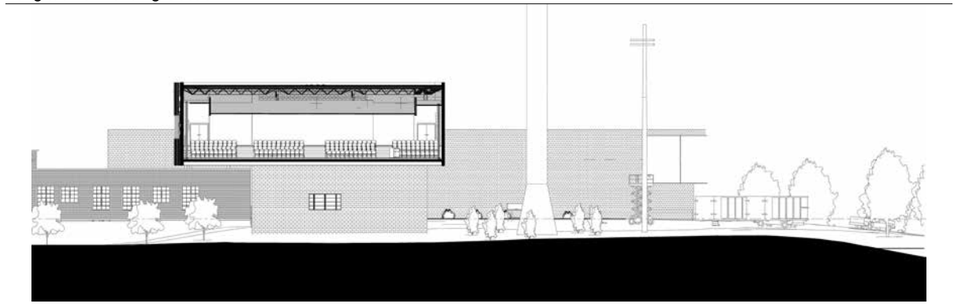


First Floor Plan

1. Faculty Offices 2. Conference Room 3. Classroom 4. Reception

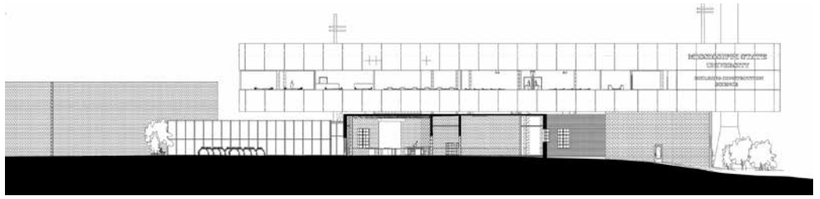


Longitudinal Building Section

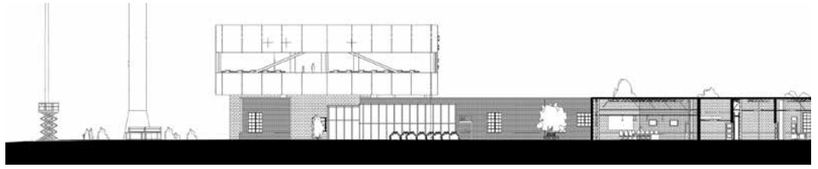


Cross Building Section

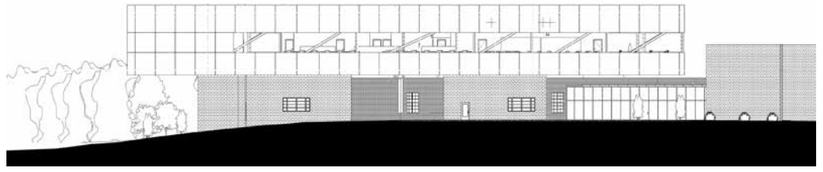
The most beautiful aspect of Team 16's design is also its most expensive. It is also the most challenging from a construction standpoint. The entire BCS wing, which spans above Howell, does so by bearing on only two structural stairwell/elevator cores and is completely independent of Howell with regard to loading. This act of apparent levitation is carried out by the entire building slab being, in fact, a Vierendeel truss. With its heavier and more complex series of moment connections, an attractive option for construction would be to field assemble component parts on the ground and crane the unit into place in whole. This all calls to attention the difficult east end of the site which has a considerable drop in topography making lay down or staging impossible. This makes the proposed work yard, wedged in between the proposed new garage and the new Art building, the most logical candidate. It also may justify a reconsideration of phasing to allow all superstructure to be placed at the beginning of the project.



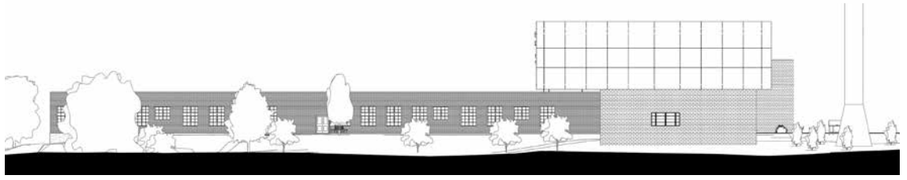
West Elevation



North Elevation



East Elevation



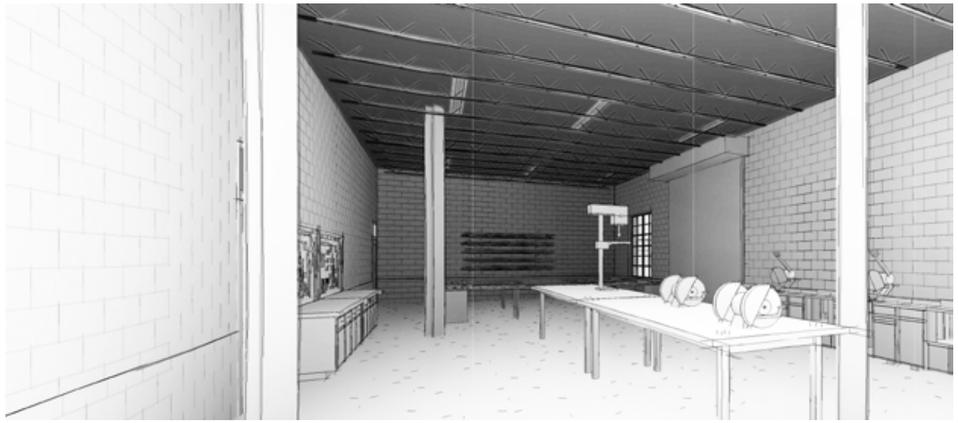
South Elevation

View of BCS Building from the south east

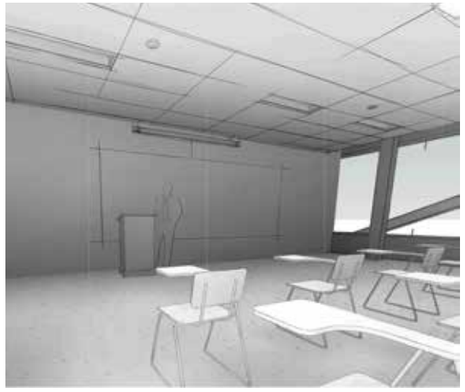
View of Howell and teh new Art Building from College View

View of new BCS Building from Howell courtyard

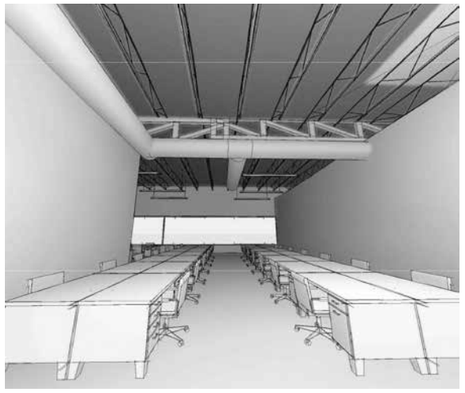
View of BCS Building from the north east



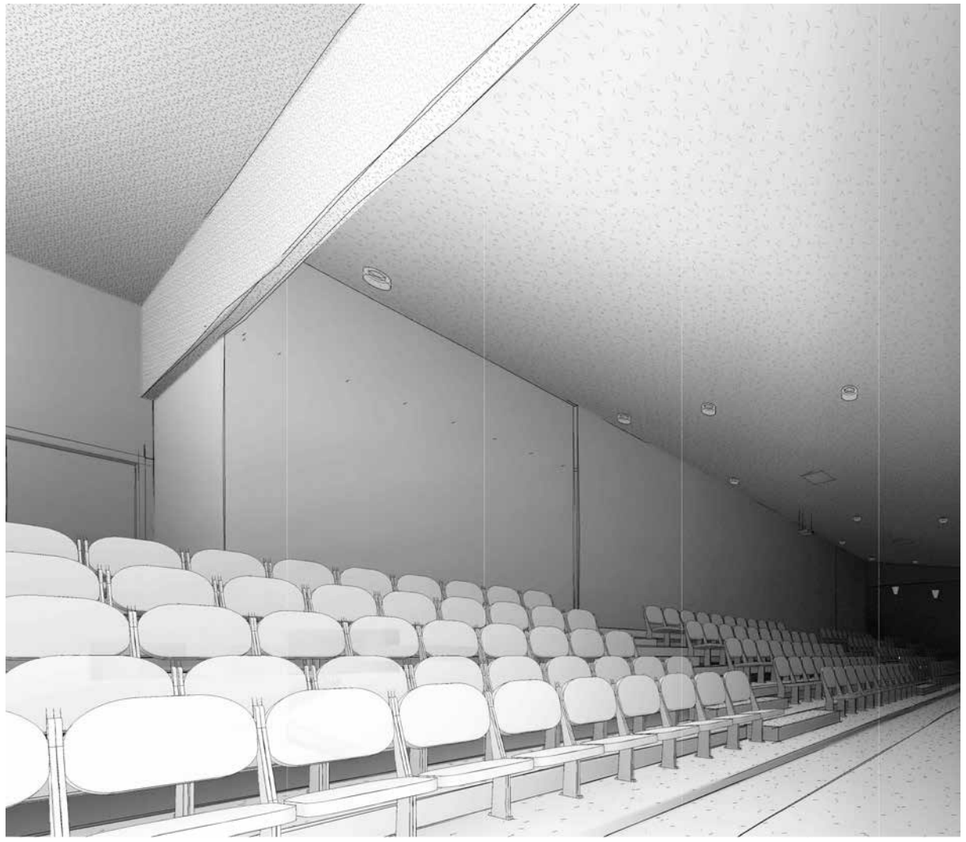
View of BCS Shop



View of typical BCS classroom



View of typical BCS studio



View of Auditorium

TEAM 17

Proposal

Recognizing the role that the corner of College View and Bailey Howell plays as one of the gateways to campus from Highway 12, Team 17 chose to locate a major multipurpose building immediately facing this approach. With a BCS wing branching off to the east and a new Art building to the South, the collection of three buildings form an inner quad that is contained on the south by Giles Hall and a new Interior Design building. With breezeway entrances beneath the connectors of each of the three new buildings on the north end of the campus, the quad is fairly well contained with its only other entry point being the small parking area between Giles and the new Art building. What distinguishes this quad from others, however, is the comparatively high building edge that contains it. With a four story elevation on each of the new proposed buildings, this quad most definitely feels like a room. Cleverly tucked away to the rear east end of the BCS building, the work yard is a level lower than the quad.

Designed to have an impact, the new BCS building makes a bold statement with its five story north-facing entry atrium. Supported by a row of eight concrete columns, a cantilevered steel bow truss roof canopy extends out over the entry creating a massive glass encased portico. On the interior, each level flanks the atrium with a generous balcony-like corridor with ample opening to each of the studios so that they benefit from the natural light and view.

Appropriate to its use as a home for Building Construction Science, architectural detailing is of paramount concern and an aspect that this proposal celebrates. The seventy-seven foot tall glass curtain wall, for example, emphasizes the delicacy of the stainless steel spider clamp connections holding the glass by contrasting their comparatively small profile with that of the over-sized concrete columns from which they are supported.

Team

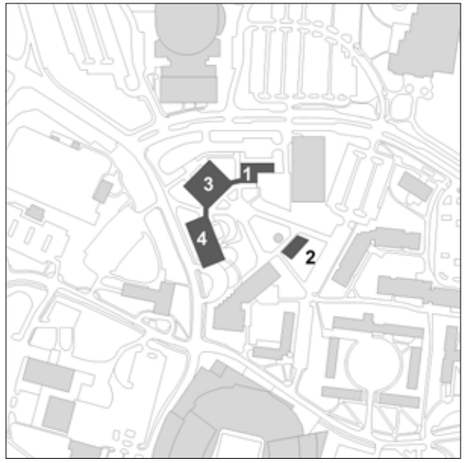
From top left to bottom right:

Brittany Roberts, *Architecture*
Historic Preservation & Code Research Group

Caleb Shaw, *Architecture*
Master Planning Research Group

Jacob Stovall, *Building Construction Science*
As-Built Research Group

Martin Wood, *Building Construction Science*
Programming Research Group



Master Plan and Phasing

Team 17 started with the Master Plan approach developed in the Master Planning Research Group 2. Proposed execution of the Plan will take place in four phases:

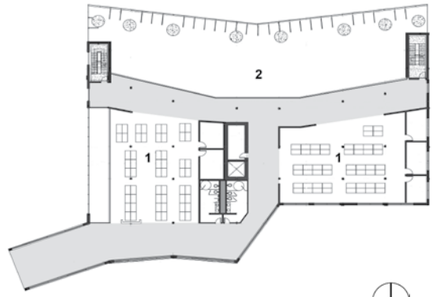
Phase 1: New BCS Building:
55,000 sq. ft., $27 million, 5/20 - 8/22

Phase 2: Demolition of Howell
New Interior Design Building:
20,000 sq. ft., $8.7 million, 8/22 - 9/23

Phase 3: New Multi-Purpose Building:
80,000 sq. ft., $38.9 million, 2/23 - 8/25

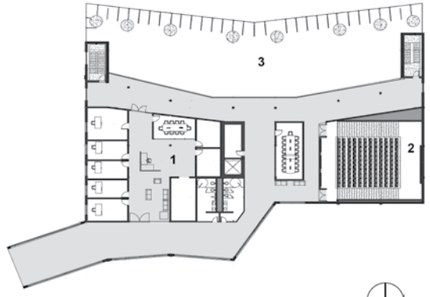
Phase 4: New Art Building
77,500 sq. ft., $36 million, 5/25 - 7/27

BCS Site Plan *(opposite page)*



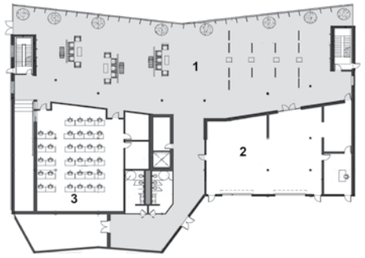
Third Floor Plan

1. Studio
2. Open to First Floor Lobby



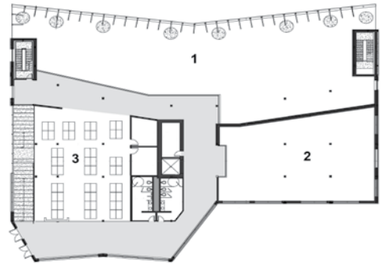
Fourth Floor Plan

1. Faculty Office Suite
2. Auditorium
3. Open to First Floor Lobby



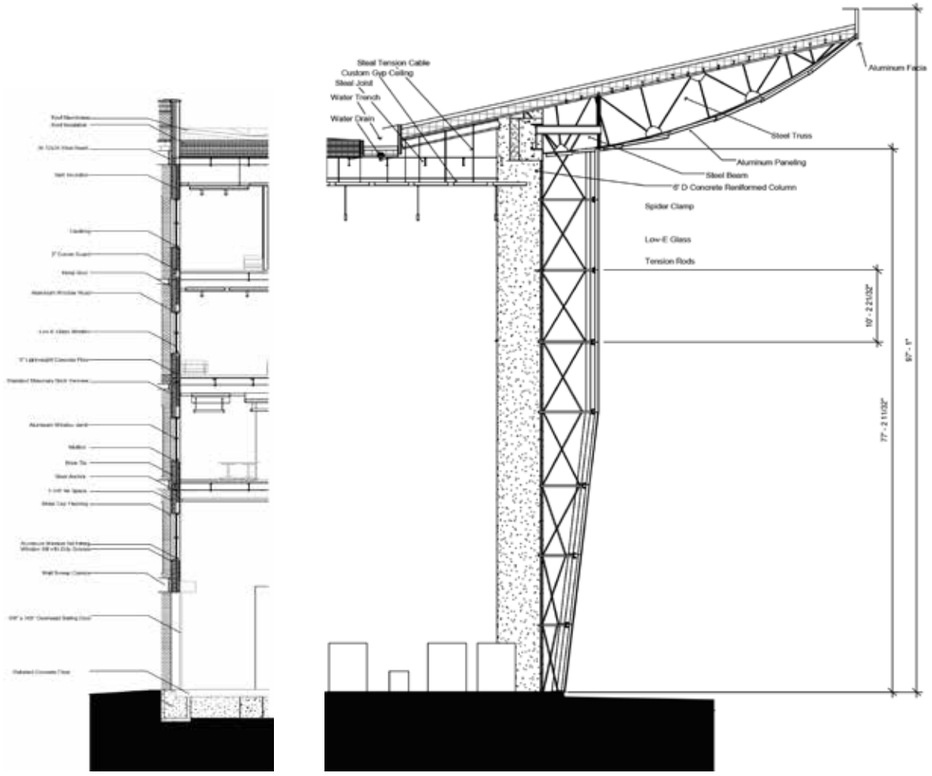
First Floor Plan

1. First Floor Lobby
2. BCS Shop
3. Classroom



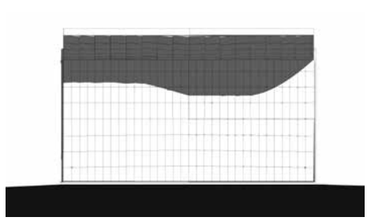
Second Floor Plan

1. Open to First Floor Lobby
2. Open to Shop
3. Studio



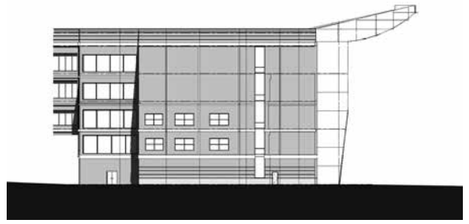
North and South Wall Sections

South Elevation



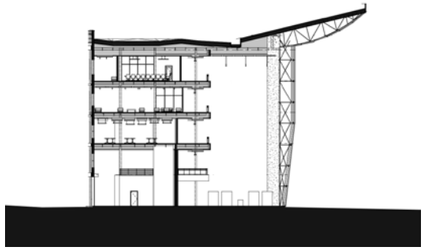
North Elevation

West Elevation



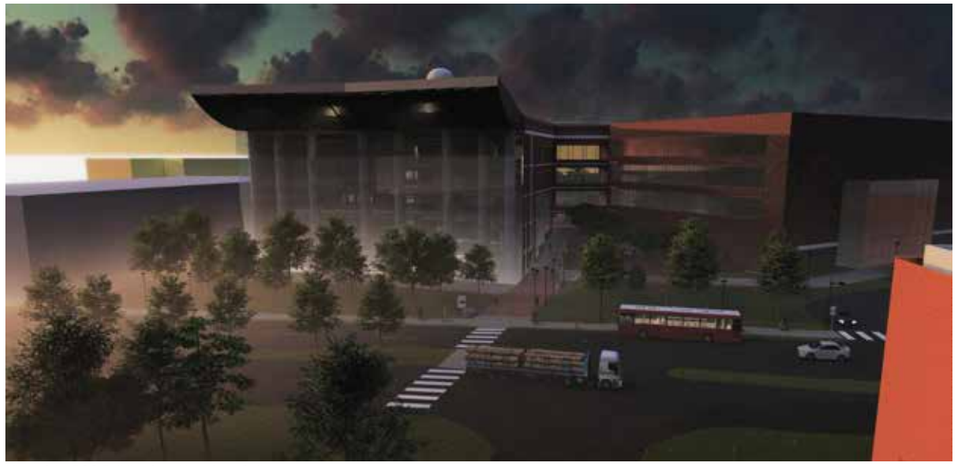
East Elevation

East - West Building Section



North - South Building Section

View of quad area looking north east



View of the BCS Building from Humphrey Coliseum

View of the BCS Building from Bailey Howell looking south east

View of the quad showing the BCS work yard in the background

View of the interior west stair corridor

TEAM 18

Proposal

Sharing orientation with the Mize Pavilion, the new Art building on the north end of the CAAD campus begins to give Bailey Howell the feel of a more urban type of street. Turning the corner south onto College View the buildings follow suit by means of a knuckle-like gallery building which connects Art to Interior Design. This then opens up to the interior of the campus revealing a series of spacious quads. Each of the other structures making up the CAAD Campus (BCS and Interior Design) share an orientation with the Giles addition which extends back into the site toward the water tower.

The proposed new BCS building seems to bifurcate what would otherwise be an expansive quad between Art and Architecture yet its form, as seen from College View Drive, is somewhat deceiving. A rectangular building with its long side running south-west to north-east and parallel to Giles Hall, it seems to insert itself in such a way as to obscure the otherwise open space and present itself as an object and not an edge. The plan and section of the building, however, tell another story. Through the center of the (mostly) two story building, an entry atrium slices a view corridor through which connects the center of the gallery to the rear of Giles Hall. Far from cutting in two, the new BCS building acts as portal linking two sections of outdoor space - one a narrow plaza between Giles and BCS, and the other, a more generous and formal space between BCS and Art. A more narrow collection of greens spans the side of BCS between Giles and Interior Design. One can almost imagine it to be a tree-lined portico separating the quads from College View.

The design takes advantage of the topography to cut away at the back side of the site and place the work area for BCS at a lower level, tucked away from the landscaped quads and against the proposed new parking garage. With a walled and landscaped separation in addition to the level change, it is almost a cloistered work yard.

Team

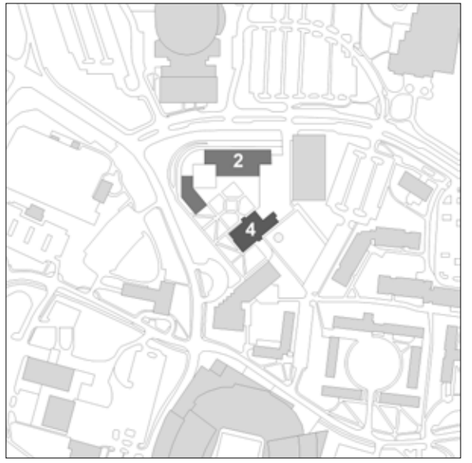
From top left to bottom right:

Tyler Cox, *Building Construction Science*
Historic Preservation & Code Research Group

O'Ryan Hooker, *Architecture*
As-Built Research Group

Felipe Olvera, *Architecture*
Master Planning Research Group

Jalyn Wallin, *Building Construction Science*
Programming Research Group



Master Plan and Phasing

Team 18 started with the Master Plan approach developed in the Master Planning Research Group 2. Proposed execution of the Plan will take place in five phases:

Phase 1: Mobilization and Demolition:
$370 thousand, 3 month duration

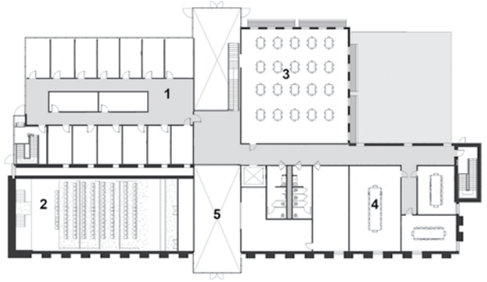
Phase 2: New Art Building:
$36.5 million, 36 month duration

Phase 3: Demolition of Howell:
$1.3 million, 4 months duration

Phase 4: New Interior Design and BCS Building:
$13.8 million, 24 months duration

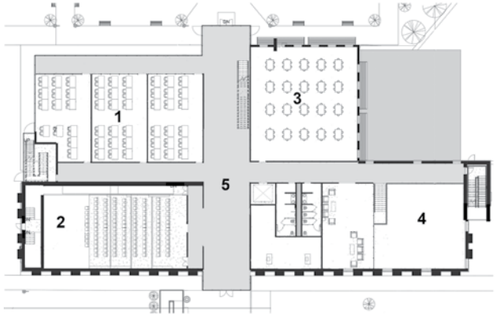
Phase 5: Landscaping and Site Work:
$170,000, 3months duration

BCS Site Plan *(opposite page)*



Second Floor Plan

1. Faculty Office Suite 2. Auditorium 3. Studio 4. Conference Room
5. Open to Lobby Below



First Floor Plan

1. Classroom 2. Auditorium 3. Studio 4. Work Shop 5. Central Lobby

Ground Level Floor Plan not shown

East Elevation

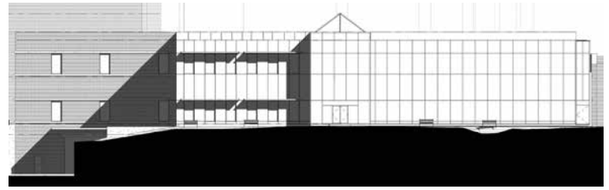
East Elevation

The main axis which runs through the site and bisects the building also serves as a dividing line for its two wings. The central lobby created by the axis further creates a division between the more public and the more intimate portions of the program. The studios are located in the same quadrant of each floor, ascending from the first year studio on the lowest level progressing up in year as it does so in floor level. All these studios have visual access to the work yard.

An important aspect of Team 18's design is their interior and exterior material choices. Wishing to express "different building tectonics" the material palette is primarily metal, masonry and glass. On the exterior the desire is to have these materials contextually react to adjoining buildings, and on the interior to be expressive of different manners of connection.

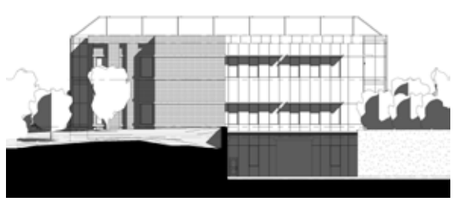
Although pulling up the rear in team order, Team 18 was a leader in the thoroughness and depth of their estimating and scheduling. An admirable aspect of the team's proposal is the clarity of an appreciation for the concerns of the client in the construction process on the part of the design-build team. With a desire for transparency in both cost and duration, the proposal is generous in explaining the process of construction, key points along the critical path, and how resources flow through the project as it progresses. Beyond communicating solely to a professional University Architect-Facilities entity who would be familiar with the process of construction, Team 18 is almost instructional in their presentation. This desire to educate as well as provide a valuable service, sets this proposal apart from the others and speaks well for the industry in general.

East Elevation

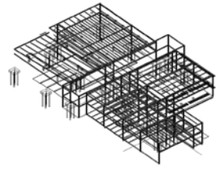


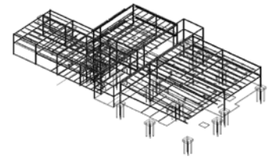
East Elevation

East Elevation



East Elevation



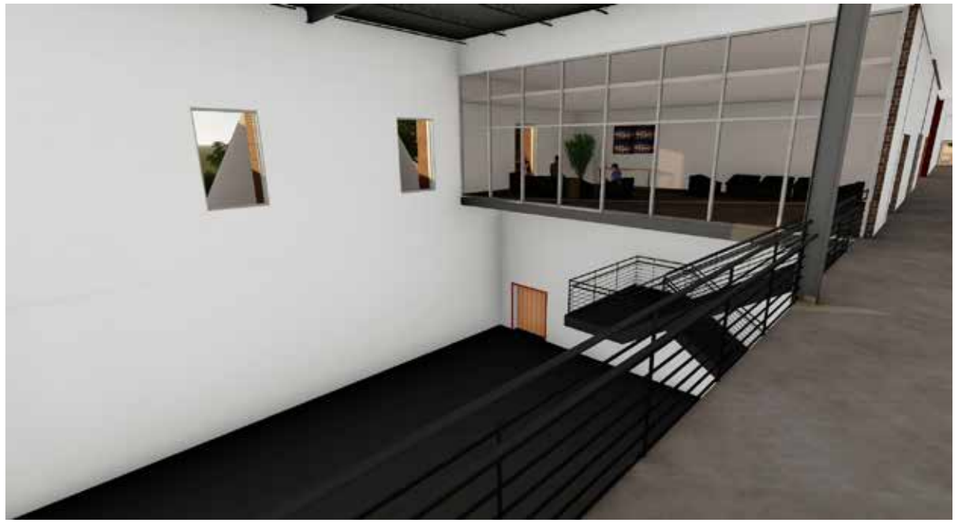


Bird's eye view of the CAAD campus from the south west

Bird's eye view of the CAAD campus from the east

View of the north (entry) elevation of the BCS Building

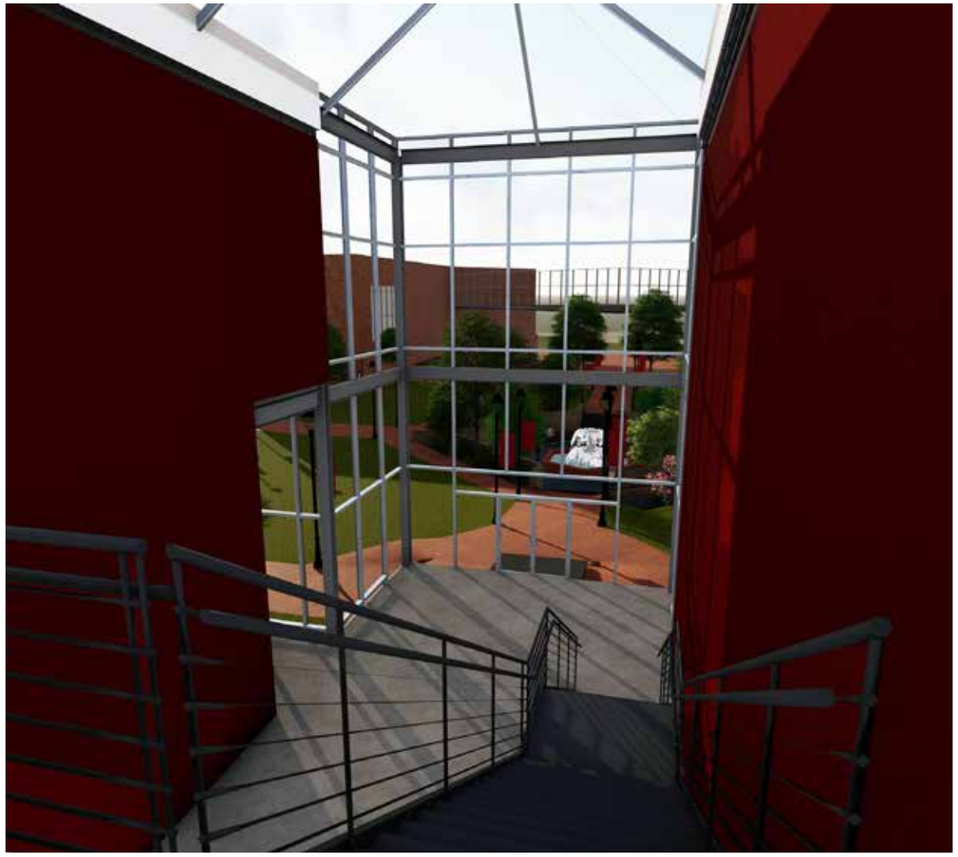
View of the BCS Building from the north east



View of the BCS warehouse

View of the BCS entry lobby looking north

View of a typical office



View of the BCS entry lobby from the second floor

ACKNOWLEDGEMENTS

The Architecture+Building Construction Science Collaborative Studio at Mississippi State University is grateful for the support of the Mississippi Construction Education Fund and the MSU Building Construction Science Industry Advisory Board.

A practice-oriented studio such as this is not possible without the resources of knowledge and experience that come form those involved in the daily exercise of the discipline. From assistance with pricing and scheduling, material samples, best practices to participating in lectures, reviews and final juries, the following individuals are an essential component for successful professional education in the building sciences. Many thanks!

Mike Barkett, *Mississippi Construction Education Foundation*
Lane Bell, *Mississippi Construction Education Foundation*
Quinn Brislin, *Brislin, Inc.*
David Bryant, *Jesco Construction, Inc.*
Tony Carroll, *Sanderson Construction, Inc.*
Brad Clark, *Clark Construction*
Chip Crane, *F.L. Crane & Sons, Inc.*
Ty Crane, *F.L. Crane & Sons, Inc.*
Allen Cravens, *Hoar Construction*
Paula DeYoung, *Probity Contracting Group*
Bryan Ellis, *ICM*
Jeff Emerson, *Montgomery Martin*
Scott Gipson, *Gipson Steel*
Matt Harrell, *Probity Contracting Group*
Christee Holbrook, *Graham Roofing*
Austin Holder, *Core Construction*
Graham Howard, *Adams Group*
Scott Kilby, *Yates Construction*
Barry Lipsky, *Lipsky Enterprises, Inc.*
Brice Marks, *Lemoine Company*
Stephen Moore, *Roy Anderson*
Chris Morrow, *Pryor and Morrow Architects*
Lee Nations, *Mississippi ABC*
Dupree Petty, *Copeland & Johns*
Chad Pippen, *White Construction*
Neil Polen, *Dale Partners Architects*
Chris Ratzlaff, *R.C. Matthews*
Robert Robison, *Brasfield & Gorrie LLC*
Allie Salas, *Turner Construction*
Brett Sanders, *Copeland & Johns*
Robert Smith, *Glass, Inc.*
Justin Smith, *Glass, Inc.*
Mike Upchurch, *Upchurch Plumbing, Inc.*
Jason Young, *Fisher Brown Bottrell*