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## **EXISTING CONDITIONS**

### **Project Background**

The new Arts & Humanities Instructional Building (AHIB) is located on the campus of Howard Community College in Columbia, Maryland. The project is new construction consisting of 78,000 square feet of classrooms, offices, theater space and gallery space. Two above-ground stories and a partial basement comprise the AHIB building. The timeline of construction for this building is from September 2004 to July 2006. Riparius Construction Company acting as CM at risk is delivering the project. The GMP for the AHIB is approximately 20 million dollars.

Below is a summary of a few associated costs.

- Total Project Costs: \$20,180,431
- Total Cost per square foot: \$262.08

#### Major Building Systems Costs:

<u>Item</u>	<u>\$</u>	<u>\$/S.F.</u>
Structural Steel Costs	\$1,284,750	\$16.69
Mechanical Costs	\$3,855,000	\$50.06
Electrical Costs	\$1,850,200	\$24.03
Masonry Costs	\$1,630,601	\$21.18
Plumbing Costs	\$ 26,000	\$ 0.34



### **Client Information**

The owner of the new Arts and Humanities Instructional Building is the Howard Community College located in Columbia, Maryland. The largest department in the school is the Arts and Humanities Department, with a growing Business Department. Currently, Howard Community College has just over thirteen thousand students enrolled. The college has grown in recent years and has seen many new construction projects on campus. The construction manager for the AHIB, Riparius Construction, Inc., has already completed another project for the college and is familiar with the demands of working with the college as an owner.

HCC is known for its strong performing arts program, and building this facility is seen as furthering their commitment to the arts. The facility must be technologically advanced, and thus be a symbol of the schools' strength in the arts. The building will be used for the study and presentation of various forms of art, well as theatrical performances, and will serve as a showcase for the college's Arts Department. Howard Community College has also requested the building be operational by the start of the 2006 academic school year, probably the greatest requirement set forth by the owners.

### **Project Delivery System**

Riparius Construction, Inc. has scheduled the project to be constructed in one phase. The owner has expressed a few concerns over the construction of the new AHIB: First, the college requests the building be operational and occupied by the start of the new 2006 academic school year. Second, a high quality product is required of the project. The last major concern for this project, as for many projects, is safety. The new building is located very close to the entrance of the college campus. Keeping students away from the dangers on the construction site is a main concern being addressed by Riparius Construction, Inc.

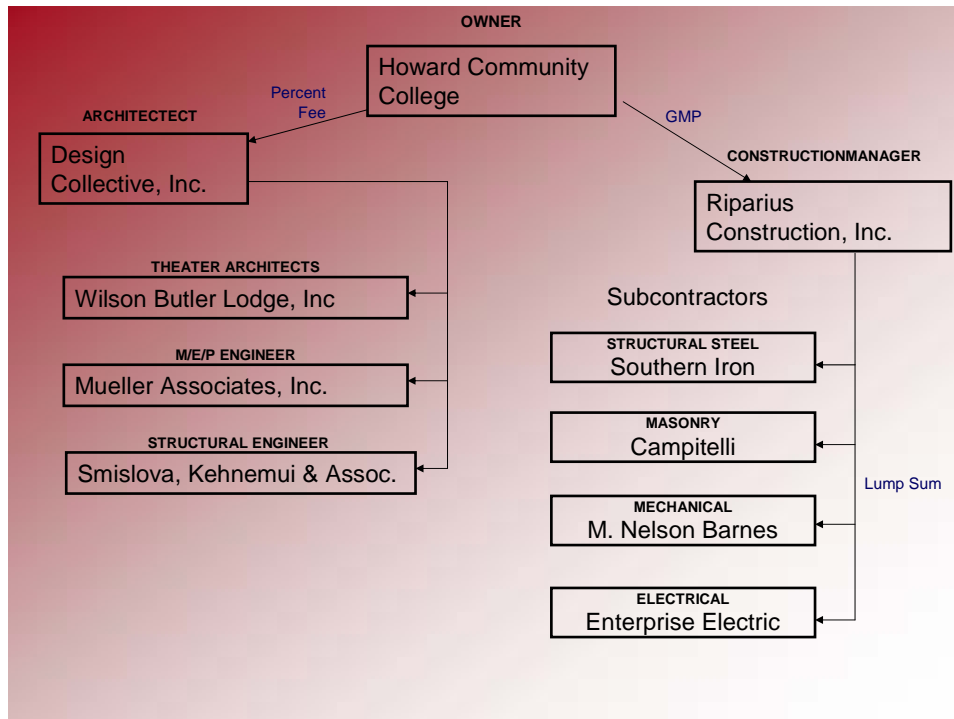


Riparius Construction, Inc., is acting as the construction manager for this project. As stated earlier, the project is bid as a GMP with a construction manager at risk. All the subcontracts are held by the construction manager. This project delivery method is appropriate for the owner and the type of project. Although the owner, HCC, has recently completed a few other projects, it is a relatively inexperienced owner. The construction manager delivery system allows Riparius to hold all the contracts and deliver the project in an efficient manner.

**Primary Project Team:**

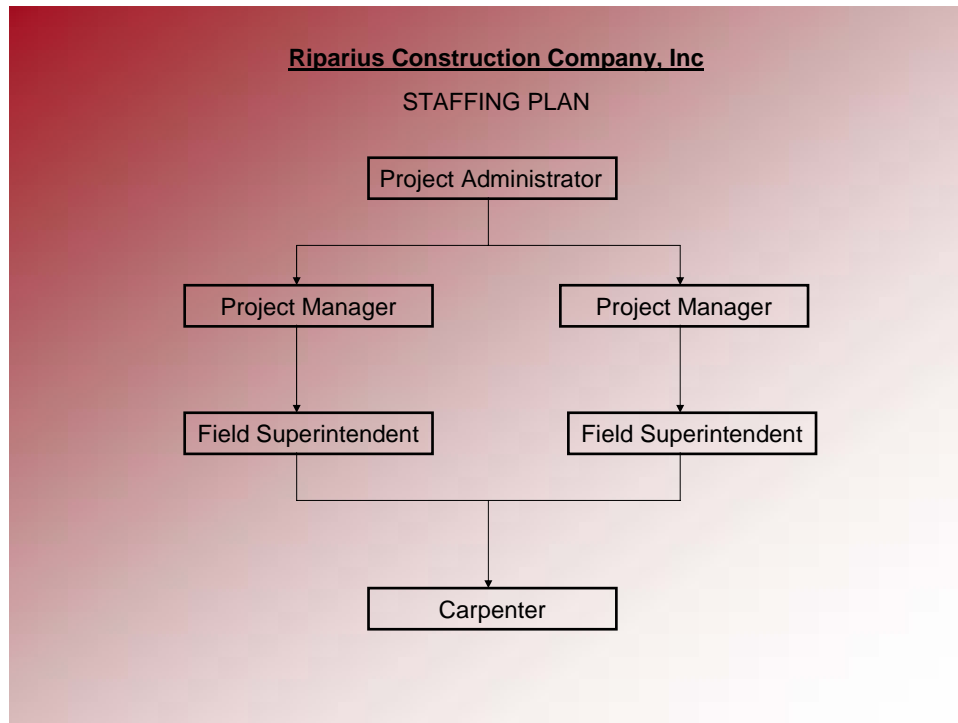
The project team and organizational chart is shown below.

- **Owner:** Howard Community College  
Website: [www.howardcc.edu](http://www.howardcc.edu)
- **Architect:** Design Collective, Inc.  
Website: [www.designcollective.com](http://www.designcollective.com)
- **Construction Manager:** Riparius Construction, Inc.  
Website: [www.ripariusconstruction.com](http://www.ripariusconstruction.com)
- **Structural Engineer:** Smislova, Kehnemui & Associates  
Website: [www.skaengineers.com](http://www.skaengineers.com)
- **M/E/P Engineer:** Mueller Associates, Inc.  
Website: [www.muellerassoc.com](http://www.muellerassoc.com)
- **Theater Architects:** Wilson Butler Lodge, Inc.  
Website: [www.wilsonbutlerlodge.com](http://www.wilsonbutlerlodge.com)
- **Acoustical Consultants:** Shen Milsom & Wilke  
Website: [www.smwinc.com](http://www.smwinc.com)
- **Lighting Consultants:** Lighting Design Collaborative



### Staffing Plan

To complete the construction of the AHIB, Riparius Construction, Inc. has assembled a diverse project team. Riparius Construction is employing a project administrator to spend the majority of his time on the AHIB. Currently working onsite in the construction trailer are the two main project managers who are devoted solely to the AHIB project and who have two full-time field superintendents working for them. Also on the team is a full-time carpenter. Although this project is more than just a typical office or classroom building, Riparius and the project team are familiar with the constructability issues of the building, since they have already completed similar jobs.



### Local Conditions

The new AHIB is located in the relatively flat and wooded area of Columbia, Maryland, which was the first planned community in the United States. Existing buildings on the HCC campus are steel structure with brick façade and curtain wall. The first buildings on campus were constructed in the late sixties and early seventies.

Upon investigation of the soil conditions, a soft weathered rock was encountered at depths of 18 to 30 feet below the ground surface. Sands and clays were found at the surface of the soil and at depths up to 28 feet. Measurable subsurface water was encountered in depths ranging from 15 to 27 feet.



## **Building Systems Summary**

### **Architecture**

The new Arts & Humanities Instructional Building (AHIB) is going on the small Howard Community College campus. The intent of this building is to provide the students with state-of-the-art classrooms, an auditorium, and gallery space to display art work. The architecture of the new building is consistent with the other buildings on campus with a more modern approach. The building's design is unique from the other buildings on campus because of the larger windows and a curtain wall system. The AHIB has a large 2-story lobby with a glass covered bridge located on the second floor. A 100-seat music multimedia lab with a stage is located on the first floor along with two dance studios, classrooms and a 3000-square-foot black box theater. A gallery space is located on the first floor to display student art work. The second floor consists of class rooms and music practice rooms.

### **Demolition**

Minimal demolition is required to construct the AHIB. The AHIB will share an entrance with an existing building on campus, the Smith Theater. The existing entrance on the Smith Theater requires demolition in order to construct the new curtain wall entrance lobby. Some of the materials requiring demolition are a sloped metal panel roof overhang, a precast beam, 20 ft of storefront, and concrete pavers. Other demolition requirements include removing lighting fixtures and a payphone in the same area. This demolition is very minor compared to the entire project, and no hazardous materials are expected to be encountered during excavation.



### **Structural Steel Frame**

The portion of the AHIB building with no basement is supported primarily by structural steel with a 3" poured concrete on a metal deck composite system. The structural steel system is comprised of approximately 28' x 28' bays. The roof is framed with open web steel joists. Bolted moment connections are used for the construction of the wide flange beams. The crane being used is a 100-ton rubber tire truck crane.

### **Cast-In-Place Concrete**

The cast-in-place concrete walls for the AHIB only exist in the small basement level. The walls are not very complicated with curves, but are straight and perpendicular to each other. Also, the walls are only 15 feet high. The form selection for this wall type is a traditional reusable form. The cast-in-place concrete floor is poured on the metal deck, which acts also as the form. The concrete that will not be placed out of the truck chute will be placed with a pump.

### **Mechanical System**

The basement of the AHIB is fully dedicated for mechanical space. There are four air handling units all located on the roof. The 12,200 cfm AHU is dedicated to serving the theater. A 40,000 cfm AHU serves the studio spaces as well as the classrooms and offices. A 9,000 cfm AHU serves only the black box theater. Another 33,500 cfm AHU serves the lobby and art gallery. A 380-ton cooling tower is located on the roof to provide chilled water. Two gas-fired boilers are located in the basement, providing heated water to the building. A fully sprinkled and automatic wet pipe system is used for fire protection.



### **Electrical System**

The main power enters the building at the basement mechanical room and is stepped down to 480Y/277V by the primary transformer. The power is then fed to the main switchboard. The main switchboard distributes the power to the mechanical equipment and to transformers to further step the power down. The majority of the sources in the building require 208Y/120V, which is provided by the secondary transformers feeding the individual panel boards.

### **Masonry**

The exterior wall of the AHIB is a split face CMU façade with an 8” CMU wall carrying the load. The load bearing CMU wall is tied to the spread footing foundations with steel rebar ties. The façade is attached to the CMU wall with masonry ties spaced at 16” on center. Ladder or truss-type horizontal reinforcement spaced at 16” on center is used for the construction of the masonry walls. The mason will use a hydraulic scaffold to lay the concrete block for the entire building.

### **Curtain Wall**

A pressure-glazing system with a pre-finished extruded aluminum pipe and tube frame was selected for the curtain wall. The curtain wall uses spandrel glass throughout the entire system. The glazing is two panes separated by a 1” gap filled with an insulating gas. The entire system is self-supporting.

### **Project Schedule Summary**

The total timeframe for construction of the Arts and Humanities Instructional Building is about 21 months. The design phase took approximately 2 years; site work on the project lasted approximately 3 weeks. The spread footing foundations have been scheduled for completion in month. The structural steel frame will be erected with final connections





taking place in just over 2 months. The building will be completely enclosed within 12 months of beginning the site work, and will take 5 months from start to completion. Finishes will last about 4 months, with final occupancy taking place the end of June.

The foundation system for the majority of the building is spread footings. Although this type of construction is fairly typical, it requires some specific attention. The rebar must be procured and placed in time to keep the project on schedule. Construction managers are also concerned with the formwork, as forming and stripping the forms requires a lot of manpower, which is a potential issue.

The structural steel frame clearly is on the critical path of the job. The steel needs to be procured and delivered on site for the construction managers to shake out the steel for the job to run smoothly. Some coordination needs to be done between the construction manager and the steel fabricator to have the correct pieces on site and on time. This is especially important if a lot of beam sizes differ, because the steel fabricator will want to stay productive and produce all the same beam sizes at once, regardless of when they are needed.

The finish schedule is especially problematic for the construction manager and requires more attention. During this time, there will be many different trades on site simultaneously. It is important to know when items are being delivered, and to be prepared with lay down areas for the contractors. Construction managers must also prevent trade stacking and prepare schedules that allow subcontractors enough room to work. It is important to provide a good work plan and work sequence so that the work flows in a logical and efficient pattern. Knowing in which area of the building work will be started, and where work will go from there, is one of the most important functions of the construction manager. The following pages highlight some of the major phases of construction.



