



OPPIN STATE UNIVERSITY

**HEALTH & HUMAN SERVICES BUILDING
BALTIMORE, MARYLAND**



CORINNE AMBLER • CONSTRUCTION MANAGEMENT • ADVISOR: DR. HORMAN

PROJECT OVERVIEW

The Health and Human Services Building at Coppin State University, located at 2500 W. North Avenue in Baltimore, Maryland, is the first building of many to be located on the future south campus. The University's campus currently exists only on the north side of W. North Avenue. The project also includes an overhead pedestrian bridge to connect the two campuses. The building will house many different academic programs. Construction of this 150,000 gross square feet building began in January 2006 and will be completed in June 2008. The estimated cost of this five-story facility is \$48.6 million.

PROJECT TEAM

Owner - University of Maryland, Baltimore
Client - Coppin State University
Construction Manager - Barton Malow Company
Architect - Design Collective, Inc
Structural Engineer - Hope Furrer Associates
MEP Engineer - RMF Engineering
Civil Engineer - Site Resources, Inc

CLIENT INFORMATION

Coppin State University is one of many colleges in the University System of Maryland. The college offers a comprehensive, urban, liberal arts institution with a commitment to excellence in teaching, research and continuing service to its community. The number of commuter students has been increasing over the past five years. The University has decided to respond to this by creating a south campus and updating their athletic facilities. At the present time the campus consists of eight buildings residing on the north side of W. North Avenue. In years to come the University has devised a Master Plan to add twenty-one new facilities and expand campus to the south side of W. North Avenue. The Health and Human Services Building will be the first building on the new South Campus.

The map and list of new and old facilities is available on the next page.

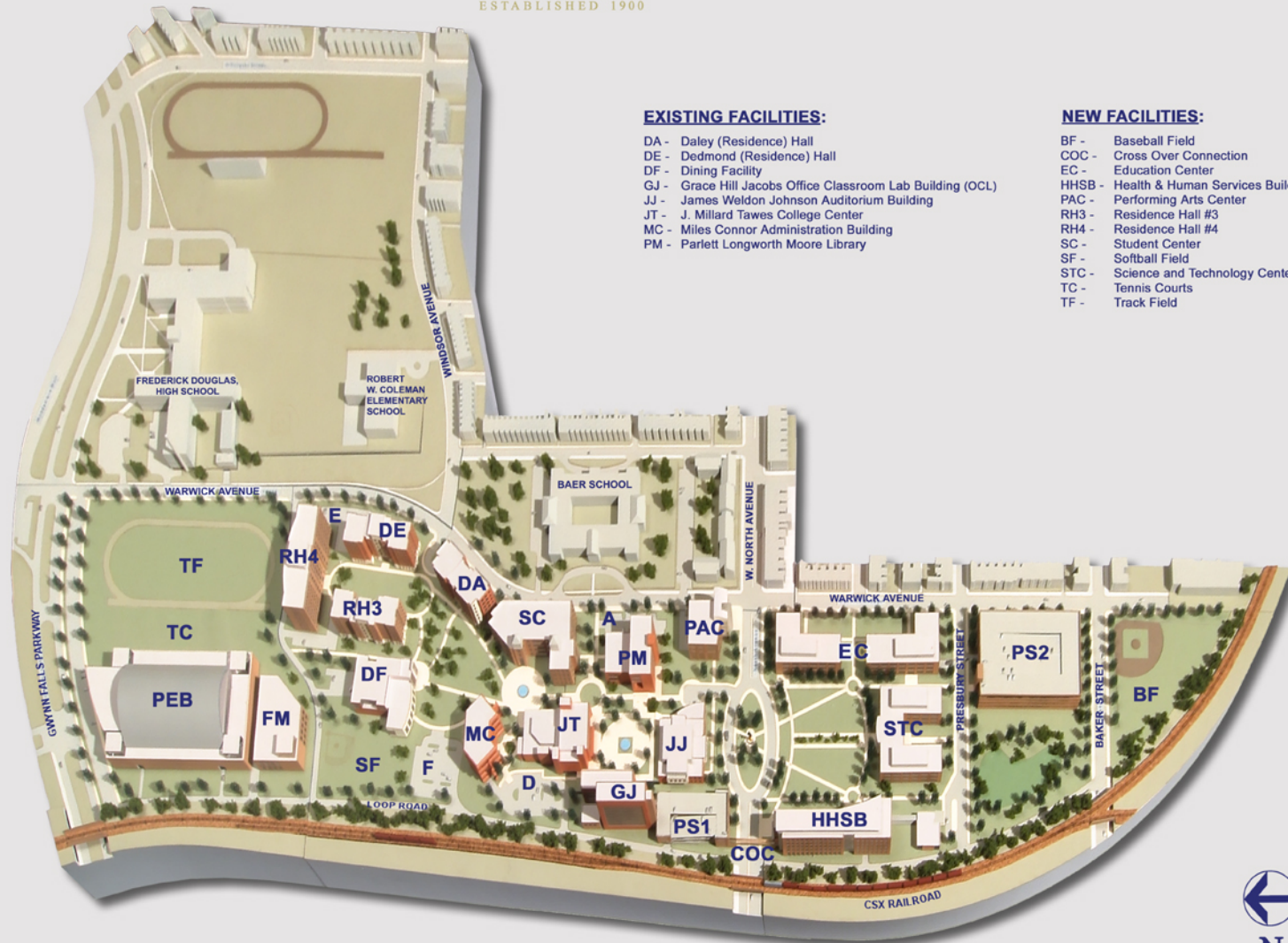


ESTABLISHED 1900

COPPIN STATE UNIVERSITY

2500 WEST NORTH AVENUE
BALTIMORE MARYLAND 21216

PROPOSED FACILITIES MASTER PLAN



EXISTING FACILITIES:

- DA - Daley (Residence) Hall
- DE - Dedmond (Residence) Hall
- DF - Dining Facility
- GJ - Grace Hill Jacobs Office Classroom Lab Building (OCL)
- JJ - James Weldon Johnson Auditorium Building
- JT - J. Millard Tawes College Center
- MC - Miles Connor Administration Building
- PM - Parlett Longworth Moore Library

NEW FACILITIES:

- BF - Baseball Field
- COC - Cross Over Connection
- EC - Education Center
- HHSB - Health & Human Services Building
- PAC - Performing Arts Center
- RH3 - Residence Hall #3
- RH4 - Residence Hall #4
- SC - Student Center
- SF - Softball Field
- STC - Science and Technology Center
- TC - Tennis Courts
- TF - Track Field

PHYSICAL EDUCATION COMPLEX:

- FM - Facilities Management / Public Safety
- PEB - Physical Education Building

PARKING:

- A - Parking Lot A
- D - Parking Lot D
- E - Parking Lot E
- F - Parking Lot F
- PS1 - Parking Structure #1
- PS2 - Parking Structure #2



CSU
LUTHERAN SITE

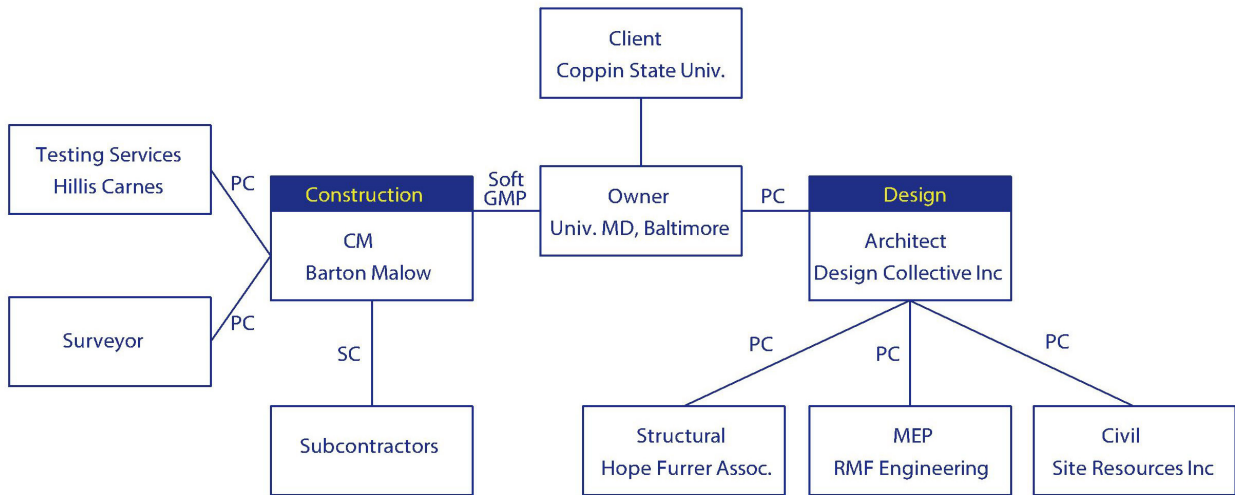


JANUARY 2005

PROJECT DELIVERY METHOD

Coppin State University is part of the University System of Maryland. The state of Maryland requires the construction of all new buildings in the University of Maryland System are to be controlled by The University of Maryland. Therefore the contract for the building is held by The University of Maryland, Baltimore. Barton Malow Company has been chosen as the construction manager at risk for the project. A soft guaranteed maximum price (GMP) was established between Barton Malow and The University of Maryland, Baltimore. This means a fee was decided upon, the project was bid by contractors and then a GMP was established based on the total bid amounts by the accepted contractors.

The organizational chart below shows the members involved in the delivery of the project and the type of contract between the two parties. A Professional Contract (PC) has a fee associated with it for the professional services provided and a Services Contract (SC) is a GMP that was hard bid.



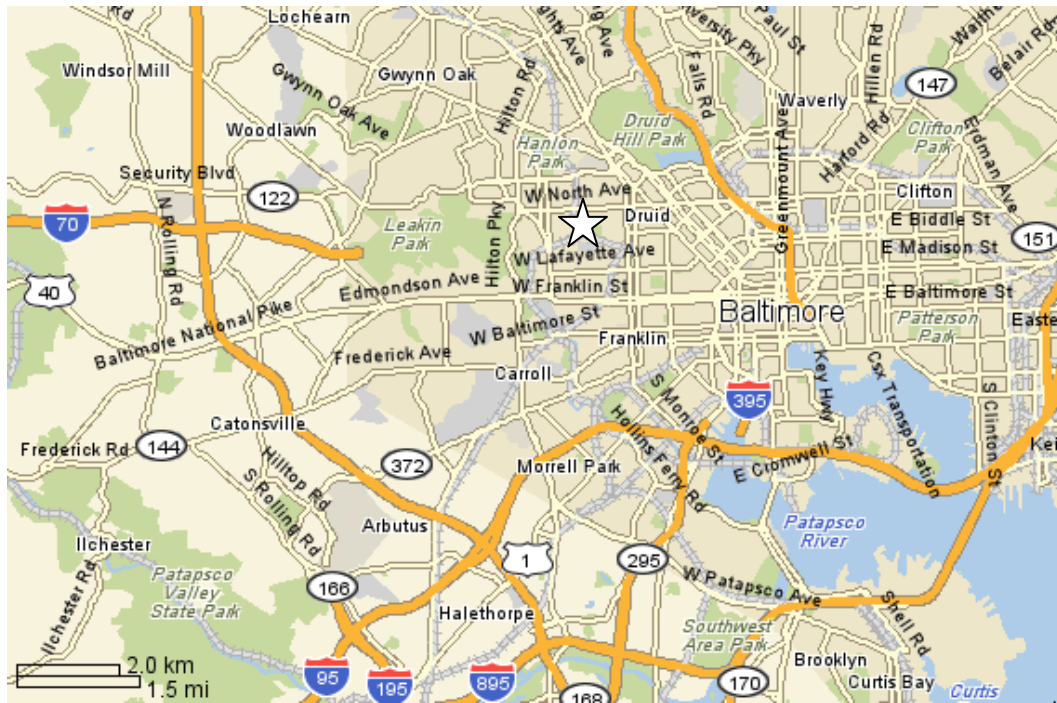
Organizational Chart of Delivery System

The project was bid to the contractors in three different phases at three different times according to trade. A new GMP was agreed upon between Barton Malow Company and University of Baltimore, Maryland after each phase was bid. The table on the next page depicts which trade was bid in each phase.

Phase I	Phase II	Phase III
Excavation and Grading	Fireproofing	Final Sitework
Demolition	Glass Systems	Landscaping
Deep Foundations	Fire Protection	Masonry
Concrete	Mechanical	Misc. Metals
Structural Steel Elevators	Electrical	Carpentry & Woodwork
		Metal Panels
		Roofing
		Doors, Frames and Hardware
		Partitions and Ceilings
		Ceramic Tile
		Painting and Coating
		Lab Casework

SITE PLAN AND EXISTING CONDITIONS

The Health and Human Services Building is located at 2500 W. North Avenue in Baltimore, Maryland. This is located northwest of the Inner Harbor. The urban setting limits the availability of parking. Geologically there are rocks near the surface and the design team thought blasting was going to be necessary. The site is ten to fifteen miles from the Inner Harbor which caused the water table to not be an issue.

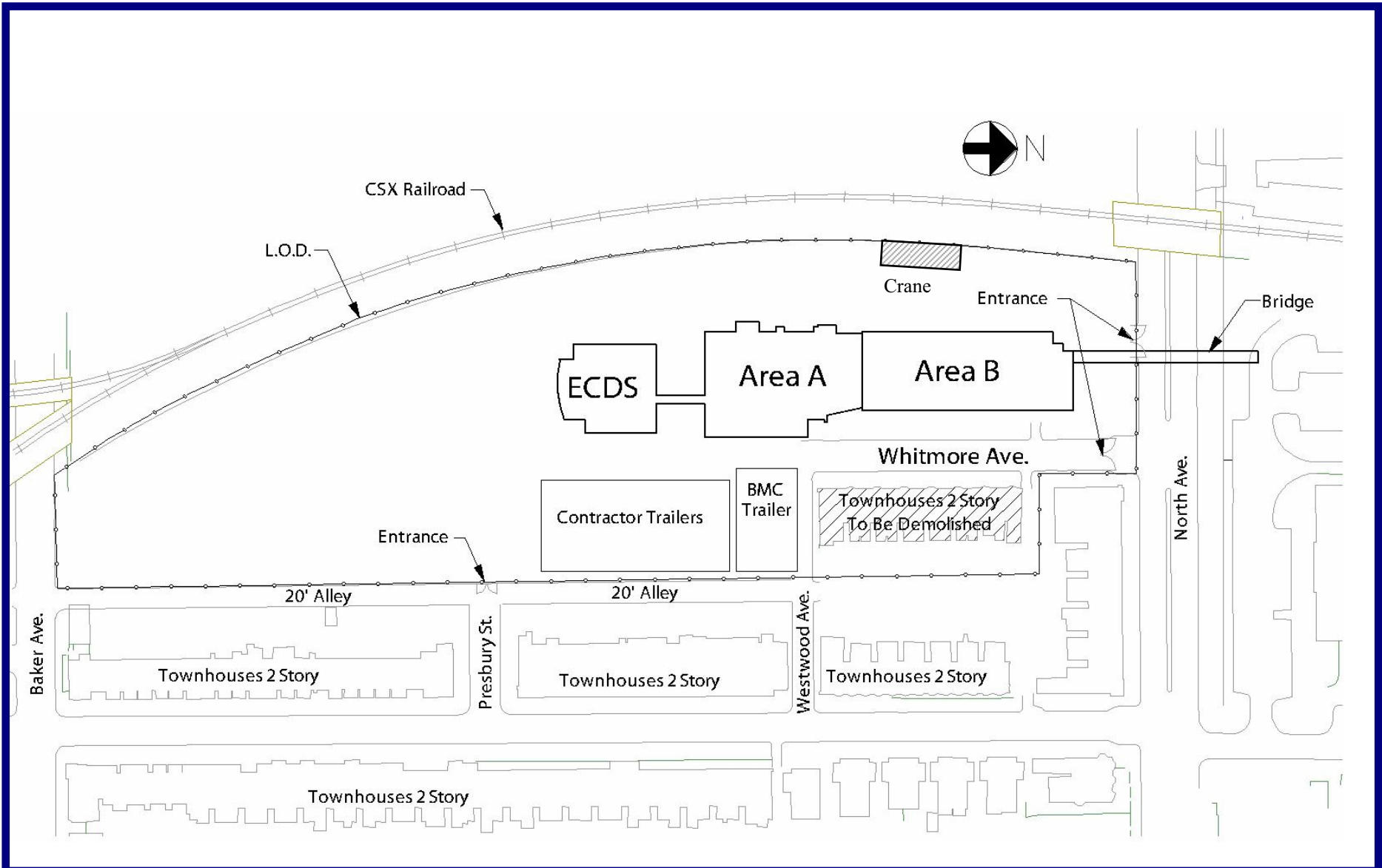


Map of Baltimore, Maryland

The layout and logistics of the site have changed from the original plans. The townhouses located on the east side of Whitmore Avenue were to be demolished in April 2006. Unfortunately, the University has not been able to acquire these properties. This has restricted Barton Malow Company's on site storage as well as the lay-down and shake-out area. The crawler crane was originally planned to move up and down Whitmore Avenue erecting steel. The un-demolished houses have forced the crane to erect steel from the opposite side of the building. The crane will now travel along the west side of the building.

The three entrances to the site allow all entering trucks to make a loop within the site. This reduces congestion because the trucks do not need to turn around. All trucks enter the site on Whitmore Avenue and must pass the Barton Malow Company trailer. Wheel washes are located at the other two entrances for sediment control. Dumpsters are located near the entrances to allow for easy trash removal.

The site plan can be seen on the next page.



Coppin State University
 Health and Human Services Building
 Site Plan

BUILDING SYSTEMS SUMMARY

Architectural Design and Function

The building program provides classroom, research, meeting and office space for various departments of the College which include Divisions of Graduate Studies, Nursing, Criminal Justice, Social Work and Applied Psychology and Rehabilitation Counseling. Also included in the building is space for various community outreach and clinical programs that are an integral part of the College.

The first floor of the new academic building will consist of a child-care center demonstration suite, lecture halls, meeting rooms and an outpatient health clinic. The second floor will house additional outreach offices, classrooms and labs. Classrooms, labs, graduate student and faculty offices will be located on the third, fourth and fifth floors. Air-handling units and cooling towers will be located on the roof which is accessible by a stair tower. Chillers and boilers will be located in the basement along with electrical equipment. This building will serve as a future hub for South campus telecommunications and water service. An overhead connector for pedestrians will join the second floor of the new academic building with a future parking garage on the other side of W. North Avenue.

Structural System

The structural system is primarily ASTM A992 Structural Steel with composite metal decking. The metal decking carries a 3" 3500psi reinforced lightweight concrete slab. The foundation is a system of cast in place concrete caissons and grade beams.

Building Envelope

The building exterior consists of glazed aluminum curtain wall and storefront, brick face veneer in a masonry cavity wall construction, cast stone panels and pre-finished insulated metal wall panels with exposed flashings and copings. Two different metal wall type panels exist with 2" insulated panels. All panels, copings and flashings are pre-finished to match a custom color. The face brick is a running bond accented with stack bond window jambs and cast stone headers, sills and copings. The roof-top equipment is screened by a pre-finished insulated metal-panel screen wall. Structural tube framing supports the screen wall vertically. The feature wall at the Early Childhood Demonstration Suite is constructed of segmented glazed aluminum curtain wall accented with insulated art-glass units of varying colors and textures. Generally, throughout the building, large vertical spans of curtain wall are braced by steel tube framing behind to limit the depth of units to 7-1/2". All curtain wall and storefront are factory finished to match a custom color.

Electrical System

The building ties into the north campus by running the lines underneath the overhead pedestrian bridge that crosses W. North Avenue. The service is 3000A with a 3-Phase 4-wire system. It runs at 480/277 Volts. All panel and switchboards are located in the basement of the building. There is a 400kW emergency back-up generator.

Mechanical System

All mechanical equipment is located on the roof or in the basement of the building. Two 1200 GPM 400ton cooling towers are on the roof of the building with seven air handling units ranging from 12000 to 28000 CFM. There is also an eighth 1500 CFM air handling unit for make-up air in the kitchen located on the first floor. Two 6700MBH natural gas fired boilers are in the basement with two 400 ton chillers. The VAV boxes throughout the building are equipped with reheat coils. The distribution system is that of a supply duct and an open air return plenum. There are transfer ducts for non-critical spaces, such as storage, closets and hallways. Climate control is regulated by thermostats. Baseboard heating exists throughout the building. The fire suppression system is both wet and dry and there is a 750 GPM 125HP Motor wet pipe system.

PROJECT SCHEDULE SUMMARY

A detailed project schedule is provided in Appendix A. Construction of the building began in January 2006 and will be completed in June 2008. The building is broken down into four different areas. As shown in the picture below.



Coppin State University Health and Human Services Building's Construction Area

The ECDS is the Early Childhood Development Center. It is a one story building that will house childhood day care. Although it is only one story, careful consideration has been taken in the selection of materials and products because it will be primarily used by children. One of these special features is a heated floor slab because the designers assumed the younger children would be crawling on the floor. The university has gone back and forth on the decision to save money or keep the one-story building included in the scope of work. This has made scheduling for the project difficult at times. Sub-contractors that were awarded with Bid-Package 3 were told not to include the ECDS when ordering materials.

The main building is divided into two areas. - Area A and Area B. Area A is the southern part of the main building. It is the only part of the building that has a sub-grade level. Area B is the northern part of the main building. The main building is 5 stories with mechanical equipment on the roof shielded by a metal screen wall.

The connection bridge is a pedestrian walkway that spans W. North Avenue. It connects the current Coppin State campus to the new part of campus. The walkway allows building occupants to exit the 2nd floor and walk across W. North Avenue without having to worry about traffic. The bridge will be constructed in a parking lot on the north side of W. North Avenue and then be lifted into place by a crane. W. North Avenue will be closed for the weekend to allow the placement of the bridge to occur.

Foundation

The foundation system in the Health and Human Services Building is concrete. The deep foundation system utilized is caissons. Caisson caps and grade beams sit on top of the caissons. The basement walls are cast-in-place concrete. The basement only exists in the south end of the main building. Construction of the foundation system started in the basement, continued to the north end of the main building and completed in the Early Childhood Development Center (ECDS).

Structural

The steel erection system divides the building into three sections. As mentioned above in the foundation summary, the south end of the main building with the basement is considered 'Area A', the north end of the main building is considered 'Area B' and the Early Childhood Development Center referred to as ECDS. Floors one through three will be erected in Area A, followed by floors one through three in Area B. The remaining fourth and fifth floors will be completed in a similar matter by completing Area A and then Area B. The ECDS is the last part of the building to be completed.

Finishes

MEP coordination was completed with weekly team meetings using a light table. Once all of the major units are put into place finishes will begin. Finishes will be sequenced in the same manner as the steel was erected. The contractors will complete the finishes in the following order:

- Metal Studs
- MEP Rough-in
- Gypsum Board
- Ceiling Grid
- Electrical and Lighting Fixtures
- Ceiling Tiles
- Painting
- Floor Finishes (Carpet, Tile, etc.)
- Furniture

A summary of the project schedule is provided on the next page.

Activity ID	Activity Description	Orig Dur	Rem Dur	%	Early Start	Early Finish	Total Float	2003												2004												2005												2006												2007												2008											
Owner Property Acquisition																																																																															
+ Schematic Design																																																																															
		556	556	0	09SEP03	31OCT05	12																																																																								
Pre-Construction																																																																															
+ Schematic Design																																																																															
		329	329	0	09SEP03	15DEC04	0																																																																								
+ Design Development																																																																															
		119	119	0	16DEC04	31MAY05	2																																																																								
+ 50% Construction Documents																																																																															
		239	239	0	02MAY05	31MAR06	212																																																																								
+ 95% Construction Documents																																																																															
		65	65	0	10AUG05	08NOV05	17																																																																								
+ 100% Construction Documents																																																																															
		139	139	0	17AUG05	27FEB06	17																																																																								
Construction																																																																															
+ Submittal Phase																																																																															
		153	153	0	06OCT05	08MAY06	17																																																																								
Construction																																																																															
1269	GMP #1-Notice to Proceed to Start Construction	0	0	0	17NOV05		0																																																																								
1270	Mobilize to Job Site	10	10	0	17NOV05	30NOV05	0																																																																								
1335	Fabrication/ Deliver Steel	80	80	0	17NOV05	08MAR06	0																																																																								
1300	Install Sediment & Erosion Controls	5	5	0	24NOV05	30NOV05	0																																																																								
1310	Abandon and New Utilities	30	30	0	01DEC05	11JAN06	0																																																																								
1315	Hazmat Abatement/ Site Demolition	20	20	0	15DEC05	11JAN06	0																																																																								
1320	Mass Excavation/ Earth Retention System	20	20	0	12JAN06	08FEB06	0																																																																								
1330	Foundations & Abutments	35	35	0	26JAN06	15MAR06	0																																																																								
1340	Structure	60	60	0	09MAR06	31MAY06	0																																																																								
1360	Pedestrian Bridge	140	140	0	03APR06	16OCT06	212																																																																								
1345	Concrete Topping Slab	15	15	0	18MAY06	07JUN06	5																																																																								
1350	MEP Rough-In	140	140	0	01JUN06	14DEC06	0																																																																								
1370	Building Enclosure	120	120	0	01JUN06	16NOV06	0																																																																								
1380	Interiors Rough-in	120	120	0	17NOV06	07MAY07	0																																																																								
1390	Roofing	30	30	0	17NOV06	29DEC06	189																																																																								
1400	Conveying Systems	100	100	0	02JAN07	21MAY07	189																																																																								
1410	Interior Finishes	220	220	0	27FEB07	03JAN08	0																																																																								
1420	Final Site Work ("Hardscape")	30	30	0	22MAY07	02JUL07	189																																																																								
1440	Landscaping	20	20	0	03JUL07	31JUL07	189																																																																								
1430	Commissioning	79	79	0	04JAN08	23APR08	0																																																																								

GMP #1-Notice to Proceed to Start Construction
 Mobilize to Job Site
 Fabrication/ Deliver Steel
 Install Sediment & Erosion Controls
 Abandon and New Utilities
 Hazmat Abatement/ Site Demolition
 Mass Excavation/ Earth Retention System
 Foundations & Abutments
 Structure
 Pedestrian Bridge
 Concrete Topping Slab
 MEP Rough-In
 Building Enclosure
 Interiors Rough-in
 Roofing
 Conveying Systems
 Interior Finishes
 Final Site Work ("Hardscape")
 Landscaping
 Commissioning

Start Date 09SEP03
 Finish Date 23APR08
 Data Date 09SEP03
 Run Date 05OCT06 14:49

Early Bar
 Float Bar
 Progress Bar
 Critical Activity

CORI
 Barton Malow Company
 CSC Health & Human Service Building
 Sheet 1 of 1

Date	Revision	Checked	Approved

PROJECT COST SUMMARY

The project was bid out to subcontractors in three separate bid packages. When construction began in January 2006 the cost of the building was \$41.95 million since then the cost has inflated to \$48.6 million. This means that at the current time the construction cost of the building is \$324/SF. The building system costs for each bid category are listed below:

Building System Costs	
Excavation and Grading	\$3,272,000
Demolition	\$63,290
Deep Foundations	\$400,750
Concrete (building)	\$3,031,600
Structural Steel	\$3,618,375
Spray Fireproofing	\$168,000
Elevators	\$734,685
Final Sitework (includes sidewalk concrete)	\$899,383
Landscaping	\$276,316
Masonry	\$2,505,700
Misc. Metals	\$484,018
Carpentry & Millwork	\$690,014
Metal Panels	\$1,256,700
Roofing	\$320,655
Doors, Frames, Hardware and General Trades	\$1,601,600
Glass Systems	\$2,902,720
Partitions and Ceilings	\$3,315,470
Ceramic Tile	\$126,652
Terrazzo	\$229,610
Carpet & Resilient Flooring	\$442,286
Painting and Coating	\$317,560
Lab Casework	\$171,240
Fire Protection	\$487,200
Mechanical	\$9,799,140