



Project Information and Background

Project Information

The Kennedy Krieger Institute Outpatient Medical Center is a 6 story cast in place structure. It is located in downtown Baltimore on the corner of East Madison Avenue and North Broadway. Also, it is next to the Existing Kennedy Krieger Institute and the John Hopkins Medical University. This building includes 30 exam rooms, 15 treatment rooms, several conference rooms, 54 offices, a physical therapy/occupational therapy gym, a spinal cord gym, and a physical therapy Natatorium which includes two pools varying in size. In order to start excavation and construction, an existing parking lot had to be removed. The Outpatient Medical Center is being constructed beside the Kennedy Krieger Institute Parking Garage which was recently built and it will utilize parking for the two Kennedy Krieger buildings in that location. The project is currently under construction. It is a 24 month long project which began on January 1, 2007 and is schedule to be completed on January 22, 2009.



Client Information

Kennedy Krieger Institute strives to help children and adolescents with development disabilities by providing personal patient care, professional training programs, research, and special education. Kennedy Krieger Institute is internationally known and provides its facilities with some of the world's leading experts in the development disabilities field of study. Kennedy Krieger Institute is located in Baltimore, Maryland. Their mission statement is:

*"We at the Kennedy Krieger Institute dedicate ourselves to helping children and adolescents with disorders of the brain and spinal cord achieve their potential and participate as fully as possible in family, school and community life."**

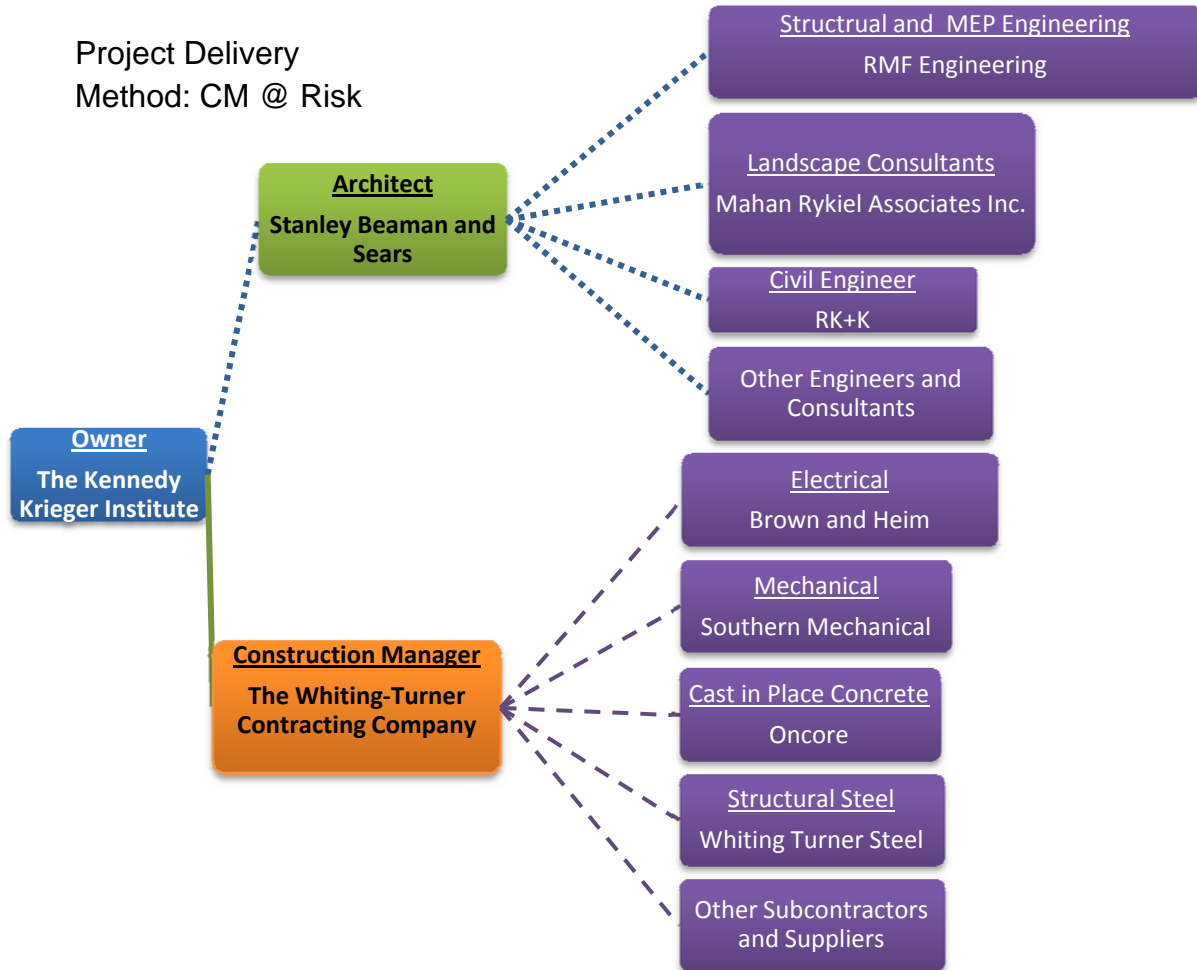
The Outpatient Medical Center will house the developmental disabilities center. Once the project is complete, the building will have a large physical therapy occupational therapy gymnasium, therapy pools, many treatment and exam rooms, children life area, and a therapy garden that will be located near the entrance of the building. Kennedy Krieger is excited to be able to expand its institution and can't wait to occupy the new facility.

*Quote is from the Kennedy Krieger Institute, more information can be found at kennedykrieger.org



Project Delivery

Contract types: — GMP Cost + Fee - - - Lump Sum

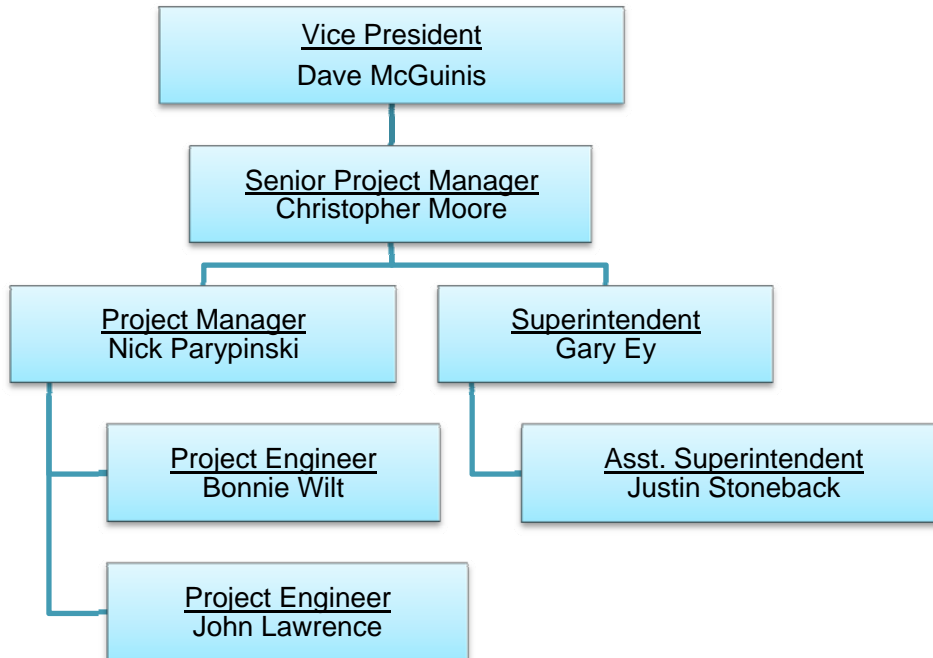


The above organizational chart shows that Whiting-Turner acts as the CM at risk and holds a GMP contract with the owner. Whiting-Turner has lump sum contracts with all its subcontractors. The owner has a cost, plus a fee contract with the Architect. The Architect also has cost plus a fee with the Engineers. This is the typical AIA standard for a CM at Risk.



Project Team

The organizational chart below shows all people involved with the construction of the Outpatient Medical Center. The Vice President acts as the project executive and spends most of his time working from the main corporate office. The rest of the staff works onsite to ensure construction is being done to the proper specifications according to the architect, engineers, and owner. The Senior Project Manager is responsible for all activities that take place onsite and is responsible for all the employees below him. He is in charge of overseeing the project engineers and the project progress. Each project engineer is given a set of responsibilities, such as overseeing and contracting subcontractors in a variety of trades. All project managers and project engineers are responsible to maintain and update each other on their trades work progress to continue good coordination between trades. This helps to keep the project running smoothly and efficiently. The superintendent and assistant superintendent work onsite and are responsible for keeping track of shipments and supplies as well as ensure that the construction workers and subcontractors are meeting their tasks accurately and safely. They are also in charge of keeping project managers informed of construction issues.





Building Systems Summary

- *Demolition/Excavation*

Demolition was needed to remove an existing parking lot. Once the parking lot was removed, excavation took place. Excavation at the south side was about 50 feet below the street level and the rest was surface grading from the north side toward the area where the foundation system would be installed (at the south end of the site). All site soils that were excavated were permanently removed from site.

- *Structural Steel*

Structural steel is used on the sixth floor penthouse area. Wide flange structural steel is carbon steel, ASTM A992, Grade 50. High strength bolts, nuts, and washers are ASMT 325 and have a mechanically deposited zinc-coating ASTM B695, class 50. Cold formed structural steel tubing is ASTM A500, Grade B material. The Structural steel is for the cooling tower framing, elevator connections, and to enclose the roof area.

- *Cast In Place*

The entire Medical center is cast in place concrete; this includes the foundation mat system, floors, and columns but excludes the 6th floor roof system which consists of structural steel. The foundation system consists of several mat slabs which are placed under the elevators, the columns, and exterior walls. Foundations are approximately 3 feet thick and vary in surface area depending on the item it is supporting. The floors are a pan and joist system with a floor thickness of 6 inches and joist spacing about every 8 inches on center. The columns are an average size of 30 inches in diameter and are located about every 24 feet from north to south and about every 29 feet east to west. Concrete compressive strength used throughout the building is 4000 psi concrete.



- *Precast Concrete*

The exterior façade is made up of architectural precast concrete panels. Panels are made with a minimum of 5000 psi concrete, 28 day strength, and air entrained 5 to 7 percent. Connection devices are all stainless steel, which are connected to embedded plates, and angels. Grout is to be of a minimum strength of 10,000 psi, 28 day strength and will be tinted to coordinate with panels.

- *Mechanical System*

The mechanical system consists of 3 air handling units with 40,000 cfm. There is also 1 air handling unit for the natatorium which has a 5,500 cfm. There are 2 chiller units with a 245 ton capacity. The chiller towers are located in the penthouse. Mechanical rooms are located in the basement and one mechanical room is located on the fifth floor and is for the natatorium units only.

- *Electrical System*

The Outpatient Medical Center uses 2500 amp power source that enters the building at its main switch board. The building also has twenty one 480/270 3 phase distribution switch boards and forty four 208/120 3 phase distribution switch boards and a 1500kVA transformer. The lighting in the building is mainly 277 volt lighting fixtures.

- *Curtain wall*

The curtain wall consists of aluminum frames with vision glazing and glass infill panels at the building's exterior as well as the canopy at the front entrance. The glazing used is one of five different types of glazing, some are tempered and some are filter, all are tinted.

- *Support for excavation*

Standard sheeting and shoring is used, which includes steel wide flange piles, with wood inlay to hold back the ground, and a several wailers to provide more structural support.



Project Costs

Total Building Area = 115,000 SF

- Construction Cost
 - \$32,840,888
 - \$285.57 / SF

- Total Project Cost
 - \$35,156,010
 - \$305.70 / SF

- Major Building Systems
 - Electrical
 - \$3,382,300
 - \$29.41 / SF
 - Structural
 - Concrete: \$4,181,700
 - \$36.36 / SF
 - Structural Steel: \$441,300
 - \$3.84 / SF
 - Mechanical
 - \$5,658,700
 - \$49.20 / SF



General Conditions Estimate

The General Conditions estimate summary is in the following table.

General Conditions Estimate	
Personnel	\$1,802,824.00
On-Site Office Trailer	\$8,580.00
Field Trailer	\$2,860.00
Site Miscellaneous	\$3,198,277.00
Total	\$5,012,541.00

The GC estimate summary is broke up into four categories: the personnel/staff, the main site trailer, the file trailer, and the rest of the site items. The general conditions cost is about \$5 million with a \$1.8 million for the staff, which is one reason why the general conditions is \$5 million. The site miscellaneous items included are construction tools, safety items, dumpsters demobilizing trailers and so on. For a look at the break down of the general conditions, go to [Appendix A](#). For a breakdown of the staffing cost, see table below.



Detailed Project Schedule

The detailed project schedule which can be found in **Appendix B** is a summary of the main construction activities. The project schedule is set up by major activities such as foundation, concrete floor slabs and concrete columns, structural steel, as well as a summary breakdown of each floor rough in and finishes. A majority of the items in the schedule have more than one activity per line. This is because several important of the trade tasks happen at the same time and therefore have been scheduled together. Multiple tasks per line item may not be of the same trade, this is good because it shows where different trades are working respectively beside another trade. This will also show the areas of the schedule where trade coordination will be needed. Once the concrete is placed and cured, mechanical, electrical, and plumbing rough-ins being. These critical activities being in the basement, where the mechanical equipment room is located and where the power enters the building, and continues upward from floor to floor until terminating at the penthouse where the AHU's and HVAC equipment is located. The schedule also divides each floor up into its own group of items. This illustrates the major tasks and their durations throughout the project time period. This division of floors does not happen for the third and fourth floor because they are very similar and therefore the critical items occur at the same time.

To see understand more about the Detailed Project Schedule, go to **Appendix B**.



Site Layout

The site plan depicts the superstructure phase of the project. This is the best phase to illustrate the size of the site with the limitations on available space. A tower crane is located at the center of the site. This works best because of its size and capabilities. It is able to reach most of the site and is used for lifting and moving all items on site. Although the crane is owned and operated by the concrete contractor they, signed a contract allowing other trades to use it when the concrete workers were not using it. The site plan shows a lot going on but one of the most important items is the access to the site. There is only one access to the site and it is located at the north end. Delivery trucks had to be scheduled very closely when materials were to be delivered because of the lack of space and because of the concrete trucks coming and going every twenty to thirty minutes.

Formwork and steel lay down area takes up about fifty percent of the available area. This creates little room to move large equipment around and does not permit construction workers space to park. Parking must be found among the local streets. Site utilities are hard to show on the site plan, because the temporary power was coming directly from the Kennedy Krieger Parking Garage which is located right beside the construction site. This powered the entire site including all site trailers. Temporary water was the only utility needed from the city, because sewer waste was pumped out of the trailer every week. Telecommunications was in the WT trailers only.

For public safety a chain linked fence surround the entire perimeter of the site and around the WT trailer, which is locate on median, and a fire hydrate was located at the corner of North Broadway and Ashland. For more site information, please see the site plan on **Appendix C**; note that the site scale is 1" = 40'.