

TECHNICAL ASSIGNMENT TWO
Cost and Schedule Analysis
October 24, 2008

The Scripps Research Institute

Biomedical Research Building

Florida Atlantic University
Jupiter, FL

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Architectural Engineering
Construction Management Option

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*. . . . at the forefront of biomedical science, a vital segment of medical research
that seeks to comprehend the most fundamental processes of life*



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Overview

Technical Assignment Two focuses on evaluating the scheduling, planning and cost of The Scripps Research Institute Biomedical Research Building in Jupiter, Florida. Included in this report are the following items: Detailed project schedule with respect to phasing of major construction sequences, site plans of the project for the structural phase of this project, detailed structural system estimate of the building, detailed general conditions estimate and a summary of critical industry issues discussed at the PACE roundtable meeting.

Schedule

The schedules found in *Appendix A* are detailed with respect to the phases of: site construction, foundations, structure, exterior and interior. These areas are further broken down to display the time in which key activities take place during each phase of construction. The level of detail is limited due to the 200 activity limit. Areas for improvement are identified and discussed in this report as well. Total Construction Time on this project totals 436 days.

Site Layout

Site plans can be found in *Appendix B*. These site plans identify the layout of management trailers, parking, each building, temporary utilities, as well as temporary operating around the building for crane and pump trucks for the placement of the structural concrete. Key decisions made by management that helped the efficiency of this project are discussed, as well as the advantages of the project location.

Structural Estimate

The detailed structural estimate was done utilizing a 3D model created utilizing Revit Structure 2009. The schedule outputs from this model were organized and the data was entered into MC² ICE Estimating Software. This estimate was then organized in excel and summarized in this report. Impacts that this type of structural system has on cost are discussed as well. *Appendix C* contains takeoff details and the entire MC² estimate. Total: **\$2,443,467.87**

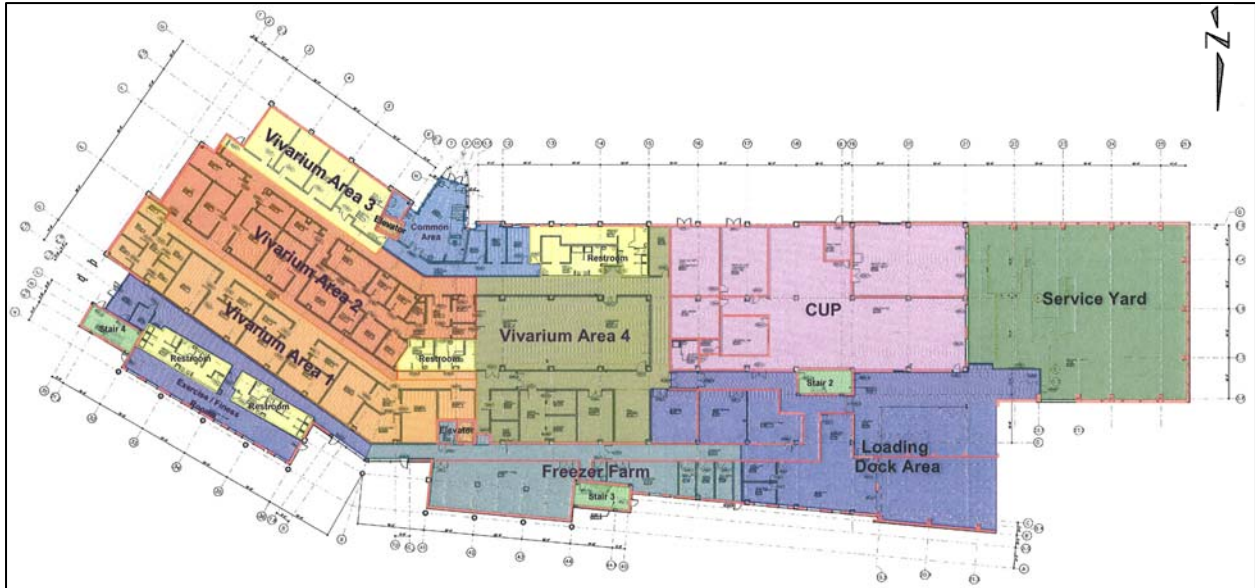
General Conditions

A highly detailed general conditions estimate based on information from the project team and RS Means 2008 totaling **\$9,214,945** is detailed and discussed in this report based on a 22 month construction time. This cost represents **5.2%** of the total project cost.

Critical Industry Issues

The breakout sessions from the PACE roundtable meeting; LEED Evolution and the Mentoring program are detailed in this report along with key contacts interacted with during the PACE roundtable event. These contacts include Coleman Walker from HASKELL, and John Bechtel with OPP.

The detailed schedule found in **Appendix A** shows construction activities that cover start to finish of TSRI Biomedical Research Building. The technical nature of this project made it difficult to decide how to show the level of detail and coordination required for this project in 200 activities. The first schedule in Appendix A shows the durations that specific activities occur on each floor. The second schedule in Appendix A depicts more clearly the activities and the order that they occur on each floor. Further breakdowns by the division of each floor into zones as depicted in the images below, helps management and subs alike to keep track of their progress and where they need to be to complete the project in the scheduled amount of time. Additional Floor plan and sequencing images can be found in **Appendix B**.



First Floor Construction Areas Division



Second Floor Construction Areas Division (very similar to the Third Floor Plan)

Detailed Project Schedule

FOUNDATIONS & SUPERSTRUCTURE

The schedule begins with preparation (vibroflotation) and testing of the building pad in preparation for foundations to begin. The foundations are completed in three phases from east, center and west beginning with the excavation and formwork for footings. Following the day that the footings are poured the formwork for 1st Floor columns begins. The building follows this pattern throughout from east to west through the construction of the superstructure.

INTERIORS

The Interior Construction starts with the construction of the interior and exterior CMU walls to prepare the building for enclosure. This is followed by the installation of MEP hangers and mechanical overhead MEP rough-in. The starts of framing and in wall rough-ins are nearly simultaneous. The first floor of this building is much more intensive due to the nature of the facility. All floors, walls, and ceilings are epoxy coated so the rough-in procedures must be highly coordinated to avoid problems and costly recoating of the walls and floors due to incorrect placement of the many technical elements which are a part of the experiments which will be performed in these lab areas. This area is equipped with a Vapor Hydrogen Peroxide (VHP) high level decontamination system to deal with health threats in this research area, which is another reason for the epoxy finishes. All equipment and nearly all the surfaces on this level are stainless steel. On all levels the installation of the laboratory systems is a critical component of construction and requires a high level of quality control. One area that I feel could have been evaluated and planned for to a much higher level of productivity pertains to the research labs on the 2nd and 3rd floors. These floors critical path was largely driven by the Islands in the research labs. The installation of the Island Tube Supports followed the framing of the walls and installation of flooring under the areas to have casework. Once the tube supports were installed the Casework could be installed on one side of the supports and left open on the other for the MEP trades to rough-in the Laboratory services required at each island. This was a major hold up at many points throughout the project. The same problems were experienced with the overhead service carriers installed on this project. Whenever hold ups occurred with the rough-in of these islands the casework contractor was delayed in installing the other side of the island casework, leading to delays in setting the epoxy tops, sinks and metal shelving for each island. One option that may have helped to alleviate these coordination issues would be prefabricating the MEP rough-in with the Island supports, lifting them into the building, bolting them down and installing the casework may have been a viable option for this system. Other Items on the critical path for this project include the specialized equipment installation. (Cage Washers, Fume Hoods, Bio Safety Cabinets etc.)

Summary of Select Events

Foundations	103 Days
Structure	281 Days
Exterior	219 Days
MEP Rough-in	190 Days
Elevators	73 Days
CUP & Penthouse Mechanical Systems	313 Days
Startup & Commissioning	174 Days

Summary of Key Dates

Bldg. Permit Issued	9/6/06
Begin Site Construction	10/10/06
Begin Bldg. Construction	12/15/06
Foundations Complete	7/9/07
Structure Complete	9/6/07
Watertight	1/25/08
Owner Move In	1/2/09



Scripps Florida

Print# 80923183
Date: 09/23/08

 Aerial Photography, Inc. 954-568-0484

Aerial View of the construction site reflects the site plans in **Appendix B**. The Conex Locations from the beginning of the project have been repaved and the conex relocated or removed from the site as many of the materials are inside the buildings at this point.

LOCATION ADVANTAGES

The Florida Atlantic University, Abacoa Campus is located in Jupiter, Florida off Interstate 95. The thirty three acre site is bordered by Donald Ross Road to the south, Central Blvd wraps the north and east sides of the site and the existing campus borders the west of the site. Donald Ross Road is the access point for the site due to the fact that it connects with Interstate 95 makes it an effective location for deliveries.

SITE SIZE REDUCES CONFLICT

Due to the size of the site there were no major limitations in organizing the site for various phases of construction. The choice to pre-pave and utilize future parking areas for material shakeout and storage was a key decision management made with the intent of providing space that was not going to become muddy or difficult to operate in due to the regular downpours experienced in this climate. A portion of this parking was also utilized for construction trades parking.

The Size of the site also allowed management to layout their site trailers at a location that made it easy for them to be located for deliveries immediately upon entering the site. Another advantage to the size of the site is the ability to separate main traffic routes for their

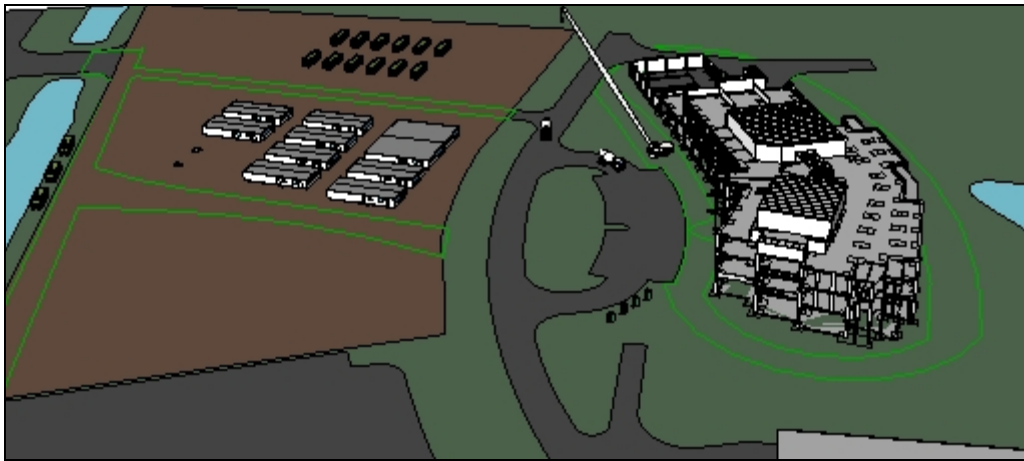
Site Layout Planning

designated purposes. Site trailers and trades parking is separated from the actual construction site. This allows efficient flow of material deliveries on the construction site without the confusion of site personnel and visitors being in the same traffic pattern. Separate parking controlled by permits for management, and construction personnel also allows for a more efficient site logistics plan and control.

EFFECTIVE DECISIONS

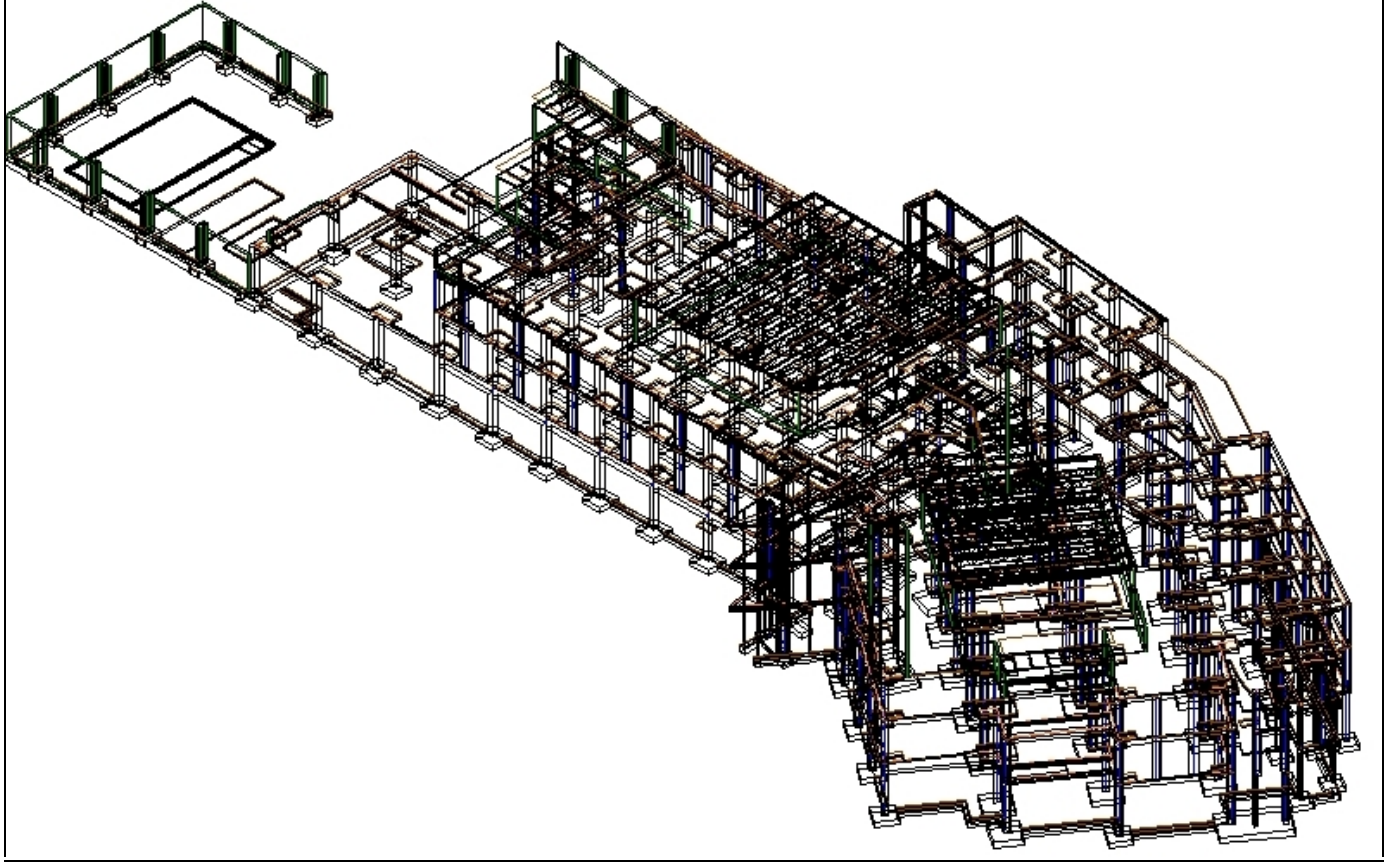
The early paving of the main roads through the site provided the areas in-front of each building for concrete deliveries to occur without hindering access to the other buildings on site as well as creating an area for staging material for the building enclosure.

The site plans in **Appendix B** show the location of site trailers, temporary utilities, site access and travel routes, dumpster locations and material storage locations. The concrete structure was phased from east to west on this project.



Site with the Crane & Pump Truck path around the building during the structural Phase

The Building has a temporary operation path around the building for the crane and pump truck to operate to maximum efficiency at each stage of pouring the CIP concrete structure.



The Structural System Is Cast In Place Concrete (Modeled In Revit for Takeoffs)

The Structural System of TSRI Biomedical Research Building is a two way cast in place 10" flat slab with 14" drop panels, 24"x24" perimeter beams, and 24" square concrete columns which run to square spread footings which are 2' deep. Typical bays are 22' by 32'. The floor to floor height on the first floor is 18' and 15' at the other levels. The lateral system is comprised of concrete moment frames formed by the concrete columns and the flat slab. The mechanical penthouse consists of steel joists on 12" masonry. The horizontal formwork for the slabs and beams was all plywood and timber formwork constructed onsite. The vertical formworks for the columns were all steel forms which were prefabricated and bolted together onsite.

To accurately calculate the quantities for this structural takeoff the concrete structure was modeled in Autodesk Revit Structure 2009. The quantities for each component of the structural system were then entered into MC² ICE Estimating Software to come up with cost information. Quantity takeoff information can be found in **Appendix C** along with the MC² Cost Estimate organized in Excel.

Detailed Structural Estimate

Structural Estimate Summary

Excavation / Backfill / Fill / Vapor Barrier	\$67,452.32
Formwork / Control Joints	\$980,559.96
Concrete Footings	\$60,931.72
Concrete & Steel Columns	\$52,516.43
Slabs & Concrete Beams	\$685,625.87
Concrete Reinforcing	\$428,021.80
Concrete Finishing	\$127,811.37
Metal Roof Decking	\$13,012.83
Steel Beams / K & LH Joists	\$27,535.57

TOTAL: \$2,443,467.87

ASSUMPTIONS / DETAILS

The Structural Estimate was developed utilizing a 3-D model created in Revit Structure 2009. One advantage obtained through the utilization of this model was accounting for the amount of concrete that was framed into each component so as to not double count at the intersection of beams, columns, drop panels and slabs. The exported schedules of the system were organized into the takeoff summary in Appendix C.

- Formwork on the project for columns were prefabricated metal forms bolted together on site, so Metal Framed Column Forms were selected in MC²
- All other formwork on this project was field constructed timber formwork
- Rebar Calculations were performed for the most common column, floor slab, beam and drop panels throughout the system and these weights were used to enter in each component of the structural concrete system to MC² with respect to the calculated amounts.

The cost of formwork is **40%** of the cost in this estimate. The initial cost of the pre-fabricated metal forms will easily pay for itself in the field due to the number of columns which have the same dimensions. Any type of repetitive design for a concrete system which can have pre-fabricated formwork that can be reused on this project would provide a great cost and time savings to this type of system. Also a shoring system such as ALSHOR PLUS could have a great impact on time savings for this activity on a project of this nature.

(<http://www.rmdaustralia.com.au/>)

General Conditions Estimate

The Detailed General Conditions Estimate on the next few pages is a combination of research conducted on this project through communication with members of the project team, as well as a number of items from RS Means 2008. The total Estimate for The Scripps Research Institute came to a total of **\$9,214,945**. This figure does not include insurance, bonding, fee, or contingency. Those costs are all covered under a separate category for this project. Other costs which were covered under the price of the work under separate contracts include equipment costs associated with the work performed by subcontractors. Each subcontractor supplied the equipment necessary to complete their work.

The project duration of 22 months was used as a base for many of the calculations found in the general conditions estimate. Security is a very large concern from a construction standpoint on a facility of this technical nature, which accounts for the large amount allocated for security on this project. Security was handled by a third party who provided 24 hour/day personnel on the site as well as cameras located at multiple locations over the project site.

The largest cost to the project comes from the staffing costs for the site personnel. The combined cost of the staffing the project and travel/relocation costs totals nearly **78%** of the General Conditions Estimate. This is a necessary component of the project and providing travel and relocation costs for employee's results in less stress for the employees concerning the stress of being away from family, and being placed in an unfamiliar location. This project is staffed with highly experienced personnel who have worked with the owner on projects in California, so the owner knows that the personnel on this project are devoted to making the project a success which helps promote a positive working relationship.

The General Conditions Cost on this project account for approximately **5.2%** of the entire project cost of all construction and design fees which **\$186,751,957**.

General Conditions Estimate Summary

Site Personnel	\$7,071,218
Staff Travel/Relocation Costs	\$423,958
Jobsite Office	\$725,393
Vehicles/Travel	\$308,464
Jobsite Office Eq/Services	\$574,696
Security/Safety/Cleanup	\$536,216

TOTAL: \$9,639,945

GENERAL CONDITIONS ESTIMATE

DESCRIPTION	QUANTITY	UNIT	UNIT COST	SUBTOTAL
Jobsite Management				
Project Director	96	Weeks	5,114.58	\$491,000
Site/Shells				
Senior Project Manager - Site/Shells	96	Weeks	4,296.25	\$412,440
Project Manager - Structural/Site	53	Weeks	3,403.21	\$180,370
Project Engineer - Structural/Site	83	Weeks	2,230	\$185,090
Project Manager - Ext. Envelope/Elev.	56	Weeks	3388.57	\$189,760
Assistant Project Manager - Ext. Envelope/Elev.	52	Weeks	2,600	\$135,200
Superintendent Bldgs. A, C	41	Weeks	3,400	\$139,400
Superintendent Bldgs. B, Site	65	Weeks	3,447.08	\$224,060
Assistant Superintendent Bldgs. A, C	43	Weeks	2,600	\$111,800
Assistant Superintendent Bldgs. B, Site	78	Weeks	2,651.67	\$206,830
FOC - Site/Shells	96	Weeks	1,630	\$156,480
Receptionist	70	Weeks	1,028.57	\$72,000
MEP/BAC/I&C				
MEP Coordinator	100	Weeks	3,468.4	\$346,840
Electrical Coordinator	96	Weeks	3,477.92	\$333,880
Project Engineer - MEP	57	Weeks	2,209.65	\$125,950
Interiors				
Senior Project Manager - Interiors	87	Weeks	4,306.21	\$374,640
Project Manager - Lab Casework / Interiors	44	Weeks	3,570	\$157,080
Project Manager - Interior Finishes	43	Weeks	3,570	\$153,510
Project Manager - Food Servie/Specialties	74	Weeks	3,501.08	\$259,080
Project Engineer	44	Weeks	2,310	\$101,640
Project Engineer	39	Weeks	2,310	\$90,090
Superintendent - Bldg. A	55	Weeks	3,536	\$194,480
Superintendent - Bldg. B	57	Weeks	3,531.23	\$201,280
Superintendent - Bldg. C	57	Weeks	3,531.23	\$201,280
Assistant Superintendent - Cafeteria/Food Service	48	Weeks	2,719.17	\$130,520
FOC - Interiors	74	Weeks	1,647.57	\$121,920
Project Controls				
Senior Project Manager	100	Weeks	4,284.4	\$428,440
Scheduler	83	Weeks	2,648.55	\$219,830
Safety	92	Weeks	2,452.17	\$225,600
Document Control	96	Weeks	1,882.17	\$180,688
QA/QC	87	Weeks	3,075.86	\$267,600
Accountant	96	Weeks	1,841.25	\$176,760
Cost Engineer	96	Weeks	2,455	\$235,680
SBE	1	LS	40,000	\$40,000

General Conditions Estimate



Staff Travel/Relocation Costs (Non-Precon)

Airfares	101	Trips	500	\$50,500
Auto Rental/Taxi	28	Days	57.2	\$1,602
Fuel/Parking	28	Days	73.43	\$2,056
Lodging/Hotel	50	Days	228	\$11,400
Housing	82.2	Months	2,500	\$205,500
Moving costs	6	EA	12,500	\$75,000
Relocation/closing costs	1	LS	42,200	\$42,200
Meals	1	LS	35,700	\$35,700

Jobsite Office

Office Trailer (7 units- 84'x56')	24	Months	4,825	\$115,800
Owner Trailer (double - 24' x 56')	24	Months	835	\$20,040
Conference Trailer (double - 24' x 56')	24	Months	835	\$20,040
Jobsite Set-up/Demobilization	1	LS	78,370	\$78,370
Decks/Porches/Steps	1	LS	60,272	\$60,272
Trailer Improvements	1	LS	44,878	\$44,878
Jobsite Furniture	32	Staff	520	\$16,640
Copy Machine (Full Size)	22	Months	794.18	\$17,472
IT Systems & Support	22	Months	9,068.18	\$199,500
Network Active Equipment	1	LS	15,000	\$15,000
High Speed Data Set-up	1	LS	2,600	\$2,600
High Speed Data Monthly	22	Months	416	\$9,152
Printer	2	EA	780	\$1,560
Scanner	1	EA	905	\$905
Plotter	1	EA	6,240	\$6,240
Fax Machine	2	EA	520	\$1,040
Telephone Set-up (New Service)	1	LS	7,800	\$7,800
Telephone Monthly Cost	22	Months	1,638	\$36,036
Security System/Service	22	Months	1,090.91	\$24,000
Radios/Nextels/Cell Phones	22	Months	2,184	\$48,048

Vehicles/Travel

Trucks (8ea.)	21	Months	9,984	\$209,664
Fuel-Trucks/Cars	100	Weeks	988	\$98,800

Jobsite Office Eq/Services

Courier	92	run/day	312	\$28,704
Postage/Federal Express	22	Months	595.64	\$13,104
Owner Meetings & Planning	96	weeks	236.17	\$22,672
Petty Cash	96	weeks	176.58	\$16,952
Office Supplies	22	Months	1,701.82	\$37,440
Copier Paper	22	Months	200	\$4,400
Drinking Water/Soda/Coffee	22	Months	64.73	\$1,424
Document Reproduction	1	LS	450,000	\$450,000

General Conditions Estimate



Security/Safety/Cleanup

Project Signs/Bulletin Boards	1	LS	520	\$520
Debris Boxes (Trailer Only)	44	EA	327.27	\$14,400
Construction Water Costs	22	Months	58.91	\$1,296
Temporary Toilet Services - Trailers	22	Months	227.27	\$5,000
Security Allowance	1	LS	425,000	\$425,000
Site Fencing	1	LS	90,000	\$90,000

TOTAL - ESTIMATE	\$9,639,945			
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LEED EVOLUTION OVERVIEW

In attending the LEED Evolution breakout session many key points were discussed in relation to the way that LEED has impacted the construction industry on many levels. Industry members from Southland had a lot to say about their position as mechanical specialists as to the effect that LEED has had on their projects, and problems that they see with the rating system as it is now. The main points discussed in this session included the lack of integration with respect to key project team members being brought onto the project at a date too late for them to have any substantial input into the design of the building. Scheduling time frames for the new sophisticated systems being installed, along with the decision making process involved with selecting new technologies for projects were also discussed. The variations to come with LEED 2009 were also discussed. The biggest discussion topic which was brought up many times throughout the session focused on project owners.

LEED impacts/problems from design standpoint

One problem which has become evident to professionals who have experience with LEED projects is the way that innovation points are awarded. Industry members are seeing that the awarding of points is not consistent from project to projects, making it difficult to make an accurate prediction of all the points you will be able to obtain from one project to the next. The possibility of documentation of successful strategies for obtaining innovation points for reference to design professionals was discussed as a possibility to have an impact on this specific problem.

Integration

A major discussion topic of this session focused on the need for project team integration and involvement from the earliest stages of design. By having the project team communicate about advantages and disadvantages as well as solutions to problems during the design phase alleviates many problems which can occur by bringing team members on board too far along in the design process. By the time the mechanical engineer is being asked to do his/her design many opportunities to optimize the performance of the building system are lost. Design Build has proved to be a much more effective delivery method for these kinds of projects according to the experience the industry members have had.

Scheduling

Scheduling problems associated with employing new technologies to the building systems have also been realized. Many contractors are used to installing the same type of equipment job after job, and learning about the new system and how it operates can be a major problem in the selection of these technologies. Also the time it takes owners to make decisions to go with the different technologies can become an issue with respect to lead time for these systems.

Changes in LEED 2009

In discussing the changes to come with LEED 2009 many issues and questions came up. The need for regional points based on the climate conditions of the geographic area of projects is apparent to professionals being asked to design LEED projects in different areas of the country. A way to keep a running list of points based on the region is a needed addition to the rating system in the eyes of the industry members, as well as a more performance based rating

system, which includes the need for ongoing commissioning (Permanent Level Metering System) of the building systems after construction is completed and the project team has fulfilled its contractual obligations. A problem that the industry members are predicting with respect to the hold that LEED will take industry wide is the advantage to building in cities as opposed to more rural areas. Points that are automatic for city projects are nearly impossible or much more difficult and costly in urban regions. Things such as material availability, recycling costs and public transportation are all much easier to achieve in urban settings. The possibility that LEED will only be concentrated to the big cities is very real. The difficulty associated with achieving a LEED rating in a rural area is already somewhat high. This may pose the problem of owners not even attempting to achieve a LEED rating in many areas. The need for a rural standard and an urban standard is apparent.

Owner

The topic of owners and LEED was the strongest topic of discussion in this session without question. The problem with most owners who want LEED projects is that they do not grasp what owning a LEED building entails, and the problem with the resistance to LEED is largely related to the first cost mentality of the industry. More evaluations of the cost impacts of using sustainable technology compared to conventional building methods with respect to initial construction costs v.s. lifecycle costs of operating the building needs to be taken on by an organization which is not pushing for or against the LEED evolution. The need for a multiple project case study in the same area with the same intended use and size being designed conventionally and sustainability to provide evidence of the cost difference so that it is more clear to owners how their decision to green will affect cost in the short and long term cases. The main problem discussed with respect to the project owner and LEED is simply the need for the owner to be educated as to what they are purchasing. Training and the possibility of LEED points for the level of involvement the owner takes in the interest of LEED and operating the building as it is designed once the project team is off the project were items discussed. The need for commitment from the owner through all phases of construction and after construction to have personnel trained to operate the new technologies and maintain efficiency is necessary to the impact that LEED will have on this industry.

Summation of the LEED Evolution Session

In summation this discussion made something very clear. Owners Bring The Change. The ability that owners have to affect the direction the industry will take is very real. Sustainable building technologies are taking a hold in the market and as the owners continue to promote the use of these technologies the costs will come down as technology and competition improve. Government energy standards are forcing the performance of systems to be maximized. In this way they are leading the owners. Sustainable practices need to be an industry standard. It needs to be "What We Do". It should not be a cost issue.

MENTORSHIP

Three to four students partnered with an industry member for a breakout session to discuss the mentorship plan that the AE program here is currently working on getting started. This session focused on identifying the benefits for students, benefit to industry professionals who participate, how to match mentors and students, how to maintain contact, as well as how to assess the success of the relationship between the mentor and the student.

Benefits to Student

The benefits to the student will vary with respect to the year of the student in the major, as well as the interest that the student has in various areas of construction. Obvious benefits to students include exposure and advice from real industry professionals who have been in their position, and are now working in the fields of interest which are being considered by the students, providing career path selection advice as well as establishing a connection between what is being learned in the classroom and how it is applied in the industry.

Benefits to Industry

The benefits to professionals pertain to the knowledge that students are gaining prior to their employment in the industry. The ability to influence what is being taught within the curriculum to enhance the learning experience and better prepare students for life after college is also a very real possibility through this program. Taking advantage of the most up to date technology and software being taught to the students is also a benefit that the industry members can obtain from these relationships. The companies who participate in this will also have a great chance to enhance their image to the students that they look to hire through showing that they have interest in helping and mentoring the students.

Matching Mentors

The issue of matching students to mentors was controversy. In one case a group of students (1st & 2nd years prior to option selection) having a single mentor, or group of diversified mentors were ideas. The idea of rotating, or having the option to change mentors for various reasons were also discussed. One key point that was made about the mentorship program was the fact that it should be completely separate from any recruiting operations, and used solely for the benefit of the student and mentor alike.

Contact

Maintaining effective contact was discussed briefly to include a face to face meeting to kick the interaction off. Following that the need for pre-arranged meetings at defined times would be an effective way to ensure that contact is maintained.

Assessment

The assessment of the relationships between students and mentors needs to be taken seriously so that should a student or mentor not hold to their commitments that there is a fallback system to address any problems that exist. Assessing the availability and willingness of the students and mentors to be available to their contacts is vital to the success of such a program. Having group sessions that bring industry and students together frequently were also discussed as good ways to assess, maintain and build the relationships which exist between industry professionals and students.

KEY CONTACTS

I was able to spend a large amount of time interacting with Coleman Walker the Director of Corporate Recruiting for HASKELL based out of Jacksonville, Florida. He spoke at length about the importance of having face time with the future industry members such as ourselves, and took the time to discuss in detail the type of work that HASKELL is a part of, and how they are working to be an industry leader once again in implementing the new technologies that are becoming an integral part of many construction projects. As a Design Build Leader in the industry I feel that the advice, and contacts he will be able to provide with respect to the changes in construction services and methods will be invaluable in the near future.

John Bechtel with OPP here at Penn State was another industry professional I was able to interact with during one of the session breaks. His view from the owners side of the industry, and the fact that he is located here at Penn State makes him a valuable contact to have.

Appendix A

Detailed Project Schedule

Key Interior Activities

Appendix B

Site Layout of Zones & Phasing

Overall Site Plan For All Phases & Buildings

Structural Up Close To The Building

Appendix C

Detailed Structural Estimate

MC² Estimate Organized in Excel

ID	Task Name	Duration	Start	Finish	October 1	March 21	September	February	July 21	January 1	June 11	November					
					9/18	12/4	2/19	5/7	7/23	10/8	2/2	3/11	5/27	8/12	0/2	1/13	3/30
1	The Scripps Research Institute	619 days?	Tue 8/22/06	Fri 1/2/09													
2	Building Permit Issued	0 days	Wed 9/6/06	Wed 9/6/06													
3	Site	457 days	Tue 10/10/06	Wed 7/9/08													
4	Begin Site Construction	0 days	Tue 10/10/06	Tue 10/10/06													
5	Construction	457 days	Tue 10/10/06	Wed 7/9/08													
6	BUILDING C	619 days?	Tue 8/22/06	Fri 1/2/09													
7	Bid/Buyout	6 days	Tue 8/22/06	Tue 8/29/06													
8	Coordination/Shop Drawings/Submittals	103 days	Thu 11/30/06	Mon 4/23/07													
9	Fabrication	190 days	Mon 1/8/07	Fri 9/28/07													
10	Begin Building C Construction	0 days	Fri 12/15/06	Fri 12/15/06													
11	Construction	436 days?	Fri 12/15/06	Fri 8/15/08													
12	Rough Grade Bldg. Pad	15 days	Fri 12/15/06	Thu 1/4/07													
13	Vibroflotation	13 days?	Tue 1/9/07	Thu 1/25/07													
14	Bldg. Pad Tested	3 days	Fri 2/2/07	Tue 2/6/07													
15	Foundations	103 days?	Thu 2/15/07	Mon 7/9/07													
16	East	92 days?	Thu 2/15/07	Fri 6/22/07													
17	Drill Holes/Set Cylinders	8 days	Thu 2/15/07	Mon 2/26/07													
18	Excavate/Form Footings & Pads	10 days	Thu 2/15/07	Wed 2/28/07													
19	Excavate/Form/ Pour/ Strip Elevator Pit	10 days	Thu 2/15/07	Wed 2/28/07													
20	Waterproofing	1 day	Tue 2/27/07	Tue 2/27/07													
21	Pour Footing & Mech. Pads	1 day?	Thu 3/1/07	Thu 3/1/07													
22	Backfill & Compact Subgrade	8 days?	Mon 5/14/07	Wed 5/23/07													
23	Strip Shoring	2 days	Thu 5/17/07	Fri 5/18/07													
24	Underground Plumbing	11 days?	Mon 5/21/07	Mon 6/4/07													
25	Underground Mechanical Piping	10 days?	Fri 6/1/07	Thu 6/14/07													
26	Prep & Pour Slab on Grade	6 days?	Fri 6/15/07	Fri 6/22/07													
27	Center	82 days?	Thu 3/1/07	Fri 6/22/07													
28	West	84 days?	Wed 3/14/07	Mon 7/9/07													
29	Foundations Complete	0 days	Mon 7/9/07	Mon 7/9/07													
30	Structure	281 days?	Fri 3/2/07	Fri 3/28/08													
31	1st Floor Pour #1: EAST	6 days?	Fri 3/2/07	Fri 3/9/07													
32	Form/ Pour/ Strip Columns	6 days?	Fri 3/2/07	Fri 3/9/07													
33	1st Floor Pour #2: Center	6 days?	Thu 3/15/07	Thu 3/22/07													
34	Form/ Pour/ Strip Columns	6 days?	Thu 3/15/07	Thu 3/22/07													
35	1st Floor Pour #3: West	6 days?	Wed 3/28/07	Wed 4/4/07													
36	Form/ Pour/ Strip Columns	6 days?	Wed 3/28/07	Wed 4/4/07													
37	2nd Floor Pour #1	10 days?	Thu 3/15/07	Wed 3/28/07													
38	Form & Shore Deck	3 days?	Thu 3/15/07	Mon 3/19/07													
39	Install Rebar	2 days?	Tue 3/20/07	Wed 3/21/07													
40	Deck Rough-in	3 days	Wed 3/21/07	Fri 3/23/07													
41	Pour Deck	1 day?	Fri 3/23/07	Fri 3/23/07													

Project: Summary Schedule of The Sc
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Task		Rolled Up Task		External Tasks	
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ID	Task Name	Duration	Start	Finish	October 1	March 21	September	February	July 21	January 1	June 11	November				
					9/18	12/4	2/19	5/7	7/23	10/8	2/2	3/11	5/27	8/12	0/2	1/13
42	Form/ Pour/ Strip Columns	2 days?	Tue 3/27/07	Wed 3/28/07					I							
43	2nd Floor Pour #2	12 days	Tue 3/20/07	Wed 4/4/07					I							
44	2nd Floor Pour #3	12 days	Thu 3/29/07	Fri 4/13/07					I							
45	2nd Floor Pour #4	12 days	Thu 4/5/07	Fri 4/20/07					I							
46	2nd Floor Pour #5	11 days	Thu 4/12/07	Thu 4/26/07					I							
47	3rd Floor Pour #1	10 days	Wed 4/18/07	Tue 5/1/07					I							
48	3rd Floor Pour #2	10 days	Mon 4/23/07	Fri 5/4/07					I							
49	3rd Floor Pour #3	10 days	Thu 4/26/07	Wed 5/9/07					I							
50	3rd Floor Pour #4	10 days	Tue 5/1/07	Mon 5/14/07					I							
51	Roof Pour #1	7 days?	Fri 5/4/07	Mon 5/14/07					I							
52	Form & Shore Deck	4 days	Fri 5/4/07	Wed 5/9/07					I							
53	Install Rebar	2 days	Wed 5/9/07	Thu 5/10/07					I							
54	Deck Rough-in	2 days	Thu 5/10/07	Fri 5/11/07					I							
55	Pour Roof Deck	1 day?	Mon 5/14/07	Mon 5/14/07					I							
56	Roof Pour #2	7 days	Thu 5/10/07	Fri 5/18/07					I							
57	Roof Pour #3	7 days	Wed 5/16/07	Thu 5/24/07					I							
58	Roof Pour #4	8 days	Mon 5/21/07	Wed 5/30/07					I							
59	Penthouse	71 days?	Thu 5/31/07	Thu 9/6/07					I							
60	Erect Scaffolding	4 days?	Thu 5/31/07	Tue 6/5/07					I							
61	Equipment Pads	5 days	Thu 5/31/07	Wed 6/6/07					I							
62	CMU Walls	19 days	Tue 7/17/07	Fri 8/10/07					I							
63	Joist & Deck	9 days	Mon 8/27/07	Thu 9/6/07					I							
64	Install Metal Stairs	159 days	Tue 8/21/07	Fri 3/28/08					I							
65	Stairwell 2	154 days	Tue 8/28/07	Fri 3/28/08					I							
66	Install Metal Stairs	6 days	Tue 8/28/07	Tue 9/4/07					I							
67	Pour Stairs & Landings	3 days	Wed 9/5/07	Fri 9/7/07					I							
68	Install Handrails	5 days	Mon 3/24/08	Fri 3/28/08					I							
69	Stairwell 3	148 days	Wed 9/5/07	Fri 3/28/08					I							
70	Stairwell 4	159 days	Tue 8/21/07	Fri 3/28/08					I							
71	Structure Complete	0 days	Thu 9/6/07	Thu 9/6/07					I							
72	Exterior	219 days	Tue 3/27/07	Fri 1/25/08					I							
73	Service Yard	152 days	Tue 3/27/07	Wed 10/24/07					I							
74	Loading Dock	196 days	Fri 4/27/07	Fri 1/25/08					I							
75	Roof	101 days	Tue 7/17/07	Tue 12/4/07					I							
76	South Elevation	76 days	Tue 7/24/07	Tue 11/6/07					I							
77	West Elevation	67 days	Thu 8/16/07	Fri 11/16/07					I							
78	North Elevation	75 days	Wed 9/5/07	Tue 12/18/07					I							
79	Erect Scaffolding	5 days	Wed 9/5/07	Tue 9/11/07					I							
80	Stucco	15 days	Wed 9/12/07	Tue 10/2/07					I							
81	Soffit Work	10 days	Wed 9/26/07	Tue 10/9/07					I							
82	Hollow Metal Doors	2 days	Wed 10/3/07	Thu 10/4/07					I							

Project: Summary Schedule of The Sc Date: Thu 10/23/08	Task		Rolled Up Task		External Tasks	
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					9/18	12/4	2/19	5/7	7/23	10/8	2/2	3/11	5/27	8/12	0/2	1/13
83	EFIS Finish	5 days	Wed 10/3/07	Tue 10/9/07												
84	Windows/Curtain Wall	20 days	Wed 10/10/07	Tue 11/6/07												
85	Waterproofing	3 days	Wed 10/10/07	Fri 10/12/07												
86	Caulking	5 days	Wed 10/31/07	Tue 11/6/07												
87	Paint	8 days	Wed 11/7/07	Fri 11/16/07												
88	Dismantel Scaffolding	7 days	Mon 11/19/07	Tue 11/27/07												
89	Metal Cladding/Trim	15 days	Wed 11/28/07	Tue 12/18/07												
90	Penthouse Roofing	7 days	Fri 9/7/07	Mon 9/17/07												
91	East Elevation	71 days	Fri 9/28/07	Fri 1/4/08												
92	Window/Curtain Wall Testing	3 days	Fri 11/2/07	Tue 11/6/07												
93	Watertight	0 days	Fri 1/25/08	Fri 1/25/08												
94	Interior Construction	313 days?	Wed 6/6/07	Fri 8/15/08												
95	Central Utilities Plant Installatoin of Mech Equip 1st Floor	145 days	Tue 7/10/07	Mon 1/28/08												
96	Penthouse Mech Equip & Connections	114 days?	Mon 8/13/07	Thu 1/17/08												
97	CMU All Areas Including Exterior 1st Floor	30 days?	Tue 7/10/07	Mon 8/20/07												
98	CMU All Areas Including Exterior 2nd Floor	14 days?	Wed 6/6/07	Mon 6/25/07												
99	CMU All Areas Including Exterior 3rd Floor	15 days?	Tue 6/26/07	Mon 7/16/07												
100	MEP Hangers 3rd Floor	10 days?	Tue 6/26/07	Mon 7/9/07												
101	MEP Hangers 1st Floor	10 days?	Tue 7/24/07	Mon 8/6/07												
102	MEP Hangers 2nd Floor	10 days?	Mon 9/17/07	Fri 9/28/07												
103	OH MEP Rough-in 3rd Floor	30 days?	Tue 7/17/07	Mon 8/27/07												
104	OH MEP Rough-in 1st Floor	40 days	Tue 8/7/07	Mon 10/1/07												
105	OH MEP Rough-in 2nd Floor	30 days	Mon 10/1/07	Fri 11/9/07												
106	Plumbing In-wall Rough 3rd Floor	46 days	Tue 8/28/07	Tue 10/30/07												
107	Plumbing In-wall Rough 1st Floor	124 days	Fri 9/7/07	Wed 2/27/08												
108	Plumbing In-wall Rough 2nd Floor	47 days	Thu 12/13/07	Fri 2/15/08												
109	Electrical In-wall Rough 3rd Floor	46 days	Tue 8/28/07	Tue 10/30/07												
110	Electrical In-wall Rough 1st Floor	124 days	Fri 9/7/07	Wed 2/27/08												
111	Electrical In-wall Rough 2nd Floor	47 days	Thu 12/13/07	Fri 2/15/08												
112	Door Frames 3rd Floor	36 days	Tue 8/28/07	Tue 10/16/07												
113	Door Frames 1st Floor	113 days	Fri 9/7/07	Tue 2/12/08												
114	Door Frames 2nd Floor	37 days	Thu 12/13/07	Fri 2/1/08												
115	Frame Soffits/Ceilings/ Walls 3rd Floor	41 days	Tue 8/28/07	Tue 10/23/07												
116	Frame Soffits/Ceilings/ Walls 1st Floor	106 days	Wed 9/26/07	Wed 2/20/08												
117	Frame Soffits/Ceilings /Walls 2nd Floor	42 days	Thu 12/13/07	Fri 2/8/08												
118	Branch Duct & VAV's 3rd Floor	77 days	Tue 8/14/07	Wed 11/28/07												
119	Branch Duct & VAV's 1st Floor	75 days	Wed 10/24/07	Tue 2/5/08												
120	Branch Duct & VAV's 2nd Floor	42 days	Thu 11/29/07	Fri 1/25/08												
121	Service Carrier 3rd Floor	16 days?	Tue 8/28/07	Tue 9/18/07												
122	Service Carrier 2nd Floor	17 days?	Thu 12/13/07	Fri 1/4/08												
123	Piping/ Conduit @ Service Carrier 3rd Floor	20 days?	Wed 9/5/07	Tue 10/2/07												















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Task		Rolled Up Task		External Tasks	
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					9/18	12/4	2/19	5/7	7/23	10/8	2/2	3/11	5/27	8/12	0/2	1/13
124	Piping/ Conduit @ Service Carrier 2nd Floor	22 days?	Thu 12/20/07	Fri 1/18/08												
125	Island Casework Supports 3rd Floor	16 days?	Tue 8/28/07	Tue 9/18/07												
126	Island Casework Supports 2nd Floor	17 days?	Thu 12/13/07	Fri 1/4/08												
127	Island Piping/ Conduit 3rd Floor	20 days?	Wed 9/5/07	Tue 10/2/07												
128	Island Piping/ Conduit 2nd Floor	22 days?	Thu 12/20/07	Fri 1/18/08												
129	Rough-in Hard Lids 1st Floor	42 days?	Mon 12/10/07	Tue 2/5/08												
130	Gyp Board @ Walls/ Soffits 3rd Floor	16 days?	Mon 12/10/07	Mon 12/31/07												
131	Gyp Board @ Walls/ Soffits 1st Floor	46 days?	Thu 1/3/08	Thu 3/6/08												
132	Gyp Board @ Walls/ Soffits 2nd Floor	36 days?	Tue 1/8/08	Tue 2/26/08												
133	Taping @ Walls/Soffits 3rd Floor	12 days?	Tue 12/18/07	Wed 1/2/08												
134	Taping @ Walls/Soffits 1st Floor	51 days?	Fri 1/11/08	Fri 3/21/08												
135	Taping @ Walls/Soffits 2nd Floor	41 days?	Wed 1/16/08	Wed 3/12/08												
136	Pull Data Cable 3rd Floor	31 days	Tue 9/25/07	Tue 11/6/07												
137	Pull Data Cable 1st Floor	63 days	Mon 12/10/07	Wed 3/5/08												
138	Pull Data Cable 2nd Floor	42 days	Fri 12/28/07	Mon 2/25/08												
139	Low Voltage Ceiling Devices 3rd Floor	29 days?	Thu 1/17/08	Tue 2/26/08												
140	Low Voltage Ceiling Devices 1st Floor	35 days?	Mon 2/25/08	Fri 4/11/08												
141	Low Voltage Ceiling Devices 2nd Floor	12 days?	Tue 3/18/08	Wed 4/2/08												
142	Light Fixtures 3rd Floor	32 days?	Thu 1/17/08	Fri 2/29/08												
143	Light Fixtures 1st Floor	38 days?	Mon 2/25/08	Wed 4/16/08												
144	Light Fixtures 2nd Floor	15 days?	Tue 3/18/08	Mon 4/7/08												
145	Fire Protection Heads 3rd Floor	29 days?	Thu 1/17/08	Tue 2/26/08												
146	Fire Protection Heads 1st Floor	90 days?	Mon 12/10/07	Fri 4/11/08												
147	Fire Protection Heads 2nd Floor	12 days?	Tue 3/18/08	Wed 4/2/08												
148	Counter Tops 1st Floor	51 days?	Wed 1/23/08	Wed 4/2/08												
149	Epoxy Finishes (FLOORS/WALLS/CEILINGS) 1st Floor	81 days?	Fri 1/25/08	Fri 5/16/08												
150	Install Fume Hoods 3rd Floor	20 days?	Tue 1/15/08	Mon 2/11/08												
151	Install Fume Hoods 2nd Floor	31 days?	Mon 2/11/08	Mon 3/24/08												
152	Install Fume Hoods 1st Floor	65 days?	Mon 2/25/08	Fri 5/23/08												
153	HVAC Diffusers 3rd Floor	29 days?	Thu 1/17/08	Tue 2/26/08												
154	HVAC Diffusers 1st Floor	30 days?	Mon 3/3/08	Fri 4/11/08												
155	HVAC Diffusers 2nd Floor	12 days?	Tue 3/18/08	Wed 4/2/08												
156	Lab Piping / Conduit @ Wall Casework 3rd Floor	10 days?	Thu 1/17/08	Wed 1/30/08												
157	Lab Piping / Conduit @ Wall Casework 2nd Floor	21 days?	Wed 2/13/08	Wed 3/12/08												
158	Lab Piping / Conduit @ Wall Casework 1st Floor	71 days?	Mon 3/3/08	Mon 6/9/08												
159	Paint Walls - Prime/ First Coat 3rd Floor	14 days?	Thu 1/3/08	Tue 1/22/08												
160	Paint Walls - Prime/ First Coat 2nd Floor	36 days?	Wed 1/30/08	Wed 3/19/08												
161	Paint Walls - Prime/ First Coat 1st Floor	15 days?	Mon 3/10/08	Fri 3/28/08												
162	T-Bar Ceiling Grid 1st Floor	15 days?	Mon 3/17/08	Fri 4/4/08												
163	T-Bar Ceiling Grid 2nd Floor	12 days?	Tue 3/11/08	Wed 3/26/08												
164	T-Bar Ceiling Grid 3rd Floor	29 days?	Thu 1/10/08	Tue 2/19/08												

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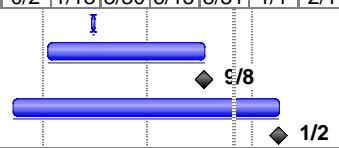
ID	Task Name	Duration	Start	Finish	October 1	March 21	September	February	July 21	January 1	June 11	November				
					9/18	12/4	2/19	5/7	7/23	10/8	2/2	3/11	5/27	8/12	0/2	1/13
165	Install Casework @ Walls 3rd Floor	35 days	Thu 3/13/08	Wed 4/30/08												
166	Install Casework @ Walls 1st Floor	71 days	Mon 3/17/08	Mon 6/23/08												
167	Install Casework @ Walls 2nd Floor	37 days	Thu 5/22/08	Fri 7/11/08												
168	Ceramic Tile 3rd Floor	8 days	Wed 1/9/08	Fri 1/18/08												
169	Ceramic Tile 2nd Floor	8 days?	Tue 3/11/08	Thu 3/20/08												
170	Ceramic Tile 1st Floor	18 days?	Thu 3/20/08	Mon 4/14/08												
171	Epoxy Tops @ Wall Casework 3rd Floor	35 days?	Thu 3/27/08	Wed 5/14/08												
172	Epoxy Tops @ Wall Casework 1st Floor	72 days?	Mon 3/31/08	Tue 7/8/08												
173	Epoxy Tops @ Wall Casework 2nd Floor	36 days?	Fri 6/6/08	Fri 7/25/08												
174	Plumbing Fixtures/Trim 1st Floor	11 days?	Thu 4/3/08	Thu 4/17/08												
175	Toilet Partitions 3rd Floor	2 days	Mon 1/21/08	Tue 1/22/08												
176	Toilet Partitions 2nd Floor	2 days	Thu 2/21/08	Fri 2/22/08												
177	Toilet Partitions 1st Floor	2 days	Tue 4/15/08	Wed 4/16/08												
178	Drop Ceiling Tile 3rd Floor	29 days?	Fri 2/1/08	Wed 3/12/08												
179	Drop Ceiling Tile 2nd Floor	12 days?	Wed 4/2/08	Thu 4/17/08												
180	Drop Ceiling Tile 1st Floor	15 days?	Tue 4/8/08	Mon 4/28/08												
181	Doors/Hardware 3rd Floor	69 days?	Mon 2/25/08	Thu 5/29/08												
182	Doors/Hardware 1st Floor	67 days?	Mon 4/14/08	Tue 7/15/08												
183	Doors/Hardware 2nd Floor	71 days?	Fri 5/2/08	Fri 8/8/08												
184	Tele/Data Terminations 3rd Floor	61 days?	Mon 2/25/08	Mon 5/19/08												
185	Tele/Data Terminations 1st Floor	65 days?	Mon 4/14/08	Fri 7/11/08												
186	Tele/Data Terminations 2nd Floor	64 days?	Fri 5/2/08	Wed 7/30/08												
187	Deck Mounted Fixtures 3rd Floor	29 days?	Thu 4/10/08	Tue 5/20/08												
188	Deck Mounted Fixtures 1st Floor	67 days?	Mon 4/14/08	Tue 7/15/08												
189	Deck Mounted Fixtures 2nd Floor	31 days?	Fri 6/20/08	Fri 8/1/08												
190	Install Island Casework 3rd Floor	41 days?	Wed 2/20/08	Wed 4/16/08												
191	Install Island Casework 2nd Floor	41 days?	Thu 5/1/08	Thu 6/26/08												
192	Epoxy Tops @ Island 3rd Floor	36 days?	Wed 3/12/08	Wed 4/30/08												
193	Epoxy Tops @ Island 2nd Floor	37 days?	Thu 5/22/08	Fri 7/11/08												
194	Environmental Control Rooms 2nd Floor	43 days?	Tue 1/15/08	Thu 3/13/08												
195	Glass Wash 2nd Floor 3rd Floor	82 days?	Tue 1/29/08	Wed 5/21/08												
196	Flooring 3rd Floor	74 days?	Fri 2/8/08	Wed 5/21/08												
197	Flooring 2nd Floor	99 days?	Tue 3/18/08	Fri 8/1/08												
198	Flooring 1st Floor	20 days?	Tue 4/15/08	Mon 5/12/08												
199	Final Paint 3rd Floor	60 days?	Fri 3/14/08	Thu 6/5/08												
200	Final Paint 1st Floor	67 days?	Mon 4/21/08	Tue 7/22/08												
201	Final Paint 2nd Floor	82 days?	Thu 4/24/08	Fri 8/15/08												
202	Elevators	154 days	Tue 8/21/07	Fri 3/21/08												
203	Elevator Entries, Platforms & Rails	41 days	Tue 8/21/07	Tue 10/16/07												
204	Pit Ladder/ Light, Patch Shaft	6 days	Wed 10/10/07	Wed 10/17/07												
205	Elevator Cabs	21 days	Wed 10/17/07	Wed 11/14/07												

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					9/18	12/4	2/19	5/7	7/23	10/8	2/2	3/11	5/27	8/12	0/2	1/13
206	Test & Inspect Elevators	5 days	Mon 3/17/08	Fri 3/21/08												
207	Startup & Commissioning	174 days	Wed 1/9/08	Mon 9/8/08												
208	Startup & Commissioning Complete	0 days	Mon 9/8/08	Mon 9/8/08												
209	Occupancy	296 days	Fri 11/16/07	Fri 1/2/09												
210	Owner Move In	0 days	Fri 1/2/09	Fri 1/2/09												



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					9/18	12/4	2/19	5/7	7/23	10/8	12/24	3/11	5/27	8/12	10/28	1/13	3/30	6/15	8/31
1	Interior Construction	329 days?	Wed 6/6/07	Mon 9/8/08															
2	Interior Finishes starting w/ drywall Begin	0 days	Mon 12/10/07	Mon 12/10/07															
3	3rd Floor	263 days?	Tue 6/26/07	Thu 6/26/08															
4	CMU All Areas Including Exterior	15 days?	Tue 6/26/07	Mon 7/16/07															
5	MEP Hangers	10 days?	Tue 6/26/07	Mon 7/9/07															
6	OH MEP Rough-in	30 days?	Tue 7/17/07	Mon 8/27/07															
7	Primary Research Labs	228 days	Tue 8/14/07	Thu 6/26/08															
8	Offices	143 days	Wed 9/12/07	Fri 3/28/08															
9	Rest Rooms	123 days	Wed 9/26/07	Fri 3/14/08															
10	Common Area	108 days	Tue 11/13/07	Thu 4/10/08															
11	Complete Punchlist 3rd Floor	0 days	Thu 6/26/08	Thu 6/26/08															
12	2nd Floor	329 days?	Wed 6/6/07	Mon 9/8/08															
13	CMU All Areas Including Exterior	14 days?	Wed 6/6/07	Mon 6/25/07															
14	MEP Hangers	10 days?	Mon 9/17/07	Fri 9/28/07															
15	OH MEP Rough-in	30 days	Mon 10/1/07	Fri 11/9/07															
16	Primary Research Labs	203 days?	Thu 11/29/07	Mon 9/8/08															
17	Island Casework Supports	17 days?	Thu 12/13/07	Fri 1/4/08															
18	Service Carrier	17 days?	Thu 12/13/07	Fri 1/4/08															
19	Piping/ Conduit @ Service Carrier	22 days?	Thu 12/20/07	Fri 1/18/08															
20	Island Piping/ Conduit	22 days?	Thu 12/20/07	Fri 1/18/08															
21	Offices	116 days?	Fri 12/28/07	Fri 6/6/08															
22	Common Area	105 days?	Mon 1/14/08	Fri 6/6/08															
23	Rest Rooms	88 days?	Mon 1/14/08	Wed 5/14/08															
24	Environmental Control Rooms	43 days?	Tue 1/15/08	Thu 3/13/08															
25	Glass Wash	82 days?	Tue 1/29/08	Wed 5/21/08															
26	Install Fume Hoods	31 days?	Mon 2/11/08	Mon 3/24/08															
27	Lab Piping/ Conduit @ Wall Casework	21 days?	Wed 2/13/08	Wed 3/12/08															
28	Install Island Casework	41 days?	Thu 5/1/08	Thu 6/26/08															
29	Install Casework @ Walls	37 days?	Thu 5/22/08	Fri 7/11/08															
30	Epoxy Tops @ Island	37 days?	Thu 5/22/08	Fri 7/11/08															
31	Epoxy Tops @ Wall Casework	36 days?	Fri 6/6/08	Fri 7/25/08															
32	Complete Punchlist 2nd Floor	0 days	Mon 9/8/08	Mon 9/8/08															
33	1st Floor	285 days?	Tue 7/10/07	Tue 8/12/08															
34	CMU All Areas	30 days?	Tue 7/10/07	Mon 8/20/07															
35	Central Utilities Plant Installation of Mech Equip	145 days	Tue 7/10/07	Mon 1/28/08															
36	MEP Hangers	10 days?	Tue 7/24/07	Mon 8/6/07															
37	OH MEP Rough-in	40 days	Tue 8/7/07	Mon 10/1/07															
38	Plumbing In-wall Rough	124 days	Fri 9/7/07	Wed 2/27/08															
39	Electrical In-wall Rough	124 days	Fri 9/7/07	Wed 2/27/08															
40	Door Frames	113 days	Fri 9/7/07	Tue 2/12/08															
41	Frame Soffits/Ceilings	106 days	Wed 9/26/07	Wed 2/20/08															
42	Frame Wall Partitions	75 days	Wed 10/24/07	Tue 2/5/08															
43	Branch Duct & VAV's	75 days	Wed 10/24/07	Tue 2/5/08															
44	Rough-in Hard Lids	42 days?	Mon 12/10/07	Tue 2/5/08															
45	Pull Data Cable	63 days	Mon 12/10/07	Wed 3/5/08															
46	Fire Protection Heads	90 days?	Mon 12/10/07	Fri 4/11/08															
47	Plywood Above Corridor Ceilings	37 days?	Mon 12/24/07	Tue 2/12/08															
48	Gyp Board @ Walls/ Soffits	46 days?	Thu 1/3/08	Thu 3/6/08															
49	Taping @ Walls/Soffits	51 days?	Fri 1/11/08	Fri 3/21/08															
50	Counter Tops	51 days?	Wed 1/23/08	Wed 4/2/08															
51	Epoxy Finishes (FLOORS/WALLS/CEILINGS)	81 days?	Fri 1/25/08	Fri 5/16/08															
52	Low Voltage Ceiling Devices	35 days?	Mon 2/25/08	Fri 4/11/08															
53	Light Fixtures	38 days?	Mon 2/25/08	Wed 4/16/08															
54	Install Fume Hoods	65 days?	Mon 2/25/08	Fri 5/23/08															
55	HVAC Diffusers	30 days?	Mon 3/3/08	Fri 4/11/08															
56	Lab Piping / Conduit @ Wall Casework	71 days?	Mon 3/3/08	Mon 6/9/08															

Project: Summary Schedule of The Sc
Date: Wed 10/22/08

Task		Summary		Rolled Up Progress		Project Summary	
Progress		Rolled Up Task		Split		Group By Summary	
Milestone		Rolled Up Milestone		External Tasks		Deadline	

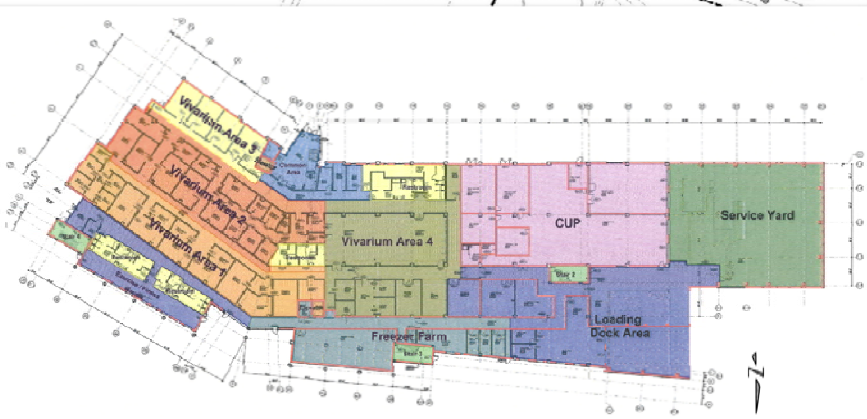


ID	Task Name	Duration	Start	Finish	October 11		March 21		September 1		February 11		July 21		January 1		June 11		November	
					9/18	12/4	2/19	5/7	7/23	10/8	12/24	3/11	5/27	8/12	10/28	1/13	3/30	6/15		8/31
57	Paint Walls - Prime/ First Coat	15 days?	Mon 3/10/08	Fri 3/28/08																
58	T-Bar Ceiling Grid	15 days?	Mon 3/17/08	Fri 4/4/08																
59	Install Casework @ Walls	71 days	Mon 3/17/08	Mon 6/23/08																
60	Ceramic Tile	18 days?	Thu 3/20/08	Mon 4/14/08																
61	Epoxy Tops @ Wall Casework	72 days?	Mon 3/31/08	Tue 7/8/08																
62	Plumbing Fixtures/Trim	11 days?	Thu 4/3/08	Thu 4/17/08																
63	Toilet Partitions	2 days	Tue 4/15/08	Wed 4/16/08																
64	Drop Ceiling Tile	15 days?	Tue 4/8/08	Mon 4/28/08																
65	Tele/Data Terminations	65 days?	Mon 4/14/08	Fri 7/11/08																
66	Doors/Hardware	67 days?	Mon 4/14/08	Tue 7/15/08																
67	Deck Mounted Fixtures	67 days?	Mon 4/14/08	Tue 7/15/08																
68	Flooring	20 days?	Tue 4/15/08	Mon 5/12/08																
69	Final Piping Tests	64 days?	Mon 4/21/08	Thu 7/17/08																
70	Final Paint	67 days?	Mon 4/21/08	Tue 7/22/08																
71	Complete Punchlist 1st Floor	0 days	Tue 8/12/08	Tue 8/12/08																
72	Penthouse	114 days?	Mon 8/13/07	Thu 1/17/08																◆ 8/12
73	Install Air Handling Units	10 days?	Mon 8/13/07	Fri 8/24/07																
74	Supply Air Duct Mains	5 days?	Mon 8/13/07	Fri 8/17/07																
75	Chilled Water Hangers	5 days?	Fri 9/7/07	Thu 9/13/07																
76	HHW Hangers	5 days?	Fri 9/7/07	Thu 9/13/07																
77	Duct Hangers	10 days?	Fri 9/7/07	Thu 9/20/07																
78	Install Water Heaters	5 days	Fri 9/7/07	Thu 9/13/07																
79	Install Industrial Water Heaters/Softeners	15 days	Fri 9/7/07	Thu 9/27/07																
80	Fire Protection Mains	15 days	Fri 9/7/07	Thu 9/27/07																
81	Install VAC Pumps	10 days	Fri 9/7/07	Thu 9/20/07																
82	HHW Mains	10 days	Fri 9/14/07	Thu 9/27/07																
83	Chilled Water Mains	15 days	Fri 9/14/07	Thu 10/4/07																
84	Install Supply Air Duct	25 days	Fri 9/21/07	Thu 10/25/07																
85	HHW Branch Piping	15 days	Fri 9/28/07	Thu 10/18/07																
86	Plumbing Mains	15 days	Fri 9/28/07	Thu 10/18/07																
87	Lighting Fixtures	8 days	Fri 10/5/07	Tue 10/16/07																
88	Chilled Water Branch Piping	15 days	Fri 10/5/07	Thu 10/25/07																
89	Install Vac Pumps/ Receiver Tank	10 days	Fri 10/19/07	Thu 11/1/07																
90	Final Piping Connections @ AHU's	16 days	Fri 10/26/07	Fri 11/16/07																
91	Install DHW & IHW Heaters	11 days	Fri 11/2/07	Fri 11/16/07																
92	Conduit/ Wire to Mechanical/Plumbing Equipment	28 days	Mon 11/19/07	Wed 12/26/07																
93	Control Wiring to Penthouse/ Roof Equipment	28 days	Mon 11/19/07	Wed 12/26/07																
94	Natural Gas Piping	22 days	Mon 11/19/07	Tue 12/18/07																
95	Electrical Connections to MEP Equipment	16 days	Thu 12/27/07	Thu 1/17/08																

Project: Summary Schedule of The Sc
 Date: Wed 10/22/08

Task		Summary		Rolled Up Progress		Project Summary	
Progress		Rolled Up Task		Split		Group By Summary	
Milestone	◆	Rolled Up Milestone	◇	External Tasks		Deadline	↓





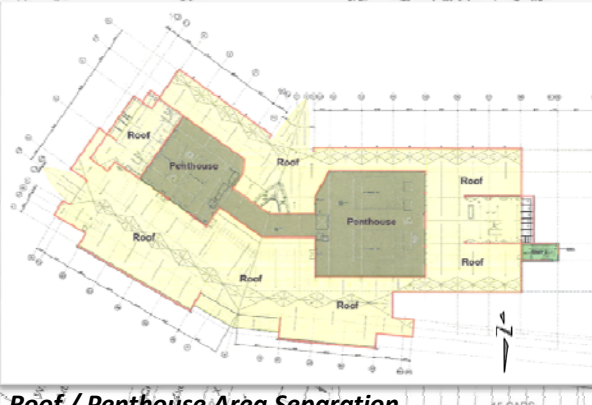
1st Floor Area Separation



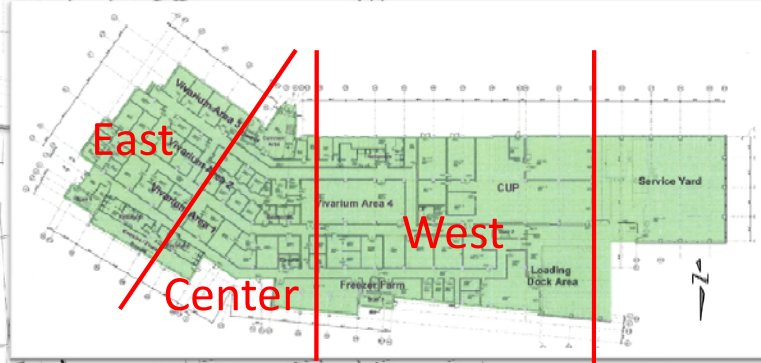
2nd Floor Area Separation



3rd Floor Area Separation



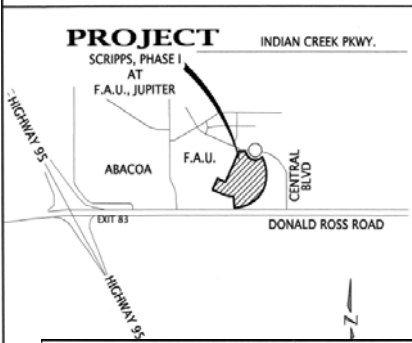
Roof / Penthouse Area Separation



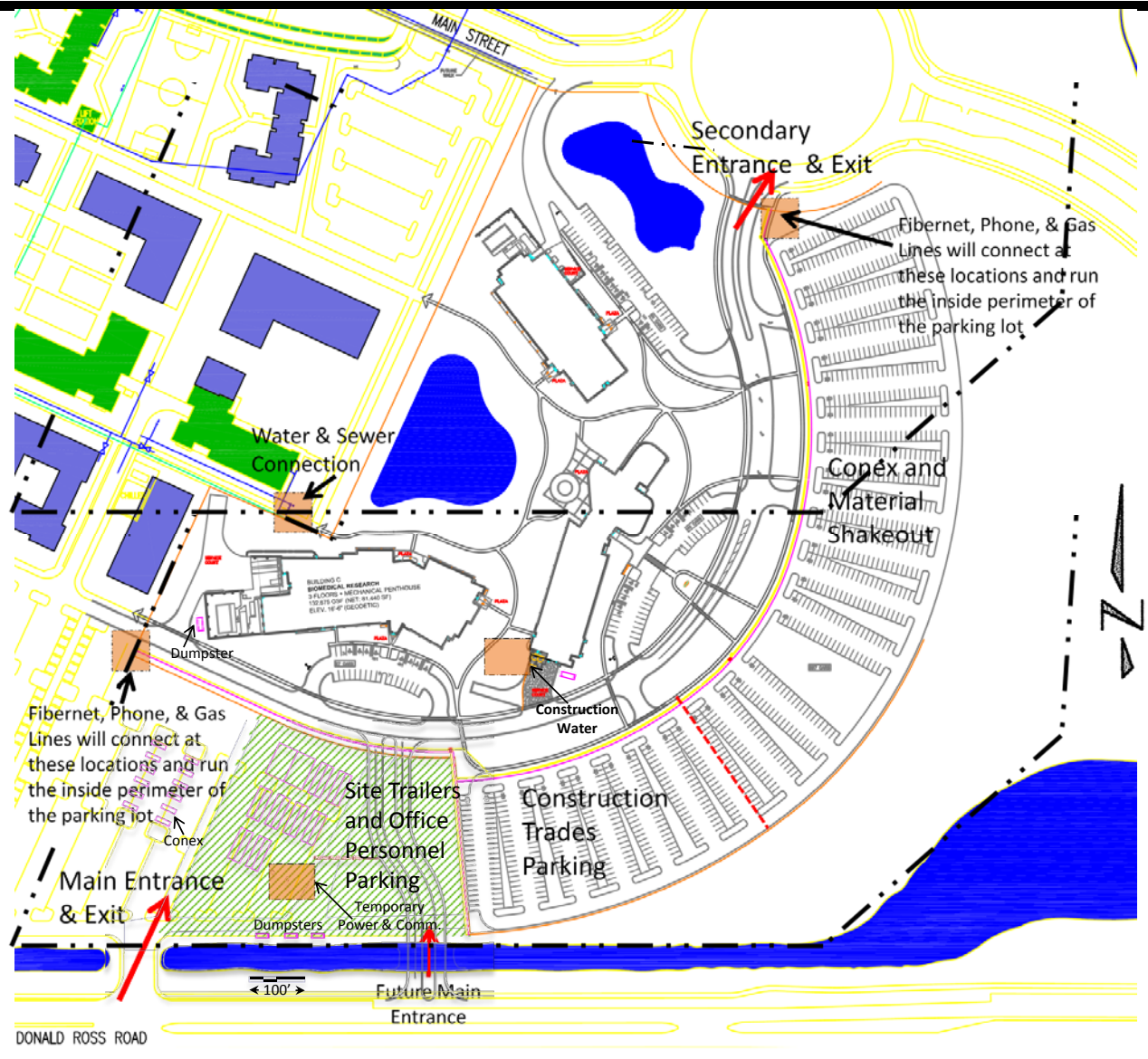
Structural Sequencing

BUILDING B
 ADMINISTRATION / ADVANCED TECHNOLOGY
 4-FLOORS + MECHANICAL PENTHOUSE
 118,870 CSF (NET: 73,105 SF)
 ELEV. 16'-6" (GEODETIC)

PROJECT LOCATION MAP



GENERAL VICINITY MAP



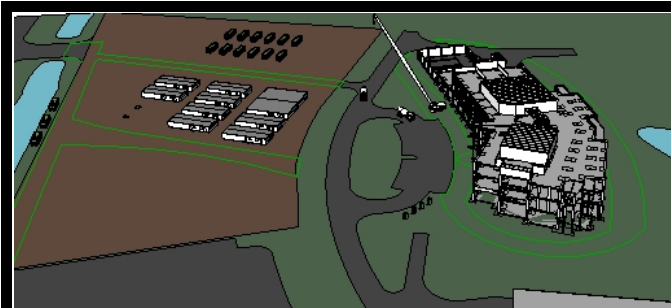
The Scripps Research Institute
Biomedical Research Building

Technical Assignment Two
October 24, 2008

All Construction
Appendix B

Adam Houck

Faculty Advisor: **Dr. David Riley**



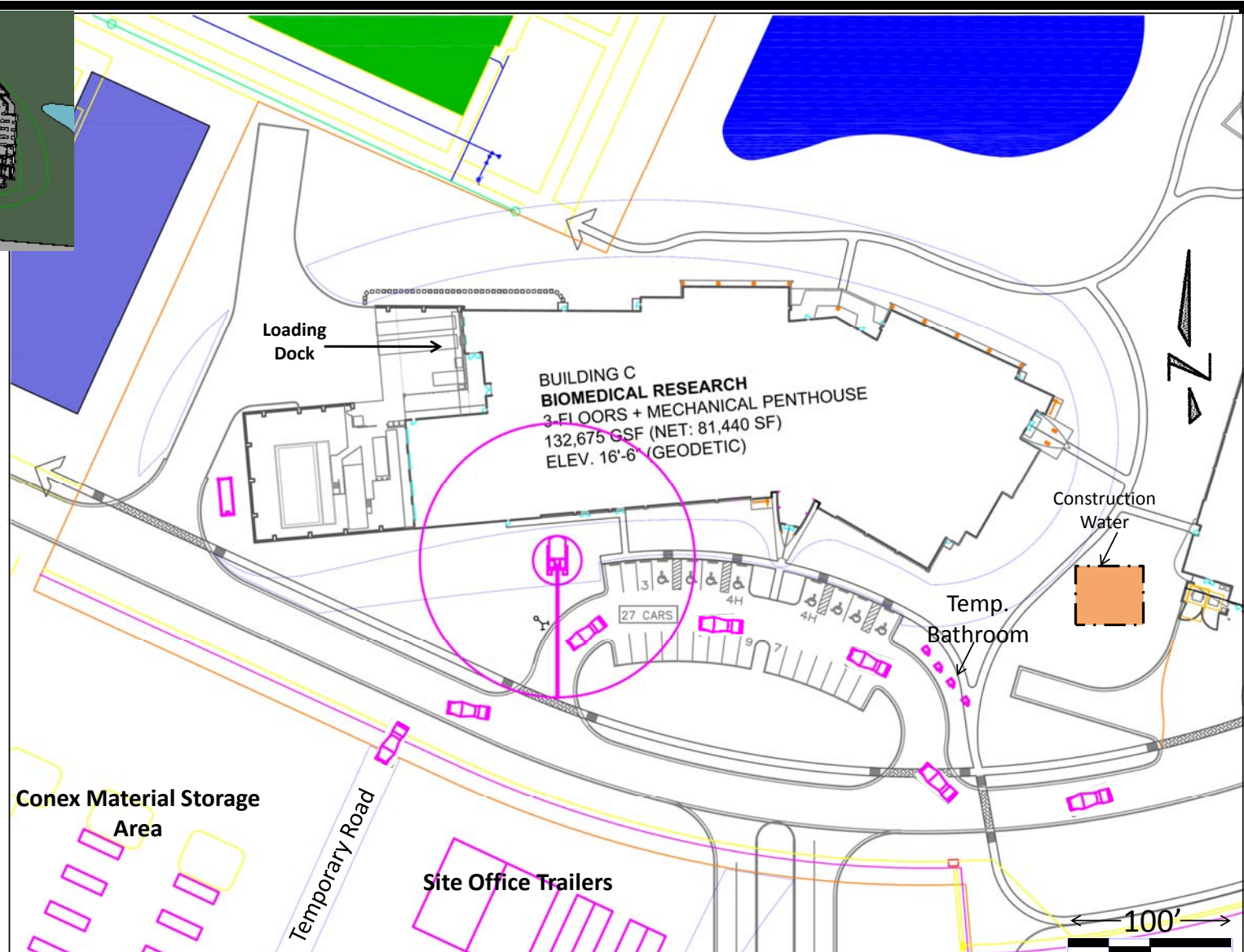
Concrete Structure

The Structural System Is Concrete: the horizontal components are poured utilizing a concrete pump truck, while the vertical components are placed with a crane and bucket.

The Size of the site is such that there is not a major concern regarding site congestion. Two main access points to the site allow for a one way flow of traffic when the concrete deliveries are occurring. The Crane is able to operate around the building to place concrete for the columns.

This Site will not change very much once the concrete structure is up. Space is not an Issue for shakeout of materials. Many locations on this site designated for shakeout allow it to operate without congestion.

Once the bulk of the work is completed Conex removal will commence and repaving of the temporary shakeout areas will take place to repair damaged surfaces.



The Scripps Research Institute
Biomedical Research Building

Technical Assignment Two
October 24, 2008

Structural Concrete
Frame

Appendix B

Adam Houck

Faculty Advisor: Dr. David Riley

Detailed Structural Estimate Takeoffs: Concrete System with Steel Framing Members and Roof Joists

DESCRIPTION	DIMENSIONS	QUANTITY
Column Spread Footing	12' x 12' x 2'	1
Column Spread Footing	14' x 6.5' x 2'	2
Column Spread Footing	17' x 14.75' x 2'	1
Column Spread Footing	17' x 5' x 2'	1
Column Spread Footing	22.5' x 12.5' x 2'	1
Column Spread Footing	5' x 5' x 2'	1
Column Spread Footing	6.5' x 6.5' x 2'	29
Column Spread Footing	7.5' x 17.75' x 2'	1
Column Spread Footing	7.5' x 7.5' x 2'	25
Column Spread Footing	8' x 4' x 2'	1
Column Spread Footing	9.5' x 9.5' x 2'	44

DESCRIPTION	DIMENSIONS	PERIMETER	QUANTITY
Strip Footing	2'x2'x2'	2629'	1

DESCRIPTION	DIMENSIONS	LENGTH	QUANTITY
Rectangular Column 1st Floor	10" x 26.5"	48'	2
Rectangular Column 1st Floor	12" x 12"	18'	2
Rectangular Column 1st Floor	14" x 18"	18'	1
Rectangular Column 1st Floor	15" x 28"	48'	2
Rectangular Column 1st Floor	16" x 12"	18'	2
Rectangular Column 1st Floor	16" x 8"	18'	1
Rectangular Column 1st Floor	24" x 12"	18'	3
Rectangular Column 1st Floor	24" x 24"	18'	76
Rectangular Column 1st Floor	24" x 8"	18'	1
Rectangular Column 1st Floor	28" x 16"	18'	2
Rectangular Column 1st Floor	36" x 8"	18'	2
Rectangular Column 1st Floor	40" x 8"	18'	3
Rectangular Column 1st Floor	48" x 8"	18'	1
Rectangular Column 1st Floor	64" x 8"	18'	2
Rectangular Column 1st Floor	80" x 8"	18'	1
Rectangular Column 1st Floor	92" x 8"	18'	1
Round Column 1st Floor	24" Diameter	18'	15
HSS Column Rectangular 1st Floor	6x4x1/4	48' 4"	2
HSS Column Rectangular 1st Floor	8x6x1/4	48' 4"	4
HSS Column Round 1st Floor	4.5x.237	48' 4"	2
Rectangular Column 2nd Floor	16" x 8"	15'	1
Rectangular Column 2nd Floor	18" x 14"	15'	2

Rectangular Column 2nd Floor	24" x 12"	15'	11
Rectangular Column 2nd Floor	24" x 24"	15'	71
Rectangular Column 2nd Floor	24" x 30"	15'	2
Rectangular Column 2nd Floor	28" x 16"	15'	2
Rectangular Column 2nd Floor	28" x 8"	15'	1
Rectangular Column 2nd Floor	36" x 8"	15'	3
Rectangular Column 2nd Floor	40" x 8"	15'	13
Rectangular Column 2nd Floor	8" x 16"	15'	2
Round Column 2nd Floor	24" Diameter	15'	6
Rectangular Column 3rd Floor	16" x 8"	15'	1
Rectangular Column 3rd Floor	24" x 12"	15'	11
Rectangular Column 3rd Floor	24" x 24"	15'	71
Rectangular Column 3rd Floor	24" x 30"	15'	2
Rectangular Column 3rd Floor	28" x 8"	15'	1
Rectangular Column 3rd Floor	36" x 8"	15'	3
Rectangular Column 3rd Floor	40" x 8"	15'	13
Rectangular Column 3rd Floor	8" x 16"	15'	2
Round Column 3rd Floor	24" Diameter	15'	4
Rectangular Column Roof Level	8" x 10"	7' 6"	6

DESCRIPTION	AREA	PERIMETER
12" SOG Mech Yard Pads	470 SF	544.75'
5" SOG 1st Floor and Service Bay	48583 SF	2838.86
8" SOG 1st Floor Mech Pads	2759 SF	538.5
10" Floor Slab 2nd Floor	46167 SF	1798'
14" Drop Panels 2nd Floor	5167 SF	2797' 7"
10" Floor Slad 3rd Floor	36187 SF	1708' 4"
14" Drop Panels 3rd Floor	4370 SF	2294' 6"
10" Floor/Roof Slab	38654 SF	1723' 6"
14" Drop Panels Roof	4727 SF	2397'
4" Isolation Pads Roof	2257 SF	405'
6" Roof Slab Penthouse	372 SF	80'
1-1/2" Metal Roof Deck Penthouse	10668 SF	903.1

DESCRIPTION	DIMENSIONS	LENGTH	QUANTITY
Concrete Beam	12" x 18"	18' - 0 1/4"	1

Concrete Beam	12" x 18"	22' - 9 1/2"	1
Concrete Beam	12" x 18"	24' - 9 1/2"	1
Concrete Beam	12" x 18"	25' - 4 1/4"	1
Concrete Beam	12" x 18"	23' - 9 1/2"	1
Concrete Beam	12" x 18"	30' - 0"	3
Concrete Beam	12" x 18"	6' - 10"	1
Concrete Beam	12" x 18"	11' - 4 1/8"	1
Concrete Beam	12" x 18"	11' - 4"	1
Concrete Beam	12" x 18"	16' - 0"	1
Concrete Beam	12" x 18"	11' - 4"	1
Concrete Beam	12" x 18"	20' - 7 7/8"	1
Concrete Beam	12" x 18"	22' - 9"	1
Concrete Beam	12" x 18"	24' - 0 1/4"	2
Concrete Beam	12" x 18"	24' - 0 3/4"	1
Concrete Beam	12" x 18"	22' - 8 3/4"	1
Concrete Beam	12" x 18"	22' - 9"	1
Concrete Beam	12" x 18"	11' - 4 1/8"	1
Concrete Beam	12" x 18"	5' - 9"	1
Concrete Beam	12" x 18"	24' - 2 1/2"	1
Concrete Beam	12" x 18"	10' - 4"	4
Concrete Beam	12" x 22"	22' - 10 1/2"	1
Concrete Beam	12" x 22"	25' - 0 3/4"	1
Concrete Beam	12" x 24"	11' - 6"	1
Concrete Beam	12" x 78"	23' - 3 1/8"	1
Concrete Beam	18" x 18"	6' - 1 3/4"	1
Concrete Beam	18" x 18"	24' - 5 1/4"	1
Concrete Beam	18" x 18"	30' - 0"	6
Concrete Beam	18" x 18"	25' - 4"	1
Concrete Beam	24" x 18"	88' - 0"	1
Concrete Beam	24" x 18"	8' - 5"	1
Concrete Beam	24" x 18"	9' - 0 7/8"	1
Concrete Beam	24" x 18"	9' - 10"	1
Concrete Beam	24" x 18"	10' - 4"	3
Concrete Beam	24" x 18"	13' - 0"	1
Concrete Beam	24" x 18"	12' - 10 1/4"	1
Concrete Beam	24" x 18"	13' - 0"	2
Concrete Beam	24" x 18"	14' - 0"	2
Concrete Beam	24" x 18"	13' - 7 7/8"	1
Concrete Beam	24" x 18"	13' - 8"	3
Concrete Beam	24" x 18"	13' - 8 1/8"	1
Concrete Beam	24" x 18"	13' - 10"	1
Concrete Beam	24" x 18"	66' - 0"	1
Concrete Beam	24" x 18"	14' - 6 3/4"	1
Concrete Beam	24" x 18"	15' - 0 3/4"	1
Concrete Beam	24" x 18"	16' - 3 3/4"	1

Concrete Beam	24" x 18"	16' - 3 7/8"	2
Concrete Beam	24" x 18"	16' - 4"	4
Concrete Beam	24" x 18"	17' - 7"	1
Concrete Beam	24" x 18"	17' - 4"	2
Concrete Beam	24" x 18"	17' - 3 7/8"	1
Concrete Beam	24" x 18"	17' - 4"	4
Concrete Beam	24" x 18"	20' - 0"	37
Concrete Beam	24" x 18"	19' - 11 7/8"	1
Concrete Beam	24" x 18"	22' - 1"	1
Concrete Beam	24" x 18"	20' - 8"	2
Concrete Beam	24" x 18"	21' - 0"	1
Concrete Beam	24" x 18"	22' - 1 1/4"	1
Concrete Beam	24" x 18"	22' - 0"	7
Concrete Beam	24" x 18"	23' - 4"	4
Concrete Beam	24" x 18"	25' - 5 1/4"	1
Concrete Beam	24" x 18"	25' - 6"	5
Concrete Beam	24" x 18"	26' - 6"	6
Concrete Beam	24" x 18"	29' - 0"	2
Concrete Beam	24" x 18"	31' - 0"	2
Concrete Beam	24" x 18"	29' - 6"	1
Concrete Beam	24" x 18"	30' - 0"	8
Concrete Beam	24" x 18"	30' - 8"	1
Concrete Beam	24" x 18"	31' - 0"	4
Concrete Beam	24" x 18"	32' - 6"	1
Concrete Beam	24" x 18"	41' - 11"	1
Concrete Beam	24" x 18"	6' - 0"	1
Concrete Beam	24" x 24"	6' - 3 1/2"	1
Concrete Beam	24" x 24"	9' - 8 3/8"	1
Concrete Beam	24" x 24"	9' - 9 3/8"	1
Concrete Beam	24" x 24"	18' - 7 3/8"	3
Concrete Beam	24" x 24"	15' - 0 5/8"	1
Concrete Beam	24" x 24"	24' - 5 5/8"	1
Concrete Beam	24" x 24"	24' - 6 1/2"	1
Concrete Beam	24" x 24"	33' - 6 5/8"	1
Concrete Beam	24" x 24"	33' - 6 3/4"	1
Concrete Beam	24" x 34"	33' - 6"	1
Concrete Beam	24" x 34"	48' - 3 5/8"	1
Concrete Beam	24" x 34"	6' - 0"	1
Concrete Beam	24" x 47.25"	140' - 11 7/8"	1
Concrete Beam	24" x 47.25"	20' - 0"	1
Concrete Beam	24" x 47.25"	31' - 0"	1
Concrete Beam	24" x 47.25"	42' - 0"	1
Concrete Beam	24" x 70"	16' - 10 7/8"	1
Concrete Beam	24" x 70"	24' - 2 3/4"	1
Concrete Beam	24" x 70"	31' - 0"	1

Concrete Beam	24" x 70"	89' - 0"	1
Concrete Beam	8" x 24"	7' - 4 7/8"	1
Concrete Beam	8" x 24"	7' - 3 1/2"	1

DESCRIPTION	LENGTH	QUANTITY
Hollow HSS 10X6X.25	4' - 4 1/8"	1
Hollow HSS 10X6X.25	4' - 5 1/8"	1
Hollow HSS 10X6X.25	4' - 6 3/4"	1
Hollow HSS 14X10X.5	39' - 8 5/8"	1
Hollow HSS 14X10X.5	39' - 10 3/8"	1
Hollow HSS 14X10X.5	53' - 9 7/8"	1
Hollow HSS 14X10X.5	54' - 1 7/8"	1
Hollow HSS 2.5X2.5X.25	7' - 9"	4
Hollow HSS 2.5X2.5X.25	32' - 5 7/8"	1
Hollow HSS 5X5X.25	9' - 0 3/8"	1
Hollow HSS 5X5X.25	19' - 8 3/8"	1
Hollow HSS 5X5X.25	43' - 1 1/4"	1
Hollow HSS 5X5X.25	50' - 4 7/8"	1
Hollow HSS 5X5X.25	51' - 6 3/4"	1
Hollow HSS 5X5X.25	54' - 2"	1
Hollow HSS 5X5X.25	55' - 7 3/4"	1
Hollow HSS 5X5X.25	65' - 7 7/8"	1
Hollow HSS 5X5X.25	71' - 10 7/8"	1
Hollow HSS 5X5X.25	75' - 3 5/8"	1

DESCRIPTION	LENGTH	QUANTITY
K-Series Bar Joist 10K1	11' - 8 1/2"	5
K-Series Bar Joist 12K3	16' - 0"	11
K-Series Bar Joist 12K3	16' - 10"	1
K-Series Bar Joist 8K1	7' - 8"	6
K-Series Bar Joist 8K1	8' - 0 1/4"	6
LH-Series Bar Joist 28LH09	52' - 7 3/8"	9
LH-Series Bar Joist 40LH12	63' - 7 1/2"	1
LH-Series Bar Joist 40LH12	72' - 11 1/2"	1
W-Wide Flange: W14X38	30' - 3 7/8"	2
W-Wide Flange: W8X10	13' - 6"	1
W-Wide Flange: W8X13	7' - 4 1/8"	1
W-Wide Flange: W8X13	7' - 4"	1
C-Channel: C4X7.25	4' - 1 1/8"	1

Adam Houck
Construction Management
October 24, 2008

THE SCRIPPS RESEARCH INSTITUTE
Biomedical Research Building

Appendix C
Technical Assignment Two
Faculty Advisor: Dr. David Riley

C-Channel: C4X7.25	4' - 6"	2
C-Channel: C4X7.25	4' - 9"	2
C-Channel: C4X7.25	4' - 11 1/4"	1
C-Channel: C4X7.25	5' - 0"	1
C-Channel: C4X7.25	5' - 1 3/4"	1
C-Channel: C4X7.25	5' - 6 7/8"	1
C-Channel: C8X11.5	1' - 11 1/4"	2
C-Channel: C8X11.5	4' - 7"	1
C-Channel: C8X11.5	4' - 6 3/4"	2
C-Channel: C8X11.5	5' - 6"	4
C-Channel: C8X11.5	5' - 11"	12

Detailed Structural Estimate Takeoffs: Concrete System with Steel Framing Members and Roof Joists

ITEMCODE	DESCRIPTION	QUANTITY	UNITS	LAB.UNIT	MAT.UNIT	EQP.UNIT	TOT.UNITCOST	TOTALCOST
02316.100	MACH EXCAV CONTINUOUS FTG	537.07	CUYD	6.9549	0	0.95	7.905	\$4,245.51
02316.102	FINE GRADE CONTINUOUS FTG	2489	SQFT	0.4761	0	0	0.476	\$1,185.01
02316.130	MACH BACKFILL CONTINUOUS FTG	312.13	CUYD	8.5005	0	0.5	9.001	\$2,809.35
02316.134	EXCESS CONTINUOUS FOOTING SOIL	224.94	CUYD					
02316.110	MACH EXCAV COLUMN FTG	1448.67	CUYD	6.9549	0	0.95	7.905	\$11,451.58
02316.112	FINE GRADE @ COLUMN FTG	7746.69	SQFT	0.4761	0	0	0.476	\$3,688.20
02316.140	MACH BACKFILL @ COLUMN FTG	723.73	CUYD	8.5005	0	0.5	9.001	\$6,513.96
02316.144	EXCESS COLUMN FOOTING SOIL	724.94	CUYD					
02316.002	MACHINE FINE GRADE FLOOR	51342	SQFT	0.2642	0	0.015	0.279	\$14,334.69
02316.023	CRUSHED STONE SLAB FILL	633.85	CUYD	16.1864	16.35	0	32.536	\$20,623.26
02316.002	MACHINE FINE GRADE FLOOR	470	SQFT	0.2642	0	0.015	0.279	\$131.22
02316.023	CRUSHED STONE SLAB FILL	5.8	CUYD	16.1864	16.35	0	32.536	\$188.79
03111.211	MTL FRAME WD COLM FORMS 0-8'	126	SQFT	0.9603	1.32	0	2.28	\$287.32
03111.212	MTL FRAME WD COLM FORMS 8-12'	460	SQFT	0.8865	1.32	0	2.207	\$1,014.99
03111.214	MTL FRAME WD COLM FORMS 16-18'	13480.5	SQFT	0.7947	1.32	0	2.115	\$28,507.21
03111.216	MTL FRAME WD COLM FORMS +20'	565.75	SQFT	0.7202	1.32	0	2.04	\$1,154.24
03111.244	ROUND MTL FORMS, 24" COLUMN	301.5	LNFT	19.206	2.829	0	22.035	\$6,643.49
03110.520	COLUMN FOOTING EDGE FORMS	8749.66	SQFT	4.4257	1.039	0	5.464	\$47,811.65
03110.701	FLOOR EDGE FORMS	3377.36	LNFT	3.0729	0.851	0	3.924	\$13,253.77
03110.701	FLOOR EDGE FORMS	544.75	LNFT	3.0729	0.851	0	3.924	\$2,137.76
03111.050	FORMS @ PAD	134.89	SQFT	2.2159	1.226	0	3.442	\$464.29
03111.420	BEAM SIDE FORMS	16015.65	SQFT	2.8709	1.028	0	3.899	\$62,438.61
03111.630	DROP PANEL EDGE FORMS	71864	SQFT	2.8453	0.851	0	3.697	\$265,659.65
03111.614	SLAB FORM W/2.7 BM/SF	74841	SQFT	2.6205	1.301	0	3.921	\$293,466.53
03111.616	SLAB FORM W/2.8 BM/SF	46167	SQFT	2.7392	1.338	0	4.077	\$188,241.33
03111.624	SLAB EDGE FORM	2961.78	SQFT	2.1511	0.853	0	3.004	\$8,896.59
03150.900	FORM RELEASING AGENT	38869.57	SQFT	0.2095	0.023	0	0.233	\$9,037.18
03150.100	CONTROL JOINT	3600	LNFT	0.5507	0.077	0	0.628	\$2,259.00
03150.650	SCREEDS FOR SLAB	20726.64	LNFT	0.9219	0.32	0	1.242	\$25,740.41
03150.650	SCREEDS FOR SLAB	56.4	LNFT	0.9219	0.32	0	1.242	\$70.04
03150.900	FORM RELEASING AGENT	71864	SQFT	0.2095	0.023	0	0.233	\$16,708.38
03150.900	FORM RELEASING AGENT	140120.32	SQFT	0.2095	0.023	0	0.233	\$32,577.97
03210.150	COLUMN REBAR	1760.84	CWT	24.7222	26.75	0	51.472	\$90,634.52

03210.200	CONTINUOUS FOOTING REBAR	55.31	CWT	31.7857	26.75	0	58.536	\$3,237.67
03210.210	COLUMN FOOTING REBAR	472.49	CWT	31.7857	26.75	0	58.536	\$27,657.77
03210.109	SOG REBAR	20.89	CWT	32.3636	26.75	0	59.114	\$1,234.82
03210.550	RE-STEEL @ PADS	16.72	CWT	32.3636	26.75	0	59.114	\$988.29
03210.901	RE-STEEL @ BEAMS W/SLAB	1193.28	CWT	32.3636	26.75	0	59.114	\$70,539.03
03210.130	SUPPORTED SLAB REBAR	3520.02	CWT	32.3636	26.75	0	59.114	\$208,081.05
03220.012	6x6 W2.9/W2.9 MESH	564.76	SQS	23.1663	15	0	38.166	\$21,554.88
03310.650	CONCRETE IN COLUMNS							
03310.681	5000 PSI DIRECT	9.42	CUYD	16.0131	60	0	76.013	\$716.41
03310.682	5000 PSI W/CRANE	633.37	CUYD	21.7845	60	0	81.785	\$51,800.02
03315.984	NO. OF COLUMNS	355	EACH					
03310.150	CONC IN CONTINUOUS FOOTING							
03310.167	4000 PSI DIRECT	184.37	CUYD	11.009	56	0	67.009	\$12,354.47
03310.200	CONC IN COLUMN FOOTING							
03310.217	4000 PSI DIRECT	724.94	CUYD	11.009	56	0	67.009	\$48,577.25
03315.972	NO. OF COLUMN FOOTINGS	107	EACH					
03310.350	CONC IN SLAB ON GRADE							
03310.375	4000 PSI DIRECT	792.31	CUYD	11.009	56	0	67.009	\$53,092.22
03315.976	SOG AREA	51342	SQFT					
03310.350	CONC IN SLAB ON GRADE							
03310.375	4000 PSI DIRECT	17.41	CUYD	11.009	56	0	67.009	\$1,166.45
03315.976	SOG AREA	470	SQFT					
03311.100	CONC IN BEAMS W/SLAB							
03311.800	CONCRETE IN PADS							
03311.830	4000 PSI W/PUMP	27.86	CUYD	11.1997	56	5.28	72.48	\$2,019.59
03315.981	PAD AREA	2257	SQFT					
03311.130	4000 PSI W/PUMP	547.38	CUYD	15.1196	56	5.28	76.4	\$41,819.29
03311.500	CONC IN SUPPORTED SLAB							
03311.530	4000 PSI W/PUMP	4210.8	CUYD	12.5997	56	5.28	73.88	\$311,092.37
03315.985	LENGTH OF BEAMS	4247.84	LNFT					
03315.987	NO. OF DROP PANELS	355	EACH					
03311.500	CONC IN SUPPORTED SLAB							
03311.530	4000 PSI W/PUMP	3741.7	CUYD	12.5997	56	5.28	73.88	\$276,435.95

03315.986	SUPPORTED SLAB AREA	121380	SQFT						
03350.131	POINT & PATCH	38869.57	SQFT	0.1102	0.013	0	0.123	\$4,780.96	
03350.132	FLOAT FINISH	172722	SQFT	0.2754	0	0	0.275	\$47,567.64	
03350.148	HAND TROWEL FINISH	2257	SQFT	0.3304	0	0	0.33	\$745.71	
03350.132	FLOAT FINISH	470	SQFT	0.2754	0	0	0.275	\$129.44	
03350.131	POINT & PATCH	71864	SQFT	0.1102	0.013	0	0.123	\$8,839.27	
03350.131	POINT & PATCH	140120.32	SQFT	0.1102	0.013	0	0.123	\$17,234.80	
03390.010	PROTECT & CURE	51342	SQFT	0.1102	0.019	0	0.129	\$6,643.65	
03390.010	PROTECT & CURE	470	SQFT	0.1102	0.019	0	0.129	\$60.82	
03390.010	PROTECT & CURE	123637	SQFT	0.1102	0.019	0	0.129	\$15,998.63	
05129.101	STEEL BEAMS								
05129.102	I BEAMS	30.7	CWT	28.73	35	5	68.73	\$2,110.01	
05129.103	CHANNELS	17.43	CWT	28.73	35	8	71.73	\$1,249.90	
05129.990	STRUCTURAL STEEL WEIGHT	2.41	TONS						
05131.011	IMBEDDED CURB ANGLE	404.67	LNFT	6.9164	3.2	0	10.116	\$4,093.77	
05210.011	STEEL JOISTS, SERIES K	206.73	CWT	22.984	27.5	0	50.484	\$10,436.71	
05210.300	ROD JOIST BRIDGING	236.29	CWT	30.6453	27.5	0	58.145	\$13,738.95	
05310.017	1-1/2" METAL DECK	10668	SQFT	0.4134	0.806	0	1.22	\$13,012.83	
07260.012	6MIL VISQUEEN SUBGRADE PAPER	564.76	SQS	1.1018	2.9	0	4.002	\$2,260.06	
07260.012	6MIL VISQUEEN SUBGRADE PAPER	5.17	SQS	1.1018	2.9	0	4.002	\$20.69	
TOTAL ESTIMATE								\$2,443,467.87	