Central Bed Tower Expansion

University of Virginia | Charlottesville, VA

Technical Assignment 2

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Construction Management

Executive Summary

For Technical Report 2, a detailed analysis was performed for the construction schedule, structural system estimate, general conditions estimate, LEED/sustainability evaluation, and Building Information Modeling uses. While detailed analyses were performed for specific parts of the Hospital Bed Expansion (HBE), major factors remain to be investigated throughout the entire project.

The project schedule was replicated in a detailed form of 197 activities beginning with procurement times. Because this is a phased project, the schedule will not appear linear. The schedule reflects repetitive work sequences which were summarized into single floor construction sequences after the first floor of similar construction was detailed in the schedule. New construction begins with the installation of 2nd floor columns stubs and reinforcing of existing columns. Because HBE is being built directly on top of the existing hospital lobby, a foundation will not need to be established which reduces the need for on-site excavation. After steel strengthening is complete, the steel framing can begin for the remaining floors from 3-8. Once the steel tops out at the Penthouse Level, the schedule shows the remaining interior construction to begin at the 8th floor working down and out to avoid interference with other trades and finished floors. Following this schedule will lead the construction team to a rate of 2 floors per turnover, starting with the 7th and 8th floors.

Also included in this analysis are the structural systems estimate and general conditions estimate. The structural systems estimate, which includes the steel framing and the concrete elevated floor slabs, is approximately $1,803,418. Due to a lack of cost information for some of the steel reinforcing, a hard number was not achieved for this estimate, but it can be considered to add a significant cost to the final value. The detailed structural estimate breaks down each item that was included in the final number as well as the items that were lacking cost information. The general conditions estimate reached a high of $5,034,016. The largest contributor to this value was the project staffing costs combined with insurance and tax rates.

This report also includes LEED and BIM use evaluations. UVA is seeking to achieve 42 points which will categorize the Hospital Bed Expansion with a LEED Gold certification. The design and construction teams have set realistic goals for how they will achieve this honor. Upon reviewing the proposed LEED scorecard, only 4 more potential points could be determined to be realistic goals, but even with these 4 points, HBE would still fall into the Gold category. BIM was not used on the Hospital Bed Expansion, but it was used, further systems analyses may have been performed to further the goals of LEED credits pursued. Because HBE is such a complex project with renovations tying into a new addition, BIM would have been an excellent tool to help mitigate any impending coordination/phasing issues. The nonlinear schedule could have been linked with a building model to simulate the real time work schedule thus reducing possible complications and missed details in the construction. This is something that UVA should consider further for future projects.

All references can be found in the Appendices.

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Detailed Project Schedule

Because HBE is involving renovations of the existing hospital, the schedule phasing will be complex but need to be efficient. It will be difficult to work around existing traffic patterns, but the construction will create inconvenient situations for the pedestrians who create a high traffic flow around the hospital. It is vital to achieve an efficient schedule that will limit the confusion and traffic delays for pedestrians. The schedule is broken into phasing which has created a non-linear sequence of activities.

Because HBE is being built directly on top of the existing hospital lobby, a foundation will not need to be established. However, several existing floors contain steel columns that will need to be reinforced with additional steel angles in order to support the future loads from the expansion and a newly renovated wing. After site mobilization, the project schedule specifies the installation of the 2nd floor stub columns. As the stub columns are being installed, before any more steel framing can be placed, it is vital to reinforce the specified columns. Although the schedule does not call out this activity, the reinforcing operation should begin before or during the stub column installation.

New construction primarily begins with the erection and placement of 2nd floor steel framing and elevated slabs. The steel framing begins at the 2nd floor and then works its way up to the penthouse which is then finished prior to the lower floors. The construction team plans to create a real time schedule where the trades are beginning at the 8th floor and working their way down and out of the building so as not to interfere with other trades or build themselves into a corner. Before the real time schedule can work, the upper floors will need to finish shell framing before the lower floors.

After the floors are framed, the building gap between existing and new buildings, on each floor, needs to be addressed so as to create a seemingly uniform structure.

As the structural framing is still in process, the mechanical and electrical equipment will be installed on the 2nd floor, where extra time will be necessary to create new wiring connections and alter the existing equipment. After hookup, this equipment can then generate power for the other trades on site.

The hoist will be installed during structural framing so as other trades can be transported vertically through the building. As the 8th floor ends the structural framing process, layout for interior rough in can begin. Mechanical, electrical, and plumbing will all be laid out and then roughed-in. The other interior trades will then shortly follow as each trade package works its way out of the building. The same happens from floors 7-3. During the interior installations, the façade construction will begin so as to aim for a watertight building.

After the building gap has been closed and before all of the new interiors are installed on each floor, the renovation process will begin in the existing hospital. Dust walls are placed on the limits of construction before demolition begins on the existing hospital. This schedule should result in the renovation area and bed expansion areas being in sync with their trade packages.

As the interiors are being finished, the elevators can then be installed. After the elevators are operational, the hoist can be removed so that the remaining pieces of curtain wall can be installed.

After interiors and mechanical connections are made, the commissioning process can begin on each floor. See Appendix A for the schedule.

Detailed Structural Systems Estimate

The structural system of HBE utilizes typical construction elements and design methods to achieve a stable foundation. Structural steel columns and members frame the new wing with cast-in-place (CIP) concrete acting as the floor system. Welded Wire Fabric (WWF) will serve as reinforcement for the flooring system, reducing the need for larger steel reinforcing bars (rebar). Hollow Steel Sections (HSS) frame the exterior of each floor slab which will later serve as the support system for a glass curtain wall. The HSS exterior frame was not included in this estimate due to the lack of consistency with the main steel structure.

As mentioned earlier, column reinforcing is an important aspect of this project as there is no new foundation being built. Column reinforcing is prevalent on the ground floor, 1st and 2nd floors, and the mechanical space 2M. Primarily, three different sizes of steel angles were used for column reinforcing: L8x8x1, L6x6x1, and L6x6x5/8. Although the columns have differing details that reference the method of installing new steel angles, the plate sizing will not vary outside of the three that were given. Using the steel manual, total weight in tons was found for each of these steel angles. A corresponding value could not be found in RS Means, therefore the total cost of these angles were not included in the total estimate.

Because the 2nd floor will be reserved for mechanical and electrical equipment, a different layout was assigned in order to carry the extra loading (See Drawing S1.4). The 2nd floor boasts the largest steel members for the project with sizes ranging from (2) W12x14 to (6) W36x441. The mechanical floor owns the title of "highest cost per floor" while possessing the heaviest/largest steel beams and a thick detailed floor system. The floor system consists of 6" normal weight concrete poured over a 3", 20 gage galvanized composite steel decking with 4x4 W4.0xW4.0 WWF utilized for tensile reinforcing. The floor consists of bays with the concrete sloping to a drain in the middle of each bay. This floor estimate was calculated as a flat slab to take into account expected concrete waste.

Floors 3-8 + roof are similar with a few variations (See Drawing S1.6). Floors 4,5,7,8 will be identical in reference to steel framing and floor systems. The steel members range a much smaller scale as compared to the 2nd floor. With the smallest beam being a W10x12 the largest beam only sizes to a W24x131 (small in comparison to W36x441). The elevated slab is 4 ½" lightweight concrete poured over 2", 20 gage galvanized composite steel decking with 4x4 W4.0xW4.0 WWF utilized for tensile reinforcing. Each floor contains five large and two small 4" depressed slabs to accommodate space for the bathrooms. Each main patient floor also has WT10.5x28.5 girders to reinforce the existing girders.

These girder reinforcements were not considered in this estimate due to lack of cost information from RS Means.

The 3rd floor estimate only deviates from the typical floor estimate in the elevated slab. Rather than 4 ½" light weight concrete, the 3rd floor utilizes a 6" normal weight concrete poured over a 3",20 gage galvanized composite steel decking.

The 6th floor maintains the same characteristics of the typical floor framing but also includes an additional floor space (See Drawing S1.5). The 6th floor has an extra 5066 sq. ft. of floor space that is being framed. This space is an existing lobby that needs to be further framed and reinforced in order to accommodate the new patient program.

The steel columns are spliced at every 14' floor height.

There were a number of nontraditional beam and column sizes used throughout this project. In order to find an accurate cost from R.S. Means, the values were interpolated or averaged using information from supplied cost information, an assumed O&P percentage of 15% was used. Accessories such as concrete forming, steel bolts, and connection plates were not included in the estimate, as it was considered that these items would have a negligible cost associated with them.

Shear studs were not included in the estimate due to lack of cost information from R.S. Means.

A current estimated cost for the structural system is $2,011,444.76. If the steel angles, HSS framing, and WT reinforcing girders were to be included, it is expected that this dollar amount would increase above $2,300,000.00 which falls within 16% of the typical cost for shell construction on a 60,000 square foot hospital project (See Tables 1 and 2). The current project cost for HBE well exceeds a typical hospital project of this size. It is anticipated that the actual cost for the steel package well exceeds the typical $2,760,000 value due to the phasing complications and work schedule requirements set forth by the hospital.

Summary			$ 2,011,444.76
Steel Strengthening			
Description	Weight	Quantity (tons)	Total O&P
L8 x 8 x 1	51 lbs/ft	45.696	10%
L6 x 6 x 5/8	24.2 lbs/ft	46.0768	10%
L6 x 6 x 1	37.4 lbs/ft	12.5664	10%
Level 2M			$ 282,673.14
Description	Units	Quantity	Total O&P
Steel Members	L.F.	923.5	$ 254,248.56
Steel Deck	S.F.	5376	$ 19,407.36
Concrete	C.Y.	150	$ 3,802.50
WWF	C.S.F.	54	$ 5,214.72
Level 4,5,7,8 (Typical)			$ 189,559.77
Description	Units	Quantity	Total O&P
Steel Members	L.F.	2304	$ 164,633.25
Steel Deck	S.F.	5661	$ 16,699.95
Concrete	C.Y.	94	$ 2,735.40
WWF	C.S.F.	57	$ 5,491.17
Level 3			$ 190,550.82
Description	Units	Quantity	Total O&P
Steel Members	L.F.	2304	$ 146,166.98
Steel Deck	S.F.	5661	$ 16,699.95
Concrete	C.Y.	147	$ 3,726.45
WWF	C.S.F.	57	$ 5,491.17
Level 6			$ 276,612.11
Description	Units	Quantity	Total O&P
Steel Members	L.F.	3245.5	$ 229,091.47
Steel Deck	S.F.	10727	$ 31,644.65
Concrete	C.Y.	188	$ 5,470.80
WWF	C.S.F.	107.27	$ 10,405.19
Columns			$ 313,809.84
Description	Units	Quantity	Total O&P
Columns	L.F.	1811	$ 313,809.84

Table 1 shows the structural systems summary estimate

* Values provided do not indicate the actual cost for structural systems.*

** The full detailed estimate can be found in appendix B

Building Component	% of Total Building	RS Means SQFT Estimate	Actual SQFT Cost
Substructure	2.20%	$ 264,000.00	$ 1,210,000.00
Shell	23.00%	$ 2,760,000.00	$ 12,650,000.00
Interiors	2.02%	$ 242,400.00	$ 1,111,000.00
Elevators & Lifts	2.60%	$ 312,000.00	$ 1,430,000.00
Plumbing Fixtures	2.80%	$ 336,000.00	$ 1,540,000.00
Water Distribution	7.30%	$ 876,000.00	$ 4,015,000.00
Rain Water Drainag	0.75%	$ 90,000.00	$ 412,500.00
Energy Supply	1.40%	$ 168,000.00	$ 770,000.00
Heat Generating Systems	1.60%	$ 192,000.00	$ 880,000.00
Cooling Generating Systems	1.20%	$ 144,000.00	$ 660,000.00
Other Systems	11.60%	$ 1,392,000.00	$ 6,380,000.00
Sprinklers	1.00%	$ 120,000.00	$ 550,000.00
Standpipes	0.40%	$ 48,000.00	$ 220,000.00
Electrical Service/Distributior	5.90%	$ 708,000.00	$ 3,245,000.00
Lighting and Branch Wiring	7.70%	$ 924,000.00	$ 4,235,000.00
Communication and Security	0.80%	$ 96,000.00	$ 440,000.00
Equipment & Furnshings	7.40%	$ 888,000.00	$ 4,070,000.00
Total		$ 9,560,400.00	$ 43,818,500.00
Cost/SQFT		$ 200.00	$ 916.67

Table 2 shows the estimate breakdown of the HBE

Percentages provided are strictly based off of the RS Means SQFT estimate and do not reflect actual building costs.

General Conditions Estimate

The General Conditions Estimate includes items to be covered by Gilbane/Russell acting as the CM Agent for UVA. As the CM agent, Gilbane/Russell will include items into the general conditions that will only affect the current CM agent staffing. Because of this, the majority of general conditions' hard numbers for HBE will be composed of the field personnel salaries. The cost information taken from R.S. Means for field personnel adds up to $1,970,475 for the estimated 129 schedule duration. R.S. Means line items were chosen based upon the seniority of each field office personnel.

Other hard number line items included in the general conditions are the trailer rental, office equipment, office supplies, water, telecomm, lights &HVAC, small tools, barricades, fencing, signs, and site cleanup. Gilbane/Russell may not include some of these items in the actual general conditions as they typically would place these items with the general contractor on site. The general contractor may also own barricades and fencing for the jobsite.

Gilbane/Russell will carry insurance and bonding for the entire project and subcontractors. Other items such as fees and taxes will also be covered under the general conditions.

There are aspects of the project that will be bought under the general contractor for HBE. Portable toilets, dumpsters, and site fencing will be included in the general contractor's bid package.

After all of the percentages have been added into the general conditions, a total GC value is $5,034,016.33. Time and City Index adjustment factors were taken into consideration from R.S. Means Costworks. See Appendix C for the complete general conditions estimate.

LEED Evaluation

The University of Virginia has designed the Hospital Bed Expansion to achieve a LEED Gold rating. Contributing to this accreditation are innovative design ideas and strict guidelines for construction waste.

UVA is expecting to receive (9) credits for Sustainable Sites with a possibility of (4) additional credits. The projected awarded points are realistic and should be easily obtained with the roof renovation and construction. Because the project site is in a city-like area, it would be hard to expand upon brownfield redevelopment unless a lot of time and thought is put into how to achieve this with such a limited area. It might be unrealistic to hope for the Alternative Transportation, Low-Emitting and Fuel-Efficient Vehicles credit. If UVA were to achieve this, there would need to start an initiative across all of the hospital staff to drive different cars; it's possible that this could be done in the future, but more time will need to be dedicated to the process.

(4) out of (5) credits are being attempted for Water Efficiency. Innovative Wastewater Technologies should be further researched by the designer, as there are a few simplistic methods that could prove beneficial in achieving this credit for a limited cost.

The majority of points for Energy & Atmosphere are not being attempted; only 5 points are being attempted and none are in the possible category. This credit category has much potential for HBE. There is room for on-site renewable energy sources on the hospital; cost for solar panels should be researched to weigh the cost of materials and installation versus long term operating costs. If the facilities management were to take time and measure the rate of energy usage, it would be easy to achieve the Measurement & Verification point.

The Materials & Resources category has an appropriate amount of points being sought after. The only extra credit that may be worthwhile to pursue is Materials Reuse (5%) from the existing hospital. It may be difficult to find materials that are able to salvaged, but it is something that should be considered before disposing of all equipment and cabinets.

The most points of any category are being sought after in the Indoor Environmental Quality category. Because carpet systems are not being used for the addition or renovation, the corresponding point

cannot be achieved. The IAQ management plan will require documentation throughout the project of ductwork that is being protected from dust and other resins.

It is expected that HBE will win all of the Innovation & Design points. This is something that will need to be monitored throughout the project, but is should be easily attained.

There are only a few credits that I would consider to be worthwhile in pursuing. On-Site Renewable Energy is something that should be considered by the design and construction team as well as Measurement & Verification, and Materials Reuse (5%). This would only increase the LEED rating by 4 points, which will not be enough to reach the Platinum rating, but it might be worthwhile to entertain the thought of using these credits as "backups" in case the starters end up not pulling through.

The LEED scorecards can be found in Appendix D.

			Current LEED Summary
Yes	?	No	Category
9	4	1	Sustainable Sites
4		1	Water Efficiency
5		12	Energy & Atmosphere
8		5	Materials & Resources
11		4	Indoor Environmental Quality
5			Innovation & Design Process
42	4	23	Project Totals

Table 3 shows the current LEED point summary

			Projected LEED Summary
Yes	?	No	Category
9	3	2	Sustainable Sites
5			Water Efficiency
8		9	Energy & Atmosphere
8	1	4	Materials & Resources
11		4	Indoor Environmental Quality
5			Innovation & Design Process
46	4	19	Project Totals

Table 4 shows the proposed LEED point summary

Building Information Modeling Use Evaluation

Despite the coordination challenges, the Building Information Modeling (BIM) process does not play an integral part, if it is used at all, in the progress of HBE. As mentioned earlier, HBE has many impending coordination and phasing issues involved. Considering this, the benefits in using BIM for this project outweigh the cost of implementing the process considerably. The surrounding hospital building projects should also utilize BIM in order to alleviate the coordination issues amongst all of the construction. Using BIM would not only aid in the mitigation of lost time for construction phasing, but if used during

design, it could also benefit the structural engineer in analyzing the appropriate existing steel members that would need to be reinforced. The mechanical and electrical engineers would also benefit from the systems analyses, as they would then see the details of tie-ins for the existing fixtures.

The seemingly biggest benefit in using BIM for construction would be the phasing of construction sequences and turnover sequences. As seen in the schedule explanation, the work sequence is not linear and by no means simple. If the building model could be linked with the schedule, inefficiencies could be found and resolved before even moving into the field.

It is a complicated process when hospitals move into their new space while buying new hospital equipment. It would be best if the owner could work with the construction manager to make the turnover as smooth as possible.

After construction, when the hospital is turned over to UVA, the compilation of these models and data would be given to the owner who would then have a useful tool in maintaining the hospital systems.

If BIM were to be implemented on HBE, there is not necessarily a need for every aspect of the process map (See Appendix E). To initiate the process, the building program will be developed by the owner; soon after, the architect will begin schematic designs. In this stage it would be useful to develop a rough cost estimation to give the owner/designers an idea of the project cost. Virtual prototypes can be created with an engineering analysis to compare alternative engineering systems. Once Design Development begins, cost estimation does not become a vital factor for UVA. However, a 3D model can be used amongst the designers to mitigate the instances of system discrepancies. During the construction phase, the cost estimation becomes an important factor again, and the 4D model is introduced with a virtual model and integrated schedule. After completion of the project, all of the model information can be compiled for the owner's use after construction.

PRIORITY (HIGH/ MED/ LOW)	GOAL DESCRIPTION	POTENTIAL BIM USES
High	Eliminate design clashes prior to moving into construction	3D Coordination
High	Run systems analyses to improve system designs for potential LEED credits	System Analyses
Med	Phased site plans to allow planning for smooth transitions of phased construction	Site Use Planning
High	Phased schedule and model to ensure the most efficient work sequence and tie in cost to materials	3D Coordination/ Phase Planning/Cost Estimation
Low	Operator's building information	Building Maintenance Scheduling/Record Modeling

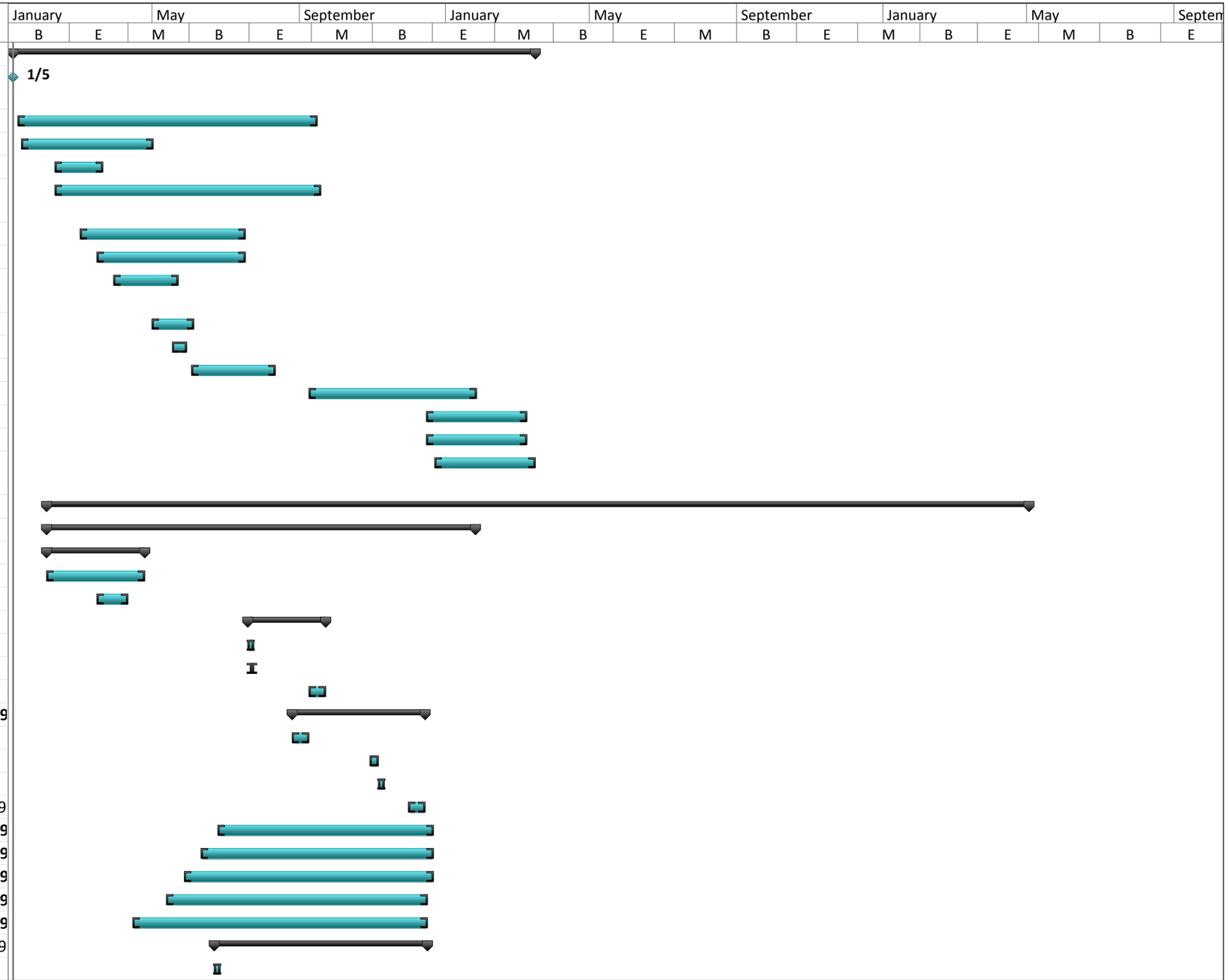
Table 5 shows the proposed goals using BIM

**The BIM tables and process map were taken from the Penn State BIM Execution Plan.

X	PLAN	X	DESIGN	X	CONSTRUCT	X	OPERATE
x	PROGRAMMING	x	DESIGN AUTHORING	x	SITE UTILIZATION PLANNING	x	BUILDING MAINTENANCE SCHEDULING
x	SITE ANALYSIS	x	DESIGN REVIEWS		CONSTRUCTION SYSTEM DESIGN		BUILDING SYSTEM ANALYSIS
		x	3D COORDINATION		3D COORDINATION	x	ASSET MANAGEMENT
		x	STRUCTURAL ANALYSIS		DIGITAL FABRICATION	x	SPACE MANAGEMENT / TRACKING
		x	LIGHTING ANALYSIS	x	3D CONTROL AND PLANNING		DISASTER PLANNING
		x	ENERGY ANALYSIS		RECORD MODELING	x	RECORD MODELING
		x	MECHANICAL ANALYSIS				
			OTHER ENG. ANALYSIS				
		x	SUSTAINABLITY (LEED) EVALUATION				
			CODE VALIDATION				
x	PHASE PLANNING (4D MODELING)		PHASE PLANNING (4D MODELING)	x	PHASE PLANNING (4D MODELING)		PHASE PLANNING (4D MODELING)
	COST ESTIMATION	x	COST ESTIMATION		COST ESTIMATION		COST ESTIMATION
	EXISTING CONDITIONS MODELING	x	EXISTING CONDITIONS MODELING	x	EXISTING CONDITIONS MODELING		EXISTING CONDITIONS MODELING

Table 6 shows the proposed BIM Use Plan

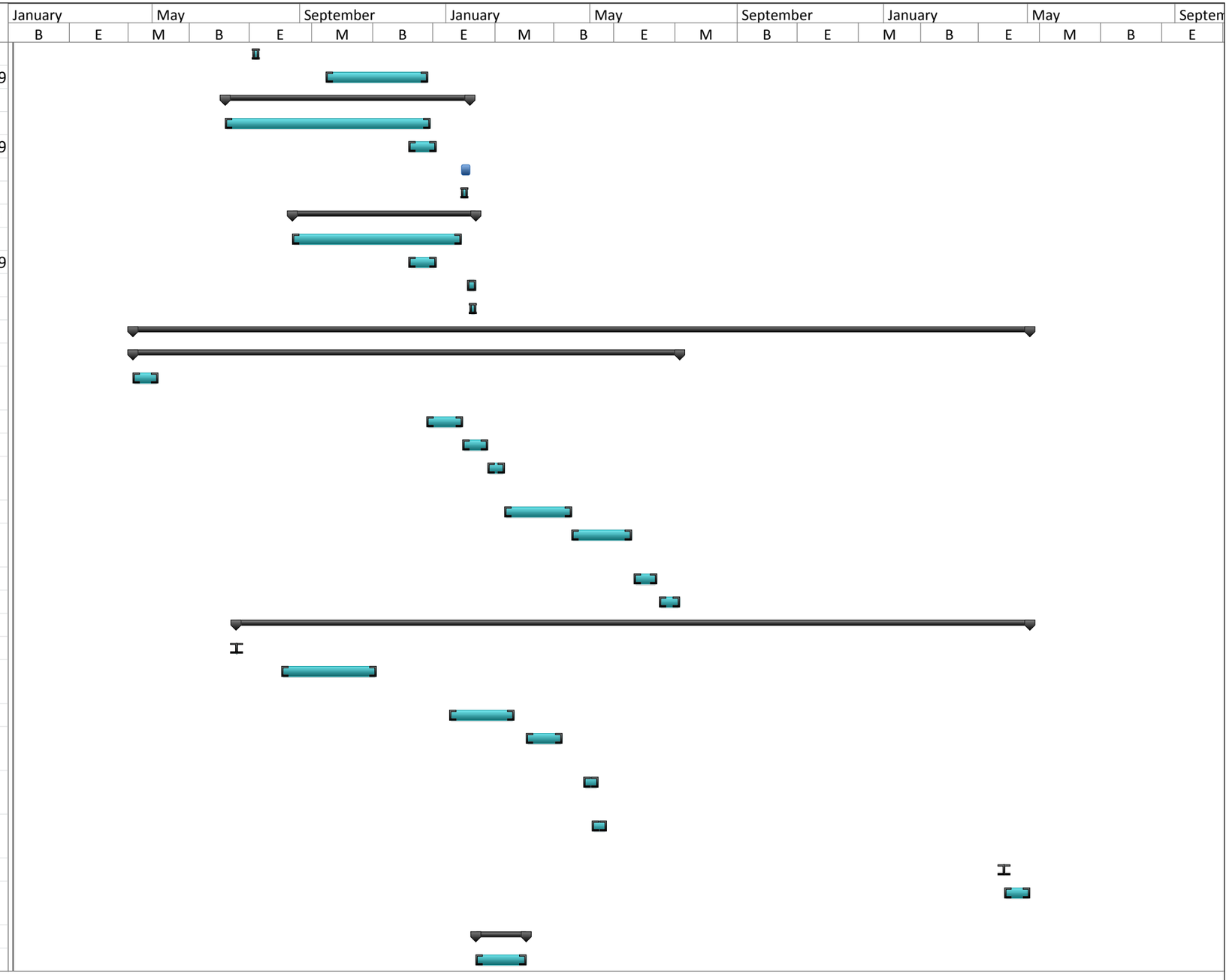
ID	Task Name	Duration	Start	Finish
1	**Procurement**	**312 days**	**Mon 1/5/09**	**Tue 3/16/10**
2	Structural Steel and Curtain Wall Bought Out	0 days	Mon 1/5/09	Mon 1/5/09
3	Prepare Structural Steel Shop	178 days	Fri 1/9/09	Tue 9/15/09
4	Prepare CW Shops/Embed	80 days	Mon 1/12/09	Fri 5/1/09
5	Fabricate Trusses/Beams	30 days	Mon 2/9/09	Fri 3/20/09
6	Fabricate Deck/Misc. Structural Members	160 days	Mon 2/9/09	Fri 9/18/09
7	Fabricate Anchors/Embeds	100 days	Mon 3/2/09	Fri 7/17/09
8	Approve Structural Steel Shop	90 days	Mon 3/16/09	Fri 7/17/09
9	Submit/Approve Chilled Water	40 days	Mon 3/30/09	Fri 5/22/09
10	Submit/Approve Ductbank	25 days	Fri 5/1/09	Thu 6/4/09
11	Fabricate Ductbank	10 days	Mon 5/18/09	Fri 5/29/09
12	Approve CW/Embed Shops	50 days	Wed 6/3/09	Tue 8/11/09
13	Fabricate Curtain Wall System	100 days	Wed 9/9/09	Tue 1/26/10
14	Fab & Deliver AHU-1	60 days	Wed 12/16/09	Tue 3/9/10
15	Fab & Deliver AHU-2	60 days	Wed 12/16/09	Tue 3/9/10
16	Fabricate Chilled Water Pumps	60 days	Wed 12/23/09	Tue 3/16/10
17	**New Construction**	**586 days**	**Mon 2/2/09**	**Mon 5/2/11**
18	**Structure**	**256 days**	**Mon 2/2/09**	**Mon 1/25/10**
19	**Not Floor Specific**	**60 days**	**Mon 2/2/09**	**Fri 4/24/09**
20	Job Set Up	60 days	Mon 2/2/09	Fri 4/24/09
21	Install Stub Columns	20 days	Mon 3/16/09	Fri 4/10/09
22	**2M Floor**	**47 days**	**Mon 7/20/09**	**Tue 9/22/09**
23	Pour Deck 2M	5 days	Mon 7/20/09	Fri 7/24/09
24	Spray Fire Proofing	3 days	Wed 7/22/09	Fri 7/24/09
25	MEP Risers Storm Piping	10 days	Wed 9/9/09	Tue 9/22/09
26	**Penthouse (Typical)**	**79 days**	**Wed 8/26/09**	**Mon 12/14/09**
27	Steel Structure and Deck	10 days	Wed 8/26/09	Tue 9/8/09
28	Pour Deck	5 days	Fri 10/30/09	Thu 11/5/09
29	Spray Fire Proofing	3 days	Fri 11/6/09	Tue 11/10/09
30	MEP Risers Storm Piping	10 days	Tue 12/1/09	Mon 12/14/09
31	**8th Floor (Typical)**	**128 days**	**Thu 6/25/09**	**Mon 12/21/09**
32	**7th Floor (Typical)**	**138 days**	**Thu 6/11/09**	**Mon 12/21/09**
33	**6th Floor (Tyipcal)**	**148 days**	**Thu 5/28/09**	**Mon 12/21/09**
34	**5th Floor (Tyipcal)**	**156 days**	**Wed 5/13/09**	**Wed 12/16/09**
35	**4th Floor (Typical)**	**176 days**	**Wed 4/15/09**	**Wed 12/16/09**
36	**3rd Floor**	**128 days**	Mon 6/22/09	Wed 12/16/09
37	Pour Deck	5 days	Mon 6/22/09	Fri 6/26/09



Project: Detailed Schedule
Date: Mon 10/17/11

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline
Split	External Tasks	Inactive Summary	Manual Summary	Progress
Milestone	External Milestone	Manual Task	Start-only	
Summary	Inactive Task	Duration-only	Finish-only	

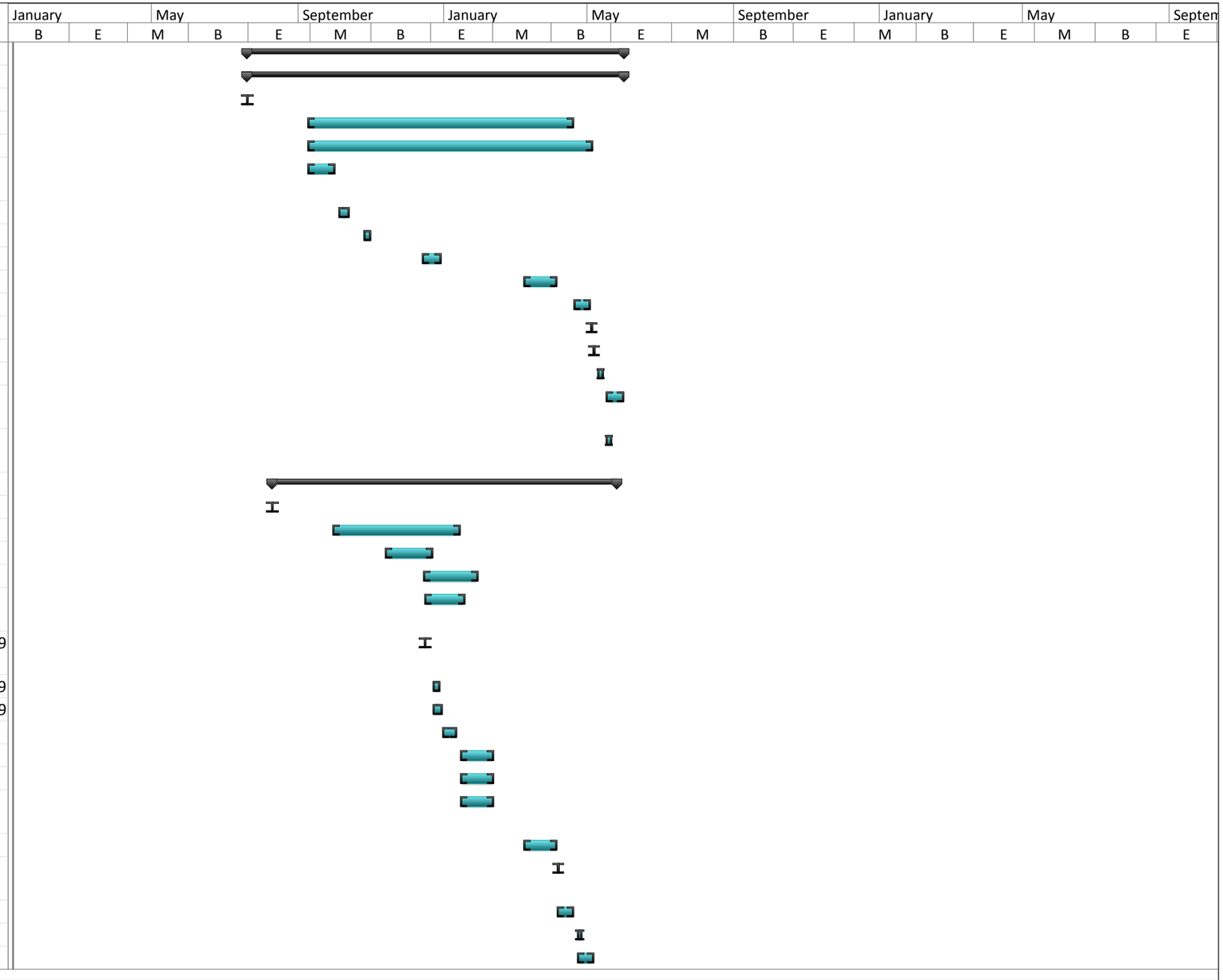
ID	Task Name	Duration	Start	Finish
38	Spray Fire Proofing	3 days	Fri 7/24/09	Tue 7/28/09
39	MEP Risers Storm Piping	61 days	Wed 9/23/09	Wed 12/16/09
40	**Low Roof**	**146 days**	Wed 7/1/09	Wed 1/20/10
41	Steel Structure and Deck	123 days	Wed 7/1/09	Fri 12/18/09
42	MEP Risers Storm Piping	17 days	Tue 12/1/09	Wed 12/23/09
43	Pour Deck	5 days	Thu 1/14/10	Wed 1/20/10
44	Spray Fire Proofing	3 days	Thu 1/14/10	Mon 1/18/10
45	**High Roof**	**109 days**	**Wed 8/26/09**	**Mon 1/25/10**
46	Steel Structure and Deck	101 days	Wed 8/26/09	Wed 1/13/10
47	MEP Risers Storm Piping	17 days	Tue 12/1/09	Wed 12/23/09
48	Penthouse Roof Curbs	5 days	Tue 1/19/10	Mon 1/25/10
49	Spray Fire Proofing	3 days	Thu 1/21/10	Mon 1/25/10
50	**Building Gap**	**534 days**	**Wed 4/15/09**	**Mon 5/2/11**
51	**Not Floor Specific**	**326 days**	**Wed 4/15/09**	**Wed 7/14/10**
52	Survey Elevation New/Existing	15 days	Wed 4/15/09	Tue 5/5/09
53	Establish Access Points	22 days	Wed 12/16/09	Thu 1/14/10
54	Field Measurements	15 days	Fri 1/15/10	Thu 2/4/10
55	Engineer/Approve Gap Beam	10 days	Fri 2/5/10	Thu 2/18/10
56	Fabricate Beams/Deck	40 days	Fri 2/19/10	Thu 4/15/10
57	Install Structural Beam @ Bldg Gap	36 days	Fri 4/16/10	Fri 6/4/10
58	Install Deck @ Bldg Gap	15 days	Mon 6/7/10	Fri 6/25/10
59	Pour Deck @ Bldg Gap	13 days	Mon 6/28/10	Wed 7/14/10
60	**Façade**	**472 days**	**Fri 7/10/09**	**Mon 5/2/11**
61	Installation of Hoist	1 day	Fri 7/10/09	Fri 7/10/09
62	Curtain Wall Construction Front	57 days	Mon 8/17/09	Tue 11/3/09
63	Penthouse Façade	40 days	Mon 1/4/10	Fri 2/26/10
64	Demo Existing Curtainwall	22 days	Tue 3/9/10	Wed 4/7/10
65	Install Metal Panels East corners	10 days	Mon 4/26/10	Fri 5/7/10
66	Install metals Panels West Corners	10 days	Mon 5/3/10	Fri 5/14/10
67	Removal of Hoist	1 day	Mon 4/11/11	Mon 4/11/11
68	Complete East/West Curtainwall	15 days	Tue 4/12/11	Mon 5/2/11
69	**Roof**	**30 days**	**Tue 1/26/10**	**Mon 3/8/10**
70	Roofing	30 days	Tue 1/26/10	Mon 3/8/10



Project: Detailed Schedule
Date: Mon 10/17/11

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline
Split	External Tasks	Inactive Summary	Manual Summary	Progress
Milestone	External Milestone	Manual Task	Start-only	
Summary	Inactive Task	Duration-only	Finish-only	

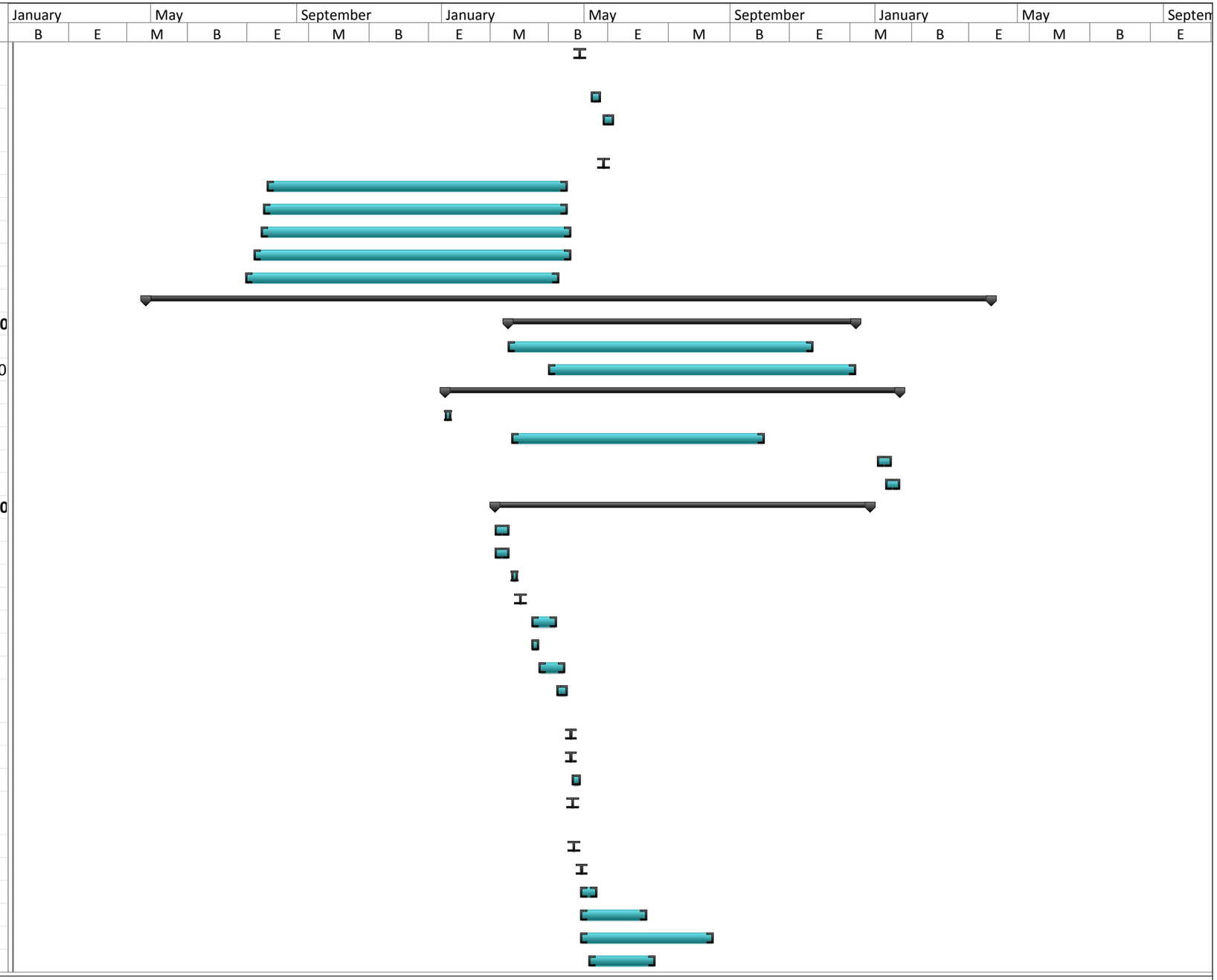
ID	Task Name	Duration	Start	Finish
71	**New Interior**	**226 days**	**Mon 7/20/09**	**Mon 5/31/10**
72	**2M Floor**	**226 days**	**Mon 7/20/09**	**Mon 5/31/10**
73	Layout for New Interior	1 day	Mon 7/20/09	Mon 7/20/09
74	Avobe Ceiling Mech R/I	159 days	Wed 9/9/09	Mon 4/19/10
75	Above Ceiling Elec R/I	171 days	Wed 9/9/09	Wed 5/5/10
76	Above Ceiling Plumbing R/I	17 days	Wed 9/9/09	Thu 10/1/09
77	FRP Equipment Pads	7 days	Mon 10/5/09	Tue 10/13/09
78	Set Switchgear	6 days	Mon 10/26/09	Sat 10/31/09
79	Ext. Framing for New Int.	12 days	Mon 12/14/09	Tue 12/29/09
80	In-Wall Elec R/I	20 days	Tue 3/9/10	Mon 4/5/10
81	Frame Drywall Partition	10 days	Tue 4/20/10	Mon 5/3/10
82	Framing Inspection	2 days	Tue 5/4/10	Wed 5/5/10
83	Close In- Inspection	2 days	Thu 5/6/10	Fri 5/7/10
84	Hang Sheet Rock	5 days	Mon 5/10/10	Fri 5/14/10
85	Frame/Hang Drywall Ceilings	11 days	Mon 5/17/10	Mon 5/31/10
86	Float, Tape & Finish Sheet Rock	5 days	Mon 5/17/10	Fri 5/21/10
87	**8th Floor (Typical)**	**207 days**	**Mon 8/10/09**	**Tue 5/25/10**
88	Layout for New Interior	1 day	Mon 8/10/09	Mon 8/10/09
89	Above Ceiling Elec R/I	77 days	Wed 9/30/09	Thu 1/14/10
90	Frame Drywall Partition	28 days	Fri 11/13/09	Tue 12/22/09
91	Above Ceiling Mech R/I	34 days	Tue 12/15/09	Fri 1/29/10
92	Above Ceiling Plumbing R/I	24 days	Wed 12/16/09	Mon 1/18/10
93	Install Hollow metal Door Frames	1 day	Wed 12/16/09	Wed 12/16/09
94	Framing Inspection	4 days	Wed 12/23/09	Mon 12/28/09
95	Drywall Top Out	6 days	Wed 12/23/09	Wed 12/30/09
96	Frame Drywall Ceilings	8 days	Thu 12/31/09	Mon 1/11/10
97	In-Wall Mech R/I	20 days	Fri 1/15/10	Thu 2/11/10
98	In-Wall Elec R/I	20 days	Fri 1/15/10	Thu 2/11/10
99	In-Wall Plumbing & Med Gas R/I	20 days	Fri 1/15/10	Thu 2/11/10
100	Overhead M&P Insulation	20 days	Tue 3/9/10	Mon 4/5/10
101	Above Ceiling Inspection	2 days	Tue 4/6/10	Wed 4/7/10
102	Install Bariatric Lift	10 days	Tue 4/6/10	Mon 4/19/10
103	Close In- Inspection	2 days	Fri 4/23/10	Mon 4/26/10
104	In-Wall M&P Insulation	10 days	Fri 4/23/10	Thu 5/6/10



Project: Detailed Schedule
Date: Mon 10/17/11

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline
Split	External Tasks	Inactive Summary	Manual Summary	Progress
Milestone	External Milestone	Manual Task	Start-only	
Summary	Inactive Task	Duration-only	Finish-only	

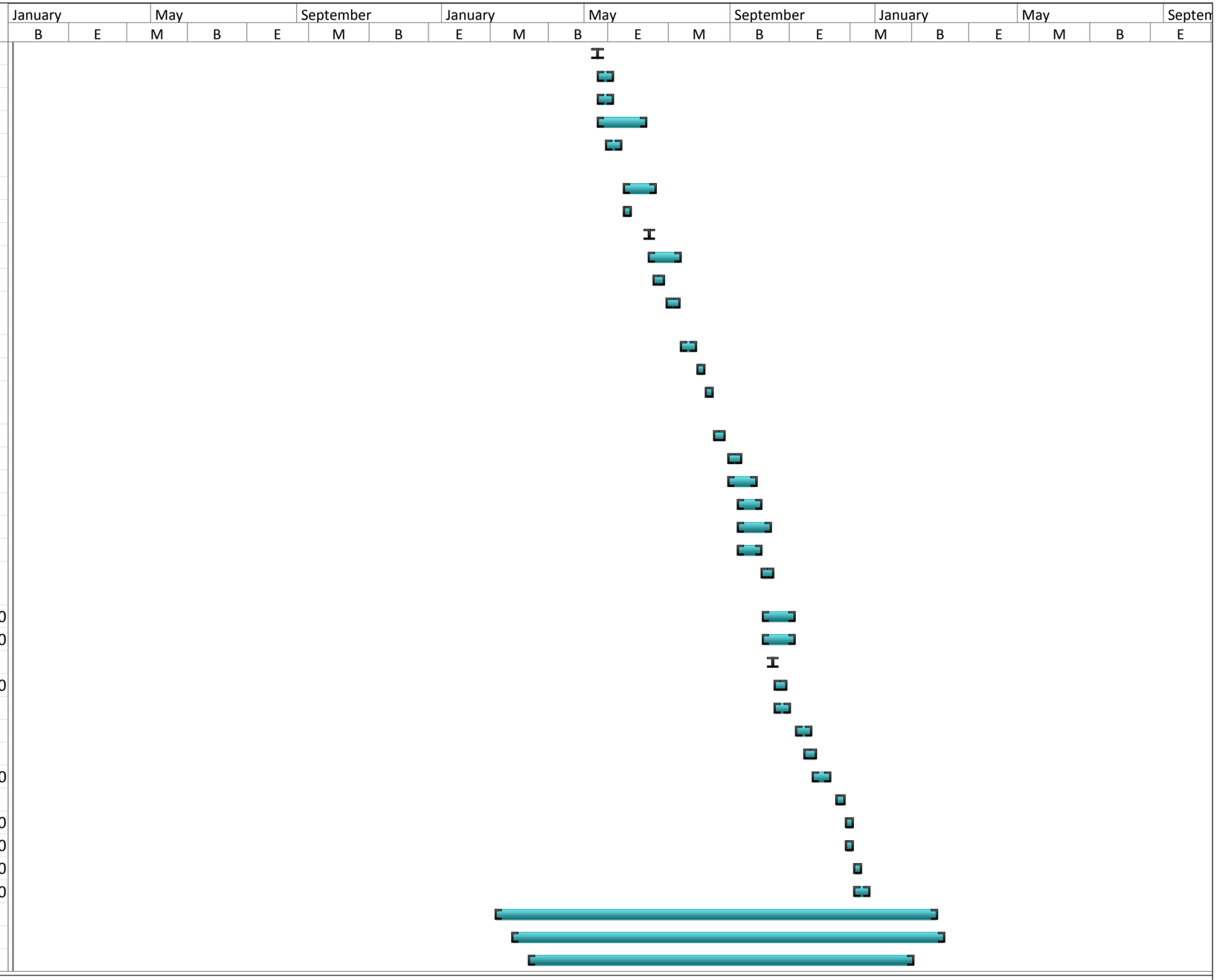
ID	Task Name	Duration	Start	Finish
105	Install Patient ICU Room Door	1 day	Tue 4/27/10	Tue 4/27/10
106	Hang Sheet Rock	6 days	Fri 5/7/10	Fri 5/14/10
107	Float, Tape & Finish Sheet Rock	7 days	Mon 5/17/10	Tue 5/25/10
108	Install Med Gas Manifold	1 day	Mon 5/17/10	Mon 5/17/10
109	**7th Floor (Typical)**	**181 days**	**Fri 8/7/09**	**Fri 4/16/10**
110	**6th Floor (Tyipcal)**	**184 days**	**Tue 8/4/09**	**Fri 4/16/10**
111	**5th Floor (Tyipcal)**	**187 days**	**Sun 8/2/09**	**Mon 4/19/10**
112	**4th Floor (Typical)**	**191 days**	**Mon 7/27/09**	**Mon 4/19/10**
113	**3rd Floor (Typical)**	**190 days**	**Mon 7/20/09**	**Fri 4/9/10**
114	**Existing Interior**	**510 days**	**Mon 4/27/09**	**Fri 4/8/11**
115	**Ground Floor**	**209 days**	**Fri 2/26/10**	**Wed 12/15/10**
116	Switchgear Room G021	183 days	Fri 2/26/10	Tue 11/9/10
117	Transformer Room G440	185 days	Thu 4/1/10	Wed 12/15/10
118	**Penthouse**	**275 days**	**Mon 1/4/10**	**Fri 1/21/11**
119	Set Equipment Pad	5 days	Mon 1/4/10	Fri 1/8/10
120	Interior Penthouse MEP	153 days	Mon 3/1/10	Wed 9/29/10
121	Install & Connect AHU-1	10 days	Mon 1/3/11	Fri 1/14/11
122	Install & Connect AHU-2	10 days	Mon 1/10/11	Fri 1/21/11
123	**8th Floor (Typical)**	**226 days**	**Mon 2/15/10**	**Mon 12/27/10**
124	Construct Dust Partition	10 days	Mon 2/15/10	Fri 2/26/10
125	Demo MEP/Cut N Cap	10 days	Mon 2/15/10	Fri 2/26/10
126	Demo Existing Exterior	5 days	Mon 3/1/10	Fri 3/5/10
127	Frame Slab	1 day	Mon 3/8/10	Mon 3/8/10
128	Demo Existing Int.	15 days	Thu 3/18/10	Wed 4/7/10
129	Install Temp Electric	4 days	Thu 3/18/10	Tue 3/23/10
130	Electric Feeders	16 days	Wed 3/24/10	Wed 4/14/10
131	Install Structural Steel Reinforcing	7 days	Thu 4/8/10	Fri 4/16/10
132	Install Fire Proofing	2 days	Mon 4/19/10	Tue 4/20/10
133	Demo Existing Roof	2 days	Mon 4/19/10	Tue 4/20/10
134	Layout for Existing Int	5 days	Wed 4/21/10	Tue 4/27/10
135	Shot Blast Existing Concrete	1 day	Wed 4/21/10	Wed 4/21/10
136	Pour Topping Concrete	1 day	Thu 4/22/10	Thu 4/22/10
137	Exterior Framing	2 days	Wed 4/28/10	Thu 4/29/10
138	Frame Drywall Partition	10 days	Wed 4/28/10	Tue 5/11/10
139	Above Ceiling Mech R/I	40 days	Wed 4/28/10	Tue 6/22/10
140	Above Ceiling Elec R/I	80 days	Wed 4/28/10	Tue 8/17/10
141	Above Ceiling Plumbing R/I	40 days	Wed 5/5/10	Tue 6/29/10



Project: Detailed Schedule
Date: Mon 10/17/11

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline
Split	External Tasks	Inactive Summary	Manual Summary	Progress
Milestone	External Milestone	Manual Task	Start-only	
Summary	Inactive Task	Duration-only	Finish-only	

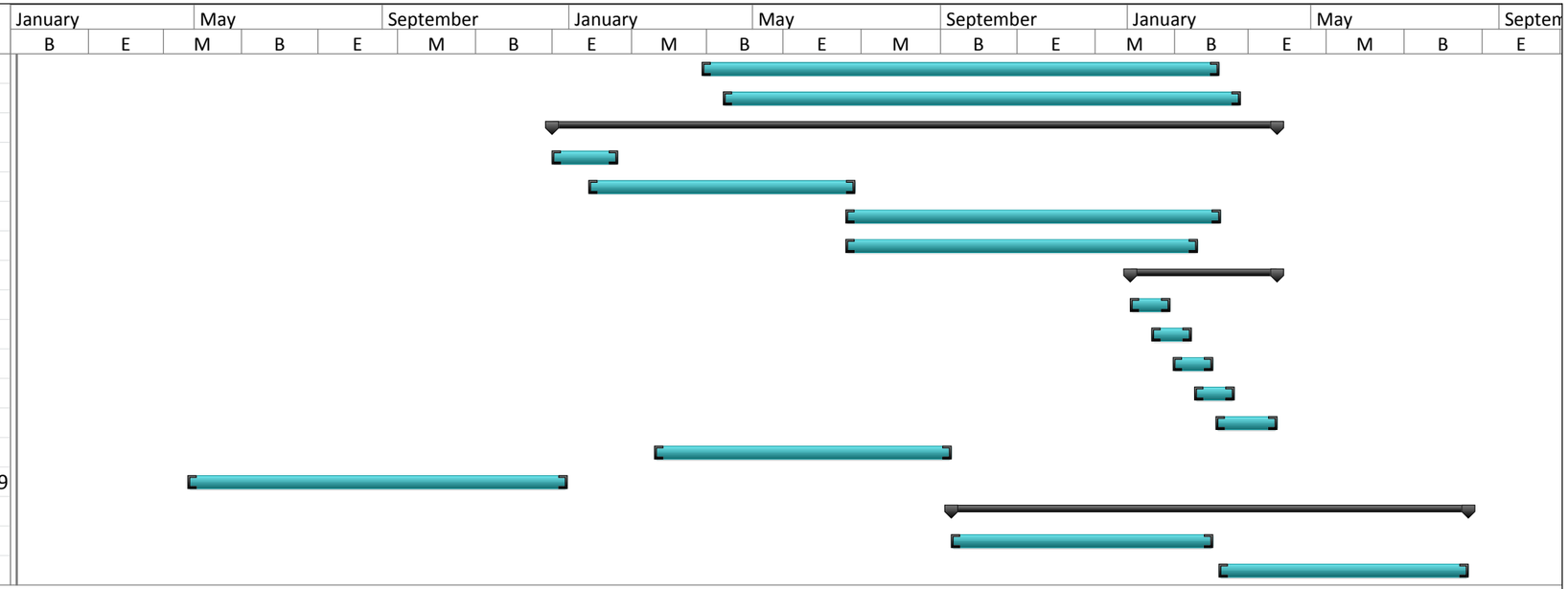
ID	Task Name	Duration	Start	Finish
142	Framing Inspection	1 day	Wed 5/12/10	Wed 5/12/10
143	Install Pneumatic Tube	10 days	Wed 5/12/10	Tue 5/25/10
144	In-Wall Mech R/I	10 days	Wed 5/12/10	Tue 5/25/10
145	In-Wall Elec R/I	30 days	Wed 5/12/10	Tue 6/22/10
146	In-Wall Plumbing & Med Gas R/I	10 days	Wed 5/19/10	Tue 6/1/10
147	Overhead M&P Insulation	20 days	Thu 6/3/10	Wed 6/30/10
148	In-Wall M&P Insulation	5 days	Thu 6/3/10	Wed 6/9/10
149	Close In- Inspection	2 days	Thu 6/24/10	Fri 6/25/10
150	Owner Systems	20 days	Thu 6/24/10	Wed 7/21/10
151	Hang Sheet Rock	8 days	Mon 6/28/10	Wed 7/7/10
152	Float, Tape & Finish Sheet Rock	8 days	Fri 7/9/10	Tue 7/20/10
153	Frame Drywall Ceilings	10 days	Wed 7/21/10	Tue 8/3/10
154	Hang Drywall Ceilings	5 days	Wed 8/4/10	Tue 8/10/10
155	Float, Tape & Finish Sheet Rock	5 days	Wed 8/11/10	Tue 8/17/10
156	Prime & First Coat Paint	8 days	Wed 8/18/10	Fri 8/27/10
157	Ceiling Grid	10 days	Mon 8/30/10	Fri 9/10/10
158	Devices & Plates	19 days	Mon 8/30/10	Thu 9/23/10
159	Registers/Grilles/Diffusers	15 days	Tue 9/7/10	Mon 9/27/10
160	Light Fixtures	21 days	Tue 9/7/10	Tue 10/5/10
161	Ceramic Tile	15 days	Tue 9/7/10	Mon 9/27/10
162	Misc. Equipment Connections	9 days	Mon 9/27/10	Thu 10/7/10
163	Plumbing Fixtures	20 days	Tue 9/28/10	Mon 10/25/10
164	Casework/Countertops	20 days	Tue 9/28/10	Mon 10/25/10
165	Above Ceiling Inspection	2 days	Wed 10/6/10	Thu 10/7/10
166	Ceiling Tile Full	7 days	Fri 10/8/10	Mon 10/18/10
167	Fire Alarm Devices	10 days	Fri 10/8/10	Thu 10/21/10
168	Countertop	10 days	Tue 10/26/10	Mon 11/8/10
169	Install Doors & Hardware	9 days	Tue 11/2/10	Fri 11/12/10
170	Install Flooring	12 days	Tue 11/9/10	Wed 11/24/10
171	Final Paitn	6 days	Mon 11/29/10	Mon 12/6/10
172	Balancing	5 days	Tue 12/7/10	Mon 12/13/10
173	Window Blinds	5 days	Tue 12/7/10	Mon 12/13/10
174	Fire marshall Inspection	5 days	Tue 12/14/10	Mon 12/20/10
175	Punchlist	10 days	Tue 12/14/10	Mon 12/27/10
176	**7th Floor (Typical)**	**267 days**	**Mon 2/15/10**	**Tue 2/22/11**
177	**6th Floor (Tyipcal)**	**261 days**	**Mon 3/1/10**	**Mon 2/28/11**
178	**5th Floor (Tyipcal)**	**233 days**	**Mon 3/15/10**	**Wed 2/2/11**



Project: Detailed Schedule
Date: Mon 10/17/11

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline
Split	External Tasks	Inactive Summary	Manual Summary	Progress
Milestone	External Milestone	Manual Task	Start-only	
Summary	Inactive Task	Duration-only	Finish-only	

ID	Task Name	Duration	Start	Finish
179	**4th Floor (Typical)**	**242 days**	**Mon 3/29/10**	**Tue 3/1/11**
180	**3rd Floor (Typical)**	**242 days**	**Mon 4/12/10**	**Tue 3/15/11**
181	**Elevators**	**340 days**	**Mon 12/21/09**	**Fri 4/8/11**
182	Ground Floor	31 days	Mon 12/21/09	Mon 2/1/10
183	1st Floor	124 days	Thu 1/14/10	Tue 7/6/10
184	2nd Floor	175 days	Thu 7/1/10	Wed 3/2/11
185	2M Floor	164 days	Thu 7/1/10	Tue 2/15/11
186	**All Floors**	**70 days**	**Mon 1/3/11**	**Fri 4/8/11**
187	Install Equipment	20 days	Mon 1/3/11	Fri 1/28/11
188	Install Rails	20 days	Mon 1/17/11	Fri 2/11/11
189	Set Platform	20 days	Mon 1/31/11	Fri 2/25/11
190	Construct Elevators	20 days	Mon 2/14/11	Fri 3/11/11
191	Wire Cab & Equipment	30 days	Mon 2/28/11	Fri 4/8/11
192	Chilled Water	138 days	Fri 2/26/10	Tue 9/7/10
193	Ductbank/Normal Upgrade	178 days	Mon 4/27/09	Wed 12/30/09
194	**Commissioning**	**242 days**	**Wed 9/8/10**	**Thu 8/11/11**
195	Equipment Start-Up	123 days	Wed 9/8/10	Fri 2/25/11
196	Commissioning	117 days	Wed 3/2/11	Thu 8/11/11



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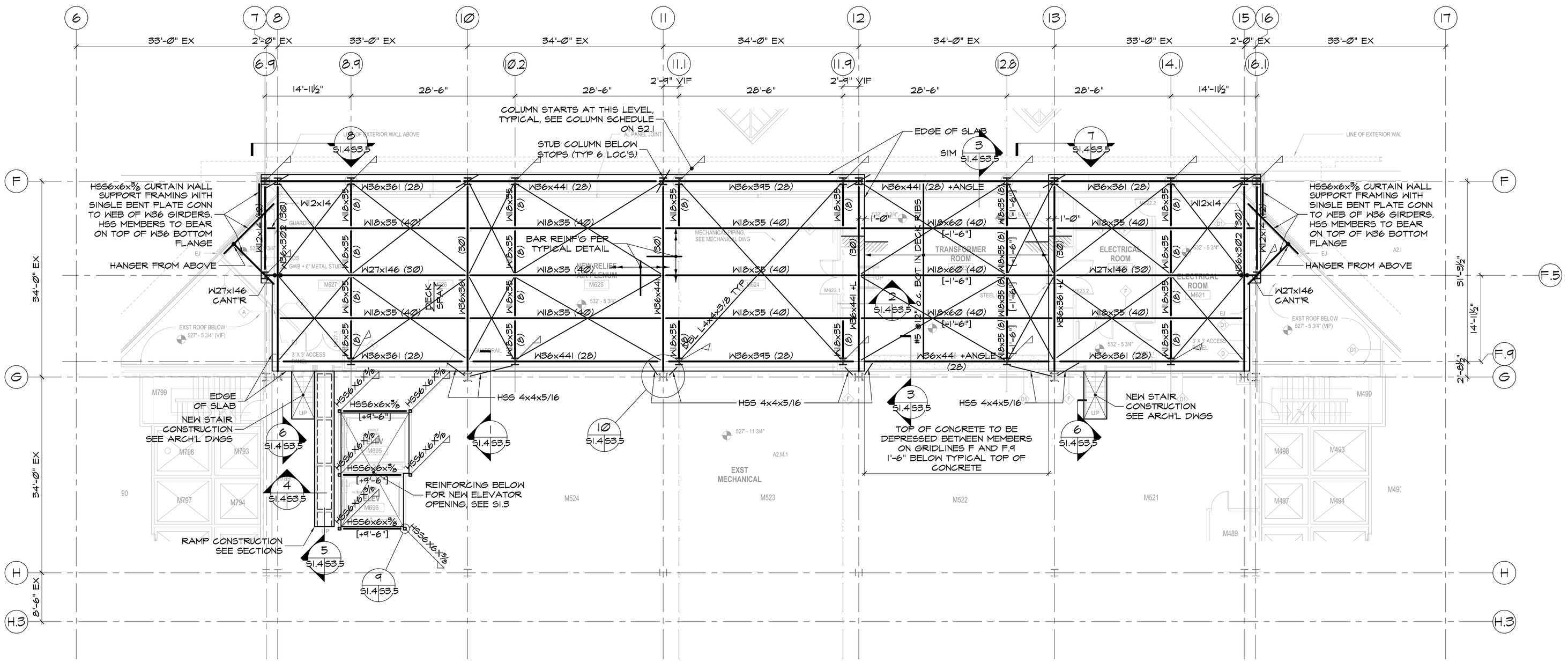
Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline
Split	External Tasks	Inactive Summary	Manual Summary	Progress
Milestone	External Milestone	Manual Task	Start-only	
Summary	Inactive Task	Duration-only	Finish-only	

Structural Detailed Estimate									Total:	$ 2,015,181.02
Level 2M										
Description	Summary	Unit	Quanitity	Total Length	Material	Labor	Equipment	Total	Total O&P	
Structural Steel										
W12 x 14		L.F.	2	30	$ 16.95	$ 2.66	$ 1.78	$ 21.39	$ 25.21	$ 756.30
W18 x 35		L.F.	28	392	$ 42.85	$ 3.53	$ 1.77	$ 47.80	$ 54.65	$ 21,422.80
W36 x 302		L.F.	2	64	$ 365.00	$ 3.28	$ 1.64	$ 369.92	$ 407.56	$ 26,083.84
W36 x 361		L.F.	6	144	$ 424.50	$ 3.78	$ 1.64	$ 429.92	$ 494.41	$ 71,195.04
W36 x 395		L.F.	2	57	$ 458.50	$ 3.78	$ 1.64	$ 463.92	$ 533.51	$ 30,409.96
W36 x 441		L.F.	6	178	$ 504.00	$ 3.78	$ 1.64	$ 509.92	$ 586.41	$ 104,380.62
HSS6 x 6 x 3/8		L.F.	5	58.5						$ -
Floor										
Steel Deck	3",2Θ gage	S.F	5376	N/A	$ 2.58	$ 0.41	$ 0.04	$ 3.03	$ 3.61	$ 19,407.36
Shear Studs	3/4"Θ x 6"	Each	1244	N/A						
Concrete	6" NW	C.Y.	150	N/A		$ 13.00	$ 4.86	$ 17.86	$ 25.35	$ 3,802.50
WWF	4x4-W4.0xW4.0	C.S.F.	53.76	N/A	$ 47.00	$ 27.50		$ 74.50	$ 97.00	$ 5,214.72
Level 4,5,7,8 (Typical)										
Description	Summary	Unit	Quanitity	Total Length	Material	Labor	Equipment	Total	Total O&P	
Structural Steel										
W10 x 12		L.F.	13	26	$ 14.50	$ 3.91	$ 2.61	$ 21.02	$ 25.57	$ 664.82
W12 x 14		L.F.	35	664	$ 16.95	$ 2.66	$ 1.78	$ 21.39	$ 25.21	$ 16,739.44
W12 x 16		L.F.	12	180	$ 20.05	$ 2.66	$ 1.78	$ 24.49	$ 28.16	$ 5,068.80
W12 x 26		L.F.	4	104	$ 31.50	$ 2.66	$ 1.78	$ 35.94	$ 41.06	$ 4,270.24
W14 x 22		L.F.	15	244.5	$ 26.50	$ 2.66	$ 1.56	$ 30.72	$ 35.33	$ 8,637.70
W14 x 26		L.F.	7	62.5	$ 31.50	$ 2.37	$ 1.58	$ 35.45	$ 40.33	$ 2,520.63
W14 x 30		L.F.	11	25	$ 36.50	$ 2.60	$ 1.74	$ 40.84	$ 46.42	$ 1,160.50
W16 x 26		L.F.	10	285	$ 31.50	$ 2.34	$ 1.57	$ 35.41	$ 40.27	$ 11,476.95
W24 x 55		L.F.	4	104	$ 66.50	$ 3.06	$ 1.53	$ 71.09	$ 80.03	$ 8,323.12
W24 x 68		L.F.	3	102	$ 82.50	$ 3.06	$ 1.53	$ 87.09	$ 97.53	$ 9,948.06
W24 x 131		L.F.	18	507	$ 159.50	$ 3.23	$ 1.62	$ 164.35	$ 189.00	$ 95,823.00
WT10.5 x 28.5		LBS	4	3876						$ -
HSS12 x 8x 3/8		L.F.	4	20						$ -
Floor										
Steel Deck	2",2Θ gage	S.F	5661	N/A	$ 2.01	$ 0.39	$ 0.04	$ 2.44	$ 2.95	$ 16,699.95

Shear Studs	3/4"Θ x 5"	Each	1232	N/A						
Concrete	4 1/2" LW	C.Y.	94	N/A		$ 14.90	$ 5.55	$ 20.45	$ 29.10	$ 2,735.40
WWF	4x4-W4.0xW4.0	C.S.F.	56.61	N/A	$ 47.00	$ 27.50		$ 74.50	$ 97.00	$ 5,491.17
Level 3										
Description	Summary	Unit	Quanitity	Total Length	Material	Labor	Equipment	Total	Total O&P	
Structural Steel										
W10 x 12		L.F.	13	26	$ 14.50	$ 3.91	$ 2.61	$ 21.02	$ 25.57	$ 664.82
W12 x 14		L.F.	35	664	$ 16.95	$ 2.66	$ 1.78	$ 21.39	$ 25.21	$ 16,739.44
W12 x 16		L.F.	12	180	$ 20.05	$ 2.66	$ 1.78	$ 24.49	$ 28.16	$ 5,068.80
W12 x 26		L.F.	4	104	$ 31.50	$ 2.66	$ 1.78	$ 35.94	$ 41.06	$ 4,270.24
W14 x 22		L.F.	15	244.5	$ 26.50	$ 2.66	$ 1.56	$ 30.72	$ 35.33	$ 8,637.70
W14 x 26		L.F.	7	62.5	$ 31.50	$ 2.37	$ 1.58	$ 35.45	$ 40.33	$ 2,520.63
W14 x 30		L.F.	11	25	$ 36.50	$ 2.60	$ 1.74	$ 40.84	$ 46.42	$ 1,160.50
W16 x 26		L.F.	10	285	$ 31.50	$ 2.34	$ 1.57	$ 35.41	$ 40.27	$ 11,476.95
W24 x 55		L.F.	4	104	$ 66.50	$ 3.06	$ 1.53	$ 71.09	$ 80.03	$ 8,323.12
W24 x 68		L.F.	3	102	$ 82.50	$ 3.06	$ 1.53	$ 87.09	$ 97.53	$ 9,948.06
W24 x 131		L.F.	18	507	$ 159.50	$ 3.23	$ 1.62	$ 164.35	$ 189.00	$ 95,823.00
WT10.5 x 28.5		LBS	4	3876						$ -
HSS12 x 8x 3/8		L.F.	4	20						$ -
Floor										
Steel Deck	3",2Θ gage	S.F	5661	N/A	$ 2.58	$ 0.41	$ 0.04	$ 3.03	$ 3.61	$ 20,436.21
Shear Studs	3/4"Θ x 6"	Each	1232	N/A						
Concrete	6" NW	C.Y.	147	N/A		$ 13.00	$ 4.86	$ 17.86	$ 25.35	$ 3,726.45
WWF	4x4-W4.0xW4.0	C.S.F.	56.61	N/A	$ 47.00	$ 27.50		$ 74.50	$ 97.00	$ 5,491.17
Level 6										
Description	Summary	Unit	Quanitity	Total Length	Material	Labor	Equipment	Total	Total O&P	
Structural Steel										
W10 x 12		L.F.	27	54	$ 14.50	$ 3.91	$ 2.61	$ 21.02	$ 25.57	$ 1,380.78
W12 x 14		L.F.	35	664	$ 16.95	$ 2.66	$ 1.78	$ 21.39	$ 25.21	$ 16,739.44
W12 x 16		L.F.	13	187.5	$ 20.05	$ 2.66	$ 1.78	$ 24.49	$ 28.16	$ 5,280.00
W12 x 26		L.F.	4	104	$ 31.50	$ 2.66	$ 1.78	$ 35.94	$ 41.06	$ 4,270.24
W14 x 22		L.F.	20	282	$ 26.50	$ 2.66	$ 1.56	$ 30.72	$ 35.33	$ 9,962.50
W14 x 26		L.F.	10	85	$ 31.50	$ 2.37	$ 1.58	$ 35.45	$ 40.33	$ 3,428.05
W14 x 30		L.F.	11	25	$ 36.50	$ 2.60	$ 1.74	$ 40.84	$ 46.42	$ 1,160.50

W16 x 26		L.F.	12	342	$ 31.50	$ 2.34	$ 1.57	$ 35.41	$ 40.27	$ 13,772.34
W16 x 31		L.F.	3	102	$ 37.50	$ 2.60	$ 1.74	$ 41.84	$ 47.92	$ 4,887.84
W18 x 40		L.F.	11	356	$ 48.50	$ 3.53	$ 1.77	$ 53.80	$ 61.15	$ 21,769.40
W21 x 50		L.F.	3	93	$ 60.50	$ 3.19	$ 1.60	$ 65.29	$ 73.86	$ 6,868.98
W24 x 55		L.F.	5	138	$ 66.50	$ 3.06	$ 1.53	$ 71.09	$ 80.03	$ 11,044.14
W24 x 68		L.F.	5	170	$ 82.50	$ 3.06	$ 1.53	$ 87.09	$ 97.53	$ 16,580.10
W24 x 131		L.F.	18	507	$ 159.50	$ 3.23	$ 1.62	$ 164.35	$ 189.00	$ 95,823.00
W27 x 84		L.F.	4	136	$ 102.00	$ 2.85	$ 1.43	$ 106.28	$ 118.56	$ 16,124.16
WT10.5 x 28.5		LBS	4	3876						$ -
HSS12 x 8x 3/8		L.F.	4	20						$ -
Floor										
Steel Deck	2",2Θ gage	S.F	10727	N/A	$ 2.01	$ 0.39	$ 0.04	$ 2.44	$ 2.95	$ 31,644.65
Shear Studs	3/4"Θ x 5"	Each	2242	N/A						
Concrete	4 1/2" LW	C.Y.	188	N/A		$ 14.90	$ 5.55	$ 20.45	$ 29.10	$ 5,470.80
WWF	4x4-W4.0xW4.0	C.S.F.	107.27	N/A	$ 47.00	$ 27.50		$ 74.50	$ 97.00	$ 10,405.19
Steel Strengthening (Typical Length = 14')										
Description	Weight	Unit	Quanitity	Total Length	Material	Labor	Equipment	Total	Total O&P	
Ground Floor - 2M (Height = 14' Typical)										
L8 x 8 x 1	51 lbs/ft	Ton	64	896	10%					
L6 x 6 x 5/8	24.2 lbs/ft	Ton	136	1904	10%					
L6 x 6 x 1	37.4 lbs/ft	Ton	24	336	10%					
Column Schedule (Typical Floor Height = 14')										
Description	Summary	Unit	Quanitity	Total Length	Material	Labor	Equipment	Total	Total O&P	
W14 x 90		L.F.	17	238	$ 109.00	$ 3.17	$ 2.12	$ 114.29	$ 127.78	$ 30,411.64
W14 x 99		L.F.	46	644	$ 120.00	$ 2.83	$ 1.42	$ 124.25	$ 142.89	$ 92,021.16
W14 x 109		L.F.	20	280	$ 127.00	$ 3.77	$ 1.68	$ 132.45	$ 152.32	$ 42,649.60
W14 x 120		L.F.	8	112	$ 145.00	$ 2.44	$ 1.63	$ 149.07	$ 166.02	$ 18,594.24
W14 x 132		L.F.	4	56	$ 161.00	$ 2.70	$ 1.63	$ 165.33	$ 190.13	$ 10,647.28
W14 x 145		L.F.	16	224	$ 177.00	$ 2.95	$ 1.48	$ 181.43	$ 200.78	$ 44,974.72
W14 x 176		L.F.	4	56	$ 213.00	$ 2.57	$ 1.72	$ 217.29	$ 240.33	$ 13,458.48
W14 x 193		L.F.	4	56	$ 233.00	$ 3.08	$ 1.54	$ 237.62	$ 273.26	$ 15,302.56
W14 x 211		L.F.	8	112	$ 253.00	$ 3.08	$ 1.54	$ 257.62	$ 296.26	$ 33,181.12
W14 x 342	Stub Columns	L.F.	6	33	$ 326.00	$ 3.56	$ 1.64	$ 331.20	$ 380.88	$ 12,569.04
TS6 x 6x 3/8		L.F.	28	392						$ -



PARTIAL 2M.1 LEVEL FLOOR FRAMING PLAN

SCALE:

NOTES:

1. THESE STRUCTURAL PLANS HAVE BEEN PRODUCED OVER THE ARCHITECTURAL BACKGROUNDS (HALF TONE). THE BACKGROUND INFORMATION FOR ARCHITECTURAL ITEMS IS FOR REFERENCE ONLY. ARCHITECT SHOULD BE CONSULTED FOR COORDINATION REGARDING BACKGROUND INFORMATION.

2. DIMENSIONS AND MEMBER SIZES MARKED 'EX' ARE TAKEN FROM EXISTING DRAWINGS OF ORIGINAL CONSTRUCTION AND ARE TO BE FIELD VERIFIED. SEE DRAWING S1.3 FOR EXISTING FRAMING AT LEVEL 2M.

3. NEW FLOOR CONSTRUCTION TO BE 6" NORMAL WEIGHT CONCRETE ON 3", 20 GAGE GALVANIZED, COMPOSITE STEEL FLOOR DECK AS MANUFACTURED BY USD, INC OR EQUAL SUPPORTED ON STEEL FRAMING TOTAL SLAB THICKNESS 9", SLAB TO BE REINFORCED WITH 4x4-W4.0xW4.0 WWF AND ADDITIONAL BAR REINFORCING.

   A. TOP OF CONCRETE TO BE 4'-6" ABOVE EXISTING ADJACENT CONCRETE SLAB AT LEVEL 2M (EXCEPT WHERE NOTED OTHERWISE ON PLAN): LEVEL 2M, EL 527'-11¾" VIF.

   B. TYPICAL TOP OF STEEL REFERENCE ELEVATION TO BE 9" BELOW TYPICAL TOP OF CONCRETE, MEMBERS LABELED THUS: [-0"] DENOTES TOP OF STEEL ABOVE OR BELOW REFERENCE ELEVATION.

4. PROPOSED NEW MOMENT CONNECTIONS ARE SHOWN THUS: ——●—— AND ARE TO BE BOLTED AND/OR WELDED TO ACHIEVED FULL MEMBER STRENGTH.

5. INDICATES COLUMN STARTS AT THIS LEVEL.

   INDICATES COLUMN STOPS AT THIS LEVEL.

University of Virginia Health System
University Hospital
Building #1150
Charlottesville, Virginia

CENTRAL TOWER BED EXPANSION

100% SUBMISSION

Project Code: 209-17302

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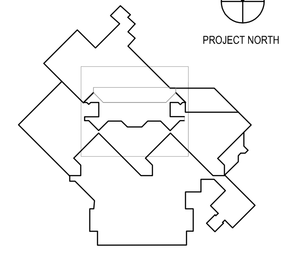
ISSUED FOR	REV	DATE
100% Submission		NOV 26, 2008

SEALS AND SIGNATURES

KEYPLAN



DRAWING TITLE

PARTIAL 2M.1 FLOOR FRAMING PLAN

1/8" = 1'-0"

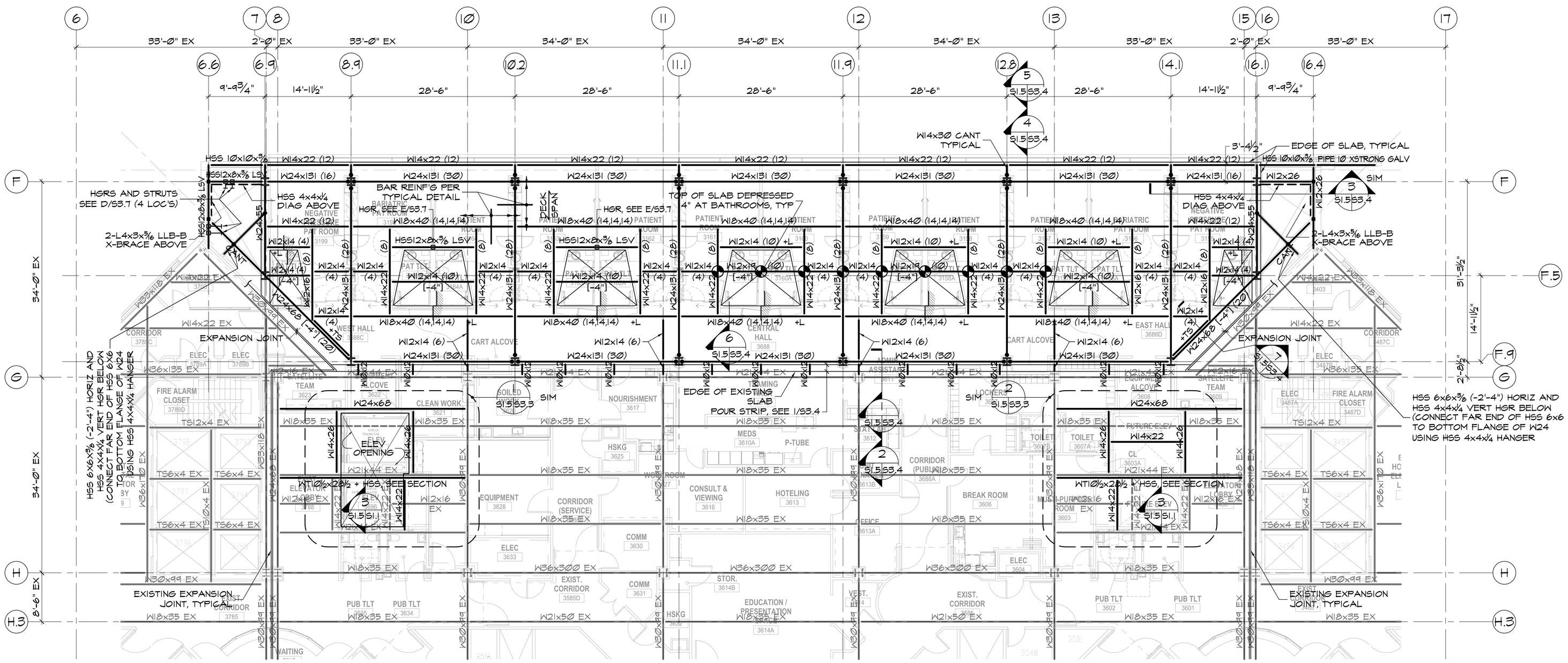
SCALE

25880.000

PROJECT NUMBER

S1.4

DRAWING NUMBER



PARTIAL 3rd FLOOR FRAMING PLAN

SCALE: 1/8" = 1'-0"

NOTES:

1. DIMENSIONS AND MEMBER SIZES MARKED 'EX' ARE TAKEN FROM EXISTING DRAWINGS OF ORIGINAL CONSTRUCTION AND ARE TO BE FIELD VERIFIED.

2. NEW FLOOR CONSTRUCTION TO BE 6" NORMAL WEIGHT CONCRETE ON 3", 20 GAGE GALVANIZED, COMPOSITE STEEL FLOOR DECK AS MANUFACTURED BY USD, INC OR EQUAL SUPPORTED ON STEEL FRAMING TOTAL SLAB THICKNESS 9", SLAB TO BE REINFORCED WITH 4x4-W4.0xW4.0 WWF AND ADDITIONAL BAR REINFORCING AS SHOWN ON PLAN AND SECTIONS. CONNECT NEW FLOOR TO EXISTING FLOOR @48" o.c., SEE DETAILS.

   A. TOP OF CONCRETE TO BE SAME AS THAT OF EXISTING ADJACENT CONSTRUCTION: EL 545'-5" VIF

   B. TYPICAL TOP OF STEEL REFERENCE ELEVATION TO BE 9" BELOW TYPICAL TOP OF CONCRETE, MEMBERS LABELED THUS: [-Ø"] DENOTES TOP OF STEEL ABOVE OR BELOW REFERENCE ELEVATION.

   C. NUMBER OF HEADED SHEAR CONNECTORS WELDED TO STEEL MEMBERS FOR COMPOSITE DESIGN SHOWN THUS: (34) INDICATES NUMBER OF EQUALLY SPACED STUDS. STUDS TO BE ¾"Ø x 6" LONG HEADED NELSON STUDS.

3. PROPOSED NEW MOMENT CONNECTIONS ARE SHOWN THUS: ——●—— AND ✛ AND ARE TO BE BOLTED AND/OR WELDED TO ACHIEVED FULL MEMBER STRENGTH.

4. LOCATIONS MARKED THUS ◔ INDICATE WHERE A TRAVELING HOIST SUPPORT MAY BE INSTALLED. BEAMS DESIGNED FOR 21 KIP LOAD (INCLUDING IMPACT).

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University Hospital
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Charlottesville, Virginia

CENTRAL TOWER BED EXPANSION

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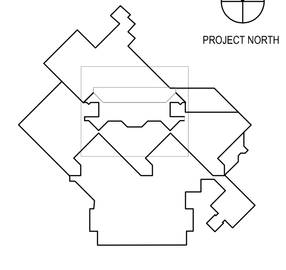
ISSUED FOR	REV	DATE
100% Submission	—	NOV 26, 2008

SEALS AND SIGNATURES

KEYPLAN



DRAWING TITLE

PARTIAL 3rd FLOOR FRAMING PLAN

1/8" = 1'-0"

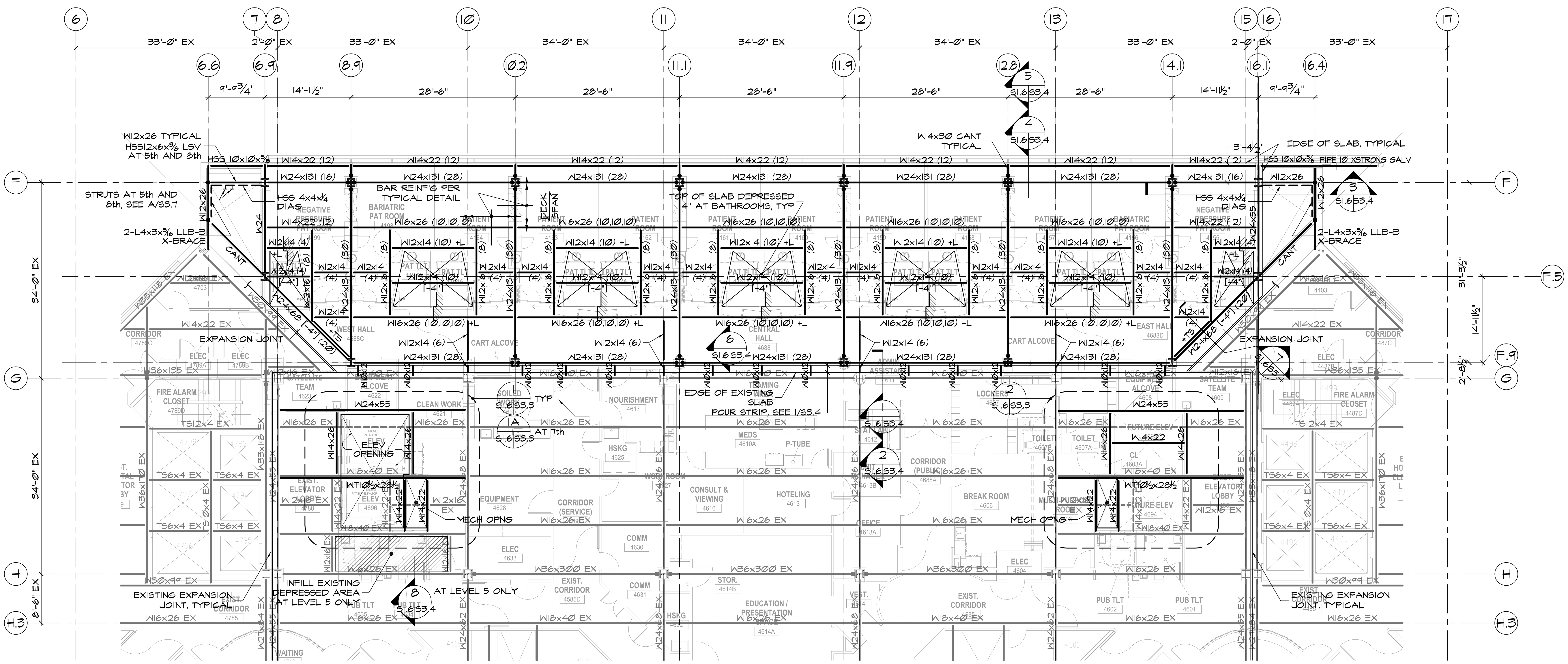
SCALE

25880.000

PROJECT NUMBER

S1.5

DRAWING NUMBER



PARTIAL TYPICAL FLOOR FRAMING PLAN

SCALE: 1/8" = 1'-0"

NOTES:

1. THESE STRUCTURAL PLANS HAVE BEEN PRODUCED OVER THE ARCHITECTURAL BACKGROUNDS (HALF TONE). THE BACKGROUND INFORMATION FOR ARCHITECTURAL ITEMS IS FOR REFERENCE ONLY. ARCHITECT SHOULD BE CONSULTED FOR COORDINATION REGARDING BACKGROUND INFORMATION.

2. MEMBER SIZES MARKED 'EX' ARE TAKEN FROM EXISTING DRAWINGS OF ORIGINAL LEVEL 4 CONSTRUCTION (EXISTING FRAMING AT LEVELS 5, 7, AND 8 SIMILAR) AND ARE TO BE FIELD VERIFIED.

3. NEW FLOOR CONSTRUCTION TO BE 4¼" LIGHTWEIGHT CONCRETE ON 2", 20 GAGE GALVANIZED, COMPOSITE STEEL FLOOR DECK AS MANUFACTURED BY USD, INC OR EQUAL SUPPORTED ON STEEL FRAMING TOTAL SLAB THICKNESS 6¼", SLAB TO BE REINFORCED WITH 4x4-W4.0xW4.0 WWF AND ADDITIONAL BAR REINFORCING AS SHOWN ON PLAN AND SECTION. CONNECT NEW FLOOR TO EXISTING FLOOR @48" o.c., SEE DETAILS.

   A. TOP OF CONCRETE TO BE SAME AS THAT OF EXISTING ADJACENT CONSTRUCTION:
      LEVEL 4, EL 559'-5" VIF
      LEVEL 5, EL 573'-5" VIF
      LEVEL 7, EL 601'-5" VIF
      LEVEL 8, EL 615'-5" VIF

   B. TYPICAL TOP OF STEEL REFERENCE ELEVATION TO BE 6¼" BELOW TYPICAL TOP OF CONCRETE, MEMBERS LABELED THUS: [-0"] DENOTES TOP OF STEEL ABOVE OR BELOW REFERENCE ELEVATION.

   C. NUMBER OF HEADED SHEAR CONNECTORS WELDED TO STEEL MEMBERS FOR COMPOSITE DESIGN SHOWN THUS: (34) INDICATES NUMBER OF EQUALLY SPACED STUDS. STUDS TO BE ¾"Ø x5" LONG HEADED NELSON STUDS.

4. PROPOSED NEW MOMENT CONNECTIONS ARE SHOWN THUS: ━●●━ AND ✚ AND ARE TO BE BOLTED AND/OR WELDED TO ACHIEVED FULL MEMBER STRENGTH.

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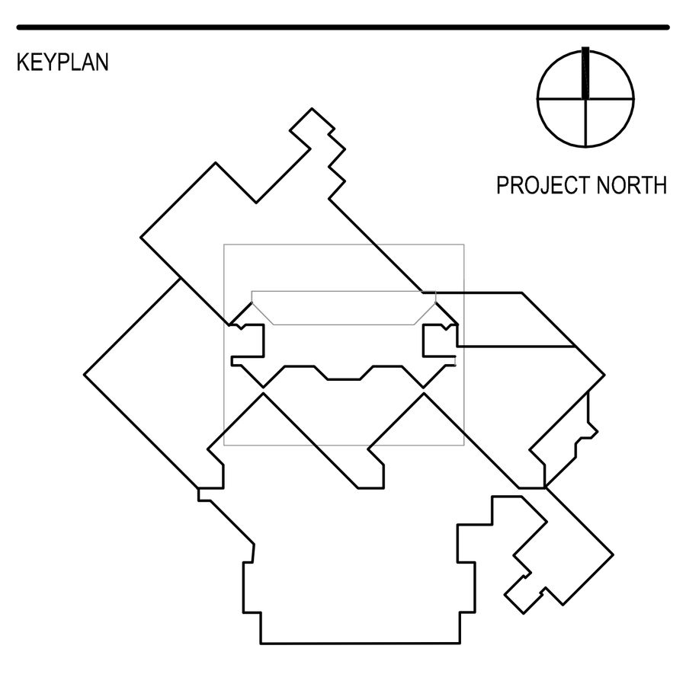
SEALS AND SIGNATURES

KEYPLAN



DRAWING TITLE

PARTIAL TYPICAL FLOOR FRAMING PLAN

1/8" = 1'-0"

SCALE

PROJECT NUMBER 25880.000

S1.6

DRAWING NUMBER

General Conditions

Category	Item	Units	Quantity	Material	Labor	Equip	Total Cost	Total Inclu. O&P	Subtotal	Total
Professional Consultants										
Architectural Fees	Maximum	Project						16.00%	$ 537,646.93	$ 3,897,940.24
CM Fees	Maximum	Project						2.50%	$ 84,007.33	$ 3,981,947.57
Engineering Fees										
Structural	Maximum	Project						2.50%	$ 84,007.33	$ 4,065,954.91
Contingency Allowances										
Contingency	Construction Phase	Project						8.00%	$ 268,823.46	$ 4,334,778.37
Taxes										
Sales tax	Average			5.01%					$ 168,350.69	$ 4,503,129.07
Social Security	First $106,800 Wages		$ 640,800.00		7.65%				$ 49,021.20	$ 4,552,150.27
Unemployment	Average				6.20%				$ 208,338.19	$ 4,760,488.45
Project Coordination										
Field Personnel	Field Engineer (Avg)	Week	129		$ 1,215.00		$ 1,215.00	$ 1,875.00	$ 241,875.00	
Field Personnel	Field Engineer (Max)	Week	129		$ 1,400.00		$ 1,400.00	$ 2,150.00	$ 277,350.00	
Field Personnel	Project Manager (Max)	Week	129		$ 2,275.00		$ 2,275.00	$ 3,500.00	$ 451,500.00	
Field Personnel	Superintendent (Avg)	Week	129		$ 1,850.00		$ 1,850.00	$ 2,850.00	$ 367,650.00	
Field Personnel	Superintendent (Max)	Week	129		$ 2,100.00		$ 2,100.00	$ 3,225.00	$ 416,025.00	
Field Personnel	Timekeeper (Avg)	Week	129		$ 1,085.00		$ 1,085.00	$ 1,675.00	$ 216,075.00	
Builder's Risk Insurance	Maximum	Job						0.64%	$ 21,505.88	$ 4,781,994.33
Performance Bond	Maximum	Job						2.50%	$ 84,007.33	$ 4,866,001.66
Permits										
Rule of Thumb	Maximum	Job						2.00%	$ 67,205.87	$ 4,933,207.53
Temporary Electricity										
Water Bill/month	Average	Month	28	$ 62.00			$ 62.00	$ 68.00	$ 1,904.00	
Field Offices and Sheds										
Trailer	32'x8' Rented	Month	28	$ 193.00			$ 193.00	$ 213.00	$ 5,964.00	

Office Equipment	Rental Average	Month	28	$ 155.00			$ 155.00	$ 171.00	$ 4,788.00	
Office Supplies	Average	Month	28	$ 85.00			$ 85.00	$ 93.50	$ 2,618.00	
Telephone Bill	Average	Month	28	$ 80.00			$ 80.00	$ 88.00	$ 2,464.00	
Lights & HVAC		Month	28	$ 150.00			$ 150.00	$ 165.00	$ 4,620.00	
Construction Equipment										
Small Tools	Maximum	Total		2.00%					$ 67,205.87	$ 5,000,413.39
Temporary Barricades										
Barricades	W/ Reflective tape	Each	30	$ 525.00			$ 525.00	$ 580.00	$ 17,400.00	
Temporary Fencing										
Chain Link	11 ga, 6' high	L.F.	300	$ 3.25	$ 1.77		$ 5.02	$ 6.50	$ 1,950.00	
Temporary Project Signs										
Signs	High Intensity Reflected	S.F.	150	$ 26.50			$ 26.50	$ 29.50	$ 4,425.00	
Progress Cleaning										
Cleanup of floor area	Continuous per day	M.S.F.	20000	$ 1.70	$ 37.00	$ 3.75	$ 42.45	$ 67.00	$ 1,340,000.00	
Final by GC	End of job	M.S.F.	39.627	$ 2.71	$ 51.50	$ 5.20	$ 59.41	$ 93.00	$ 3,685.31	
General Commissioning										
Commissioning	O&M, Training, Minimum	Project						1.00%	$ 33,602.93	$ 5,034,016.33
								Subtotal	$ 3,360,293.31	
								Total	$ 5,034,016.33	

LEED-NC

LEED-NC v2.2, Project Checklist

UVA Central Tower Bed Expansion
Charlottesville, VA 22908

11/19/2008

Yes	?	No				Application	Responsibility
9	4	**1**	**Sustainable Sites**	**14** Points			
Y			Prereq 1	**Construction Activity Pollution Prevention**	Required	C	C
1			Credit 1	**Site Selection**	1	D	
1			Credit 2	**Development Density & Community Connectivity**	1	D	
		1	Credit 3	**Brownfield Redevelopment**	1	D	
1			Credit 4.1	**Alternative Transportation**, Public Transportation Access	1	D	
1			Credit 4.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms	1	D	
	1		Credit 4.3	**Alternative Transportation**, Low-Emitting and Fuel-Efficient Vehicles	1	D	
1			Credit 4.4	**Alternative Transportation**, Parking Capacity	1	D	
1			Credit 5.1	**Site Development,** Protect of Restore Habitat	1	C	D
	1		Credit 5.2	**Site Development,** Maximize Open Space	1	D	
1			Credit 6.1	**Stormwater Design,** Quantity Control	1	D	
1			Credit 6.2	**Stormwater Design,** Quality Control	1	D	
	1		Credit 7.1	**Heat Island Effect,** Non-Roof	1	C	D
1			Credit 7.2	**Heat Island Effect,** Roof	1	D	
	1		Credit 8	**Light Pollution Reduction**	1	D	
Yes	?	No					
4		**1**	**Water Efficiency**	**5** Points			
1			Credit 1.1	**Water Efficient Landscaping**, Reduce by 50%	1	D	
1			Credit 1.2	**Water Efficient Landscaping**, No Potable Use or No Irrigation	1	D	
		1	Credit 2	**Innovative Wastewater Technologies**	1	D	
1			Credit 3.1	**Water Use Reduction**, 20% Reduction	1	D	
1			Credit 3.2	**Water Use Reduction**, 30% Reduction	1	D	
Yes	?	No					
5		**12**	**Energy & Atmosphere**	**17** Points			
Y			Prereq 1	**Fundamental Commissioning of the Building Energy Systems**	Required	C	X
Y			Prereq 2	**Minimum Energy Performance**	Required	D	
Y			Prereq 3	**Fundamental Refrigerant Management**	Required	D	
3		7	Credit 1	**Optimize Energy Performance**	1 to 10	D	
		3	Credit 2	**On-Site Renewable Energy**	1 to 3	D	
1			Credit 3	**Enhanced Commissioning**	1	C	X
1			Credit 4	**Enhanced Refrigerant Management**	1	D	
		1	Credit 5	**Measurement & Verification**	1	C	
		1	Credit 6	**Green Power**	1	C	

Responsibility: D - Design Team **C** - Construction Manager **X** - Commissioning Agent

continued…

Yes	?	No						
8		5	**Materials & Resources**		13 Points			
Y			Prereq 1	**Storage & Collection of Recyclables**	Required	D		
1			Credit 1.1	**Building Reuse**, Maintain 75% of Existing Walls, Floors & Roof	1	C	D	
		1	Credit 1.2	**Building Reuse**, Maintain 100% of Existing Walls, Floors & Roof	1	~~C~~		
		1	Credit 1.3	**Building Reuse**, Maintain 50% of Interior Non-Structural Elements	1	~~C~~		
1			Credit 2.1	**Construction Waste Management**, Divert 50% from Disposal	1	C	C	
1			Credit 2.2	**Construction Waste Management**, Divert 75% from Disposal	1	C	C	
		1	Credit 3.1	**Materials Reuse**, 5%	1	~~C~~		
		1	Credit 3.2	**Materials Reuse**,10%	1	~~C~~		
1			Credit 4.1	**Recycled Content**, 10% (post-consumer + ½ pre-consumer)	1	C	C	
1			Credit 4.2	**Recycled Content**, 20% (post-consumer + ½ pre-consumer)	1	C	C	
1			Credit 5.1	**Regional Materials**, 10% Extracted, Processed & Manufactured Regionally	1	C	C	
1			Credit 5.2	**Regional Materials**, 20% Extracted, Processed & Manufactured Regionally	1	C	C	
		1	Credit 6	**Rapidly Renewable Materials**	1	~~C~~		
1			Credit 7	**Certified Wood**	1	C	C	

Yes	?	No						
11		4	**Indoor Environmental Quality**		15 Points			
Y			Prereq 1	**Minimum IAQ Performance**	Required	D		
Y			Prereq 2	**Environmental Tobacco Smoke** (ETS) **Control**	Required	D		
1			Credit 1	**Outdoor Air Delivery Monitoring**	1	D		
		1	Credit 2	**Increased Ventilation**	1	~~D~~		
1			Credit 3.1	**Construction IAQ Management Plan**, During Construction	1	C	C	
1			Credit 3.2	**Construction IAQ Management Plan**, Before Occupancy	1	C	C	
1			Credit 4.1	**Low-Emitting Materials**, Adhesives & Sealants	1	C	C	
1			Credit 4.2	**Low-Emitting Materials**, Paints & Coatings	1	C	C	
		1	Credit 4.3	**Low-Emitting Materials**, Carpet Systems	1	~~C~~		
1			Credit 4.4	**Low-Emitting Materials**, Composite Wood & Agrifiber Products	1	C	C	
1			Credit 5	**Indoor Chemical & Pollutant Source Control**	1	D		
1			Credit 6.1	**Controllability of Systems**, Lighting	1	D		
1			Credit 6.2	**Controllability of Systems**, Thermal Comfort	1	D		
1			Credit 7.1	**Thermal Comfort**, Design	1	D		
1			Credit 7.2	**Thermal Comfort**, Verification	1	D		
		1	Credit 8.1	**Daylight & Views**, Daylight 75% of Spaces	1	~~D~~		
		1	Credit 8.2	**Daylight & Views**, Views for 90% of Spaces	1	~~D~~		

Yes	?	No						
5			**Innovation & Design Process**		5 Points			
1			Credit 1.1	**ID**: Per LEED HC MR 4.2 PBT Source Reduction: Mercury	1	D/C	C	
1			Credit 1.2	**ID**: Exemp. Perf.: SSc4.1 (Design Submittal) or MRc4 (Construction Submitt	1	D/C	C	
1			Credit 1.3	**ID**: Exemp. Perf.: MRc5	1	D/C	C	
1			Credit 1.4	**ID**: Per LEED HC EQ 2 Acoustic Env. or Avail. Exem. Perf. approach	1	D/C	C	
1			Credit 2	**LEED® Accredited Professional**	1	C	D	

Yes	?	No			
42	4	23	**Project Totals** (pre-certification estimates)		69 Points

Certified 26-32 points **Silver** 33-38 points **Gold** 39-51 points **Platinum** 52-69 points

Responsibility: D - Design Team **C** - Construction Manager **X** - Commissioning Agent

Developed with the BIM Project Execution Planning Procedure by the Penn State CIC Research Team.
http://www.engr/psu.edu/ae/cic/bimex