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## **Executive Summary**

This technical assignment contains analysis of the cost and construction method used on the Bloomingdales department store. A detailed project schedule has been determined showing the majority of pertinent activities occurring during the current project schedule and projected dates of future work. Beginning with Buch acceptance of parking garage slab from Turner was completed on 10/31/05 with the accepted date of close out being 8/11/07. It begins with excavation, site work, foundation work consisting of a cast in place reinforced concrete slab garage performed by Turner Construction which then hands building construction to Buch, who then continues to proceed with the structural steel, building envelope, and interiors.

A site layout plan for the delivery flow and crane pad placement is attached to help visualize from where the materials will be staged and erected. An assemblies estimate for the buildings curtain wall/ skylight system has been calculated using RS Means Assemblies Cost Data 2005. As well as detailed structural systems estimate using the same RS Means Construction Cost Data 2005. Finally, a general conditions estimate is shown demonstrating project staffing costs and monthly costs incurred by Buch during the construction of Bloomingdales.



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## Detailed project schedule

The detailed project schedule to follow contains around 130 activities, each separated into their own respective portion of work. The construction phase of the Bloomingdales began 10/31/2005 and is projected to continue until 8/11/2007. This facility, specifically the 2<sup>nd</sup> and 3<sup>rd</sup> floors have an abundance of repetitiveness with the typical bays, and interior construction. This allows the subcontractors to divide space and work in short intervals then move on to the next area. Preconstruction, superstructure sequencing, and building envelope are the largest portions of construction, therefore those are the substance of the following line items.

Note that sequence 1 is listed with the majority of the appropriate tasks listed. Sequence 1-6 is repetitive through out the project.



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## Site Layout Planning

The Bloomingdales building proves to be a challenging project when looking at the confined site conditions during construction. Bloomingdales is located between an existing Hecht's Department Store to the east, a four way intersection along the west and south borders, with a soon to be Community Center directly to the north. This allows limited space for crane placement, preconstruction work or site flow for incoming deliveries and the placement for staging areas. Please see the attached site plan noting crane pad placement on the west side of the site.



## Assemblies Estimate

The following is an assemblies estimate of the Bloomingdales curtain wall & skylight systems. The take-off quantities were taken from the contract documents while the per unit costs were taken from RS Means 2005. Figure 1 below is a summary of the results found. The numbers found were slightly off for the given bid. This is due to added estimation considering weather protection, moisture barriers, delivery, and labor with in these systems.

Skylight	Length(ft)	Width (ft)	Area (sf)	Pieces	Total Area (sf)	Unit	Price (\$)	Amount
Spans	21	0.5	10.5	16	168	SF	36.45	6123.6
Circumfrence pieces	8	1	8	16	128	SF	25.1	3212.8
<b>Curtain Wall</b>								
<b>South &amp; East Elevations</b>								
<b>Aluminum Mullions</b>								
Verticals	26	1	26	16	416	SF	28.05	11668.8
Horizontal 1	8	0.5	4	24	96	SF	28.05	2692.8
Horizontal 2	28	0.5	14	12	168	SF	28.05	4712.4
<b>Canopy Accents</b>								
Short	8	2	16	12	192	SF	34.85	6691.2
Long	28	2	56	6	336	SF	34.85	11709.6
Entrance	58	2	116	2	232	SF	34.85	8085.2
Base	8	1	8	4	32	SF	34.85	1115.2
<b>Glazed glass</b>								
Curtain Wall	52	6	312	4	1248	SF	47.54	59329.92
Entrance Glass	52	27	1404	2	2808	SF	26.8	75254.4
Skylight Glass	20	8	160	16	2560	SF	64.26	164505.6
<b>West Elevation</b>								
<b>Aluminum Mullions</b>								
Vertical	52	1	52	3	156	SF	34.85	5436.6
Horizontal	21	1	21	1	21	SF	34.85	731.85
<b>Canopy Accents</b>								
Short	21	2	42	3	126	SF	34.85	4391.1
Long	51	2	102	1	102	SF	34.85	3554.7
<b>Glazed Glass</b>								
Curtain Wall	52	20	1040	1	1040	SF	47.54	49441.6
Entrance Glass	26	10	260	1	260	SF	26.8	6968
Entrance Glass	16	10	160	1	160	SF	64.26	10281.6
							<b>Total (\$)</b>	435907

**Fig. 1**



## Detailed Structural Systems Estimate

The estimate below is the detailed structural systems estimate for the entire Bloomingdales superstructure using a piece by piece take off. The cost per unit numbers used to figure out the systems cost were obtained from Buch's estimating department and are the actual competitive numbers from the market when the project went out to bid. By using these numbers an accurate estimate was created with only 7% error. In the accompanying figures (Fig. 2-8) below you will find a summary of the results found.

Steel				
W beams				
# of Memembers	Section	Weight (lbs/ft)	Length (feet)	Total Weight (tons)
2	W	135	30	4.1
2	W	118	66.67	7.9
2	W	118	30	3.5
6	W	99	30	8.9
2	W	90	59.33	5.3
3	W	90	41.67	5.6
16	W	90	36.67	26.4
4	W	90	29	5.2
3	W	84	38.67	4.9
4	W	84	30.33	5.1
6	W	84	30	7.6
3	W	76	30	3.4
3	W	68	35	3.6
6	W	68	30	6.1
4	W	62	30.33	3.8
6	W	62	30	5.6
5	W	55	34.67	4.8
3	W	55	33	2.7
84	W	55	30	69.3
5	W	55	29	4.0
12	W	50	30	9.0
3	W	44	46	3.0
3	W	44	40	2.6
3	W	44	36.5	2.4
3	W	44	30.5	2.0
51	W	44	30	33.7
3	W	50	38.5	2.9
4	W	50	33	3.3
21	W	50	30	15.8

Fig. 2



<b>W beams</b>				
<b># of Memebers</b>	<b>Section</b>	<b>Weight (lbs/ft)</b>	<b>Length (feet)</b>	<b>Total Weight (tons)</b>
5	W	40	47	4.7
5	W	40	30	3.0
7	W	35	43.5	5.3
9	W	35	37	5.8
270	W	35	30	141.8
42	W	31	30	19.5
21	W	26	50	13.7
49	W	26	30	19.1
7	W	22	50	3.9
7	W	22	30	2.3
9	W	22	28	2.8
27	W	87	40.67	47.8
15	W	79	40.67	24.1
6	W	72	45	9.7
10	W	72	40.67	14.6
3	W	65	45	4.4
5	W	65	40.67	6.6
4	W	65	30.33	3.9
10	W	53	31.67	8.4
5	W	45	50	5.6
20	W	60	40.67	24.4
7	W	54	40.67	7.7
10	W	49	41	10.0
5	W	39	40	3.9
7	W	39	37	5.1
10	W	33	45	7.4
5	W	24	40	2.4
5	W	24	36	2.2
12	W	24	34	4.9
<b>Total</b>				<b>677.4</b>

Fig. 3



<b>Columns</b>				
# of Members	Section	Weight (lbs/ft)	Length (feet)	Total Weight (tons)
6	HSS 8x8x1/2	47.35	40	5.7
3	HSS 8x8x1/2	47.35	35	2.5
1	HSS 8x8x1/2	47.35	24	0.6
18	HSS 6x6x1/2	34.48	35	10.9
1	HSS 5x5x1/4	15.42	35	0.3
1	HSS 5x5x1/4	15.42	24	0.2
2	HSS 3x3x1/4	8.8	35	0.3
2	HSS 3x3x1/4	8.8	20	0.2
<b>Total</b>				20.5

Fig. 4

<b>Beams</b>				
# of Members	Section	Weight (lbs/ft)	Length (feet)	Total Weight (tons)
2	HSS 14x6x3/8	47.9	35	1.7
1	HSS 14x6x3/8	47.9	20	0.5
1	HSS 12x4x1/2	48.85	30	0.7
1	HSS 12x4x1/4	25.44	44	0.6
1	HSS 12x4x1/4	25.44	30	0.4
1	HSS 12x4x1/4	25.44	24	0.3
10	HSS 8x8x1/2	47.35	30	7.1
1	HSS 8x4x3/8	27.04	50	0.7
1	HSS 8x4x3/8	27.04	40	0.5
1	HSS 8x4x1/4	18.82	30	0.3
1	HSS 6x6x1/4	18.82	48	0.5
1	HSS 5x4x5/16	16.96	48	0.4
2	HSS 5x4x5/16	16.96	40	0.7
2	HSS 4x3x1/4	10.5	28	0.3
<b>Total</b>				14.6

Fig. 5

<b>Braces</b>				
# of Members	Section	Weight (lbs/ft)	Length (feet)	Total Weight (tons)
1	HSS 5x5x1/4	15.42	50	0.4
4	HSS 5x5x1/4	15.42	40	1.2
1	HSS 5x5x1/4	15.42	38	0.3
3	HSS 5x5x1/4	15.42	33	0.8
35	HSS 5x5x1/4	15.42	32	8.6
2	HSS 5x5x1/4	15.42	31	0.5
36	HSS 5x5x1/4	15.42	30	8.3
3	HSS 5x5x1/4	15.42	29	0.7
5	HSS 5x5x1/4	15.42	28	1.1
2	HSS 5x5x1/4	15.42	26	0.4
4	HSS 5x5x1/4	15.42	24	0.7
1	HSS 4x4x1/4	12.02	48	0.3
1	HSS 4x4x1/4	12.02	44	0.3
1	HSS 4x4x1/4	12.02	35	0.2
<b>Total</b>				23.8

Fig. 6



Misc				
# of Members	Section	Weight (lbs/ft)	Length (feet)	Total Weight (tons)
1	HSS 12x4x1/2	25.44	35	0.4
1	HSS 12x4x1/2	25.44	30	0.4
1	HSS 12x8x3/8	47.9	24	0.6
1	HSS 12x6x3/8	41.93	15	0.3
1	HSS 12x4x1/4	25.44	35	0.4
3	HSS 8x8x3/8	36.83	60	3.3
1	HSS 8x8x3/8	36.83	20	0.4
1	HSS 8x6x3/8	31.73	44	0.7
1	HSS 8x4x3/8	27.04	44	0.6
2	HSS 8x4x3/8	27.04	20	0.5
6	HSS 8x6x1/4	22.04	35	2.3
1	HSS 6x4x1/2	27.68	44	0.6
2	HSS 6x4x1/2	27.68	35	1.0
1	HSS 6x4x3/8	21.94	24	0.3
7	HSS 6x6x1/4	18.82	35	2.3
1	HSS 6x6x1/4	18.82	24	0.2
6	HSS 5x4x5/16	16.96	48	2.4
1	HSS 4x4x1/4	12.02	40	0.2
1	HSS 4x4x1/4	12.02	20	0.1
2	HSS 3x3x1/4	8.8	24	0.2
1	HSS 3x3x1/4	8.8	20	0.1
2	HSS 2-1/2x2-1/2x1/4	7.1	24	0.2
2	HSS 10x8x3/8	41.93	60	2.5
1	HSS 10x8x3/8	41.93	44	0.9
1	HSS 10x8x3/8	41.93	30	0.6
			<b>Total</b>	21.7

Fig. 7

Concrete	SF/ Floor	Depth	CY
1st floor Slab on Deck	60000	3.25	601.8519
2nd floor Slab on Deck	60000	3.25	601.8519
3rd floor Slab on Deck	60000	3.25	601.8519
Penthouse	2976	4.25	39.03704
		<b>Total CY</b>	1844.593

Fig. 8





## General Conditions Estimate

The General Conditions Estimate shown in Figure 7 below is a representation of the general conditions owned by Buch on the Bloomingdales buildings. The estimate includes all project staffing, fees, and temporary services which can be broken down into monthly job costs. Below find the take-off breakdown of the general conditions estimate using the assumption of a year duration:

Cost Code	Description	Labor	Material	Subcontractor	Montly fees
01000	<b>General Conditions</b>				
01040	<b>Supervision</b>				
01042	Project Manager	\$80,000			\$6,667
01043	Project Engineer	\$52,000			\$4,333
01044	Superintendent	\$106,800			\$8,900
01045	Assistant Superintendent	\$48,800			\$4,067
01048	Accounting	\$3,600			\$300
01049	Job Related Travel		\$1,575		\$131
01340	Extra Drawings & Blueprinting		\$3,675		\$306
	<b>Total Supervision and Management</b>	\$296,450			
01510	<b>Temporary Facilities</b>				
01514	Temporary Telephone		\$10,080		\$840
01515	Temporary Water		\$3,780		\$315
01516	Sanitary Facilities		\$12,600		\$1,050
01517	Fire Extinguishers & Protection		\$4,095		\$341
01526	Scaffolding		\$26,250		\$2,188
01528	Temporary Ladders & Stairs	\$1,000	\$1,050		\$171
01529	First Aid		\$525		\$44
	<b>Total Facilities</b>		\$59,380		
01530	<b>Barricades &amp; Protection</b>				
01535	Safety Railings & Protection	\$7,000	\$3,150		\$846
01536	Hardhats & Protective Equipment		\$525		\$44
01540	Safety Traffic Control			\$10,000	\$833
01580	Project Signs		\$1,050		\$88
	<b>Total</b>		\$21,725		
01590	<b>Temporary Offices &amp; Sheds</b>		\$10,080		\$840
01591	Temp Construction for Offices	\$1,000	\$2,100		\$258
01592	Office Furniture		\$1,050		\$88
01593	Office Machines & Equipment		\$945		\$79
01594	Office Supplies		\$3,150		\$263
01595	Postage & Express		\$3,780		\$315
01610	Trucking		\$9,450		\$788
01612	Autos & Trucks		\$10,395		\$866
01614	Fuel & Repairs		\$8,820		\$735
01690	Small Tools & Accessories		\$2,625		\$219
	<b>Total</b>		\$53,395		
01710	<b>Cleaning</b>				
01711	General Cleanup	\$28,500	\$9,975		\$3,206
01712	Dumpster Rental		\$50,873		\$4,239
01714	Final Cleaning		\$18,900		\$1,575
	<b>Total</b>		\$108,248		

Fig. 7