The New York Times Building

IPD/ BIM Thesis Technical Assignment Two

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EXECUTIVE SUMMARY

This report primarily focuses on in depth analysis of construction cost and schedule for the New York Times Building. Site utilization and logistics, project schedule, detailed structural estimate and general conditions issues are also addressed. An in depth discussion of the PACE Roundtable is included, covering all three sessions of the conference.

This second technical report further develops the introductory analysis provided from Technical Assignmentone. An updated project schedule was developed to provide a higher level of detail analysis of trade sequencing, structural assembly, façade construction, and mechanical systems installation. In addition, all major milestones are included in this updated schedule.

There were many constraints imposed on the construction team based on the location of the site. Site layouts changed drastically from phase to phase, and these changes are highlighted in the site layout and utilization analysis portion of the report.

Detailed structural and general conditions estimates were also developed for this report. The structural estimate summarizes the expected costs for all steel, concrete, and reinforcing required for the New York Times Building. Conversely, the general conditions estimate includes overhead costs from personnel, site utilities, temporary facilities, fencing, barricades and signage for the project jobsite.

Last, an analysis of topics covered at each of the three technical sessions of the PACE Roundtable is included. The three topics covered include sustainability, Building Information Modeling execution planning, and Business Networking and Relationships.

DETAILED PROJECT SCHEDULE

OVERVIEW

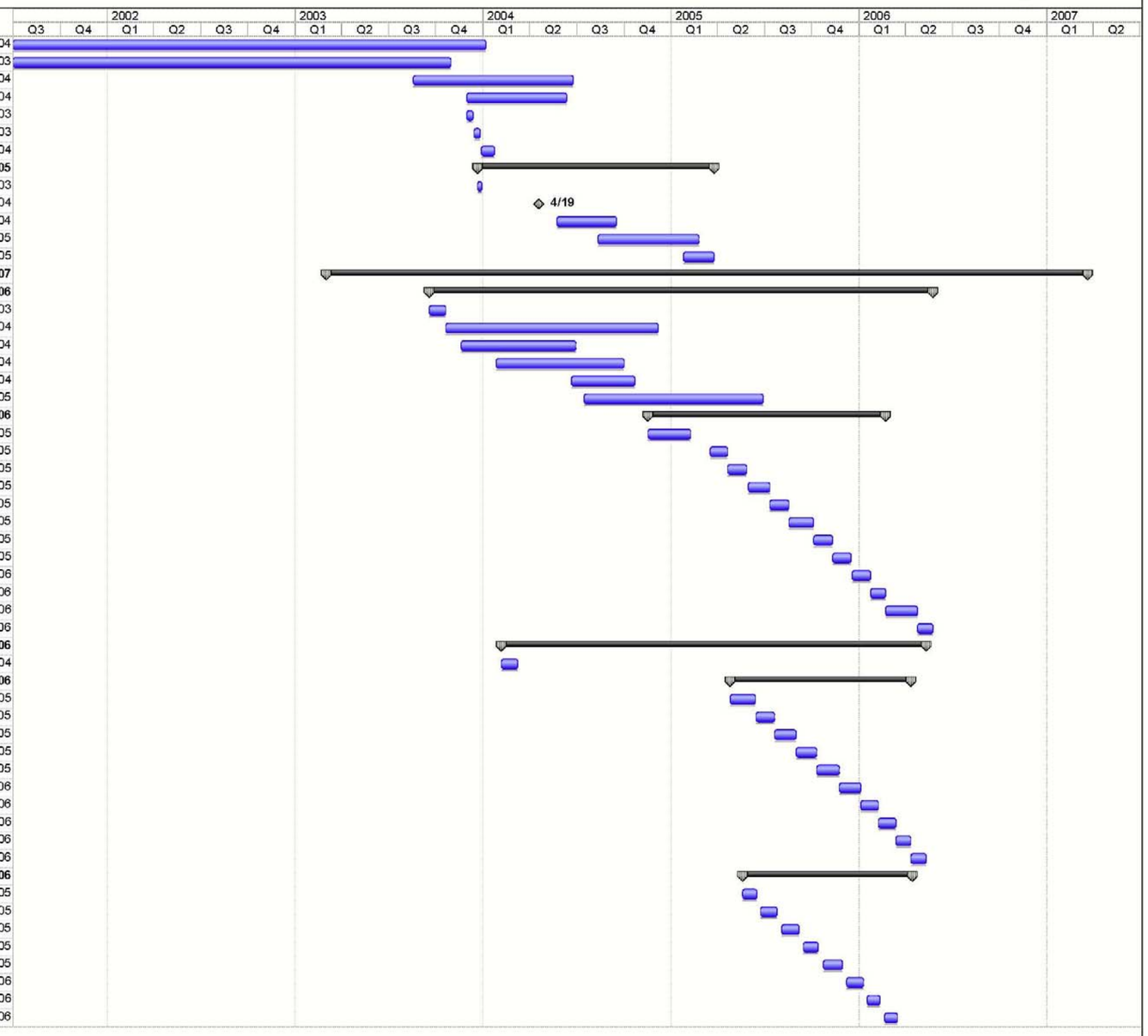
The detailed schedule represents the important activities that occurred during the construction of the New York Times Building. This schedule is a modification of the summary schedule that was provided in the Technical Report 1. Below are some key durations and milestones that were used in the General Conditions Estimate:

ACTIVITY	YEARS	MONTHS	WEEKS	WORK DAYS
Construction Duration	3.5	42	182	910
Tower Crane	1.25	15	65	325
Material Hoists	2	24	104	520
Demolition	0.5	6	26	130
Foundations	1.5	18	78	390
Steel	1.5	18	78	390
Concrete	0.75	9	39	195
Curtainwall	1.25	15	65	325
Mech./Plum.	3	36	156	780
Electrical	2	24	104	520
Interiors	1.75	21	91	455

DURATIONS	DATE	DURATIONS	DATE
Start of Construction	12/1/2003	Concrete Fill / Tower Topout	8/23/2006
Start Demolition	12/1/2003	Curtainwall - Poduim Finish	3/13/2006
Finish Demolition	6/30/2004	Curtainwall - Tower	1/3/2007
Start of Excavation Foundations	4/19/2004	MP - Start	5/3/2004
Finish Foundations	9/12/2005	MP - Finish	4/23/2007
Start of Steel Erection (Tower)	5/2/2005	Electrical - Start	8/19/2005
Start of Steel Erection (Podium)	7/26/2005	Electrical - Finish	4/12/2007
Steel Top Out	5/24/2006	Interior Finishes - Start	10/3/2005
Mobilize Podium Concrete	10/24/2005	Interior Finishes - Finish	6/20/2007
Podium Concrete Finished	12/6/2005	Remove Tower Cranes	7/25/2006
Mobilize Tower Concrete	7/18/2005	Remove Hoists	5/31/2007
Pour Concrete 51,52	7/24/2006	Project Closeout	6/20/2007

The New York Times Building — Detailed Project Schedule

ID	Task Name	Duration	Start	Finish
1	Owner Acquisition	657 days?	Mon 7/2/01	Tue 1/6/04
2	Documents Available	609 days?	Mon 7/2/01	Thu 10/30/03
3	Bid and Award	223 days?	Tue 8/19/03	Thu 6/24/04
4	Site Mobilization/Abatement and Demo	140 days?	Mon 12/1/03	Fri 6/11/04
5	Site Fence	10 days	Mon 12/1/03	Fri 12/12/03
6	Pedestrian Walkway	10 days	Mon 12/15/03	Fri 12/26/03
7	Overhead Protection	20 days	Mon 12/29/03	Fri 1/23/04
8	**Foundations**	**330 days?**	**Mon 12/22/03**	**Fri 3/25/05**
9	Award Excavations/Foundations	6 days?	Mon 12/22/03	Mon 12/29/03
10	Start Construction	0 days	Mon 4/19/04	Mon 4/19/04
11	Excavation/Foundations - East	84 days?	Mon 5/24/04	Thu 9/16/04
12	Excavation/Foundations - West	140 days?	Thu 8/12/04	Wed 2/23/05
13	Slab On Grade	44 days	Tue 1/25/05	Fri 3/25/05
14	**Superstructure**	**1060 days?**	**Mon 3/3/03**	**Wed 3/21/07**
15	**Steel and Metal Deck**	**700 days?**	**Fri 9/19/03**	**Wed 5/24/06**
16	Award Steel Package	22 days?	Fri 9/19/03	Mon 10/20/03
17	Shop Drawings	295 days?	Tue 10/21/03	Mon 12/6/04
18	Mill Orders	159 days?	Thu 11/20/03	Tue 6/29/04
19	Material Deliveries	179 days?	Tue 1/27/04	Fri 10/1/04
20	Fabrication - Podium	90 days?	Mon 6/21/04	Fri 10/22/04
21	Fabrication - Tower	248 days?	Fri 7/16/04	Tue 6/28/05
22	**Erect Steel**	**331 days?**	**Wed 11/17/04**	**Tue 2/21/06**
23	Erect Steel - Podium: 2nd thru 5th Floor	59 days?	Wed 11/17/04	Mon 2/7/05
24	Erect Steel - Floors 1-6	24 days?	Fri 3/18/05	Wed 4/20/05
25	Erect Steel - Floors 7-12	27 days?	Thu 4/21/05	Fri 5/27/05
26	Erect Steel - Floors 13-18	31 days?	Tue 5/31/05	Mon 7/11/05
27	Erect Steel - Floors 19-24	27 days?	Tue 7/12/05	Wed 8/17/05
28	Erect Steel - Floors 25-30	34 days?	Thu 8/18/05	Tue 10/4/05
29	Erect Steel - Floors 31-36	27 days?	Wed 10/5/05	Thu 11/10/05
30	Erect Steel - Floors 37-42	26 days?	Fri 11/11/05	Fri 12/16/05
31	Erect Steel - Floors 43-48	26 days?	Mon 12/19/05	Mon 1/23/06
32	Erect Steel - Floors 49-52	21 days?	Tue 1/24/06	Tue 2/21/06
33	Roof Screen Support/Topout/MEP Equipment	44 days?	Wed 2/22/06	Mon 4/24/06
34	Demobilize	22 days?	Tue 4/25/06	Wed 5/24/06
35	**Concrete**	**591 days?**	**Fri 2/6/04**	**Thu 5/11/06**
36	Award	22 days?	Fri 2/6/04	Mon 3/8/04
37	**Pour Concrete**	**252 days?**	**Tue 4/26/05**	**Tue 4/11/06**
38	Pour Concrete - Floors 1-6	35 days?	Tue 4/26/05	Mon 6/13/05
39	Pour Concrete - Floors 7-12	27 days?	Wed 6/15/05	Wed 7/20/05
40	Pour Concrete - Floors 13-18	30 days?	Thu 7/21/05	Wed 8/31/05
41	Pour Concrete - Floors 19-24	28 days?	Thu 9/1/05	Mon 10/10/05
42	Pour Concrete - Floors 25-30	32 days?	Tue 10/11/05	Wed 11/23/05
43	Pour Concrete - Floors 31-36	30 days?	Thu 11/24/05	Wed 1/4/06
44	Pour Concrete - Floors 37-42	24 days?	Thu 1/5/06	Tue 2/7/06
45	Pour Concrete - Floors 43-48	24 days?	Wed 2/8/06	Mon 3/13/06
46	Pour Concrete - Floors 49-52	21 days?	Tue 3/14/06	Tue 4/11/06
47	Concrete Fills/Topout	22 days?	Wed 4/12/06	Thu 5/11/06
48	**Conc - N/S Cantilever**	**237 days?**	**Fri 5/20/05**	**Fri 4/14/06**
49	Conc - N/S Cantilever - Floors 2-6	20 days?	Fri 5/20/05	Thu 6/16/05
50	Conc - N/S Cantilever - Floors 7-12	23 days?	Fri 6/24/05	Mon 7/25/05
51	Conc - N/S Cantilever - Floors 13-18	24 days?	Thu 8/4/05	Tue 9/6/05
52	Conc - N/S Cantilever - Floors 19-24	21 days?	Thu 9/15/05	Thu 10/13/05
53	Conc - N/S Cantilever - Floors 25-30	27 days?	Mon 10/24/05	Tue 11/29/05
54	Conc - N/S Cantilever - Floors 31-36	23 days?	Thu 12/8/05	Mon 1/9/06
55	Conc - N/S Cantilever - Floors 37-42	19 days?	Tue 1/17/06	Fri 2/10/06
56	Conc - N/S Cantilever - Floors 43-48	19 days?	Mon 2/20/06	Thu 3/16/06



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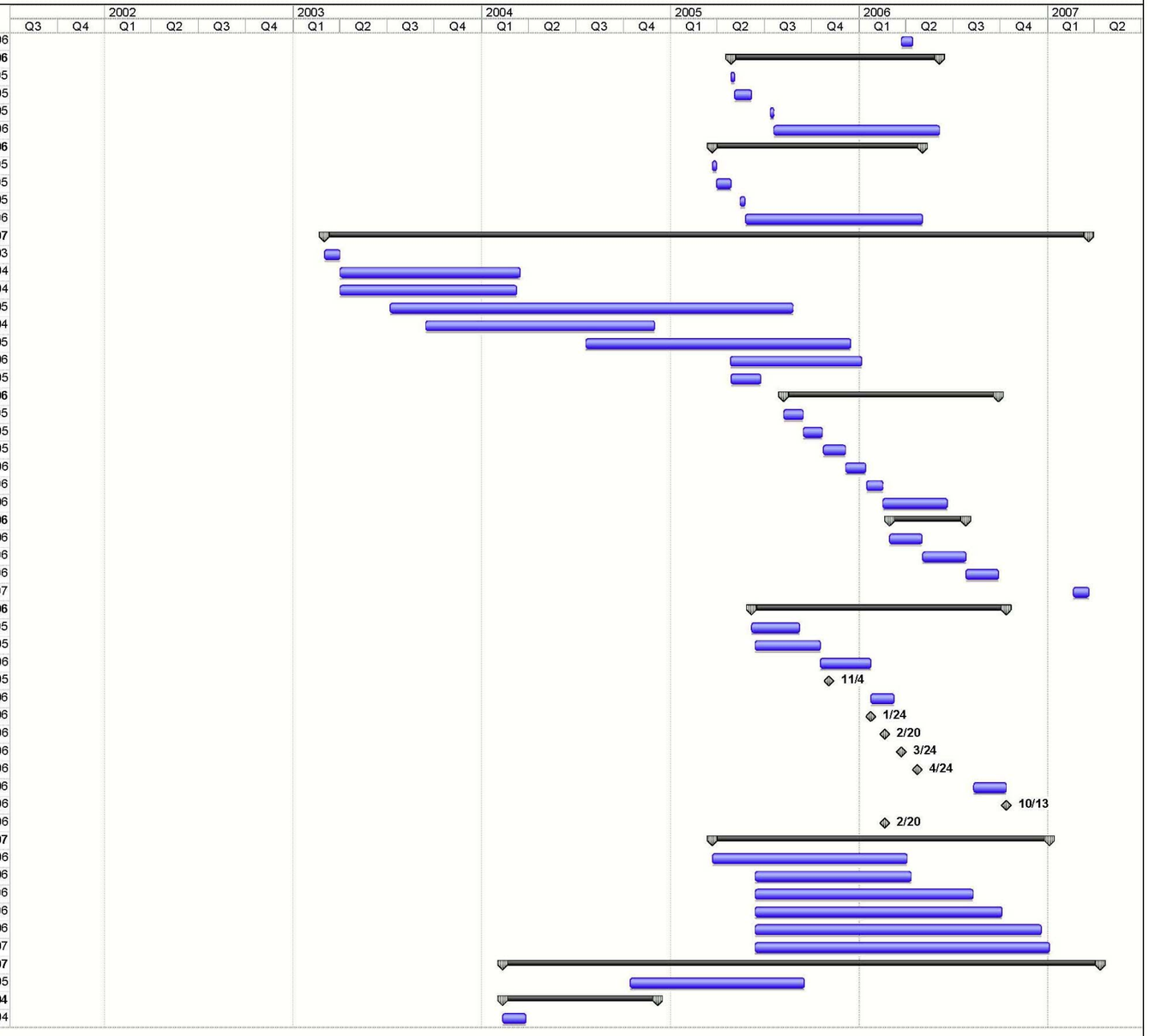
Detailed Project Schedule

ID	Task Name	Duration	Start	Finish
57	Conc - N/S Cantilever - Floors 49-52	16 days?	Fri 3/24/06	Fri 4/14/06
58	**Intumescent Paint Fireproofing**	**289 days?**	**Thu 4/28/05**	**Mon 6/5/06**
59	Intumescent FR - Podium Mobilization	5 days?	Thu 4/28/05	Wed 5/4/05
60	Intumescent FR - Podium	23 days?	Thu 5/5/05	Mon 6/6/05
61	Intumescent FR - Tower Mobilization	5 days?	Wed 7/13/05	Tue 7/19/05
62	Intumescent FR - Tower	229 days?	Wed 7/20/05	Mon 6/5/06
63	**Spray Fireproofing**	**292 days?**	**Wed 3/23/05**	**Wed 5/3/06**
64	Mobilize SOFP - Podium	6 days?	Wed 3/23/05	Wed 3/30/05
65	Spray Fireproof - Podium	20 days?	Thu 3/31/05	Wed 4/27/05
66	Spray Fireproof Mobilization - Tower	7 days?	Mon 5/16/05	Tue 5/24/05
67	Spray Fireproof - Tower	246 days?	Thu 5/26/05	Wed 5/3/06
68	**Curtain Wall**	**1060 days?**	**Mon 3/3/03**	**Wed 3/21/07**
69	Award	22 days?	Mon 3/3/03	Tue 4/1/03
70	Shop Drawings	249 days?	Wed 4/2/03	Mon 3/15/04
71	Mock Ups	244 days?	Wed 4/2/03	Mon 3/8/04
72	Material Procurement and Delivery	559 days?	Tue 7/8/03	Thu 8/25/05
73	Fabrication Drawings	317 days?	Mon 9/15/03	Tue 11/30/04
74	Shop Assembly/Shipping - Utilized Frames	368 days?	Wed 7/21/04	Thu 12/15/05
75	Set Inserts/Clips	183 days?	Wed 4/27/05	Thu 1/5/06
76	Curtain Wall Podium	42 days?	Thu 4/28/05	Fri 6/24/05
77	**Curtain Wall Tower**	**299 days?**	**Mon 8/8/05**	**Wed 9/27/06**
78	Curtain Wall Tower - Floors 2-7	28 days?	Mon 8/8/05	Wed 9/14/05
79	Curtain Wall Tower - Floors 8-13	27 days?	Thu 9/15/05	Fri 10/21/05
80	Curtain Wall Tower - Floors 14-19	31 days?	Mon 10/24/05	Mon 12/5/05
81	Curtain Wall Tower - Floors 20-25	29 days?	Tue 12/6/05	Fri 1/13/06
82	Curtain Wall Tower - Floors 26-28	23 days?	Mon 1/16/06	Wed 2/15/06
83	Curtain Wall Tower - Floors 29-50	89 days?	Thu 2/16/06	Tue 6/20/06
84	**Curtain Wall Tower North/South Wings**	**107 days?**	**Wed 3/1/06**	**Wed 7/26/06**
85	Curtain Wall Tower - Floors 31-40	45 days?	Wed 3/1/06	Tue 5/2/06
86	Curtain Wall Tower - Floors 41-51	61 days?	Thu 5/4/06	Wed 7/26/06
87	Roof Top Work - Screen Walls	45 days?	Thu 7/27/06	Wed 9/27/06
88	Curtain Wall Infill	22 days?	Tue 2/20/07	Wed 3/21/07
89	**Roofing**	**355 days?**	**Tue 6/7/05**	**Fri 10/13/06**
90	Port Authority Lighting Assembly	68 days?	Tue 6/7/05	Wed 9/7/05
91	Podium Skylights	91 days?	Tue 6/14/05	Mon 10/17/05
92	Roofing at 5th Floor Podium	70 days?	Tue 10/18/05	Mon 1/23/06
93	Temp. Watertight Roof Above 15th Floor	0 days	Fri 11/4/05	Fri 11/4/05
94	5th Floor Roof Pavers	33 days?	Tue 1/24/06	Thu 3/9/06
95	Weathertight Podium Roof	0 days	Tue 1/24/06	Tue 1/24/06
96	Temp. Watertight Roof Above 28th Floor	0 days	Mon 2/20/06	Mon 2/20/06
97	Temp. Watertight Roof Above 36th Floor	0 days	Fri 3/24/06	Fri 3/24/06
98	Temp. Watertight Roof Above 44th Floor	0 days	Mon 4/24/06	Mon 4/24/06
99	Roofing at Tower	45 days?	Fri 8/11/06	Thu 10/12/06
100	Watertight Tower Roof	0 days	Fri 10/13/06	Fri 10/13/06
101	NY Times Tenant Floors - Weather Tight	0 days	Mon 2/20/06	Mon 2/20/06
102	**Elevators**	**469 days?**	**Wed 3/23/05**	**Thu 1/4/07**
103	Podium Elevators	270 days?	Wed 3/23/05	Mon 4/3/06
104	Low Rise: P1 - P6	217 days?	Tue 6/14/05	Tue 4/11/06
105	Mid-Low Rise: P7 - P12	304 days?	Tue 6/14/05	Wed 8/9/06
106	Mid-High Rise: P13 - P18	344 days?	Tue 6/14/05	Wed 10/4/06
107	High Rise: P19 - P26	398 days?	Tue 6/14/05	Tue 12/19/06
108	Service Elevators: S27 & S28	410 days?	Tue 6/14/05	Thu 1/4/07
109	**Building Systems**	**829 days?**	**Wed 2/11/04**	**Thu 4/12/07**
110	Utilities	242 days?	Fri 10/15/04	Fri 9/16/05
111	**MEP Coordination**	**214 days?**	**Wed 2/11/04**	**Mon 12/6/04**
112	MEP Coordination - Shop Standards	33 days?	Wed 2/11/04	Fri 3/26/04



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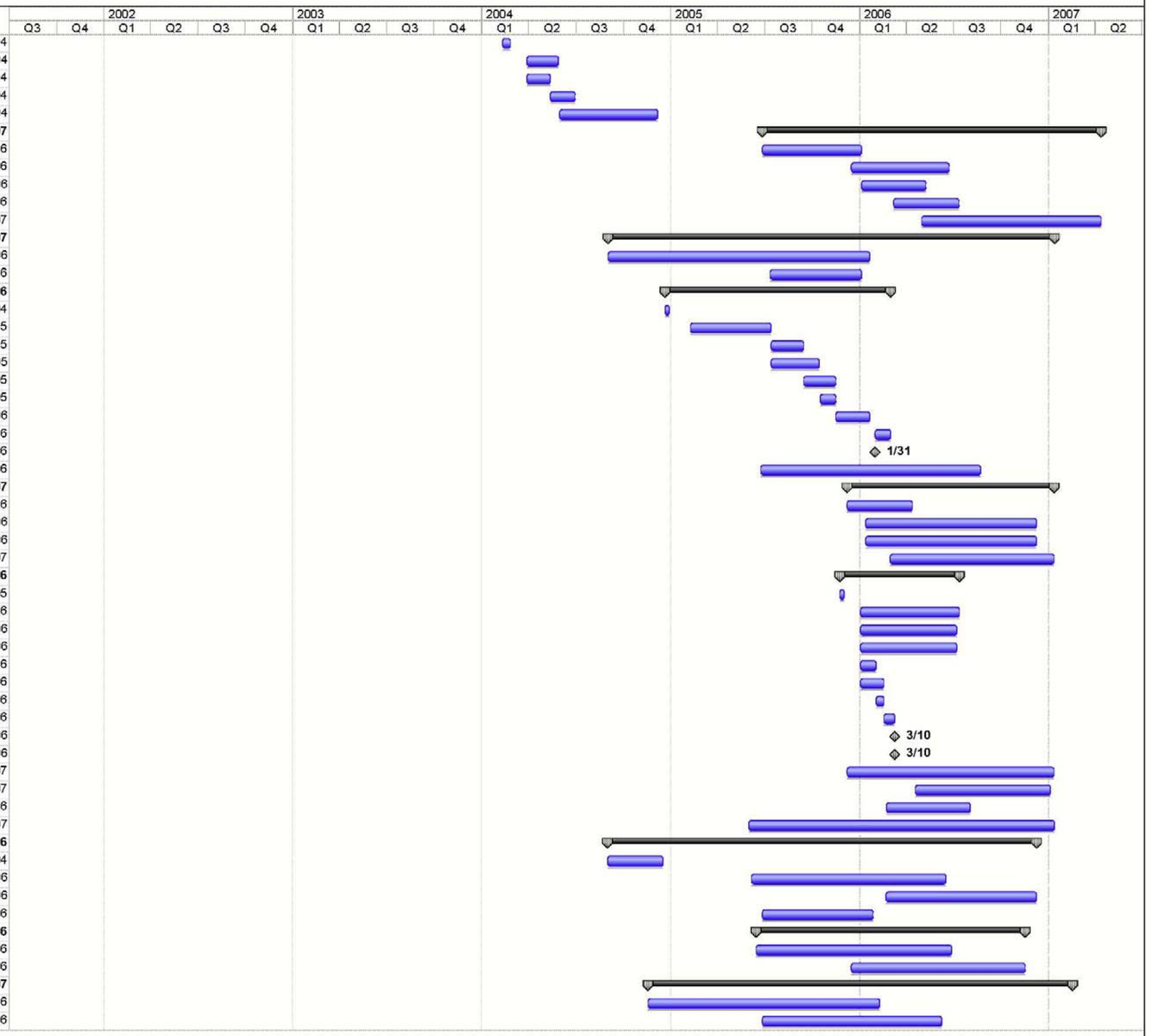
The New York Times Building — Detailed Project Schedule

ID	Task Name	Duration	Start	Finish
113	MEP - Underground Coordination	11 days?	Wed 2/11/04	Wed 2/25/04
114	MEP Coordination - Risers	45 days?	Mon 3/29/04	Fri 5/28/04
115	MEP Coordination - Cellar Floor	33 days?	Mon 3/29/04	Wed 5/12/04
116	MEP Coordination - Ground Floor	34 days?	Thu 5/13/04	Tue 6/29/04
117	MEP Coordination - Mechanical RMS & Typical Floors	136 days?	Mon 5/31/04	Mon 12/6/04
118	**B.A.T.C**	**471 days?**	**Mon 6/27/05**	**Thu 4/12/07**
119	BATC - Low Rise Backbone & Panels: C - 27	139 days?	Mon 6/27/05	Wed 1/4/06
120	BATC - High Rise Backbone & Panels: 28 - Roof	135 days?	Fri 12/16/05	Thu 6/22/06
121	BATC - Install Head End Equipment	88 days?	Thu 1/5/06	Mon 5/8/06
122	BATC - Programming	90 days?	Wed 3/8/06	Tue 7/11/06
123	BATC - Commissioning	250 days?	Mon 5/1/06	Thu 4/12/07
124	**HVAC**	**619 days?**	**Thu 9/2/04**	**Fri 1/12/07**
125	Cellar Level - Chiller Plant and Switchgear Room	363 days?	Thu 9/2/04	Fri 1/20/06
126	Ground Floor - 4th Floor	127 days?	Tue 7/12/05	Wed 1/4/06
127	**Co-Gen Plant**	**313 days?**	**Tue 12/21/04**	**Wed 3/1/06**
128	Co-Gen: Rig Equipment	6 days?	Tue 12/21/04	Tue 12/28/04
129	Co-Gen Plant - Structure & Enclosure	113 days?	Tue 2/8/05	Wed 7/13/05
130	Co-Gen: HVAC Piping (Heat Exchangers, Radiators)	45 days?	Thu 7/14/05	Wed 9/14/05
131	Co-Gen: Switchgear, Gererators, Co-Gen Equipment	67 days?	Thu 7/14/05	Fri 10/14/05
132	Co-Gen: HVAC Plenumsm Dampers, etc	44 days?	Thu 9/15/05	Tue 11/15/05
133	Co-Gen: Electrical Wiring/Terminations	22 days?	Mon 10/17/05	Tue 11/15/05
134	Co-Gen Instrumentation And Controls	48 days?	Wed 11/16/05	Fri 1/20/06
135	Co-Gen: Testing	22 days?	Tue 1/31/06	Wed 3/1/06
136	Gas - Blue Card Required	0 days	Tue 1/31/06	Tue 1/31/06
137	5th Floor MER - Podium Roof	305 days?	Fri 6/24/05	Tue 8/22/06
138	**Low Rise**	**287 days?**	**Thu 12/8/05**	**Thu 1/11/07**
139	Rig AHUs: 6th thru 27th Floors	90 days?	Thu 12/8/05	Wed 4/12/06
140	Piping @ AHUs: 29th thru 50th Floor	237 days?	Fri 1/13/06	Fri 12/8/06
141	AHU Ductwork: 29th thru 50th Floor	237 days?	Fri 1/13/06	Fri 12/8/06
142	Pipe/Duct - Floor Run Outs: 29th thru 50th Floor	228 days?	Wed 3/1/06	Thu 1/11/07
143	**28th Floor - Mechanical Room**	**165 days?**	**Thu 11/24/05**	**Wed 7/12/06**
144	Rig All Mech Equipment: 28th Floor	6 days?	Thu 11/24/05	Thu 12/1/05
145	Steam Station - PRV	137 days?	Tue 1/3/06	Wed 7/12/06
146	Piping Equipment	134 days?	Tue 1/3/06	Fri 7/7/06
147	AHU Ductwork	134 days?	Tue 1/3/06	Fri 7/7/06
148	Low Zone Chilled Water Return Loop	22 days?	Tue 1/3/06	Wed 2/1/06
149	LR - Hot Water Return Loop	33 days?	Tue 1/3/06	Thu 2/16/06
150	Testing - Low Zone Chilled Water Loop	11 days?	Thu 2/2/06	Thu 2/16/06
151	LR - Hot Water System - Testing/Comm.	15 days?	Fri 2/17/06	Thu 3/9/06
152	Low Zone Chilled Water Available for NYT	0 days	Fri 3/10/06	Fri 3/10/06
153	LR - Hot Water Sys. - Available for NYT	0 days	Fri 3/10/06	Fri 3/10/06
154	High Rise	287 days?	Thu 12/8/05	Thu 1/11/07
155	51st Floor - Mechanical Room	188 days?	Wed 4/19/06	Thu 1/4/07
156	Roof	117 days?	Wed 2/22/06	Wed 8/2/06
157	Risers	425 days?	Wed 6/1/05	Fri 1/12/07
158	**Plumbing**	**595 days?**	**Wed 9/1/04**	**Fri 12/8/06**
159	Underground	77 days?	Wed 9/1/04	Thu 12/16/04
160	Low Rise	271 days?	Mon 6/6/05	Fri 6/16/06
161	High Rise	210 days?	Tue 2/21/06	Fri 12/8/06
162	Gas Risers	155 days?	Mon 6/27/05	Thu 1/26/06
163	**Fire Protection**	**374 days?**	**Wed 6/15/05**	**Thu 11/16/06**
164	Low Rise	271 days?	Wed 6/15/05	Tue 6/27/06
165	High Rise	241 days?	Fri 12/16/05	Thu 11/16/06
166	**Electrical**	**589 days?**	**Thu 11/18/04**	**Fri 2/16/07**
167	Cellar Level - Chiller Plant and Swithgear Room	321 days?	Thu 11/18/04	Wed 2/8/06
168	Low Rise	250 days?	Mon 6/27/05	Thu 6/8/06



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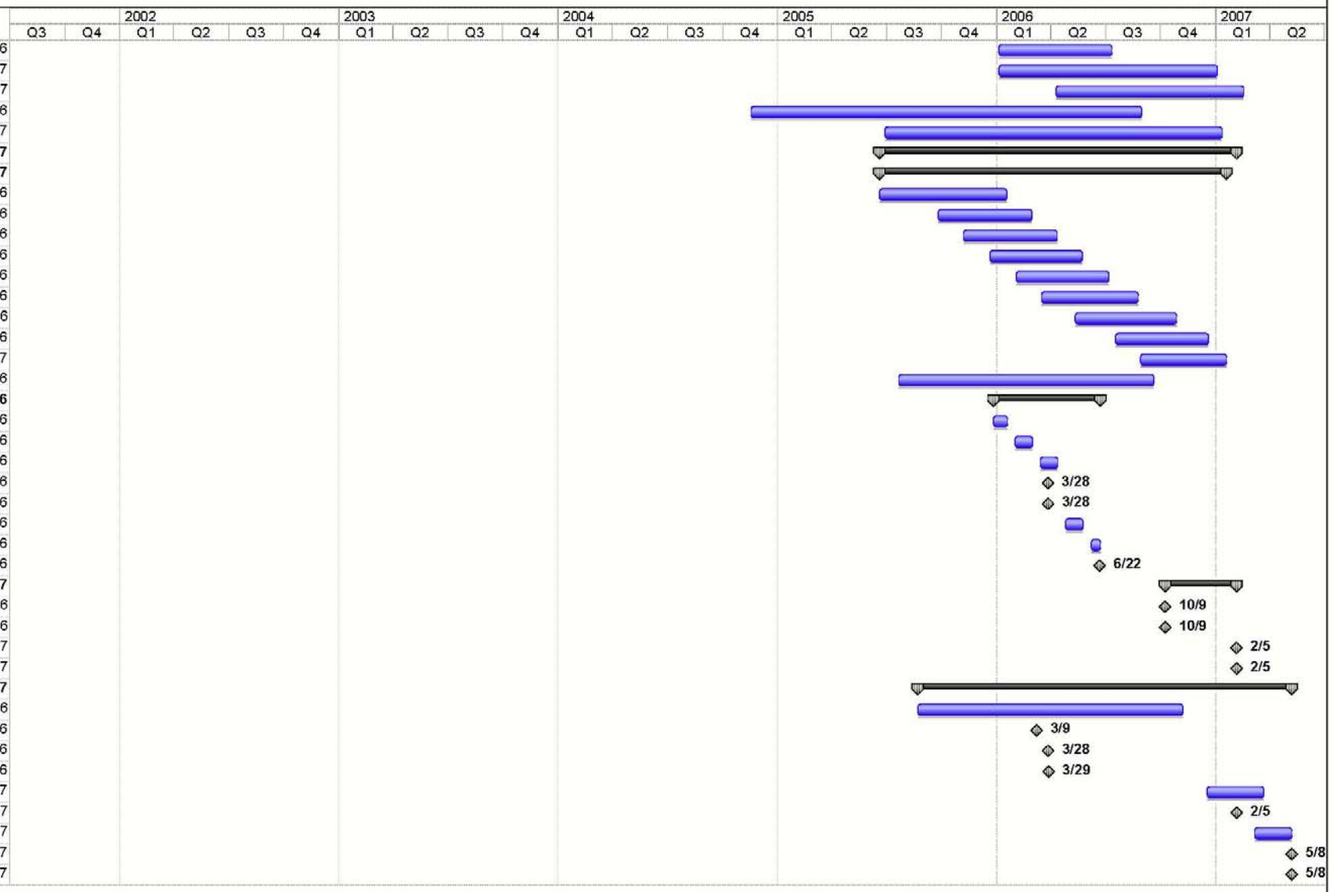
ID	Task Name	Duration	Start	Finish
169	28th Floor - Mechanical Room	134 days?	Thu 1/5/06	Tue 7/11/06
170	High Rise	261 days?	Thu 1/5/06	Wed 1/3/07
171	51st Floor - Mechanical Room	226 days?	Mon 4/10/06	Fri 2/16/07
172	Life Safety	467 days?	Thu 11/18/04	Wed 8/30/06
173	Fire Alarm	404 days?	Wed 6/29/05	Thu 1/11/07
174	**Interior Finishes**	**427 days?**	**Mon 6/20/05**	**Mon 2/5/07**
175	**Core Program**	**416 days?**	**Mon 6/20/05**	**Thu 1/18/07**
176	Core Program - Floors 1-6	153 days?	Mon 6/20/05	Tue 1/17/06
177	Core Program - Floors 7-12	112 days?	Mon 9/26/05	Tue 2/28/06
178	Core Program - Floors 13-18	112 days?	Mon 11/7/05	Tue 4/11/06
179	Core Program - Floors 19-24	110 days?	Wed 12/21/05	Tue 5/23/06
180	Core Program - Floors 25-30	110 days?	Fri 2/3/06	Thu 7/6/06
181	Core Program - Floors 31-36	116 days?	Fri 3/17/06	Thu 8/24/06
182	Core Program - Floors 37-42	122 days?	Fri 5/12/06	Fri 10/27/06
183	Core Program - Floors 43-48	112 days?	Tue 7/18/06	Tue 12/19/06
184	Core Program - Floors 49-52	103 days?	Tue 8/29/06	Thu 1/18/07
185	Perimeter Program	304 days?	Fri 7/22/05	Tue 9/19/06
186	**NYT - Interior Program - Floor Handover**	**128 days?**	**Tue 12/27/05**	**Thu 6/22/06**
187	NYT - Floors 3-6 Handover	17 days	Tue 12/27/05	Wed 1/18/06
188	NYT - Floors 7-12 Handover	21 days	Wed 2/1/06	Wed 3/1/06
189	NYT - Floors 13-18 Handover	21 days	Wed 3/15/06	Wed 4/12/06
190	NYT - Cellar Level Handover	0 days	Tue 3/28/06	Tue 3/28/06
191	NYT - 1st Floor Area - Handover	0 days	Tue 3/28/06	Tue 3/28/06
192	NYT - Floors 19-24 Handover	21 days?	Wed 4/26/06	Wed 5/24/06
193	NYT - Floors 25-28 Handover	11 days?	Thu 6/8/06	Thu 6/22/06
194	NYT - 2nd Floor Handover	0 days	Thu 6/22/06	Thu 6/22/06
195	**FCRC - Turnovers**	**85 days**	**Mon 10/9/06**	**Mon 2/5/07**
196	FCRC Tenant Turnover A (29-34)	0 days	Mon 10/9/06	Mon 10/9/06
197	FCRC Tenant Turnover B (35-40)	0 days	Mon 10/9/06	Mon 10/9/06
198	FCRC Tenant Turnover C (41-46)	0 days	Mon 2/5/07	Mon 2/5/07
199	FCRC Tenant Turnover D (47-50)	0 days	Mon 2/5/07	Mon 2/5/07
200	**Finish and Closeout**	**446 days?**	**Tue 8/23/05**	**Tue 5/8/07**
201	Tower Lobby - Interior and Entrances	316 days?	Tue 8/23/05	Mon 11/6/06
202	NYT - Times Center - 1st Floor Handover	0 days	Thu 3/9/06	Thu 3/9/06
203	NYT - Times Center - Cellar Floor Handover	0 days	Tue 3/28/06	Tue 3/28/06
204	Low Rise TCO	0 days	Wed 3/29/06	Wed 3/29/06
205	Project Punchlist/Closeout/Demobilization	68 days?	Mon 12/18/06	Wed 3/21/07
206	High Rise TCO	0 days	Mon 2/5/07	Mon 2/5/07
207	Internal Garden/Lobby Restoration and Landscaping	44 days?	Wed 3/7/07	Mon 5/7/07
208	Lobby Completion	0 days	Tue 5/8/07	Tue 5/8/07
209	Project Close Out	0 days	Tue 5/8/07	Tue 5/8/07



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

Technical Assignment 2 — Hedrick | Miller | Wiacek — Page 4

SITE LAYOUT PLANNING

As outlined in Technical Assignment I, The New York Times Building is located in the Times Square District of Manhattan, directly across 8th Ave. from the Port Authority Bus Terminal and approximately eight blocks Northwest from the Empire State Building. There were four phases for the construction process- demolition, foundations (two parts), superstructure, and interior turnover.

Please refer to Appendix A for more detailed information regarding the site layout planning for The New York Times Building site. General descriptions of major site logistics issues with a particular phase are outlined below. Please note that site layout plans were only obtained for the AMEC portion of the construction process as Turner plans were not obtained. It was assumed that the site layout plan remained largely the same following turnover for interior fit out.

DEMOLITION

This phase consisted of the abatement of the existing structures on the block that the New York Times Building would ultimately occupy. Safety scaffolding was placed above the entirety of the 8th Avenue portion of the site, and partially along both the West 41st Street and West 40th Street site boundaries.

FOUNDATIONS – PART I

The eastern portion of the site was demolished first- excavation then followed with the placement of the ramp in the northeast corner. The entire excavated area was surrounded with site fencing, and scaffolding was placed around the western cluster of existing structures that were still undergoing abatement. During this process, the foundation was placed (including deep foundations were placed in the southeast corner of the site).

FOUNDATIONS – PART II

The remaining western portion of the site was demolished in the second portion of the foundation placement phase. The western portion of the site was then excavated (Ramp in NW corner) and foundations were placed.

SUPERSTRUCTURE

The entirety of the steel erection took place during this phase. One tower crane was placed in the center of each of the northwestern and southwestern quadrants of the site. Personnel site access was allowed through the northern portion of the site, with staging areas on the northern and southern site boundaries. The subway exit could be closed on a provisional bases based on a permit obtained by the construction team.

INTERIOR TURNOVER

For this phase, AMEC turned over the project to Turner Construction to complete the interior fit out of the project. It was assumed by the project team that the site layout plan would remain largely the same, for this portion of the project.

DETAILED STRUCTURAL SYSTEMS ESTIMATE

Note: Please reference Appendix B for a more detailed version of the structural systems estimate.

FOUNDATIONS

The foundations of the New York Times building consist of spread footings over the footprint of most of the site in addition to caissons located on the southeast side of the building. The exact size, locations and quantity for the deep foundation system is unknown, however several assumptions were made from based on the results from D4 cost analysis and RS Means Costworks. The total foundations cost came to approximately $21,344,000.00 based on these assumptions.

STRUCTURAL STEEL FRAMING

Structural steel member sizes and lengths were taken from the existing Revitmodel, which were updated according to the provided structural drawings. Specialty columns are used throughout the structure, primarily consisting of the built-up plate columns within the core of the building in addition to flanged box columns on the exterior of the building. The structural steel framing estimate is summarized in Figure 1 below.

QUANTITY	UNIT	DESCRIPTION	PRICE
		STRUCTURAL STEEL MEMBERS	
398.55	L.F.	HSS6x4x3/8	$30,758.10
53.7	L.F.	TT14x99	$13,908.67
673.67	L.F.	W4x13	$35,905.27
41.33	L.F.	W10x26	$3,340.66
887.43	L.F.	W12x19	$58,635.16
18.29	L.F.	W12x26	$1,387.46
951.23	L.F.	W14x22	$71,027.39
37.72	L.F.	W14x30	$3,235.02
57	L.F.	W14x43	$6,812.53
30	L.F.	W14x48	$4,339.23
70.47	L.F.	W14x82	$16,823.16
179.26	L.F.	W14x90	$42,794.38
134.38	L.F.	W14x109	$42,251.62
151.18	L.F.	W14x120	$47,533.86
123.34	L.F.	W14x132	$41,672.76
22.74	L.F.	W14x257	$15,186.41
101.25	L.F.	W14x283	$78,253.80
398.86	L.F.	W16x26	$29,751.77
114.96	L.F.	W16x31	$10,151.54
260	L.F.	W16x36	$29,130.92
2310.15	L.F.	W18x35	$233,606.99
364.18	L.F.	W18x40	$41,313.31

280	L.F.	W18x50	$39,064.76
120	L.F.	W18x60	$21,241.08
120	L.F.	W18x65	$21,241.08
72.49	L.F.	W18x71	$14,827.11
160	L.F.	W18x76	$32,726.40
174.12	L.F.	W18x106	$48,734.10
56.5	L.F.	W18x130	$10,042.54
123	L.F.	W18x143	$21,862.51
260	L.F.	W21x50	$35,763.00
122.12	L.F.	W21x57	$20,506.76
60	L.F.	W21x101	$15,970.08
78	L.F.	W21x132	$24,829.90
225	L.F.	W24x76	$45,424.58
60	L.F.	W33x130	$20,272.14
60	L.F.	W33x141	$21,924.00
120	L.F.	W33x221	$70,898.52
		TOTAL	**$1,323,148.55**

QUANTITY	UNIT	DESCRIPTION	PRICE
		STRUCTURAL COLUMNS	
110	L.F.	C-Channel-Column: C10X33	$30,617.40
27.5	L.F.	W-Wide Flange-Column: W14X257	$13,809.68
110	L.F.	FB-Flanged Box-Column: FB30X1116	$235,974.53
55	L.F.	BU-Built Up-Column: W23X1168	$123,408.30
27.5	L.F.	BU-Built Up-Column: W22X1032	$54,210.38
13.75	L.F.	BU-Built Up-Column: W24X985	$25,989.08
13.75	L.F.	BU-Built Up-Column: W23X729	$19,133.06
55	L.F.	BU-Built Up-Column: W29X2063	$216,841.46
27.5	L.F.	BU-Built Up-Column: W25X1401	$73,981.23
55	L.F.	W-Wide Flange-Column: W14X665	$70,154.59
55	L.F.	W-Wide Flange-Column: W14X730	$76,532.28
		TOTAL	**$940,651.99**

FIGURE 1 - Structural Framing Take-Off

SLAB SYSTEM

In the slab estimate, structural concrete with a compressive strength of 4000 psi was used. The structural slab takeoff wasgenerated through the common Revit model after applying a metal decking (18 gauge, 2" depth with 3.5" topping). An additional 5% was added to the concrete takeoff to account for waste in the construction process. Without knowing the exact welded wire fabric that was used in the project, a medium-sized fabric was selected (W2.9xW2.9, 42lb per CSF). The structural slab estimate summary is outlinedbelow in Figure 2.

QUANTITY	UNIT	DESCRIPTION	PRICE
		WELDED WIRE FABRIC REINFORCING	
2244	C.S.F.	W2.9 x W2.9 (6 x 6) 42 lb. per C.S.F.	$308,018.17
		TOTAL	**$308,018.17**
		NORMAL WEIGHT CONCRETE, READY MIX	
255	C.Y.	4000 PSI, 3.5" topping	$43,114.89
		TOTAL	**$43,114.89**
		FLOOR DECKING	
22440	C.Y.	2" D, 18 ga	$153,624.24
		TOTAL	**$153,624.24**

FIGURE 2 - Structural Slab Take-Off

RS Means pricing was used to acquire the pricing for steel, concrete and reinforcing materials. While some steel members are in RS Means, some were required to be increased price due to RS Means lacking data for members of that size. A multiplier was developed from the change in weight per linear foot, as well as the member sizeto extrapolate a value for the larger-sized members.

Each of the option-based groups analyzing the building agreed to base all analysis off of the eighth floor. For the purposes of this estimate, the eighth floor structural system was analyzed and the results were then extrapolated over the entire building to develop a more complete structural estimate. The total cost for the 8th floor was found to be $2,768,557.85- this cost was first multiplied by 1.1 to add 10% for the specialty columns designed for the core and exterior of the building. This cost was then multiplied by 58 (48 tower floors along with a 4 story podium floors which are about 2.5 times the square footage of the typical tower floor. The extrapolated cost came to $176,633,990.57 for the entire tower. Considering the foundations cost of $21,344,000.00, the final structural system cost comes to $197,977,990.57.

GENERAL CONDITIONS ESTIMATE

OVERVIEW

The general conditions estimate for the New York Times Building includes costs from field staff and facilities, temporary utilities, temporary site protection, clean up, and rigging and hoisting equipment for the project. The general conditions estimate will be used to assess any cost savings that could be seen if there is an acceleration in the project schedule.

There are a few assumptions that had to be made in order to put the general conditions estimate together:

- The total construction cost of the New York Times Building is $1 Billion.
- The square footage of the building is $1.5 million square feet.
- Only on site personnel is included in the general conditions.
- Site offices and crane equipment is rented for the project.
- Site protection has been purchased for the project.
- All lifts and equipment besides the hoists and cranes listed in the general conditions will be provided by the subcontractors.

CONSTRUCTION DURATIONS

Below are listed the construction durations that factored into the general conditions estimate. There are 12 months in a year, 52 weeks in a year, and 5 work days in a work week.

ACTIVITY	YEARS	MONTHS	WEEKS	WORK DAYS
Construction Duration	3.5	42	182	910
Tower Crane	1.25	15	65	325
Material Hoists	2	24	104	520
Demolition	0.5	6	26	130
Foundations	1.5	18	78	390
Steel	1.5	18	78	390
Concrete	0.75	9	39	195
Curtainwall	1.25	15	65	325
Mech./Plum.	3	36	156	780
Electrical	2	24	104	520
Interiors	1.75	21	91	455

COST BREAKDOWN

The general conditions on the New York Times Building project totaled $ 96,971,123. This accounted for approximately 9.71% of the overall project cost. The field personnel cost contributes $ 22,865,985 to the general conditions. That adds up to 2.3% of the overall project cost.

GENERAL CONDITIONS BREAKDOWN

Division	Description	Unit	Total	Quantity	Total Cost
01 31 13.20	**Field Personnel**				
0020	Clerk, 6	Week	$ 380.00	1,092	$ 414,960
0140	Field Engineer, 45	Week	$ 1,350.00	8,190	$ 11,056,500
0220	Project Manager, 20	Week	$ 2,175.00	1,781	$ 3,873,675
0280	Superintendant, 35	Week	$ 2,025.00	3,714	$ 7,520,850
					$ 22,865,985
01 51 13.80	**Temporary Utilities**				
0100	Heat, including fuel and operation, per week, 12 hrs	CSF Flr	$ 30.27	13,846	$ 419,123
0350	Lighting, including service lamps, wiring, and outlets, maximum	CSF Flr	$ 27.70	15,000	$ 415,500
0600	Power for job duration including elevator, etc., min	CSF Flr	$ 47.00	15,000	$ 705,000
0650	Power for job duration including elevator, etc., max	CSF Flr	$ 110.00	15,000	$ 1,650,000
					$ 3,189,623
10 52 13.20	**Office and Storage Space**				
0020	Trailer, furnished, no hookups, 20' x 8', rent per month, 8 Trailers	Each	$ 163.00	576	$ 93,888
0700	AC, rent per month, add	Each	$ 41.00	576	$ 23,616
0800	For delivery, add per mile	Mile	$ 4.50	600	$ 2,700
					$ 120,204
01 52 13.40	**Field Office Expense**				
0100	Office Equipment rental average	Month	$ 155.00	384	$ 59,520
0120	Office supplies, average	Month	$ 85.00	384	$ 32,640
0140	Telephone bill; avg. bill per month	Month	$ 80.00	384	$ 30,720
0160	Lights & HVAC	Month	$ 150.00	384	$ 57,600
					$ 180,480
01 54 19.50	**Truck Crane**				
0600	Truck Mounted, hydrolic, 100 ton capacity	Month	$ 14,100.00	16	$ 225,600
	Crew	Day	$ 104.90	320	$ 33,568
					$ 225,600
01 54 19.60	**Monthly Tower Crane Crew**				
0100	Crane, climbing, 106' jib, 6000 lb. capacity, 410 FPM	Month	$ 13,200.00	60	$ 792,000
	Tower Crane Crew	Day	$ 37.40	2,400	$ 89,760
4550	Hoist and tower, mast type, 6000 lb., 100' high, month	Each	$ 4,136.60	86	$ 357,402
4570	for each added 10' section, add, month	Each	$ 196.20	5,616	$ 1,101,859
					$ 2,341,021
01 56 26.50	**Temporary Fencing**				
0020	Chain Link, 11 ga, 6' high	L.F.	$ 8.51	980	$ 8,340
	Plywood, painted, 4" x 4" frame, 8' high	L.F.	$ 18.20	980	$ 17,836
					$ 26,176
01 56 29.50	**Temporary Protective Walkways**				
2200	Sidewalk, 2" x 12" planks, 2 uses	S.F.	$ 1.60	16,000	$ 25,600
2500	Exterior Plywood, 2 uses, 3/4" thick	S.F.	$ 0.95	16,000	$ 15,200
					$ 40,800
01 58 13.50	**Signs**				
0020	High intensity reflectorized, no posts, buy	S.F.	$ 21.00	1,000	**$ 21,000**
01 74 13.20	**Cleaning Up**				
0040	Maximum	Job	0.8%	$1 Billion	$ 8,000,000
0050	Cleanup of floor area, continuous, per day, during construction	M.S.F.	$ 27.23	1,670	$ 45,485
0100	Final by GC at end of job	M.S.F.	$ 56.44	1,670	$ 94,277
					$ 8,139,762
	Subtotal				**$ 74,313,871**
	Adjusted for Location (New York City, 130.7)				**$ 97,128,230**

PACE: CRITICAL INDUSTRY ISSUES

The construction industry is one that is perpetually evolving with regards to technology, management practices, and its relationships with related disciplines in architecture and engineering. Trends such as integrated project delivery, sustainable design and construction, building information modeling, and new trends in communication are all topics currently at the forefront of industry discussion and served as the foundations of the PACE conference on October 15th, 2009. Since the IPD/BIM Thesis CM team is comprised of three members, one person was in attendance at each of the three topics.

ENERGY AND THE BUILDING INDUSTRY

Sustainable design and construction is currently one of the most highly publicized aspects of the industry due to a very broad spectrum of reasons. A realization that energy sources are finite, increasing demand and decreasing supply in addition to the deregulation of the energy industry are creating a genuine interest amongst many people in sustainable design practices. Furthermore, pending legislation and portfolio standards by federal and local governmental agencies with regard to sustainable energy usage are currently creating new markets for sustainable technologies, creating an increased demand for these technologies and are leading to new developments in HVAC, lighting, water, and building control systems that were previously only niche markets.

However, the increased publicity that the sustainable design and construction industry is experiencing is primarily not driven by people's interest in saving the environment, or government incentives (although this may change in the future). By far the largest reason for the surge in interest in sustainable technologies is due to marketing and corporate imaging. Recent trends have shown that if a consumer has a choice between purchasing products from a company known to have an environmentally sound corporate philosophy versus a company that is a known polluter, they will typically choose the more environmentally friendly company even if it costs slightly more. Corporations may or may not see the impact of how the technologies behind their sustainable image impact the environment, but almost all of them will be able to identify their positive effects on their sales figures. As with all aspects of business, when a new market opens up there is always a risk of over saturating it with products of dubious quality. In the case of the sustainable design industry, the term "greenwashing" is used to refer to products and technologies that are labeled efficient and sustainable by their creators, often using industry buzzwords from other sustainable fields, but in actuality are anything but and are just an attempt to capitalize on a new market.

Sustainable design and construction practices are highly interdisciplinary, and it is important to understand the synergistic relationships one system has in relation to others. For instance, if a new window system is introduced to a design that allows in more daylight and has better thermodynamic properties, many new secondary changes could naturally arise. Since the windows allow in more daylight, less lighting is needed during the day and could lead to a downsizing of the lighting system. Since they have better thermodynamic properties, a downsizing of the mechanical system may now be possible. With both the mechanical and lighting systems downsized, it may now be possible to reduce the size of structural members in the building.

However, with all of these changes that could take placed based on a singular design change, it is becoming more apparent that the traditional delivery methods used for decades are becoming outdated, and a more integrated project delivery method is required.

BUSINESS NETWORKING

New types of relationships have developed in the building design and construction industry in recent years to accommodate a changing marketplace. A slowing economy paired with a rising demand for sustainable buildings has forced many companies to get creative in forming strategic partnerships with each other. Sustainable projects are requiring a more integrated approach to contracting in comparison to the majority of past projects.

Many sustainable building projects are creating a strain on the traditional Design-Bid-Build contracting method that has been used in many past projects. The integrated approach to design and construction that leads to the most successful project is being found with projects that utilize a Design-Build or Integrated Project Delivery method of contracting. These delivery methods provide a way for designers and contractors to interact with each other and share ideas in an integrated manner by creating an infrastructure of sharing the risk of the project equally between all parties. These integrated project teams can also take on larger projects than they normally undertake by joint venturing with multiple other companies. They can have a larger bonding capacity shared between the team. Some projects, especially projects larger than $350M, will require that project teams have joint ventures between multiple companies.

With the growing need for integrated project teams coupled with an economic downturn, it is very important for construction industry members to maintain positive relationships with other industry members in order to secure new projects. There were several key points to accomplishing this that were discussed at the conference. First, a contractor can cultivate relationships with owners of previous projects or owners of potential future clients in order to obtain a higher chance of obtaining work in the future. Second, they can get involved in new markets when they are just breaking into the marketplace by undertaking small, low risk projects. This allows for a position of leadership in the future should that new market become a permanent aspect of the industry. Lastly, the contractor can partner with other contractors in a joint venture.

Joint ventures between contractors offer many advantages in undertaking projects that typical structures cannot provide. There is an additional bonding capacity present in a joint venture project, allowing the team to take on a larger project while still managing their risk. In a joint venture, there is a high likelihood that one company will be stronger than the other- the smaller company is able to reap the rewards of being associated with the stronger company with respect to local connections, experience in other market types, and connections to other owners.

BIM EXECUTION PLANNING

A paradigm shift like integrated project delivery will all but require professionals to utilize new tools to aid in the integration process. Building Information Modeling (BIM) design tools have been rising in popularity for several years and are one such tool that allow AEC professionals to become more integrated. The concept of creating a building in a BIM environment is frequently misinterpreted as creating a model in a single program such as Autodesk Revit or creating 4D construction models in Autodesk Navisworks. In actuality, BIM refers to the process by which professionals in various design and construction disciplines interact with a common shared model through the use of many different (and often trade-specific) programs.

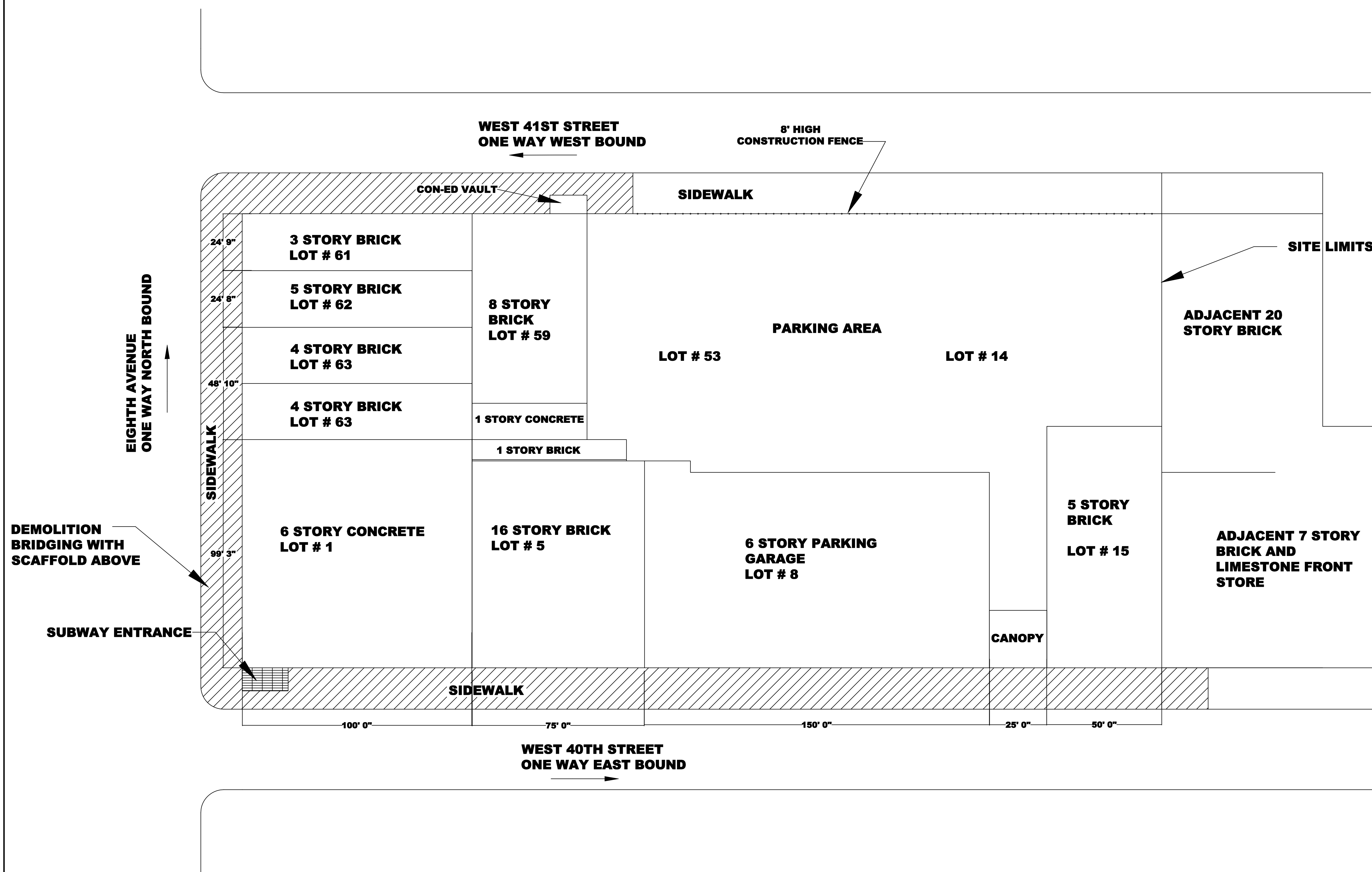
The idea of Building Information Modeling is often very appealing to owners and members of the design and construction fields, but there are several issues that are currently preventing its full adoption by the industry. Foremost, many design and construction professionals are hesitant to make drastic changes to their work methods. The process involved in creating a building using a BIM approach, while not drastic, is in many cases a fairly significant deviation. Owners are also hesitant to pay for BIM technology when told that it could help solve problems before they naturally arise- in their eyes, they have already paid for a "perfect" building design and should not have to pay extra for something that the designer should have resolved anyway. Lastly, even if a project team and owner are enthusiastic about utilizing BIM on projects, there are still many incompatibilities between software packages that can make some workflows very difficult and inefficient.

However, the general consensus among industry members is that while the BIM-based delivery method is still very much in its infancy, it is continuing to improve and will be commonplace in the near future. When industry members have given feedback requesting new features to BIM software developers, the developers have typically been very supportive and frequently implement those changes in upcoming releases of the program.

APPENDIX A

SITE LAYOUT PLAN

Detailed site layout plans for the New York Times Building



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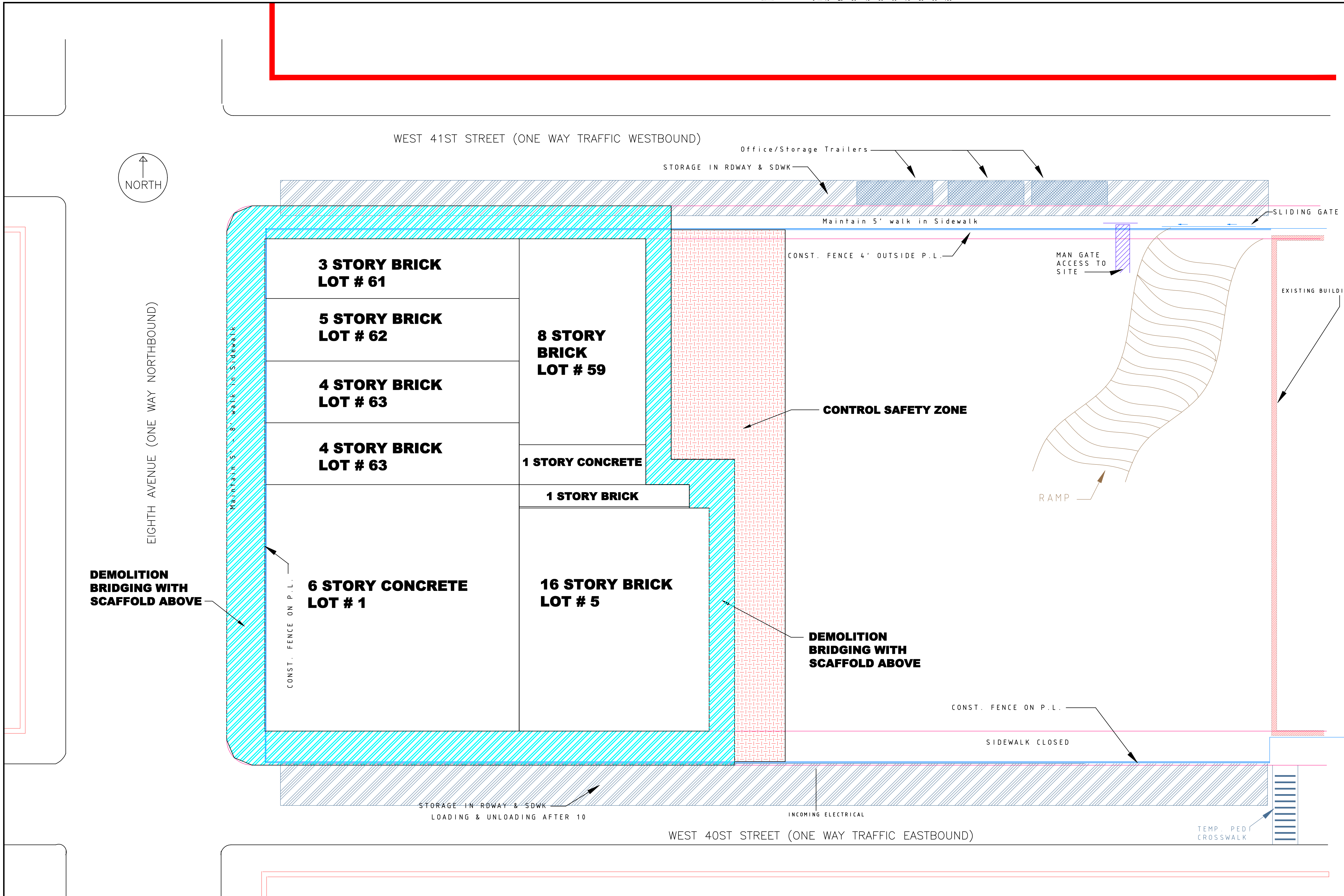

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WEST 41ST STREET (ONE WAY TRAFFIC WESTBOUND)

NORTH

Office/Storage Trailers

STORAGE IN RDWAY & SDWK

SLIDING GATE

Maintain 5' walk in Sidewalk

CONST. FENCE 4' OUTSIDE P.L.

MAN GATE ACCESS TO SITE

EXISTING BUILDING

Maintain 5' - 8' walk in Sidewalk

RAMP

EXCAVATION AND FOUNDATIONS

EIGHTH AVENUE (ONE WAY NORTHBOUND)

CONST. FENCE ON P.L.

CONST. FENCE ON P.L.

SIDEWALK CLOSED

STORAGE IN RDWAY & SDWK
LOADING & UNLOADING AFTER 10

INCOMING ELECTRICAL

TEMP. PED. CROSSWALK

WEST 40ST STREET (ONE WAY TRAFFIC EASTBOUND)

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	CHK.	AS	
	APP.		

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AREA

TITLE

SITE LOGISTICS
NEW YORK TIMES BUILDING
PHASE 2A – FOUNDATIONS

amec

CLIENT DWG. NO.

DRAWING NO. PHASE 2A

REV. 5

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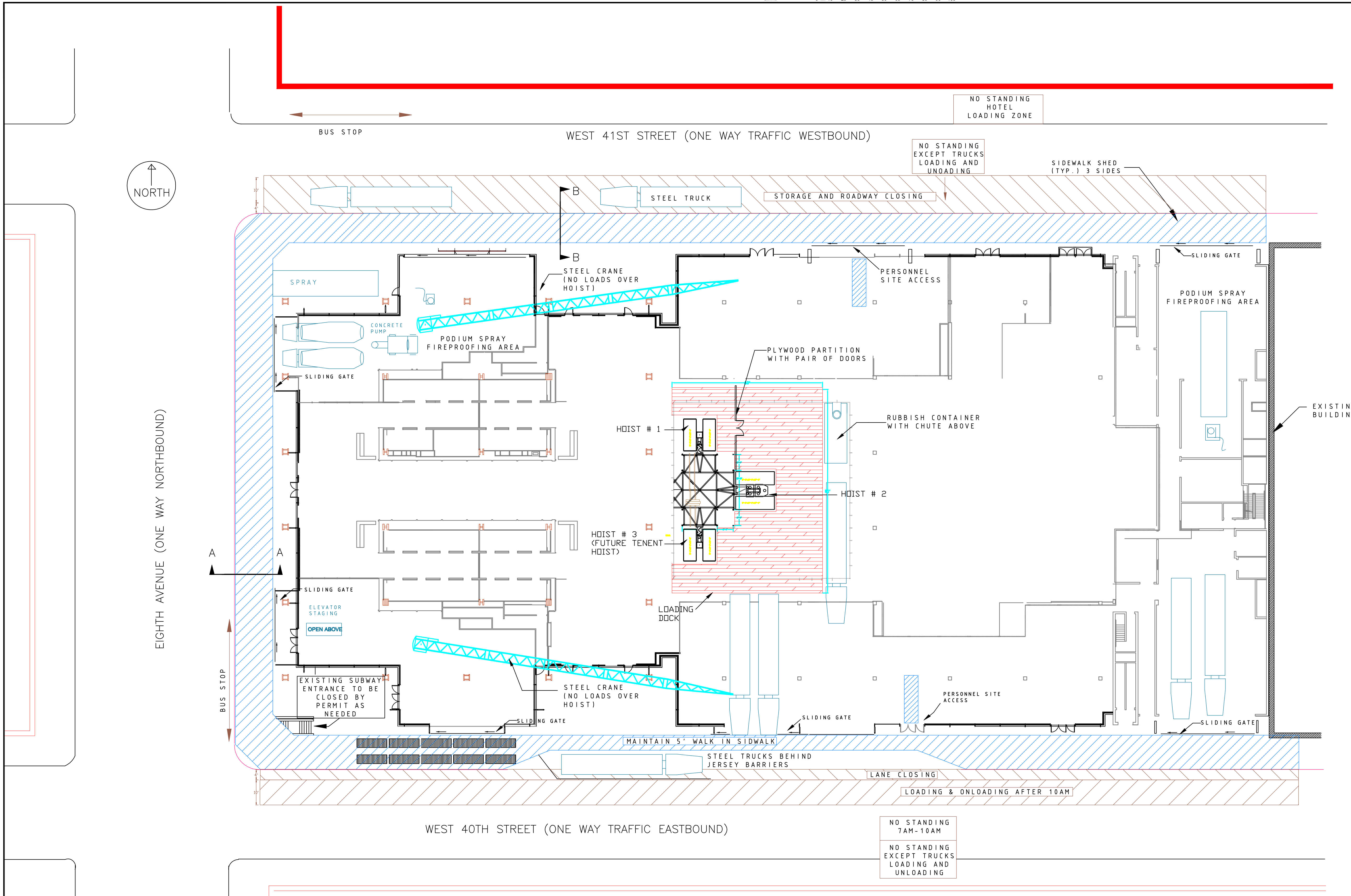

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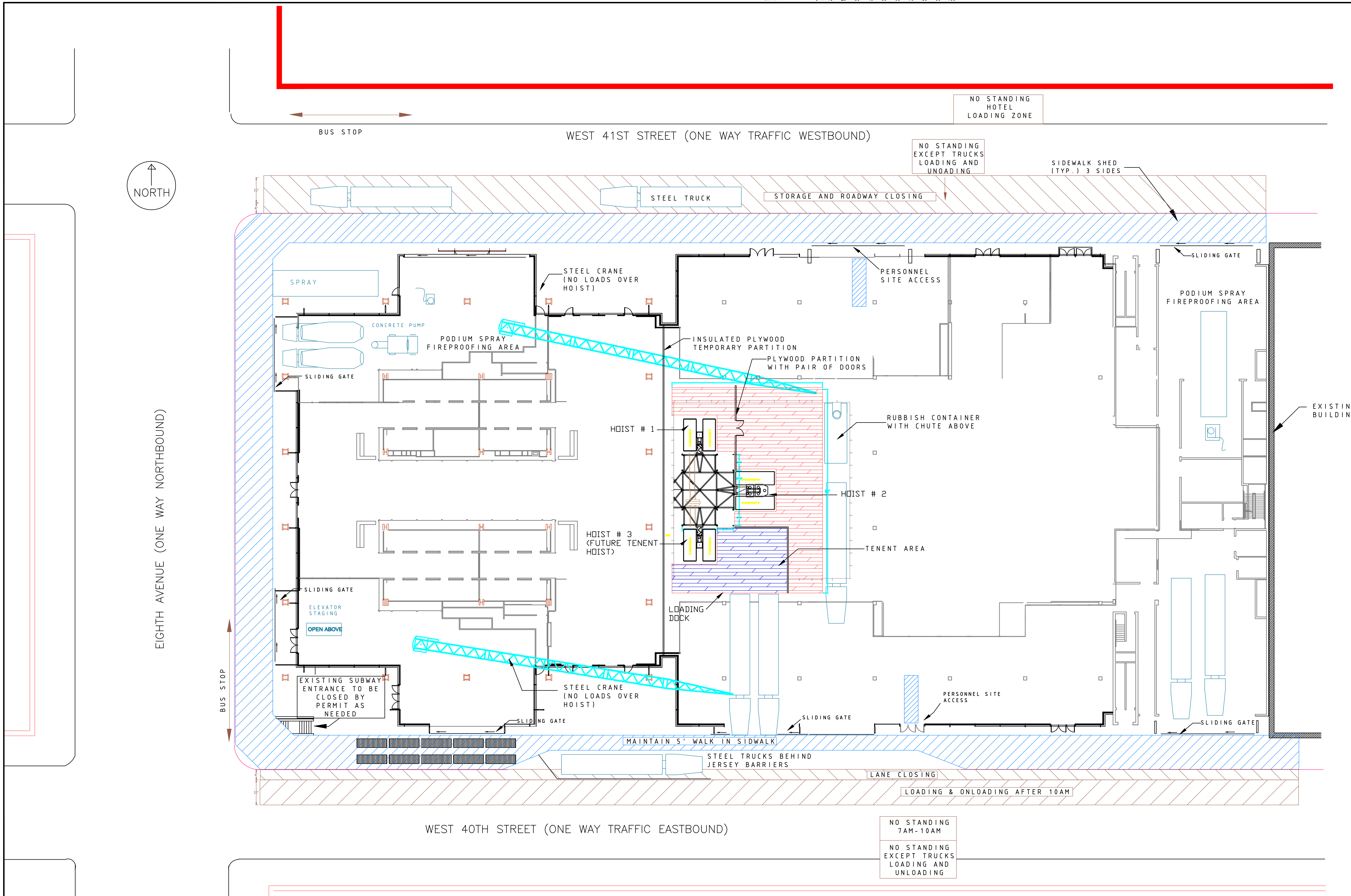

APPROVED FOR CONSTRUCTION

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SCALE NTS

STAMP/SEAL

AREA

TITLE

SITE LOGISTICS

NEW YORK TIMES BUILDING
PHASE 4 – INTERIOR TURNOVER

amec

CLIENT DWG. NO.

DRAWING NO. PHASE –4

REV. 5

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APPENDIX B

DETAILED STRUCTURAL SYSTEMS ESTIMATE

Detailed takeoff sheets for the Structural Systems Estimate

NYT Steel

Data Release : Year 2009 **Unit Cost Estimate**

Quantity	Line Number	Description	Crew	Daily Output	Labor Hours	Unit	Material	Labor	Equipment	Total	Ext. Mat.	Ext. Labor	Ext. Equip.	Ext. Total	Mat. O&P	Labor O&P	Equip. O&P	Total O&P	Ext. Mat. O&P	Ext. Labor O&P	Ext. Equip. O&P	Ext. Total O&P	Labor Type			
0	051223750010	STRUCTURAL STEEL MEMBERS					$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	STD			
41.33	051223750720	Structural steel member, 100-ton project, 1 to 2 story building, W10x26, A992 steel, shop fabricated, incl shop primer, bolted connections	E2	600	0.093	L.F.	$ 44.51	$ 5.75	$ 3.20	$ 53.46	$ 1,839.60	$ 237.65	$ 132.26	$ 2,209.50	$ 48.65	$ 9.84	$ 3.52	$ 62.01	$ 2,010.70	$ 406.69	$ 145.48	$ 2,562.87	STD	$ 4,772.37	$4,772.37	
18.29	051223751500	Structural steel member, 100-ton project, 1 to 2 story building, W12x26, A992 steel, shop fabricated, incl shop primer, bolted connections	E2	880	0.064	L.F.	$ 44.51	$ 3.92	$ 2.18	$ 50.61	$ 814.09	$ 71.70	$ 39.87	$ 925.66	$ 48.65	$ 6.71	$ 2.40	$ 57.76	$ 889.81	$ 122.73	$ 43.90	$ 1,056.43	STD	$ 1,982.09	$1,982.09	
37.72	051223752100	Structural steel member, 100-ton project, 1 to 2 story building, W14x30, A992 steel, shop fabricated, incl shop primer, bolted connections	E2	900	0.062	L.F.	$ 51.23	$ 3.84	$ 2.13	$ 57.20	$ 1,932.40	$ 144.84	$ 80.34	$ 2,157.58	$ 56.41	$ 6.56	$ 2.35	$ 65.32	$ 2,127.79	$ 247.44	$ 88.64	$ 2,463.87	STD	$ 4,621.45	$4,621.45	
57	051223752320	Structural steel member, 100-ton project, 1 to 2 story building, W14x43, A992 steel, shop fabricated, incl shop primer, bolted connections	E2	810	0.069	L.F.	$ 73.49	$ 4.26	$ 2.37	$ 80.12	$ 4,188.93	$ 242.82	$ 135.09	$ 4,566.84	$ 80.73	$ 7.29	$ 2.60	$ 90.62	$ 4,601.61	$ 415.53	$ 148.20	$ 5,165.34	STD	$ 9,732.18	$9,732.18	
179.26	051223752380	Structural steel member, 100-ton project, 1 to 2 story building, W14x90, A992 steel, shop fabricated, incl shop primer, bolted connections	E2	740	0.076	L.F.	$154.22	$ 4.67	$ 2.59	$161.48	$ 27,645.48	$ 837.14	$ 464.28	$ 28,946.90	$ 168.71	$ 8.00	$ 2.85	$ 179.56	$ 30,242.95	$ 1,434.08	$ 510.89	$ 32,187.93	STD	$ 61,134.83	$61,134.83	
151.18	051223752500	Structural steel member, 100-ton project, 1 to 2 story building, W14x120, A992 steel, shop fabricated, incl shop primer, bolted connections	E2	720	0.078	L.F.	$204.93	$ 4.80	$ 2.67	$212.40	$ 30,981.32	$ 725.66	$ 403.65	$ 32,110.63	$ 225.63	$ 8.21	$ 2.93	$ 236.77	$ 34,110.74	$ 1,241.19	$ 442.96	$ 35,794.89	STD	$ 67,905.52	$67,905.52	
398.86	051223752700	Structural steel member, 100-ton project, 1 to 2 story building, W16x26, A992 steel, shop fabricated, incl shop primer, bolted connections	E2	1000	0.056	L.F.	$ 44.51	$ 3.46	$ 1.92	$ 49.89	$ 17,753.26	$ 1,380.06	$ 765.81	$ 19,899.13	$ 48.65	$ 5.90	$ 2.12	$ 56.67	$ 19,404.54	$ 2,353.27	$ 845.58	$ 22,603.40	STD	$ 42,502.53	$42,502.53	
114.96	051223752900	Structural steel member, 100-ton project, 1 to 2 story building, W16x31, A992 steel, shop fabricated, incl shop primer, bolted connections	E2	900	0.062	L.F.	$ 52.79	$ 3.84	$ 2.13	$ 58.76	$ 6,068.74	$ 441.45	$ 244.86	$ 6,755.05	$ 58.48	$ 6.56	$ 2.35	$ 67.39	$ 6,722.86	$ 754.14	$ 270.16	$ 7,747.15	STD	$ 14,502.20	$14,502.20	
2310.15	051223753300	Structural steel member, 100-ton project, 1 to 2 story building, W18x35, A992 steel, shop fabricated, incl shop primer, bolted connections	E5	960	0.083	L.F.	$ 60.03	$ 5.20	$ 2.15	$ 67.38	$ 138,678.30	$ 12,012.78	$ 4,966.82	$ 155,657.91	$ 65.72	$ 8.99	$ 2.37	$ 77.08	$ 151,823.06	$ 20,768.25	$ 5,475.06	$ 178,066.36	STD	$ 333,724.27	$333,724.27	
364.18	051223753500	Structural steel member, 100-ton project, 1 to 2 story building, W18x40, A992 steel, shop fabricated, incl shop primer, bolted connections	E5	960	0.083	L.F.	$ 68.31	$ 5.20	$ 2.15	$ 75.66	$ 24,877.14	$ 1,893.74	$ 782.99	$ 27,553.86	$ 75.04	$ 8.99	$ 2.37	$ 86.40	$ 27,328.07	$ 3,273.98	$ 863.11	$ 31,465.15	STD	$ 59,019.01	$59,019.01	
280	051223753700	Structural steel member, 100-ton project, 1 to 2 story building, W18x50, A992 steel, shop fabricated, incl shop primer, bolted connections	E5	912	0.088	L.F.	$ 85.39	$ 5.48	$ 2.27	$ 93.14	$ 23,909.20	$ 1,534.40	$ 635.60	$ 26,079.20	$ 94.19	$ 9.49	$ 2.49	$ 106.17	$ 26,373.20	$ 2,657.20	$ 697.20	$ 29,727.60	STD	$ 55,806.80	$55,806.80	
120	051223753920	Structural steel member, 100-ton project, 1 to 2 story building, W18x65, A992 steel, shop fabricated, incl shop primer, bolted connections	E5	900	0.089	L.F.	$110.75	$ 5.55	$ 2.29	$118.59	$ 13,290.00	$ 666.00	$ 274.80	$ 14,230.80	$ 122.13	$ 9.63	$ 2.52	$ 134.28	$ 14,655.60	$ 1,155.60	$ 302.40	$ 16,113.60	STD	$ 30,344.40	$30,344.40	
160	051223753940	Structural steel member, 100-ton project, 1 to 2 story building, W18x76, A992 steel, shop fabricated, incl shop primer, bolted connections	E5	900	0.089	L.F.	$129.38	$ 5.55	$ 2.29	$137.22	$ 20,700.80	$ 888.00	$ 366.40	$ 21,955.20	$ 142.83	$ 9.63	$ 2.52	$ 154.98	$ 22,852.80	$ 1,540.80	$ 403.20	$ 24,796.80	STD	$ 46,752.00	$46,752.00	
174.12	051223753980	Structural steel member, 100-ton project, 1 to 2 story building, W18x106, A992 steel, shop fabricated, incl shop primer, bolted connections	E5	900	0.089	L.F.	$181.13	$ 5.55	$ 2.29	$188.97	$ 31,538.36	$ 966.37	$ 398.73	$ 32,903.46	$ 198.72	$ 9.63	$ 2.52	$ 210.87	$ 34,601.13	$ 1,676.78	$ 438.78	$ 36,716.68	STD	$ 69,620.14	$69,620.14	
260	051223754300	Structural steel member, 100-ton project, 1 to 2 story building, W21x50, A992 steel, shop fabricated, incl shop primer, bolted connections	E5	1064	0.075	L.F.	$ 85.39	$ 4.70	$ 1.94	$ 92.03	$ 22,201.40	$ 1,222.00	$ 504.40	$ 23,927.80	$ 94.19	$ 8.14	$ 2.14	$ 104.47	$ 24,489.40	$ 2,116.40	$ 556.40	$ 27,162.20	STD	$ 51,090.00	$51,090.00	
60	051223754760	Structural steel member, 100-ton project, 1 to 2 story building, W21x101, A992 steel, shop fabricated, incl shop primer, bolted connections	E5	1000	0.08	L.F.	$172.85	$ 5.00	$ 2.07	$179.92	$ 10,371.00	$ 300.00	$ 124.20	$ 10,795.20	$ 189.41	$ 8.64	$ 2.27	$ 200.32	$ 11,364.60	$ 518.40	$ 136.20	$ 12,019.20	STD	$ 22,814.40	$22,814.40	

225	051223755500	Structural steel member, 100-ton project, 1 to 2 story building, W24x76, A992 steel, shop fabricated, incl shop primer, bolted connections	E5	1110	0.072	L.F.	$129.38	$ 4.50	$ 1.86	$135.74	$ 29,110.50	$ 1,012.50	$ 418.50	$ 30,541.50	$ 142.83	$ 7.79	$ 2.05	$ 152.67	$ 32,136.75	$ 1,752.75	$ 461.25	$ 34,350.75	STD	$ 64,892.25	$64,892.25	
60	051223756900	Structural steel member, 100-ton project, 1 to 2 story building, W33x130, A992 steel, shop fabricated, incl shop primer, bolted connections	E5	1134	0.071	L.F.	$222.53	$ 4.40	$ 1.82	$228.75	$ 13,351.80	$ 264.00	$ 109.20	$ 13,725.00	$ 244.26	$ 7.65	$ 2.01	$ 253.92	$ 14,655.60	$ 459.00	$ 120.60	$ 15,235.20	STD	$ 28,960.20	$28,960.20	
60	051223757100	Structural steel member, 100-ton project, 1 to 2 story building, W33x141, A992 steel, shop fabricated, incl shop primer, bolted connections	E5	1134	0.071	L.F.	$241.16	$ 4.40	$ 1.82	$247.38	$ 14,469.60	$ 264.00	$ 109.20	$ 14,842.80	$ 264.96	$ 7.65	$ 2.01	$ 274.62	$ 15,897.60	$ 459.00	$ 120.60	$ 16,477.20	STD	$ 31,320.00	$31,320.00	
673.67	051223750120	Structural steel member, 100-ton project, 1 to 2 story building, W4x13, A992 steel, shop fabricated, incl shop primer, bolted connections	E2	600	0.093	L.F.	$ 25.88	$ 5.75	$ 3.20	$ 34.83	$ 17,434.58	$ 3,873.60	$ 2,155.74	$ 23,463.93	$ 27.95	$ 9.84	$ 3.52	$ 41.31	$ 18,829.08	$ 6,628.91	$ 2,371.32	$ 27,829.31	STD	$ 51,293.24	$51,293.24	
887.43	051223751300	Structural steel member, 100-ton project, 1 to 2 story building, W12x19, A992 steel, shop fabricated, incl shop primer, bolted connections	E2	880	0.064	L.F.	$ 37.78	$ 3.92	$ 2.18	$ 43.88	$ 33,527.11	$ 3,478.73	$ 1,934.60	$ 38,940.43	$ 41.40	$ 6.71	$ 2.40	$ 50.51	$ 36,739.60	$ 5,954.66	$ 2,129.83	$ 44,824.09	STD	$ 83,764.52	$83,764.52	
951.23	051223751900	Structural steel member, 100-ton project, 1 to 2 story building, W14x22, A992 steel, shop fabricated, incl shop primer, bolted connections	E2	990	0.057	L.F.	$ 44.51	$ 3.48	$ 1.94	$ 49.93	$ 42,339.25	$ 3,310.28	$ 1,845.39	$ 47,494.91	$ 48.65	$ 5.96	$ 2.13	$ 56.74	$ 46,277.34	$ 5,669.33	$ 2,026.12	$ 53,972.79	STD	$ 101,467.70	$101,467.70	
30	051223752340	Structural steel member, 100-ton project, 1 to 2 story building, W14x48, A992 steel, shop fabricated, incl shop primer, bolted connections	E2	800	0.07	L.F.	$ 90.56	$ 4.32	$ 2.40	$ 97.28	$ 2,716.80	$ 129.60	$ 72.00	$ 2,918.40	$ 99.36	$ 7.36	$ 2.63	$ 109.35	$ 2,980.80	$ 220.80	$ 78.90	$ 3,280.50	STD	$ 6,198.90	$6,198.90	
70.47	051223752380	Structural steel member, 100-ton project, 1 to 2 story building, W14x82, A992 steel, shop fabricated, incl shop primer, bolted connections	E2	740	0.076	L.F.	$154.22	$ 4.67	$ 2.59	$161.48	$ 10,867.88	$ 329.09	$ 182.52	$ 11,379.50	$ 168.71	$ 8.00	$ 2.85	$ 179.56	$ 11,888.99	$ 563.76	$ 200.84	$ 12,653.59	STD	$ 24,033.09	$24,033.09	
134.38	051223752500	Structural steel member, 100-ton project, 1 to 2 story building, W14x109, A992 steel, shop fabricated, incl shop primer, bolted connections	E2	720	0.078	L.F.	$204.93	$ 4.80	$ 2.67	$212.40	$ 27,538.49	$ 645.02	$ 358.79	$ 28,542.31	$ 225.63	$ 8.21	$ 2.93	$ 236.77	$ 30,320.16	$ 1,103.26	$ 393.73	$ 31,817.15	STD	$ 60,359.46	$60,359.46	
260	051223753100	Structural steel member, 100-ton project, 1 to 2 story building, W16x36, A992 steel, shop fabricated, incl shop primer, bolted connections	E2	800	0.07	L.F.	$ 68.31	$ 4.32	$ 2.40	$ 75.03	$ 17,760.60	$ 1,123.20	$ 624.00	$ 19,507.80	$ 75.04	$ 7.36	$ 2.63	$ 85.03	$ 19,510.40	$ 1,913.60	$ 683.80	$ 22,107.80	STD	$ 41,615.60	$41,615.60	
120	051223753920	Structural steel member, 100-ton project, 1 to 2 story building, W18x60, A992 steel, shop fabricated, incl shop primer, bolted connections	E5	900	0.089	L.F.	$110.75	$ 5.55	$ 2.29	$118.59	$ 13,290.00	$ 666.00	$ 274.80	$ 14,230.80	$ 122.13	$ 9.63	$ 2.52	$ 134.28	$ 14,655.60	$ 1,155.60	$ 302.40	$ 16,113.60	STD	$ 30,344.40	$30,344.40	
72.49	051223753940	Structural steel member, 100-ton project, 1 to 2 story building, W18x71, A992 steel, shop fabricated, incl shop primer, bolted connections	E5	900	0.089	L.F.	$129.38	$ 5.55	$ 2.29	$137.22	$ 9,378.76	$ 402.32	$ 166.00	$ 9,947.08	$ 142.83	$ 9.63	$ 2.52	$ 154.98	$ 10,353.75	$ 698.08	$ 182.67	$ 11,234.50	STD	$ 21,181.58	$21,181.58	
122.12	051223754500	Structural steel member, 100-ton project, 1 to 2 story building, W21x57, A992 steel, shop fabricated, incl shop primer, bolted connections	E5	1036	0.077	L.F.	$105.57	$ 4.83	$ 1.99	$112.39	$ 12,892.21	$ 589.84	$ 243.02	$ 13,725.07	$ 116.96	$ 8.35	$ 2.19	$ 127.50	$ 14,283.16	$ 1,019.70	$ 267.44	$ 15,570.30	STD	$ 29,295.37	$29,295.37	
78	051223754780	Structural steel member, 100-ton project, 1 to 2 story building, W21x132, A992 steel, shop fabricated, incl shop primer, bolted connections	E5	1000	0.08	L.F.	$208.04	$ 5.00	$ 2.07	$215.11	$ 16,227.12	$ 390.00	$ 161.46	$ 16,778.58	$ 228.74	$ 8.64	$ 2.27	$ 239.65	$ 17,841.72	$ 673.92	$ 177.06	$ 18,692.70	STD	$ 35,471.28	$35,471.28	
120	051223757900	Structural steel member, 100-ton project, 1 to 2 story building, W33x221, A992 steel, shop fabricated, incl shop primer, bolted connections	E5	1125	0.071	L.F.	$393.30	$ 4.45	$ 1.84	$399.59	$ 47,196.00	$ 534.00	$ 220.80	$ 47,950.80	$ 434.70	$ 7.72	$ 2.02	$ 444.44	$ 52,164.00	$ 926.40	$ 242.40	$ 53,332.80	STD	$ 101,283.60	$101,283.60	
53.7	051223756100	Structural steel member, 100-ton project, 1 to 2 story building, TT14x99, A992 steel, shop fabricated, incl shop primer, bolted connections	E5	1200	0.067	L.F.	$168.71	$ 4.16	$ 1.72	$174.59	$ 9,059.73	$ 223.39	$ 92.36	$ 9,375.48	$ 186.30	$ 7.22	$ 1.90	$ 195.42	$ 10,004.31	$ 387.71	$ 102.03	$ 10,494.05	STD	$ 19,869.53	$19,869.53	
123.34	051223756900	Structural steel member, 100-ton project, 1 to 2 story building, W14x132, A992 steel, shop fabricated, incl shop primer, bolted connections	E5	1134	0.071	L.F.	$222.53	$ 4.40	$ 1.82	$228.75	$ 27,446.85	$ 542.70	$ 224.48	$ 28,214.03	$ 244.26	$ 7.65	$ 2.01	$ 253.92	$ 30,127.03	$ 943.55	$ 247.91	$ 31,318.49	STD	$ 59,532.52	$59,532.52	

22.74	051223757920	Structural steel member, 100-ton project, 1 to 2 story building, W14x257, A992 steel, shop fabricated, incl shop primer, bolted connections	E5	1035	0.077	L.F.	$445.05	$ 4.83	$ 1.99	$451.87	$ 10,120.44	$ 109.83	$ 45.25	$ 10,275.52	$ 491.63	$ 8.35	$ 2.19	$ 502.17	$ 11,179.67	$ 189.88	$ 49.80	$ 11,419.35	STD	$ 21,694.87	$21,694.87
101.25	051223758100	Structural steel member, 100-ton project, 1 to 2 story building, W14x283, A992 steel, shop fabricated, incl shop primer, bolted connections	E5	1035	0.077	L.F.	$517.50	$ 4.83	$ 1.99	$524.32	$ 52,396.88	$ 489.04	$ 201.49	$ 53,087.40	$ 569.25	$ 8.35	$ 2.19	$ 579.79	$ 57,636.56	$ 845.44	$ 221.74	$ 58,703.74	STD	$ 111,791.14	$111,791.14
398.55	051223750360	Structural steel member, 100-ton project, 1 to 2 story building, HSS6x4x3/8, A992 steel, shop fabricated, incl shop primer, bolted connections	E2	550	0.102	L.F.	$ 40.88	$ 6.27	$ 3.49	$ 50.64	$ 16,292.72	$ 2,498.91	$ 1,390.94	$ 20,182.57	$ 45.02	$ 10.76	$ 3.83	$ 59.61	$ 17,942.72	$ 4,288.40	$ 1,526.45	$ 23,757.57	STD	$ 43,940.14	$43,940.14
56.5	051223756900	Structural steel member, 100-ton project, 1 to 2 story building, W18x130, A992 steel, shop fabricated, incl shop primer, bolted connections	E5	1134	0.071	L.F.	$222.53	$ 4.40	$ 1.82	$228.75	$ 12,572.95	$ 248.60	$ 102.83	$ 12,924.38	$ 244.26	$ 7.65	$ 2.01	$ 253.92	$ 13,800.69	$ 432.23	$ 113.57	$ 14,346.48	STD	$ 27,270.86	$14,346.48
123	051223757100	Structural steel member, 100-ton project, 1 to 2 story building, W18x143, A992 steel, shop fabricated, incl shop primer, bolted connections	E5	1134	0.071	L.F.	$222.53	$ 4.40	$ 1.82	$228.75	$ 27,371.19	$ 541.20	$ 223.86	$ 28,136.25	$ 244.26	$ 7.65	$ 2.01	$ 253.92	$ 30,043.98	$ 940.95	$ 247.23	$ 31,232.16	STD	$ 59,368.41	$31,232.16
0	**032200000000**	**Welded Wire Fabric Reinforcing**					**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**STD**		
2244	032205500300	Welded wire fabric, sheets, 6 x 6 - W2.9 x W2.9 (6 x 6) 42 lb. per C.S.F., A185	2 Rodm	29	0.552	C.S.F.	$ 34.68	$46.72	$ -	$ 81.40	$ 77,821.92	$104,839.68	$ -	$ 182,661.60	$ 38.41	$ 76.28	$ -	$ 114.69	$ 86,192.04	$ 171,172.32	$ -	$ 257,364.36	STD	$ 440,025.96	$440,025.96
0	**033105350010**	**NORMAL WEIGHT CONCRETE, READY MIX**					**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**STD**		
255	033105350300	Structural concrete, ready mix, normal weight, 4000 PSI, includes local aggregate, sand, Portland cement and water, delivered, excludes all additives and treatments				C.Y.	$115.33	$ -	$ -	$115.33	$ 29,409.15	$ -	$ -	$ 29,409.15	$ 126.21	$ -	$ -	$ 126.21	$ 32,183.55	$ -	$ -	$ 32,183.55	STD	$ 61,592.70	$61,592.70
0	**053113500010**	**FLOOR DECKING**					**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**STD**		
22440	053113505400	Metal decking, steel, non-cellular, composite, galvanized, 2" D, 18 ga	E4	3380	0.009	C.Y.	$ 3.83	$ 0.60	$ 0.04	$ 4.47	$ 85,945.20	$ 13,464.00	$ 897.60	$ 100,306.80	$ 4.21	$ 1.06	$ 0.04	$ 5.31	$ 94,472.40	$ 23,786.40	$ 897.60	$ 119,156.40	STD	$ 219,463.20	$219,463.20
Total											**$ 1,033,327.75**	**$163,534.14**	**$22,374.93**	**$ 1,219,236.81**					**$ 1,135,716.36**	**$ 272,868.13**	**$ 24,533.45**	**$ 1,003,182.53**			
																						$ 2,222,419.34			

Quantity	LineNumber	Description	Crew	Daily	Labor	Unit	Material	Labor	Equipment	Total	Ext. Mat.	Ext. Labor	Ext. Equip.	Ext. Total	Mat. O&P	Labor O&P	Equip. O&P	Total O&P	Ext. Mat. O&P	Ext. Labor O&P	Ext. Equip. O&P	Ext. Total O&P	Notes		
110	051223400672	C-Channel-Column: C10X33	E3	36	0.667	L.F.	$ 10.71	$43.19	$ 4.11	$ 58.01	$ 1,178.10	$ 4,750.90	$ 452.10	$ 6,381.10	$ 11.80	$ 76.46	$ 4.52	$ 92.78	$ 1,298.00	$ 8,410.60	$ 497.20	$ 30,617.40	X3	$ 30,617.40	$30,617.40
27.5	051223757920	W-Wide Flange-Column: W14X257	E5	1035	0.077	L.F.	$445.05	$ 4.83	$ 1.99	$451.87	$ 12,238.88	$ 132.83	$ 54.73	$ 12,426.43	$ 491.63	$ 8.35	$ 2.19	$ 502.17	$ 13,519.83	$ 229.63	$ 60.23	$ 13,809.68	X1	$ 13,809.68	$13,809.68
110	051223758100	FB-Flanged Box-Column: FB30X1116	E5	1035	0.077	L.F.	$517.50	$ 4.83	$ 1.99	$524.32	$ 56,925.00	$ 531.30	$ 218.90	$ 57,675.20	$ 569.25	$ 8.35	$ 2.19	$ 579.79	$ 62,617.50	$ 918.50	$ 240.90	$ 235,974.53	X3.7	$ 235,974.53	$235,974.53
55	051223758100	BU-Built Up-Column: W23X1168	E5	1035	0.077	L.F.	$517.50	$ 4.83	$ 1.99	$524.32	$ 28,462.50	$ 265.65	$ 109.45	$ 28,837.60	$ 569.25	$ 8.35	$ 2.19	$ 579.79	$ 31,308.75	$ 459.25	$ 120.45	$ 123,408.30	X3.87	$ 123,408.30	$123,408.30
27.5	051223758100	BU-Built Up-Column: W22X1032	E5	1035	0.077	L.F.	$517.50	$ 4.83	$ 1.99	$524.32	$ 14,231.25	$ 132.83	$ 54.73	$ 14,418.80	$ 569.25	$ 8.35	$ 2.19	$ 579.79	$ 15,654.38	$ 229.63	$ 60.23	$ 54,210.38	X3.4	$ 54,210.38	$54,210.38
13.75	051223758100	BU-Built Up-Column: W24X985	E5	1035	0.077	L.F.	$517.50	$ 4.83	$ 1.99	$524.32	$ 7,115.63	$ 66.41	$ 27.36	$ 7,209.40	$ 569.25	$ 8.35	$ 2.19	$ 579.79	$ 7,827.19	$ 114.81	$ 30.11	$ 25,989.08	X3.26	$ 25,989.08	$25,989.08
13.75	051223758100	BU-Built Up-Column: W23X729	E5	1035	0.077	L.F.	$517.50	$ 4.83	$ 1.99	$524.32	$ 7,115.63	$ 66.41	$ 27.36	$ 7,209.40	$ 569.25	$ 8.35	$ 2.19	$ 579.79	$ 7,827.19	$ 114.81	$ 30.11	$ 19,133.06	X2.4	$ 19,133.06	$19,133.06
55	051223758100	BU-Built Up-Column: W29X2063	E5	1035	0.077	L.F.	$517.50	$ 4.83	$ 1.99	$524.32	$ 28,462.50	$ 265.65	$ 109.45	$ 28,837.60	$ 569.25	$ 8.35	$ 2.19	$ 579.79	$ 31,308.75	$ 459.25	$ 120.45	$ 216,841.46	X6.8	$ 216,841.46	$216,841.46
27.5	051223758100	BU-Built Up-Column: W25X1401	E5	1035	0.077	L.F.	$517.50	$ 4.83	$ 1.99	$524.32	$ 14,231.25	$ 132.83	$ 54.73	$ 14,418.80	$ 569.25	$ 8.35	$ 2.19	$ 579.79	$ 15,654.38	$ 229.63	$ 60.23	$ 73,981.23	X4.64	$ 73,981.23	$73,981.23
55	051223758100	W-Wide Flange-Column: W14X665	E5	1035	0.077	L.F.	$517.50	$ 4.83	$ 1.99	$524.32	$ 28,462.50	$ 265.65	$ 109.45	$ 28,837.60	$ 569.25	$ 8.35	$ 2.19	$ 579.79	$ 31,308.75	$ 459.25	$ 120.45	$ 70,154.59	X2.2	$ 70,154.59	$70,154.59
55	051223758100	W-Wide Flange-Column: W14X730	E5	1035	0.077	L.F.	$517.50	$ 4.83	$ 1.99	$524.32	$ 28,462.50	$ 265.65	$ 109.45	$ 28,837.60	$ 569.25	$ 8.35	$ 2.19	$ 579.79	$ 31,308.75	$ 459.25	$ 120.45	$ 76,532.28	X2.4	$ 76,532.28	$76,532.28
Total											**$ 226,885.74**	**$ 6,876.11**	**$ 1,327.71**	**$ 235,089.53**					**$ 249,633.47**	**$ 12,084.61**	**$ 1,460.81**	**$ 940,651.99**			

$ 3,163,071.33 TOTAL

$ 177,131,994.66 BLDG TOTAL

$940,651.99
$1,003,182.53
$1,219,236.81
CHECK $3,163,071.33

APPENDIX C

GENERAL CONDITIONS ESTIMATE

Detailed estimate sheet for General Conditions Estimate

IDP/BIM Thesis - CM Option
Tech 2 Assignment
General Conditions Estimate

Division	Description	Crew	Daily Output	Labor Hours	Unit	Material	Labor	Equipment	Total	Quantity	Total Material	Total Labor	Total Equipment	Total Cost
01 31 13.20	**Field Personnel**													
0020	Clerk, 6				Week		$ 380.00		$ 380.00	1,092	$ -	$ 414,960.00	$ -	$ 414,960.00
0140	Field Engineer, 45				Week		$ 1,350.00		$ 1,350.00	8,190	$ -	$ 11,056,500.00	$ -	$ 11,056,500.00
0220	Project Manager, 20				Week		$ 2,175.00		$ 2,175.00	1,781	$ -	$ 3,873,675.00	$ -	$ 3,873,675.00
0280	Superintendant, 35				Week		$ 2,025.00		$ 2,025.00	3,714	$ -	$ 7,520,850.00	$ -	$ 7,520,850.00
														$ 22,865,985.00
01 51 13.80	**Temporary Utilities**													
0100	Heat, including fuel and operation, per week, 12 hrs	1 Skwk	100	0.08	CSF Flr	$ 27.00	$ 3.27		$ 30.27	13,846	$ 373,846.15	$ 45,276.92	$ -	$ 419,123.08
0350	Lighting, including service lamps, wiring, and outlets, maximum	1 Elec	17	0.471	CSF Flr	$ 5.70	$ 22.00		$ 27.70	15,000	$ 85,500.00	$ 330,000.00	$ -	$ 415,500.00
0600	Power for job duration including elevator, etc., min				CSF Flr				$ 47.00	15,000	$ -	$ -	$ -	$ 705,000.00
0650	Power for job duration including elevator, etc., max				CSF Flr				$ 110.00	15,000	$ -	$ -	$ -	$ 1,650,000.00
														$ 3,189,623.08
10 52 13.20	**Office and Storage Space**													
0020	Trailer, furnished, no hookups, 20' x 8', rent per month, 8 Trailers				Each	$ 163.00			$ 163.00	576	$ 93,888.00	$ -	$ -	$ 93,888.00
0700	AC, rent per month, add				Each	$ 41.00			$ 41.00	576	$ 23,616.00	$ -	$ -	$ 23,616.00
0800	For delivery, add per mile				Mile	$ 4.50			$ 4.50	600	$ 2,700.00	$ -	$ -	$ 2,700.00
														$ 120,204.00
01 52 13.40	**Field Office Expense**													
0100	Office Equipment rental average				Month	$ 155.00			$ 155.00	384	$ 59,520.00	$ -	$ -	$ 59,520.00
0120	Office supplies, average				Month	$ 85.00			$ 85.00	384	$ 32,640.00	$ -	$ -	$ 32,640.00
0140	Telephone bill; avg. bill per month				Month	$ 80.00			$ 80.00	384	$ 30,720.00	$ -	$ -	$ 30,720.00
0160	Lights & HVAC				Month	$ 150.00			$ 150.00	384	$ 57,600.00	$ -	$ -	$ 57,600.00
														$ 180,480.00
01 54 19.50	**Truck Crane**													
0600	Truck Mounted, hydrolic, 100 ton capacity				Month			$ 14,100.00	$ 14,100.00	16	$ -	$ -	$ 225,600.00	$ 225,600.00
	Crew				Day		$ 104.90		$ 104.90	320	$ -	$ 33,568.00	$ -	$ 33,568.00
														$ 225,600.00
01 54 19.60	**Monthly Tower Crane Crew**													
0100	Crane, climbing, 106' jib, 6000 lb. capacity, 410 FPM				Month			$ 13,200.00	$ 13,200.00	60	$ -	$ -	$ 792,000.00	$ 792,000.00
	Tower Crane Crew				Day		$ 37.40		$ 37.40	2,400	$ -	$ 89,760.00	$ -	$ 89,760.00
4550	Hoist and tower, mast type, 6000 lb., 100' high, month				Each		$ 1,161.60	$ 2,975.00	$ 4,136.60	86	$ -	$ 100,362.24	$ 257,040.00	$ 357,402.24
4570	for each added 10' section, add, month				Each		$ 19.20	$ 177.00	$ 196.20	5,616	$ -	$ 107,827.20	$ 994,032.00	$ 1,101,859.20
														$ 2,341,021.44
01 56 26.50	**Temporary Fencing**													
0020	Chain Link, 11 ga, 6' high	2 Clab	400	0.04	L.F.	$ 7.25	$ 1.26		$ 8.51	980	$ 7,105.00	$ 1,234.80	$ -	$ 8,339.80
	Plywood, painted, 4" x 4" frame, 8' high	A-4	110	0.218	L.F.	$ 9.85	$ 8.35		$ 18.20	980	$ 9,653.00	$ 8,183.00	$ -	$ 17,836.00
														$ 26,175.80
01 56 29.50	**Temporary Protective Walkways**													
2200	Sidewalk, 2" x 12" planks, 2 uses	1 Carp	350	0.023	S.F.	$ 0.69	$ 0.91		$ 1.60	16,000	$ 11,040.00	$ 14,560.00	$ -	$ 25,600.00
2500	Exterior Plywood, 2 uses, 3/4" thick	1 Carp	600	0.013	S.F.	$ 0.42	$ 0.53		$ 0.95	16,000	$ 6,720.00	$ 8,480.00	$ -	$ 15,200.00
														$ 40,800.00
01 58 13.50	**Signs**													
0020	High intensity reflectorized, no posts, buy				S.F.	$ 21.00			$ 21.00	1,000	$ 21,000.00	$ -	$ -	**$ 21,000.00**
01 74 13.20	**Cleaning Up**													
0040	Maximum				Job				0.8%	1,000,000,000	$ -	$ -	$ -	$ 8,000,000.00
0050	Cleanup of floor area, continuous, per day, during construction	A-5	24	0.75	M.S.F.	$ 1.70	$ 23.50	$ 2.03	$ 27.23	1,670	$ 2,839.68	$ 39,254.40	$ 3,390.91	$ 45,484.99
0100	Final by GC at end of job	A-5	11.5	1.565	M.S.F.	$ 2.71	$ 49.50	$ 4.23	$ 56.44	1,670	$ 4,526.78	$ 82,684.80	$ 7,065.79	$ 94,277.38
														$ 8,139,762.37
	Subtotal										**$ 822,914.62**	**$ 23,727,176.36**	**$ 2,279,128.70**	**$ 74,313,871.37**
	Adjusted for Location (New York City, 130.7)										**$ 1,075,549.41**	**$ 31,011,419.51**	**$ 2,978,821.22**	**$ 97,128,229.88**