



Wellington Condominiums
Exton, PA
Spring Thesis Research
BUILDING FOR THE FUTURE

D.2 Appendix

The following appendix references that are attached for further research support are listed as followed:

- Detailed Project Schedule
- D4 Cost Estimate
- Assemblies Estimate
- Structural Systems Estimate
- General Conditions
- Site Plan with Utilities
- Superstructure Phased Site Plan
- Hambros Joist Composite Deck System Comparison Chart
- Geotechnical Test Boring Results
- PCA MAT® Contours and Analysis
- Crane Selection Information

Wellington Condominiums Detailed Project Schedule

ID	Task Name	Duration	Start	Finish	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul '0	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul '0	Aug	Sep	Oct	Nov				
1	Preconstruction	355 days	Mon 9/26/05	Mon 2/5/07	[Summary bar]																															
2																																				
3	Project Management	111 days	Mon 9/26/05	Mon 2/27/06	[Summary bar]																															
4	Revised Structural Drawings	11 days	Mon 11/7/05	Mon 11/21/05	[Task bar]																															
5	Re-submit for Permits	0 days	Mon 11/21/05	Mon 11/21/05	[Milestone diamond]																															
6	Subcontractor re-bids	5 days	Tue 11/22/05	Mon 11/28/05	[Task bar]																															
7	Final Estimate & Approval	5 days	Tue 11/29/05	Mon 12/5/05	[Task bar]																															
8	Revised Arch, Strut, MEP drawings	26 days	Mon 1/23/06	Mon 2/27/06	[Task bar]																															
9	Permit Approval	80 days	Mon 9/26/05	Fri 1/13/06	[Task bar]																															
10																																				
11	Buyout	167 days	Tue 12/6/05	Thu 7/27/06	[Summary bar]																															
12	Sitework	1 day	Tue 12/6/05	Tue 12/6/05	[Task bar]																															
13	Panels and Trusses	1 day	Tue 12/6/05	Tue 12/6/05	[Task bar]																															
14	Hambro	1 day	Tue 12/6/05	Tue 12/6/05	[Task bar]																															
15	Concrete	1 day	Tue 12/6/05	Tue 12/6/05	[Task bar]																															
16	Masonry	1 day	Tue 12/6/05	Tue 12/6/05	[Task bar]																															
17	Windows and Doors	1 day	Wed 7/26/06	Thu 7/27/06	[Task bar]																															
18	Elevator	1 day	Thu 1/12/06	Fri 1/13/06	[Task bar]																															
19	Sprinkler	1 day	Tue 12/6/05	Tue 12/6/05	[Task bar]																															
20	Plumbing	1 day	Tue 12/6/05	Tue 12/6/05	[Task bar]																															
21	Electric	1 day	Tue 12/6/05	Tue 12/6/05	[Task bar]																															
22	Balconettes	20 days	Thu 6/29/06	Thu 7/27/06	[Task bar]																															
23																																				
24	Shop Drawings	206 days	Wed 12/7/05	Thu 9/21/06	[Summary bar]																															
25	Storm Sewer submittals	15 days	Mon 1/9/06	Fri 1/27/06	[Task bar]																															
26	Panel shops	40 days	Thu 6/1/06	Thu 7/27/06	[Task bar]																															
27	Truss shops	40 days	Thu 7/27/06	Thu 9/21/06	[Task bar]																															
28	Hambro shops	35 days	Thu 6/15/06	Thu 8/3/06	[Task bar]																															
29	Elevator shops	20 days	Thu 2/2/06	Thu 3/2/06	[Task bar]																															
30	Balconette shops	30 days	Thu 7/27/06	Thu 9/7/06	[Task bar]																															

Project: Wellington Condominiums
Date: 10/30/06

Task: [Blue hatched bar] Progress
Split: [Dotted line] Milestone

Summary: [Black bar] External Tasks: [Grey bar] Deadline: [Green arrow]

Project Summary: [Black arrow] External Milestone: [Black diamond]

Estimate of Probable Cost

Wellington Condominiums Estimate - Oct 2006 - PA - Allentown

Prepared By:

Prepared For:

Building Sq. Size: **116349**
 Bid Date:
 No. of floors: **4**
 No. of buildings: **1**
 Project Height: **59**
 1st Floor Height:
 1st Floor Size: **29134**

Site Sq. Size: **1807740**
 Building use: **Residential**
 Foundation: **CON**
 Exterior Walls: **MET**
 Interior Walls: **MET**
 Roof Type: **SLA**
 Floor Type: **CON**
 Project Type: **NEW**

Division	Percent	Sq. Cost	Amount
00 Bidding Requirements	0.49	0.74	86,421
Bidding Requirements	0.49	0.74	86,421
01 General Requirements	11.48	17.23	2,005,168
General Requirements	11.48	17.23	2,005,168
02 Site Work	12.34	18.51	2,154,162
Site Work	12.34	18.51	2,154,162
03 Concrete	9.25	13.88	1,615,254
Concrete	9.25	13.88	1,615,254
04 Masonry	1.87	2.81	327,256
Masonry	1.87	2.81	327,256
05 Metals	2.25	3.38	392,830
Metals	2.25	3.38	392,830
06 Wood & Plastics	7.08	10.63	1,236,949
Wood & Plastics	7.08	10.63	1,236,949
07 Thermal & Moisture Protection	1.80	2.70	314,027
Thermal & Moisture Protection	1.80	2.70	314,027
08 Doors & Windows	6.64	9.97	1,159,506
Doors & Windows	6.64	9.97	1,159,506
09 Finishes	15.61	23.42	2,724,936
Finishes	15.61	23.42	2,724,936
10 Specialties	0.79	1.18	137,381
Specialties	0.79	1.18	137,381
11 Equipment	1.40	2.10	243,768
Equipment	1.40	2.10	243,768
12 Furnishings	0.20	0.30	35,411
Furnishings	0.20	0.30	35,411
13 Special Construction	0.57	0.86	99,921
Special Construction	0.57	0.86	99,921
14 Conveying Systems	1.08	1.63	189,366
Conveying Systems	1.08	1.63	189,366
15 Mechanical	18.08	27.14	3,157,420
Mechanical	18.08	27.14	3,157,420
16 Electrical	9.05	13.59	1,581,068
Electrical	9.05	13.59	1,581,068
Total Building Costs	100.00	150.07	17,460,844

Estimate of Probable Cost

Eola South Residential Condominium - Nov 2003 - FL - Orlando

Prepared By:	Baker Barrios Architects, Inc.	Prepared For:	
	300 South Orange Avenue Ste 900		
	Orlando, FL 32801		
	Fax:		Fax:
Building Sq. Size:	60000	Site Sq. Size:	435600
Bid Date:	11/1/2003	Building use:	Residential
No. of floors:	4	Foundation:	PIL
No. of buildings:	1	Exterior Walls:	PRE
Project Height:	50.8	Interior Walls:	MAS
1st Floor Height:	11.8	Roof Type:	BUP
1st Floor Size:	15000	Floor Type:	CON
		Project Type:	NEW

Division		Percent	Sq. Cost	Amount
00	Bidding Requirements	0.31	0.30	18,000
	Permits	0.31	0.30	18,000
01	General Requirements	14.29	13.72	823,342
	Builder's Risk Insurance	0.12	0.12	7,000
	Building Permit Fees	0.43	0.42	25,000
	Change Orders	3.18	3.05	183,222
	Contractor's Fee	3.41	3.27	196,250
	Equipment Tools	0.14	0.13	8,050
	Field Labor, Safety, Clean-up	1.29	1.24	74,500
	Field Supervision	1.15	1.10	66,000
	General Conditions	1.14	1.10	65,700
	General Requirements	1.56	1.50	90,000
	Insurance (General Condition Items)	0.42	0.40	24,200
	MEP Consulting Fees	0.63	0.61	36,330
	MOT, Traffic Control	0.20	0.19	11,500
	Temporary Utilities	0.39	0.37	22,250
	Trash Removal/Hoisting	0.23	0.22	13,340
03	Concrete	36.01	34.58	2,074,734
	2nd FI Post Tension-1st FI Columns	4.25	4.08	245,000
	3rd FI Post Tension-2nd FI Columns	4.25	4.08	245,000
	4th FI Post Tension-3rd FI Columns	4.25	4.08	245,000
	Architectural Precast North Elevation	2.60	2.50	150,000
	Architectural Precast South Elevation	2.60	2.50	150,000
	Architectural Precast West Elevation	6.77	6.50	390,100
	Elevator Shaft	0.69	0.67	40,000
	Pile Caps/Foundations	3.47	3.33	200,000
	Retaining Wall	0.31	0.30	18,000
	Roof Post Tension-4th FI Columns	4.25	4.08	245,000
	Slab-On-Grade	1.24	1.19	71,634
	Stair Enclosures/Shear Wall	1.30	1.25	75,000
04	Masonry	1.04	1.00	60,000
	Masonry	1.04	1.00	60,000
05	Metals	3.38	3.25	194,750
	Exterior Handrails	1.52	1.46	87,750
	Metal Stairs (2)	1.13	1.08	65,000
	Misc. Metals	0.03	0.03	2,000
	Roof HVAC Screen Wall	0.69	0.67	40,000
06	Wood & Plastics	3.54	3.40	204,100
	Closets	0.22	0.21	12,650
	Millwork/Countertops	2.60	2.50	150,000
	Rough Carpentry-Blocking	0.46	0.44	26,600
	Wood Trim/Base	0.26	0.25	14,850
07	Thermal & Moisture Protection	2.32	2.23	133,535
	Balcony Coatings	0.29	0.28	16,650

	Dampproofing/Caulking	0.49	0.47	28,390
	Modified Bituminous Roof System	1.54	1.47	88,495
08	Doors & Windows	4.72	4.54	272,230
	Aluminum Windows & Doors	2.67	2.57	153,930
	Doors, Frames & Hardware	1.63	1.56	93,800
	Mirrors	0.12	0.12	7,000
	Shower Doors	0.30	0.29	17,500
09	Finishes	15.89	15.26	915,379
	Carpet/VCT	1.08	1.03	62,000
	Drywall	4.06	3.90	234,000
	Floor Topping	0.38	0.37	22,000
	Metal Studs/Drywall/Plaster	4.76	4.58	274,500
	Painting	2.60	2.50	150,000
	Special Coating - Stain	0.12	0.12	7,175
	Stone Flooring	0.14	0.14	8,204
	Tile	0.78	0.75	45,000
	Wood Floor	1.95	1.88	112,500
10	Specialties	0.57	0.54	32,600
	Entrance Canopy	0.09	0.08	5,000
	Fire Extinguishers	0.02	0.02	1,050
	Lockers	0.03	0.03	1,800
	Mailboxes	0.07	0.07	4,000
	Signage	0.09	0.08	5,000
	Toilet Accessories	0.27	0.26	15,750
11	Equipment	1.28	1.23	73,600
	Appliances	1.28	1.23	73,600
12	Furnishings	0.33	0.32	18,995
	Garage Entrance Door	0.23	0.23	13,500
	Trash Chute	0.10	0.09	5,495
14	Conveying Systems	0.95	0.92	55,025
	Elevator System	0.95	0.92	55,025
15	Mechanical	8.93	8.58	514,600
	Fire Protection	1.29	1.24	74,100
	Fixtures	0.43	0.42	25,000
	HVAC/Ductwork/Piping	3.73	3.58	215,000
	Plumbing	3.48	3.34	200,500
16	Electrical	6.44	6.18	370,993
	CATV/Audio/Music	0.17	0.17	10,000
	Distribution Panels	0.26	0.25	15,000
	Electrical	3.75	3.60	216,050
	Fire Alarm	0.17	0.17	10,000
	Panel Boards	0.26	0.25	15,000
	Rough-In/Wire/Conduit	1.82	1.75	104,943
Total Building Costs		100.00	96.03	5,761,883
02	Site Work	100.00	0.88	381,339
	Asphalt Pavement/Striping	7.87	0.07	30,000
	Auger Cast Piling	38.20	0.33	145,665
	Building Demolition	4.89	0.04	18,650
	Chain Link Fence	0.79	0.01	3,024
	Concrete Sidewalks/Curbs	3.67	0.03	14,000
	Dewatering System	5.77	0.05	22,000
	Earthwork	6.82	0.06	26,000
	Gravity Wall	1.84	0.02	7,000
	Landscape Irrigation	6.56	0.06	25,000
	Utilities	23.60	0.21	90,000
Total Site Costs		100.00	0.88	381,339
Total Project Costs		--	--	6,143,222

Project Notes

Eola South Residential Condominium - Nov 2003 - FL - Orlando

* Orlando, Florida

** Construction Period: Dec 2003 to Jan 2005

Special Project Notes

Sited in downtown Orlando, at the edge of the Thornton Park residential fabric and immediately across the street from a high-rise/multi-family condominium, Eola South Condominium becomes an important element of scale and proportion. The four-story height of the building tempers the 10-story vertical element located across the street as it acts as a proper introduction and transition to the surrounding residential neighborhood.

Its character and design supports the nearby commercial and mixed use buildings. The increased density will support the new, burgeoning retail businesses while the streamlined contemporary design will create a sense of unity with the existing and growing new urban fabric. One of the primary considerations in the design was identifying a way to responsibly take advantage of the natural beauty of Lake Eola Park, located northwest of the building site.

The building program is issue driven and responds to the need for height, both as a transition and a way to take advantage of the view of Lake Eola and the surrounding green-space. Other identified issues that influenced the design were parking density, circulation, security of unit occupants, and the market ability of the units themselves based on current trends and developer philosophies.

The building design responds to the identified program issues by utilizing large glass expanses on the afternoon shaded western and northern elevations of the building. The fenestrations and massing interplay create a unique rhythm connecting the units to the streets below. The building units also feature large balconies, some of which are partially covered.

The building is constructed of cast-in-place concrete as it provided the best quality finish opportunities expected by the developer and prospective occupants. The majority of the units are sized to allow more moderate-income levels the opportunity to experience the downtown urban lifestyle becoming more prevalent in Orlando.

The overall design provides a sense of connectedness and unity to the surrounding urban fabric. The design results in positive interaction and interplay between the building residents and the surrounding neighbors and businesses, providing an expanded sense of community.

MANUFACTURERS/SUPPLIERS

DIV 07: Roofing: Johns Manville.

DIV 08: Window System, Entrances & Storefronts: Vistawall.

CONSTRUCTION TEAM

STRUCTURAL ENGINEER: Walter P. Moore and Associates, Inc. - 300 South Orange Avenue, #875, Orlando, FL 32801

GENERAL CONTRACTOR: Jennings Construction Services, LLC - 1030 Wilfred Drive, Orlando, FL 32803

ELECTRICAL & MECHANICAL ENGINEER: CHP & Associates Consulting Engineers, Inc. - 1051 Winderly Place, #101, Maitland, FL 32751

LANDSCAPE ARCHITECT: Lucido & Sole Design - 827 N. Thornton Avenue, Orlando, FL 32803

Photos Courtesy of Ray Acosta/Taina Benitez

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Estimate of Probable Cost

Convent & High School - Jan 2002 - PA - Other

Prepared By: Perkins Eastman 1100 Liberty Avenue Pittsburgh, PA 15222 Fax: Building Sq. Size: 161428 Bid Date: 1/1/2002 No. of floors: 4 No. of buildings: 1 Project Height: 49 1st Floor Height: 9.8 1st Floor Size: 46482	Prepared For: , Fax: 3179880 Site Sq. Size: 3179880 Building use: Residential Foundation: EXT Exterior Walls: EXT Interior Walls: GYP Roof Type: MEM Floor Type: WOD Project Type: REN
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Division		Percent	Sq. Cost	Amount
00	Bidding Requirements	0.66	0.65	104,754
	Bond	0.66	0.65	104,754
01	General Requirements	12.74	12.58	2,031,254
	Scaffold at Chapel	0.31	0.31	49,815
	General Conditions	8.19	8.09	1,306,529
	Fees	4.23	4.18	674,910
03	Concrete	1.55	1.53	247,095
	Building Concrete	1.07	1.06	170,704
	Light Weight Concrete	0.05	0.05	7,973
	Cementitious Underlayment	0.03	0.03	5,298
	Patching	0.40	0.39	63,120
04	Masonry	2.54	2.51	404,712
	Masonry Repairs - New Openings	0.71	0.71	113,826
	Masonry	1.66	1.64	264,038
	Restoration	0.17	0.17	26,848
05	Metals	2.29	2.26	365,020
	Structural Steel/Joists & Decking	1.72	1.70	274,800
	Miscellaneous	0.54	0.54	86,810
	Architectural Joint Systems	0.02	0.02	3,410
06	Wood & Plastics	9.73	9.61	1,552,040
	Rough Carpentry	0.57	0.57	91,435
	Plywood Underlayment	0.73	0.72	116,719
	Finish Carpentry	2.71	2.68	432,412
	Install Salvaged Items	2.06	2.04	328,766
	Architectural Woodwork (Casework)	2.97	2.94	474,296
	Wood Laboratory Casework	0.68	0.67	108,412
07	Thermal & Moisture Protection	1.97	1.94	313,593
	Waterproofing	0.05	0.05	7,350
	Membrane Roofing	1.77	1.75	282,100
	Metal Roofing	0.12	0.12	19,072
	Roof Accessories	0.01	0.01	1,556
	Caulking	0.02	0.02	3,515
08	Doors & Windows	8.62	8.52	1,375,241
	Doors & Hardware	2.21	2.19	352,913
	Storefront/Glass & Glazing	0.22	0.22	34,995
	Metal Windows	5.29	5.23	844,048
	Decorative Glass & Mirrors	0.45	0.45	72,285
	Fireproofing	0.45	0.44	71,000
09	Finishes	18.56	18.34	2,960,675
	Plaster - (Patching)	0.40	0.40	64,513
	Drywall/Metal Studs	10.73	10.60	1,711,424
	Acoustical Wall Panels	0.29	0.29	46,667
	Ceramic Tile Work Allowance	1.06	1.05	169,165
	Terrazzo (Patch & Repair)	0.13	0.12	20,000
	Wood Floor & Refinishing	1.44	1.42	229,566

	Stone Window Sills	0.45	0.44	71,340
	Painting/High Performance Coatings	1.88	1.86	300,000
	Flooring Carpet/Resilient	2.18	2.16	348,000
10	Specialties	1.02	1.01	162,602
	Visual Display Boards	0.03	0.03	5,500
	Toilet Compartments	0.13	0.13	20,457
	Impact-Resistant Wall Protection	0.01	0.01	1,386
	Signs Allowance	0.13	0.12	20,000
	Metal Lockers	0.20	0.20	32,000
	Fire Protection	0.03	0.03	4,605
	Toilet Accessories	0.29	0.28	45,660
	Folding & Portable Stages	0.16	0.15	24,994
	Stage Curtains	0.05	0.05	8,000
11	Equipment	1.71	1.69	273,014
	Projection Screens	0.01	0.01	2,236
	Food Service	1.52	1.50	242,270
	Residential Appliances	0.16	0.16	25,824
	Barber & Beauty	0.02	0.02	2,684
12	Furnishings	0.20	0.20	31,487
	Floor Mats & Frames	0.03	0.03	4,167
	Window Treatment	0.17	0.17	27,320
13	Special Construction	0.44	0.44	70,800
	Fixed Auditorium Seating	0.44	0.44	70,800
14	Conveying Systems	1.34	1.33	214,200
	Elevator	1.34	1.33	214,200
15	Mechanical	24.88	24.58	3,968,000
	Plumbing	5.44	5.37	867,000
	Fire Protection	2.34	2.31	373,000
	HVAC	17.10	16.90	2,728,000
16	Electrical	11.76	11.62	1,875,446
	Electrical	11.57	11.44	1,845,946
	Light Allowance	0.18	0.18	29,500
Total Building Costs		100.00	98.81	15,949,933
02	Site Work	100.00	0.84	2,677,411
	Demo/Salvage/ASB Abate Phase 1	53.78	0.45	1,439,965
	Structural Demolition Phase 1a	17.35	0.15	464,439
	Excavation & Grading	9.66	0.08	258,548
	Asphalt Paving	2.17	0.02	58,111
	Landscaping	4.93	0.04	132,000
	Site Concrete	2.25	0.02	60,258
	Trash Enclosure Fence	0.13	0.00	3,410
	Relocation of Statues	0.67	0.01	18,000
	Storm Drainage	0.86	0.01	22,950
	Relocation of Underground Pipelines	0.37	0.00	10,000
	Site Retaining Walls	0.46	0.00	12,420
	Underpinning	1.21	0.01	32,310
	Courtyard Improvements	5.60	0.05	150,000
	Remote Garage	0.56	0.00	15,000
Total Site Costs		100.00	0.84	2,677,411
Total Project Costs		--	--	18,627,344

Project Notes

Convent & High School - Jan 2002 - PA - Other

* Coraopolis, Pennsylvania

** Construction Period: Mar 2002 to Aug 2003

*** LEED(R) GOLD PENDING

Special Project Notes

The Franciscan nuns of the Felician Sisters Convent wanted to renovate their 70-year-old provincial house to feel less like an institution and more like a home. The community was living in two buildings: St. Joseph Hall, a 1960's infirmary building, and the 1930's motherhouse, which also housed Our Lady of the Sacred Heart High School.

Perkins Eastman completed a master planning study and the Sisters decided to renovate the motherhouse and consolidate the community under one roof. As such, the existing building plan was not workable as an assisted living facility. The elderly Sisters' bedrooms were too far from existing gang bathrooms, which were too small to negotiate with walkers or wheelchairs. The building systems had not been upgraded since the 1930's, there were no individual temperature controls, and the existing partitions contained asbestos. The building needed to be gutted, yet doing so would jeopardize the very reason for renovating the motherhouse.

With full community participation, Perkins Eastman re-configured the 150,000-square-foot convent into clusters of individual rooms with private baths in 10 households arrayed around a living room, kitchen and dining room. Spatially, four different Halls organize the new school plan and express the Franciscan Order's ethics: the Hall of Life, the Hall of Social Justice, the Hall of Peace, and the Hall of Community. These Halls are focal points on each floor and are used for the presentation of student work and as informal gathering spaces. Large openings in the classrooms provide natural light, along with high reflectance paint and mecco shades. On the grounds, the students enjoy trails cut into seven acres of newly planted meadow from an area previously maintained as lawn. All plants are selected from native species.

The project team held a strong commitment to making the renovation environmentally responsible and to preserving the house's historic architectural character. While the Felician Sisters were not educated about many environmental issues, they are followers of Saint Francis of Assisi who is the Patron Saint of the Environment. This commitment allows them to view environmental stewardship as a responsibility. As the project evolved and the Sisters became more aware of the building's potential environmental impacts, they consistently made decisions based on stewardship.

Working through the project and environmental goals, the team soon realized the value in the resources that the building contained. Many materials installed in 1930 were still in excellent condition. If the Sisters wanted low maintenance and durable materials, they could not buy new materials that would perform as well as the old. A subcontractor was hired to catalog, remove, touch-up, repair and reinstall the doors, flooring, trim and cabinetry.

More than 300 original hardwood doors and transoms were refinished and re-hung; over an acre of hardwood flooring was lifted, cleaned and re-laid; over a mile of trim was removed, preserved and installed; and over 275,000 pounds of ballast for the roof was stockpiled and reused as underlayment for paving. New windows were made using energy efficient technologies but were manufactured to look like the original windows. The perimeter of the building was studded out and insulated. Construction waste was recycled and all new finishes were made from low emitting materials to preserve indoor air quality. New energy efficient systems for both lighting and heating were installed as well as solar hot water panels to aid in energy reduction.

As the project progressed it became clear that decisions most benefiting the community were also beneficial to the environment. The building has preserved the character of the original structure, is energy efficient, better serves an aging and student population, and promotes environmental stewardship. The architect achieved over a 30% reduction in energy consumption compared to a baseline model. Systems used to achieve the reduction included heat recovery from air and kitchen exhausts; individual controls in each classroom; landscaped plantings that shade the south and west facades; and recycled roof water used in the evaporative cooler. The client has used the project, which is seeking a gold LEED(R) rating, to educate their Sisters, students and staff in issues of the environment including green cleaning, recycling, vermicomposting, renewable energy, and the building itself.

MANUFACTURERS/SUPPLIERS

DIV 02: Pavers: Hanover Architectural Products.

DIV 07: Wall Insulation: Johns Manville; Roof Insulation: Carlisle Sure-Seal(R); Membrane Roofing: Carlisle Sure-Weld(R).

DIV 08: Windows: Keystone Industries.

DIV 09: Paint: Sherwin Williams; Linoleum: Forbo Marmoleum; Carpet: Interface, Collins & Aikman; Ceramic Tile: Terra Green.

CONSTRUCTION TEAM

GENERAL CONTRACTOR: Sota Construction Services, Inc. - 80 Union Avenue, Pittsburgh, PA 15202

STRUCTURAL ENGINEER: The Kachele Group - 1014 Pery Highway, #100, Pittsburgh, PA 15237

ELECTRICAL/MECHANICAL/PLUMBING ENGINEER: Elwood S. Tower Corp. - 115 Evergreen Heights Drive, #400, Pittsburgh, PA 15229

MATERIALS REUSE CONTRACTOR: Clearview Project Services Company - 3977 William Flynn Highway, Allison Park, PA 15101

LANDSCAPE ARCHITECT: Rolf Sauer and Partners, Ltd. - 3868 Terrace Street, Philadelphia, PA 19128

Photos Courtesy of Denmarsh Photography

Estimating Form		Project Summary	
PROJECT	Wellington Condominiums	TOTAL SITE AREA	5.88 Acres
BUILDING TYPE	Residential	OWNER	Hankin Group
LOCATION	Exton PA	ARCHITECT	Minno & Wasko
DATE OF CONSTRUCTION	Spring '06 - Spring '07	ESTIMATED CONSTRUCTION PERIOD	18 Months
BRIEF DESCRIPTION	Wellington Condominiums is a 4 story luxury complex that houses a parking garage on the ground level. The 147,069 SF condominium project features a concrete substructure followed by a series of Hambros Joist 3" Slab on Deck Composite System. The roof system utilizes a single ply EPDM roofing membrane and slate roof system supporting by metal rafters.		

Assemblies Estimate - Wellington Condominiums Building Envelope

Estimating Form				Systems Costs						
Qty	Assembly Number	Description	Unit	Mat.	Inst.	Total	Zip Code Prefix	Type	Release	Note
B20 Exterior Closure										
9,312.000	B20101017600	Conc wall reinforced, 8' high, 12" thick, plain finish, 5000 PSI	S.F.	63,787.20	142,939.20	206,726.40	181	Open	2006	Walls are 12' high, 6000 PSI Strength
670.910	B20101023000	Fit precast conc, 4" thick, 5x18', smooth gray, low rise	S.F.	4,193.19	2,475.66	6,668.85	181	Open	2006	
8,998.600	B20101023150	Fit precast conc, 4" thick, 12x20', smooth gray, low rise	S.F.	79,187.68	9,898.46	89,086.14	181	Open	2006	
14,588.330	B20101305200	Brk vnr/met std bkup, std face, 20gax3-5/8" nlb std, 16" OC sp, mng bnd	S.F.	86,071.15	199,860.12	285,931.27	181	Open	2006	22 Gage studs utilized
350.000	B20201046350	Windows, steel, csmt, insul gl, 5'-11" x 5'-2", 3 lite	Ea.	586,250.00	154,000.00	740,250.00	181	Open	2006	Average window size
221.000	B20302102500	Doors, birch, solid core, single door, hinged, 3'-0" x 7'-0" opening	Opng.	226,525.00	54,587.00	281,112.00	181	Open	2006	
B30 Roofing										
7,289.000	B30101202000	Sgl ply memb, EPDM, 45mils, fully adhered	S.F.	6,195.65	5,758.31	11,953.96	181	Open	2006	
25,018.000	B30101402800	Slate roofing, 4" min slope, shingles, 3/16" thick, 8.0 PSF	S.F.	162,617.00	61,043.92	223,660.92	181	Open	2006	
7,289.000	B30104300700	Flashing, copper, no backing, 16 oz, < 500 lbs	S.F.	22,158.56	26,313.29	48,471.85	181	Open	2006	6" Half round copper gutter
776.000	B30106103300	Gutters, half round, copper, 16 oz thick, 5", mill finish	L.F.	4,462.00	3,360.08	7,822.08	181	Open	2006	
1,395.875	B30106200700	Downspouts, copper, rectangular corr, 3"x4", mill, 16 oz thick	V.L.F.	7,049.17	4,997.23	12,046.40	181	Open	2006	
1.000	B30202100200	Roof hatches, with curb, and 1" fiberglass insulation, 2'-6"x3'-0", al	Opng.	605.00	172.00	777.00	181	Open	2006	
Totals				\$1,249,101.59	\$665,405.27	\$1,914,506.86				
Allentown PA location factor multiplier				x	x	x				
				0.98	1.074	1.027				
				\$1,224,119.56	\$714,645.26	\$1,966,198.55				

Detailed Structural Estimate for Wellington Condominiums

Total Unit Costs		Foundations, Substructure, Superstructure	
Qty	CSI Number	Description	Total
Division 3 Concrete - Forms and Accessories			
1.000	31104107750	C.I.P. concrete forms, column, square, steel framed plywood, 24" x 24", rent, 4 uses per month, includes erecting, bracing, stripping and cleaning	\$14,951.04
1.000	31104201000	C.I.P. concrete forms, elevated slab, flat plate, plywood, to 15' high, 1 use, includes shoring, erecting, bracing, stripping and cleaning	\$250,836.35
1.000	31104206500	C.I.P. concrete forms, elevated slab, curb forms, wood, 6" to 12" high, 1 use, includes shoring, erecting, bracing, stripping and cleaning	\$4,578.40
1.000	31104207000	C.I.P. concrete forms, elevated slab, edge forms, to 6" high, 4 use, includes shoring, erecting, bracing, stripping and cleaning	\$1,750.00
1.000	31104559260	C.I.P. concrete forms, walls, steel framed plywood, over 8' to 16' high, based on 100 uses of purchased forms, 4 uses of bracing lumber, includes erecting, bracing, stripping and cleaning	\$66,704.20
1.000	31500800020	Anchor bolts, J-type, 1/2" diameter x 6" long, includes nut and washer	\$1,338.60
1.000	31501701000	Column clamp, adjustable, buy, to 24" x 24"	\$85.00
1.000	31506001500	Shores, reshoring	\$20,912.40
Division 3 Concrete - Reinforcement			
1.000	32101001200	High chairs, for reinforcing steel, individual, no plates, plain, to 3' high, includes material only	\$19,821.00
1.000	32101001500	Bar chair, for reinforcing steel, plain, includes material only	\$14,852.26
1.000	32106000200	Reinforcing steel, in place, columns, #3 to #7, A615, grade 60, incl access. Labor	\$8,465.76
1.000	32106000400	Reinforcing steel, in place, elevated slabs, #4 to #7, A615, grade 60, incl access. Labor	\$67,314.35
1.000	32106000500	Reinforcing steel, in place, footings, #4 to #7, A615, grade 60, incl access. Labor	\$40,692.09
1.000	32106000700	Reinforcing steel, in place, walls, #3 to #7, A615, grade 60, incl access. Labor	\$16,049.42
1.000	32202000200	Welded wire fabric, sheets, 6 x 6 - W2.1 x W2.1 (8 x 8) 30 lb. per C.S.F., A185	\$12,748.80
1.000	32202000300	Welded wire fabric, sheets, 6 x 6 - W2.9 x W2.9 (6 x 6) 42 lb. per C.S.F., A185	\$58,268.00
Division 3 Concrete - Cast-In-Place			
1.000	33102200150	Structural concrete, ready mix, normal weight, 3000 psi, includes material only	\$132,168.96
1.000	33102200411	Structural concrete, ready mix, normal weight, 6000 PSI, includes material only	\$207,304.69
0.000	33102201000	Structural concrete, ready mix, high early strength cement, add, includes material only	
1.000	33107000800	Structural concrete, placing, column, square or round, pumped, 24" thick, includes vibrating, excludes material	\$1,820.03
1.000	33107001400	Structural concrete, placing, elevated slab, pumped, less than 6" thick, includes vibrating, excludes material	\$18,764.50
1.000	33107001600	Structural concrete, placing, elevated slab, pumped, over 10" thick, includes vibrating, excludes material	\$14,104.62
1.000	33107002650	Structural concrete, placing, spread footing, pumped, over 5 C.Y., includes vibrating, excludes material	\$8,204.02
1.000	33107003250	Structural concrete, placing, grade beam, pumped, includes vibrating, excludes material	\$1,043.47
1.000	33107004350	Structural concrete, placing, slab on grade, pumped, 4" thick, includes vibrating, excludes material	\$8,267.89
1.000	33107005100	Structural concrete, placing, walls, pumped, 12" thick, includes vibrating, excludes material	\$8,208.07
1.000	33503000250	Concrete finishing, floors, monolithic, machine trowel finish	\$61,705.35
1.000	33503250120	Control joint, concrete floor slab, saw cut in green concrete, 1" depth	\$794.04
Division 5 Metals - Cold Formed Framing			
1.000	54104006400	Partition, galv LB studs, 16 ga x 6" W studs 16" O.C. x 12" H, incl galv top & bottom track, excl openings, headers, beams, bracing & bridging	\$403,447.20
1.000	54204100550	Floor joist, galv CF steel, 12 ga x 12" D, incl joists (2" flange) & fasteners, excl band joists (track), web stiffeners, headers, beams, bridging & bracing, materials only	\$153,159.24
1.000	54204101550	Floor joist, galv CF steel, 12 ga x 12" D, incl fastening to band joists, beams & headers, excl materials, labor only	\$46,305.00
			Total: \$1,664,664.75
			(Addition of 3.9% Total Cost Escalation)
			\$1,729,586.68
			ENR Building Cost Index Inflation from 2005 to 2006
			Allentown, PA Location Factor already in calculations

Detailed Structural Estimate for Wellington Condominiums

Wall Strip Footings													Foundations		
Qty	CSI Number	Description	Crew	Daily Output	Labor Hours	Unit	Bare Mat.	Bare Labor	Bare Equip.	Total	Total Incl. O&P	Zip Code Prefix	Type	Release	
Division 3 Concrete															
7.610	32101001200	High chairs, for reinforcing steel				C	506.07	0.00	0.00	506.07	555.53	181	Open	2005	
7.610	32101001500	Bar chair, for reinforcing steel				C	285.38	0.00	0.00	285.38	312.01	181	Open	2005	
2.445	32106000500	Reinforcing steel, in place, footings, #4 to #7	4 Rodm	2.1	15.238	Ton	1,919.33	1,088.03	0.00	3,007.35	4,034.25	181	Open	2005	
84.56	33102200411	Structural concrete, ready mix, normal weight				C.Y.	7,737.24	0.00	0.00	7,737.24	8,510.96	181	Open	2005	
84.56	33107003250	Structural concrete, placing, grade beam	C20		180	C.Y.	0.00	634.20	409.27	1,043.47	1,509.40	181	Open	2005	
Totals							\$10,448.01	\$1,722.23	\$409.27	\$12,579.50	\$14,922.15				
									ENR Building Cost Index Inflation from 2005 to 2006 Allentown, PA Location Factor already in calculations			(Addition of 3.9% Total Cost Escalation)			
											\$13,070.10				

Single Slab Column Footings													Foundations		
Qty	CSI Number	Description	Crew	Daily Output	Labor Hours	Unit	Bare Mat.	Bare Labor	Bare Equip.	Total	Total Incl. O&P	Zip Code Prefix	Type	Release	
Division 3 Concrete															
98.000	32101001500	Bar chair, for reinforcing steel				C	3,675.00	0.00	0.00	3,675.00	4,018.00	181	Open	2005	
30.638	32106000500	Reinforcing steel, in place, footings, #4 to #7	4 Rodm	2.1	15.238	Ton	24,050.83	13,633.91	0.00	37,684.74	50,552.70	181	Open	2005	
556.205	33102200411	Structural concrete, ready mix, normal weight				C.Y.	50,892.76	0.00	0.00	50,892.76	55,982.03	181	Open	2005	
556.205	33107002650	Structural concrete, placing, spread footing	C20		150	C.Y.	0.00	4,978.03	3,225.99	8,204.02	11,958.41	181	Open	2005	
Totals							\$78,618.59	\$18,611.94	\$3,225.99	\$100,456.52	\$122,511.14				
									ENR Building Cost Index Inflation from 2005 to 2006 Allentown, PA Location Factor already in calculations			(Addition of 3.9% Total Cost Escalation)			
											\$104,374.32				

Foundation Walls													Substructure		
Qty	CSI Number	Description	Crew	Daily Output	Labor Hours	Unit	Bare Mat.	Bare Labor	Bare Equip.	Total	Total Incl. O&P	Zip Code Prefix	Type	Release	
Division 3 Concrete															
21,942.170	31104559260	C.I.P. concrete forms, walls	C2		450	SFCA	8,338.02	58,366.17	0.00	66,704.20	108,174.90	181	Open	2005	
14.657	32106000700	Reinforcing steel, in place, walls, #3 to #7	4 Rodm	3	10.667	Ton	11,505.75	4,543.67	0.00	16,049.42	20,886.23	181	Open	2005	
406.340	33102200411	Structural concrete, ready mix, normal weight				C.Y.	37,180.11	0.00	0.00	37,180.11	40,898.12	181	Open	2005	
406.340	33107005100	Structural concrete, placing, walls, pumped	C20		110	C.Y.	0.00	4,977.67	3,230.40	8,208.07	11,783.86	181	Open	2005	
Totals							\$57,023.88	\$67,887.51	\$3,230.40	\$128,141.79	\$181,743.10				
									ENR Building Cost Index Inflation from 2005 to 2006 Allentown, PA Location Factor already in calculations			(Addition of 3.9% Total Cost Escalation)			
											\$133,139.32				

Detailed Structural Estimate for Wellington Condominiums

Foundation Columns													Substructure		
Qty	CSI Number	Description	Crew	Daily Output	Labor Hours	Unit	Bare Mat.	Bare Labor	Bare Equip.	Total	Total Incl. O&P	Zip Code Prefix	Type	Release	
Division 3 Concrete															
4,516.930	31104107750	C.I.P. concrete forms, column, square	C1	440	0.073	SFCA	6,865.73	8,085.30	0.00	14,951.04	21,274.74	181	Open	2005	
1.000	31501701000	Column clamp, adjustable, buy, to 24" x 24"				Set	85.00	0.00	0.00	85.00	93.50	181	Open	2005	
5.879	32106000200	Reinforcing steel, in place, columns, #3 to #7	4 Rodm	1.5	21.333	Ton	4,850.18	3,615.59	0.00	8,465.76	11,758.00	181	Open	2005	
75.520	33102200411	Structural concrete, ready mix, normal weight				C.Y.	6,910.08	0.00	0.00	6,910.08	7,601.09	181	Open	2005	
75.520	33107000800	Structural concrete, placing, column, square	C20	92	0.696	C.Y.	0.00	1,106.37	713.66	1,820.03	2,643.20	181	Open	2005	
Totals							\$18,710.99	\$12,807.26	\$713.66	\$32,231.91	\$43,370.53				
ENR Building Cost Index Inflation from 2005 to 2006										(Addition of 3.9% Total Cost Escalation)					
Allentown, PA Location Factor already in calculations										\$33,488.95					

Slab on Grade													Substructure		
Qty	CSI Number	Description	Crew	Daily Output	Labor Hours	Unit	Bare Mat.	Bare Labor	Bare Equip.	Total	Total Incl. O&P	Zip Code Prefix	Type	Release	
Division 3 Concrete															
307.200	32202000200	Welded wire fabric, sheets, 6 x 6 - W2.1 x W2.1	2 Rodm	31	0.516	C.S.F.	8,140.80	4,608.00	0.00	12,748.80	17,203.20	181	Open	2005	
484.920	33102200150	Structural concrete, ready mix, normal weight				C.Y.	38,405.66	0.00	0.00	38,405.66	42,246.23	181	Open	2005	
484.920	33107004350	Structural concrete, placing, slab on grade	C20	130	0.492	C.Y.	0.00	5,018.92	3,248.96	8,267.89	11,880.54	181	Open	2005	
30,720.000	33503000250	Concrete finishing, floors, monolithic	1 Cefi	550	0.015	S.F.	0.00	10,752.00	0.00	10,752.00	17,510.40	181	Open	2005	
509.000	33503250120	Control joint, concrete floor slab	C27	2,000	0.008	L.F.	0.00	96.71	35.63	132.34	193.42	181	Open	2005	
Totals							\$46,546.46	\$20,475.63	\$3,284.59	\$70,306.69	\$89,033.79				
ENR Building Cost Index Inflation from 2005 to 2006										(Addition of 3.9% Total Cost Escalation)					
Allentown, PA Location Factor already in calculations										\$73,048.65					

Transfer Slab													Superstructure		
Qty	CSI Number	Description	Crew	Daily Output	Labor Hours	Unit	Bare Mat.	Bare Labor	Bare Equip.	Total	Total Incl. O&P	Zip Code Prefix	Type	Release	
Division 3 Concrete															
29,045.000	31104201000	C.I.P. concrete forms, elevated slab, flat plate	C2	470	0.102	S.F.	118,503.60	74,064.75	0.00	192,568.35	255,596.00	181	Open	2005	
776.000	31104206500	C.I.P. concrete forms, elevated slab, curb forms	C1	180	0.178	SFCA	1,171.76	3,406.64	0.00	4,578.40	7,022.80	181	Open	2005	
388.000	31500800020	Anchor bolts, J-type, 1/2" diameter x 6" long	1 Carp	90	0.089	Ea.	372.48	966.12	0.00	1,338.60	2,056.40	181	Open	2005	
29,045.000	31506001500	Shores, reshoring	2 Carp	1,400	0.011	S.F.	11,327.55	9,584.85	0.00	20,912.40	28,173.65	181	Open	2005	
290.450	32101001200	High chairs, for reinforcing steel				C	19,314.93	0.00	0.00	19,314.93	21,202.85	181	Open	2005	
290.450	32101001500	Bar chair, for reinforcing steel, plain				C	10,891.88	0.00	0.00	10,891.88	11,908.45	181	Open	2005	
56.330	32106000400	Reinforcing steel, in place, elevated slabs	4 Rodm	2.9	11.034	Ton	49,288.75	18,025.60	0.00	67,314.35	85,903.25	181	Open	2005	
1,143.000	33102200411	Structural concrete, ready mix, normal weight				C.Y.	104,584.50	0.00	0.00	104,584.50	115,042.95	181	Open	2005	
1,143.000	33107001600	Structural concrete, placing, elevated slab	C20	180	0.356	C.Y.	0.00	8,572.50	5,532.12	14,104.62	20,402.55	181	Open	2005	
29,045.000	33503000250	Concrete finishing, floors, monolithic	1 Cefi	550	0.015	S.F.	0.00	10,165.75	0.00	10,165.75	16,555.65	181	Open	2005	
509.000	33503250120	Control joint, concrete floor slab	C27	2,000	0.008	L.F.	0.00	96.71	35.63	132.34	193.42	181	Open	2005	
Totals							\$315,455.44	\$124,882.92	\$5,567.75	\$445,906.11	\$564,057.97				
ENR Building Cost Index Inflation from 2005 to 2006										(Addition of 3.9% Total Cost Escalation)					
Allentown, PA Location Factor already in calculations										\$463,296.45					

Detailed Structural Estimate for Wellington Condominiums

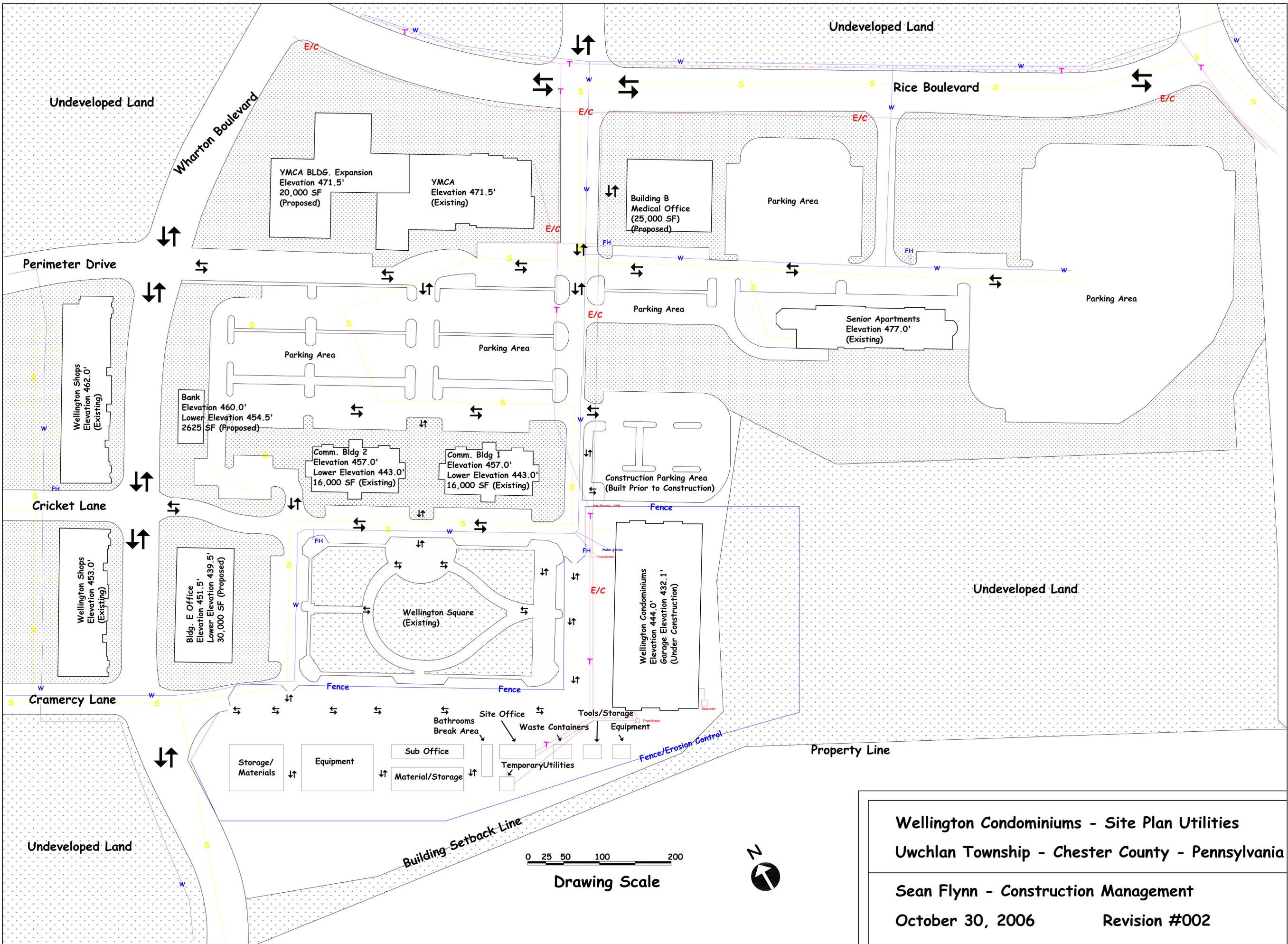
Metal Stud Framing		Superstructure												
Qty	CSI Number	Description	Crew	Daily Output	Labor Hours	Unit	Bare Mat.	Bare Labor	Bare Equip.	Total	Total Incl. O&P	Zip Code Prefix	Type	Release
Division 5 Metals														
13,936.000	54104006400	Partition, galv LB studs, 16 ga x 6" W studs	2 Carp	51	0.314	L.F.	262,693.60	140,753.60	0.00	403,447.20	529,568.00	181	Open	2005
Totals							\$262,693.60	\$140,753.60	\$0.00	\$403,447.20	\$529,568.00			
ENR Building Cost Index Inflation from 2005 to 2006 Allentown, PA Location Factor already in calculations										(Addition of 3.9% Total Cost Escalation)				
										\$419,181.64				

Hambro Joist System and Components		Superstructure												
Qty	CSI Number	Description	Crew	Daily Output	Labor Hours	Unit	Bare Mat.	Bare Labor	Bare Equip.	Total	Total Incl. O&P	Zip Code Prefix	Type	Release
Division 5 Metals														
25526.54	54204100550	Floor joist, galv CF steel, 12 ga x 12" D				L.F.	153,159.24	0.00	0.00	153,159.24	167,198.84	181	Open	2005
2,700.000	54204101550	Floor joist, galv CF steel, 12 ga x 12" D	2 Carp	30	0.533	Ea.	0.00	46,305.00	0.00	46,305.00	78,300.00	181	Open	2005
Totals							\$153,159.24	\$46,305.00	\$0.00	\$199,464.24	\$245,498.84			
ENR Building Cost Index Inflation from 2005 to 2006 Allentown, PA Location Factor already in calculations										(Addition of 3.9% Total Cost Escalation)				
										\$207,243.35				

Deck Slabs		Superstructure												
Qty	CSI Number	Description	Crew	Daily Output	Labor Hours	Unit	Bare Mat.	Bare Labor	Bare Equip.	Total	Total Incl. O&P	Zip Code Prefix	Type	Release
Division 3 Concrete														
29,134.000	31104201000	C.I.P. concrete forms, elevated slab, flat plate	C2	470	0.102	S.F.	14,567.00	14,567.00	0.00	58,268.00	98,181.58	181	Open	2005
1,000.000	31104207000	C.I.P. concrete forms, elevated slab, edge forms	C1	500	0.064	L.F.	170.00	1,580.00	0.00	1,750.00	2,860.00	181	Open	2005
1,165.360	32202000300	Welded wire fabric, sheets, 6 x 6 - W2.9 x W2.9	2 Rodm	29	0.552	C.S.F.	39,622.24	18,645.76	0.00	58,268.00	76,331.08	181	Open	2005
1,183.880	33102200150	Structural concrete, ready mix, normal weight				C.Y.	93,763.30	0.00	0.00	93,763.30	103,139.63	181	Open	2005
1,183.880	33102201000	Structural concrete, ready mix				C.Y.	10,000%	0.00	0.00	0.00	0.00	181	Open	2005
1,183.880	33107001400	Structural concrete, placing, elevated slab	C20	140	0.457	C.Y.	0.00	11,424.44	7,340.06	18,764.50	27,229.24	181	Open	2005
116,536.000	33503000250	Concrete finishing, floors, monolithic	1 Cefl	550	0.015	S.F.	0.00	40,787.60	0.00	40,787.60	66,425.52	181	Open	2005
2,036.000	33503250120	Control joint, concrete floor slab	C27	2,000	0.008	L.F.	0.00	386.84	142.52	529.36	773.68	181	Open	2005
Totals							\$148,122.64	\$87,391.64	\$7,482.58	\$272,130.75	\$374,940.73			
ENR Building Cost Index Inflation from 2005 to 2006 Allentown, PA Location Factor already in calculations										(Addition of 3.9% Total Cost Escalation)				
										\$282,743.85				

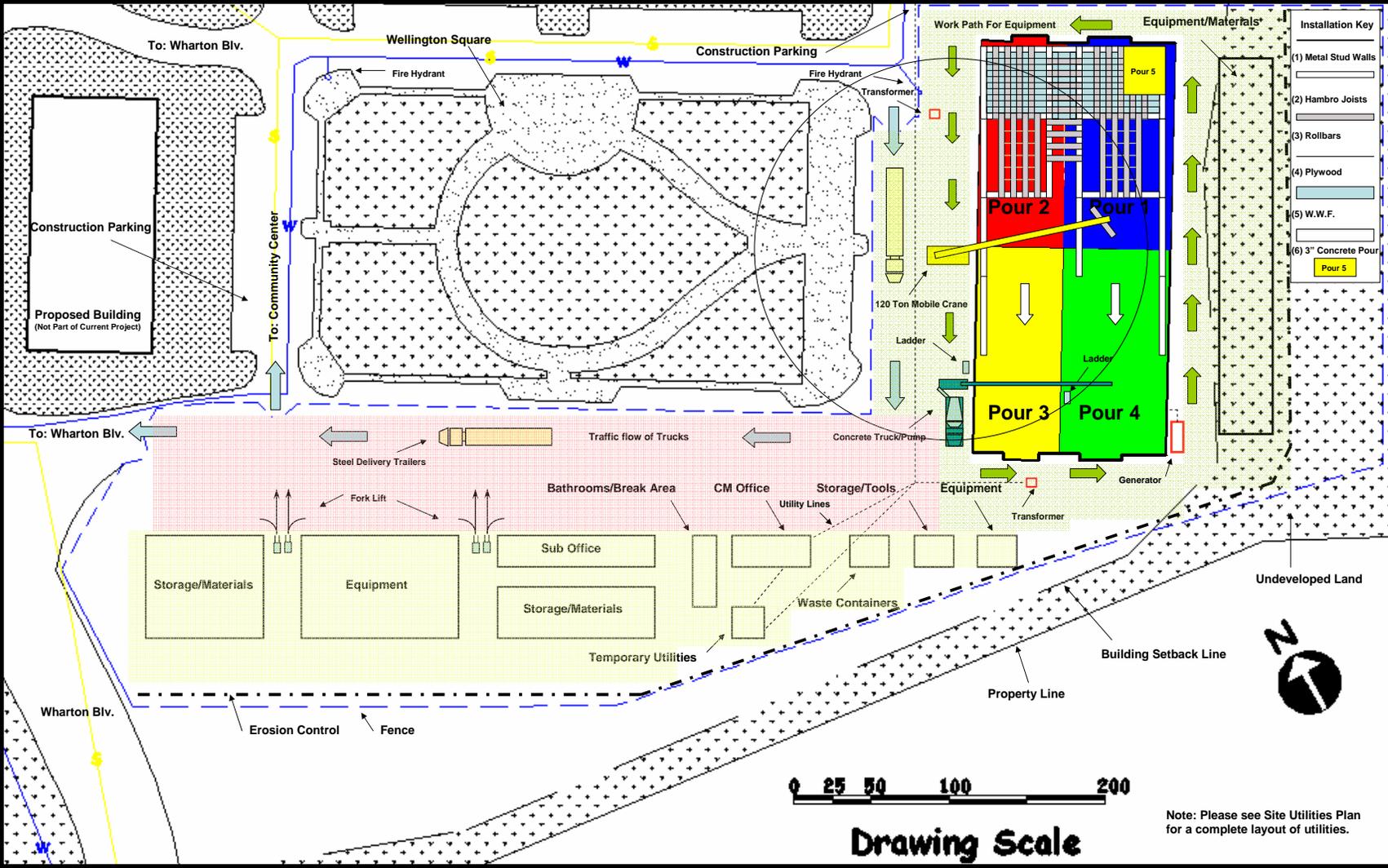
General Conditions Estimate for Wellington Condominiums

General Conditions				
Description	Quantity	Unit	Unit Cost	Total
SR. PROJECT MANAGER	35	WKS	\$3,500.00	\$122,500
SUPERINTENDENT	60	WKS	\$3,000.00	\$180,000
LABORER	52	WKS	\$800.00	\$41,600
ASSISTANT SUPERINTENDENT	30	WKS	\$2,500.00	\$75,000
SURVEYING	1	L.S	\$22,000.00	\$22,000
INSPECTIONS	1	L.S	\$30,000.00	\$30,000
TWP BLDG PERMIT	1	L.S	\$44,405.00	\$44,405
FITOUT PERMIT	48	EACH	\$400.00	\$19,200
TEMPORARY UTILITIES	1	L.S	\$30,000.00	\$30,000
TEMPORARY SIGNS	1	EACH	\$2,500.00	\$2,500
CONSTRUCTION TRAILERS	14	MTH	\$300.00	\$4,200
OFFICE EXPENSES (BLUE PRINTS)	116,000	S.F.	\$0.22	\$25,520
TRASH REMOVAL (DUMPSTERS)	60	EACH	\$500.00	\$30,000
EQUIP & TOOL RENTALS	1	L.S	\$20,000.00	\$20,000
MATERIALS & SUPPLIES	12	MTH	\$200.00	\$2,400
FINAL SITE CLEAN-UP	1	EACH	\$5,000.00	\$5,000
FINAL BUILDING CLEAN-UP	48	EACH	\$400.00	\$19,200
PUNCH LIST	48	EACH	\$400.00	\$19,200
Total:				\$692,725.00



Wellington Condominiums - Site Plan Utilities
 Uwchlan Township - Chester County - Pennsylvania

Sean Flynn - Construction Management
 October 30, 2006 Revision #002

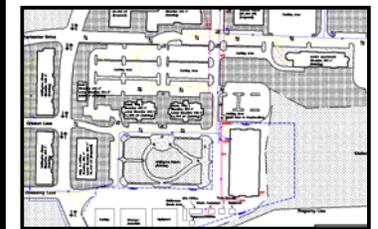


**Wellington Condominiums Site Layout
Superstructure Construction Analysis**

Uwchlan Township – Chester County - Pennsylvania

Sean Flynn – Construction Management

October 30, 2006 Revision #001



- Installation Key**
- (1) Metal Stud Walls
 - (2) Hambro Joists
 - (3) Rollbars
 - (4) Plywood
 - (5) W.W.F.
 - (6) 3" Concrete Pour
- Pour 5**

Wellington Condominium Zones

- Unloading and Vehicle Traffic Zone
- Storage/Equipment/Offices Zone
- Construction Zone

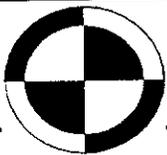
Note: Please see Site Utilities Plan for a complete layout of utilities.

Drawing Scale

Report Card for Assemblies

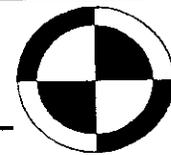
Compare and Contrast Floor-Ceiling Assemblies	Hambros Joist Composite Deck System					Conventional Steel Joist & Metal Deck System					Epicore MSR Composite Floor System				
	Categories of Interest	Ratings	Total Weight	Weight	Grade	Comment	Ratings	Total Weight	Weight	Grade	Comment	Ratings	Total Weight	Weight	Grade
Fire Ratings	8	6.83	5.12	75.00%	Good	8	6.83	5.12	75.00%	Good	8	6.83	5.81	85.00%	Great
Composite Design	9	5.83	4.37	75.00%	Good	9	5.83	4.37	75.00%	Good	9	5.83	4.96	85.00%	Great
Cost Savings	1	13.83	10.37	75.00%	Good	1	13.83	8.99	65.00%	Okay	1	13.83	10.37	75.00%	Good
Slab Penetrations	10	4.83	4.11	85.00%	Great	10	4.83	3.14	65.00%	Okay	10	4.83	3.14	65.00%	Okay
Schedule Savings	2	12.83	9.62	75.00%	Good	2	12.83	9.62	75.00%	Good	2	12.83	10.91	85.00%	Great
Mechanical Interfacing	7	7.83	6.66	85.00%	Great	7	7.83	5.87	75.00%	Good	7	7.83	5.87	75.00%	Good
Acoustical Properties	3	11.83	7.69	65.00%	Okay	3	11.83	8.87	75.00%	Good	3	11.83	8.87	75.00%	Good
Bearing Systems	11	3.83	2.49	65.00%	Okay	11	3.83	2.49	65.00%	Okay	11	3.83	2.49	65.00%	Okay
Labor Intensive	6	8.83	4.86	55.00%	Poor	6	8.83	6.62	75.00%	Good	6	8.83	7.51	85.00%	Great
Installation	5	9.83	6.39	65.00%	Okay	5	9.83	7.37	75.00%	Good	5	9.83	7.37	75.00%	Good
Versatility	12	2.83	1.56	55.00%	Poor	12	2.83	2.12	75.00%	Good	12	2.83	2.41	85.00%	Great
Quality Control	4	10.83	7.04	65.00%	Okay	4	10.83	8.12	75.00%	Good	4	10.83	8.12	75.00%	Good
TOTAL		100.00	70.3		Okay-Good		100.00	72.75		Good		100.00	77.85		Good-Great
Average				70.00%				72.50%						77.50%	

Scaling Factor		Rating Factor		
12	2.83333333	A	100-90	Excellent
11	3.83333333	B	90-80	Great
10	4.83333333	C	80-70	Good
9	5.83333333	D	70-60	Okay
8	6.83333333	F	60-50	Poor
7	7.83333333			
6	8.83333333			
5	9.83333333			
4	10.83333333			
3	11.83333333			
2	12.83333333			
1	13.83333333			



Main Line Drilling Company

101 Calvarese Lane - Wayne, PA 19087
Phone/Fax: (610) 341-9296 - Email: MLDrill@aol.com



Boring# 5
 Client: Earth Engineering Inc
 Project: Eagleview Condominiums
 Location: Eagleview, Pa
 Drill Rig: Mobile B-57

Job# 1871
 Date Started: 5/23/2005
 Completed: 5/23/2005
 Driller: William Corcoran
 Assistant: Stephen Luner

Ground Surface Elevation: 434.1				Groundwater Information			Comments
Equipment Used for Boring Advancement				Depth	Time	Date	
1	3 1/4" Hollow auger	0"	To	18'6"	Dry	1/4 hr	5/23/2005
2	Split spoon	18'6"	To	18'10"	13'10"	2.5 hrs	5/23/2005
Depth	S#	Sample Depth	Blow/Counts	Soil Description			
				Topsoil 4"			
	S1	0" - 2'	3-5-10-27-SR	Sandy silt to silty sand with rock fragments, some clay, trace organics orange-brown, brown, and gray (Fill) 11'6" Sandy silt, gray and orange brown 13' 18'10"			
	S2	3'6"-5'6"	5-5-6-7				
-5'	S3	5'6"-7'6"	11-14-18-15				
	S4	7'6"-9'6"	12-16-15-13				
-10'	S5	9'6"-11'6"	12-16-20-19				
	S6	13'6"-15'	19-18-20				
-15'	S7	18'6"-18'10"	100/4"				
-20'							
-25'							
-30'							
-35'							
-40'							
-45'							
-50'							

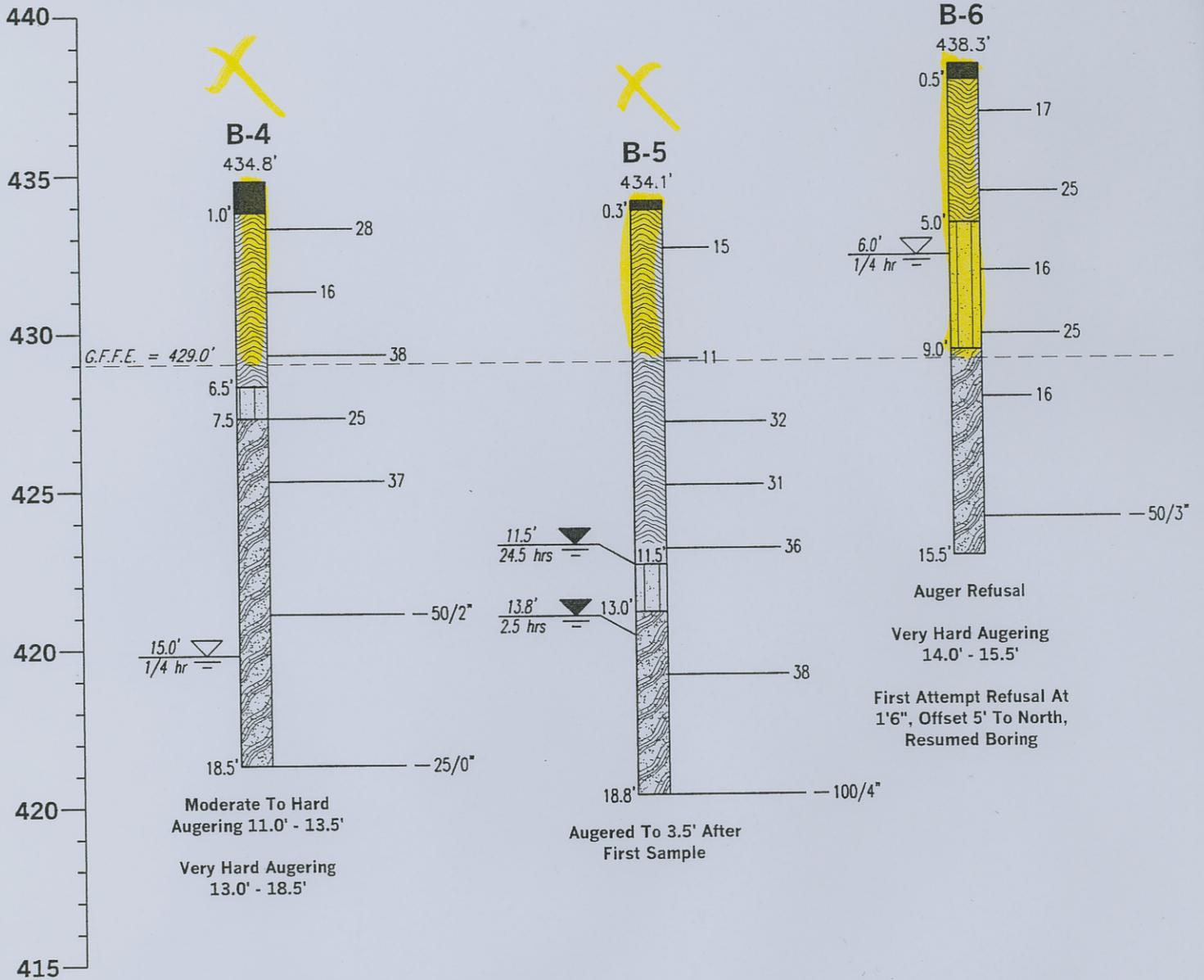
SR= Spoon refusal, large rock fragments to 3', augered to 3'6" after first sample

S1 13"
 S2 12"
 S3 14"
 S4 15"
 S5 13"
 S6 12"
 S7 4"

* TEST BORING RESULTS REPRESENT EACH BORING LOCATION ONLY *

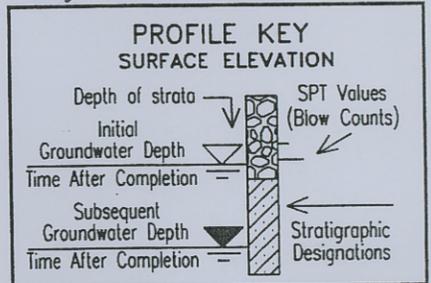
* GROUNDWATER LEVELS SHOWN ARE RECORDED AT BORING COMPLETION UNLESS OTHERWISE NOTED *

Elevation (Feet)



G.F.F.E. = Garage Finished Floor Elevation

- TOPSOIL
- FILL TAN TO ORANGE-BROWN, AND GRAY TO BROWN, SANDY SILT WITH ROCK FRAGMENTS, SOME CLAY, AND TRACE ORGANICS
- STRATUM I TAN TO ORANGE-BROWN, AND GRAY TO BROWN, SANDY SILT TO SILTY SAND, AND SOME SILTY CLAY, WITH ROCK FRAGMENTS
- STRATUM II MULTICOLORED SILTY SAND TO SAND WITH ROCK FRAGMENTS (WEATHERED GNEISS)



BORING PROFILES

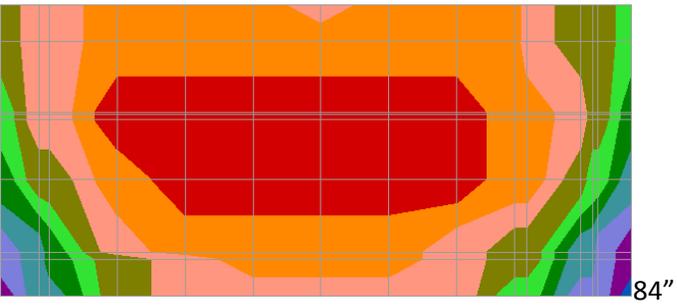
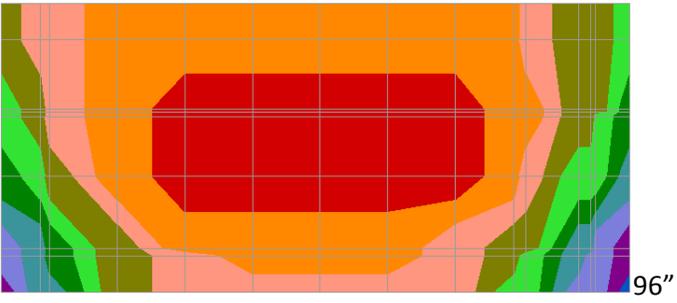
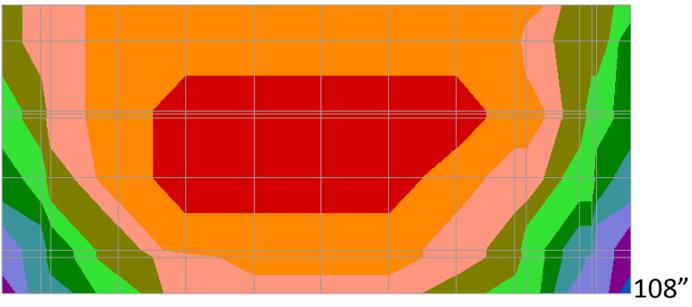
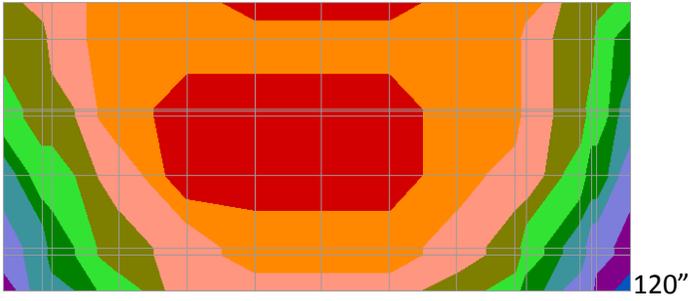
PREPARED FOR
EAGLEVIEW CONDOMINIUMS

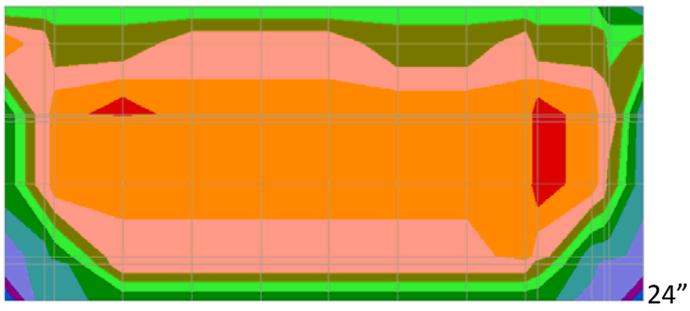
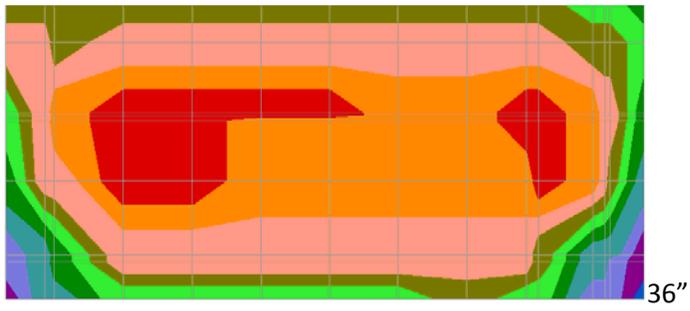
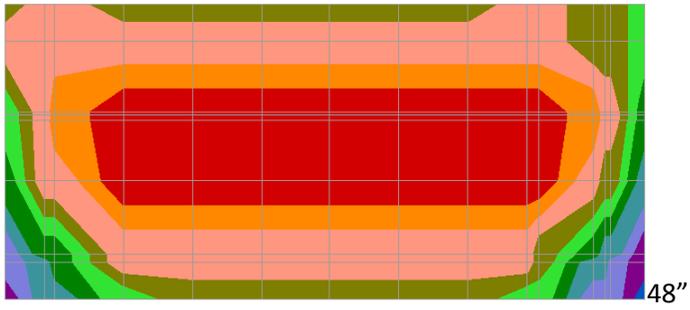
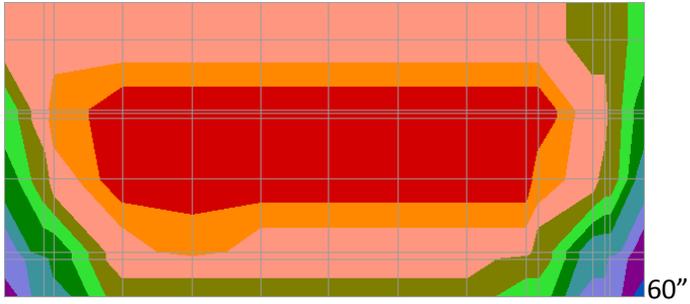
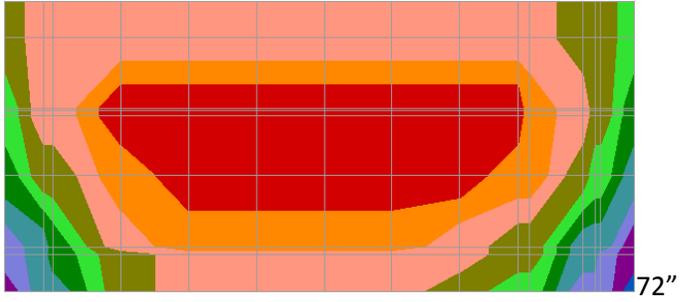
EARTH ENGINEERING INCORPORATED
Geotechnical Engineers & Geologists

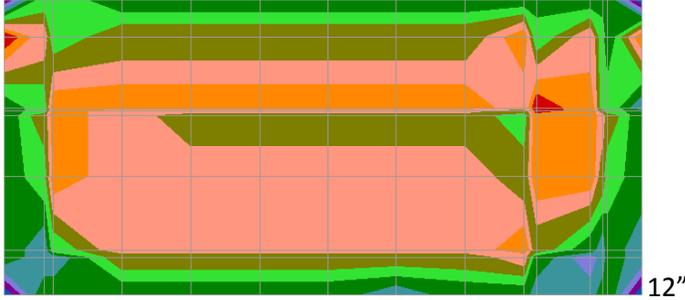
115 W. Germantown Pike
East Norriton, PA 19401
(610)277-0880
FAX (610)277-0878
www.earthengineering.com

UWCHLAN TOWNSHIP		CHESTER COUNTY		PENNSYLVANIA	
Scale: 1" = 5'V	Date: 6/29/2005	Drawn By: VAR	Checked By: GW		
Drawing Number: 19615.00-A-103		Approved By: JAM			

- PCA MAT® Contours







- PCA MAT® Analysis

Envelope - Design Moment & Steel - Top										
C5a - ELEMENT TOP DESIGN MOMENT AND REINFORCEMENT:										
=====										
Units --> Moment (kip-ft/ft), As (in ² /ft)										
Flags --> [m] Minimum controls. [x] Exceeds maximum. [*] Cannot compute.										
Elem	Node	Ld	Comb.	Max. M(ux)	As(xx)	Node	Ld	Comb.	Max. M(uy)	As(yy)
----	----	-----	-----	-----	-----	----	----	-----	-----	-----
1	2		U1	9.26	0.518m	16		U1	46.97	0.522
2	3		U1	20.69	0.518m	3		U1	17.00	0.518m
3	3		U1	10.10	0.518m	3		U1	14.72	0.518m
4	19		U1	4.39	0.518m	19		-	0.00	0.518m
5	5		-	0.00	0.518m	5		-	0.00	0.518m
6	6		-	0.00	0.518m	6		-	0.00	0.518m
7	8		-	0.00	0.518m	7		-	0.00	0.518m
8	23		U1	0.45	0.518m	9		-	0.00	0.518m
9	25		U1	37.31	0.518m	25		U1	14.63	0.518m
10	25		U1	57.52	0.635	25		U1	19.87	0.518m
11	27		-	0.00	0.518m	12		U1	7.66	0.518m
12	28		U1	12.82	0.518m	12		U1	11.85	0.518m
13	14		U1	13.40	0.518m	28		-	0.00	0.518m
14	29		U1	16.25	0.518m	30		U1	50.11	0.558
15	17		U1	13.76	0.518m	17		U1	31.47	0.518m
16	33		U1	16.85	0.518m	17		U1	25.39	0.518m
17	33		U1	15.40	0.518m	34		U1	23.84	0.518m
18	34		U1	10.68	0.518m	34		U1	24.57	0.518m
19	36		U1	3.56	0.518m	35		U1	23.51	0.518m
20	36		U1	3.50	0.518m	37		U1	23.24	0.518m
21	38		U1	4.40	0.518m	37		U1	23.24	0.518m
22	38		U1	4.96	0.518m	39		U1	26.39	0.518m
23	25		U1	39.08	0.518m	40		U1	27.45	0.518m

Envelope - Design Moment & Steel - Bot

C5b - ELEMENT BOTTOM DESIGN MOMENT AND REINFORCEMENT:

=====

Units --> Moment (kip-ft/ft), As (in²/ft)

Flags --> [m] Minimum controls. [x] Exceeds maximum. [*] Cannot compute.

Elem	Node	Ld	Comb.	Max. M(ux)	As(xx)	Node	Ld	Comb.	Max. M(uy)	As(yy)
1	17		U1	-13.22	0.518m	1		U1	-49.32	0.549
2	18		U1	-37.79	0.518m	18		U1	-45.64	0.518m
3	18		U1	-8.51	0.518m	18		U1	-30.80	0.518m
4	4		U1	-5.65	0.518m	4		U1	-29.41	0.518m
5	5		U1	-4.54	0.518m	5		U1	-26.56	0.518m
6	7		U1	-4.07	0.518m	6		U1	-26.41	0.518m
7	7		U1	-4.02	0.518m	8		U1	-26.67	0.518m
8	9		U1	-8.52	0.518m	8		U1	-26.88	0.518m
9	24		U1	-14.35	0.518m	10		U1	-38.32	0.518m
10	26		U1	-37.70	0.518m	10		U1	-40.16	0.518m
11	26		U1	-19.58	0.518m	27		U1	-35.25	0.518m
12	27		U1	-45.93	0.518m	27		U1	-52.06	0.580
13	28		U1	-1.03	0.518m	28		U1	-9.85	0.518m
14	15		U1	-5.43	0.518m	15		U1	-47.75	0.531
15	32		U1	-36.59	0.518m	32		U1	-52.92	0.590
16	32		U1	-36.49	0.518m	32		U1	-48.44	0.539
17	18		U1	-20.91	0.518m	18		U1	-48.37	0.538
18	20		U1	-3.08	0.518m	20		U1	-9.73	0.518m
19	20		U1	-2.27	0.518m	20		U1	-9.67	0.518m
20	22		U1	-1.52	0.518m	22		U1	-9.25	0.518m
21	22		U1	-1.58	0.518m	22		U1	-9.26	0.518m
22	24		U1	-9.06	0.518m	24		U1	-15.12	0.518m
23	24		U1	-13.55	0.518m	24		U1	-15.17	0.518m

Lifting Capacities

Lattice Boom Crawler Crane

LS-218H II

100-ton (90.72 metric ton)

HYLAB Series

Angle Boom Capacities

40' – 150' (12.19 – 45.72 m)

26' (7.92 m) Live Mast Capacities

- Extended / Retracted Side Frames
- On Carbody Jacks

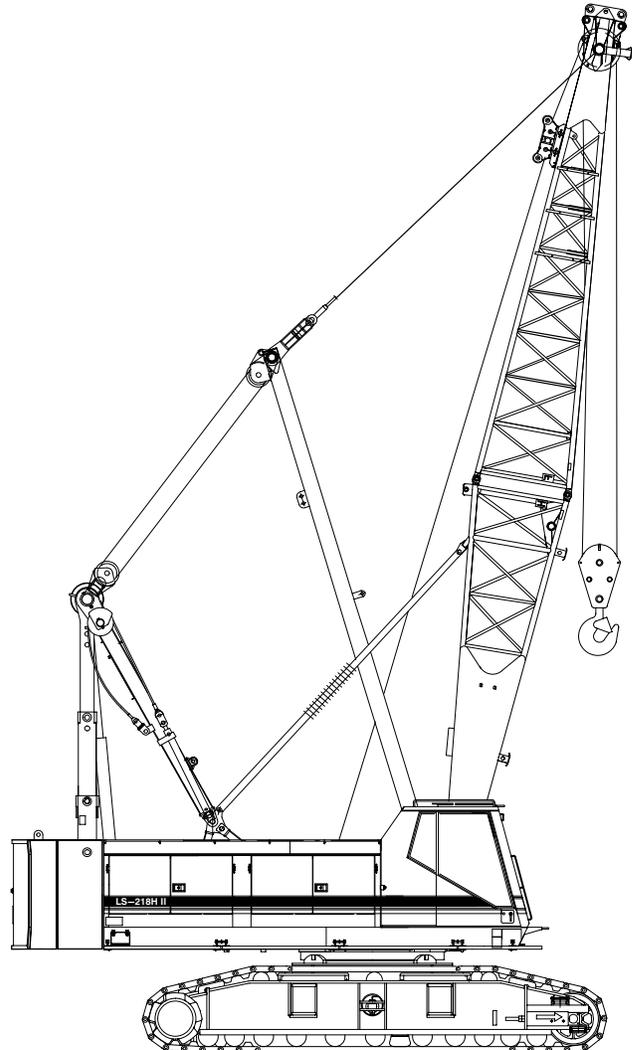
5' (1.52 m) Tip Extension Capacities

Duty Cycle Capacities

- 40' – 100' (12.19 – 30.48 m) Angle Boom
- Extended Side Frames
- Dragline
- Clamshell / Magnet
- "AB" and "A" Counterweight Options

Angle Boom Capacities

- 40' – 150' (12.19 – 45.72 m) Angle Boom
- 48" (1.22 m) Wide x 48" (1.22 m) Deep Boom
- 20' (6.10 m) Open Throat Top Section
- With or without 26' (7.92 m) Live Mast
- Extended / Retracted Side Frames
- 360° Capacities
- Over End Blocked Capacities
- "AB", "A", and "O" Counterweight Options
- 20' 10.5" in. (6.36 m) Crawler Length



CAUTION: This material is supplied for reference use only. Operator must refer to in-cab Crane Rating Manual to determine allowable machine lifting capacities and operating procedures.



WARNING

READ AND UNDERSTAND THE OPERATOR'S AND SAFETY MANUALS AND THE FOLLOWING INSTRUCTIONS AND CHART VALUES BEFORE OPERATING THE CRANE. OPERATION WHICH DOES NOT FOLLOW THESE INSTRUCTIONS MAY RESULT IN AN ACCIDENT.

OPERATING INSTRUCTIONS

GENERAL:

1. Rated lifting capacities in pounds as shown on lift charts pertain to this crane as originally manufactured and normally equipped. Modifications to the crane or use of optional equipment other than that specified can result in a reduction of capacity.
2. Construction equipment can be dangerous if improperly operated or maintained. Operation and maintenance of this crane must be in compliance with the information in the Operator's, Parts, and Safety Manuals supplied with this crane. If these manuals are missing, order replacements through the distributor.
3. The operator and other personnel associated with this crane shall read and fully understand the latest applicable American National Standards Institute (ANSI) safety standards for cranes.
4. All capacities listed in this book are in compliance with ASME/ANSI B30.5c-1998, SAE J987-April 1994, and SAE J-765 October 1990.
6. The capacities listed are for the crane equipped with or without live mast and with the gantry in the raised position.
7. The least stable rated condition is over the side.
8. Booms should be erected and lowered over the end for maximum stability. See Liff-off Capabilities before erecting or lowering boom.
9. Do not operate at radii and boom lengths where the Crane Rating Manual lists no capacity. Do not use longer booms or jibs than those listed in this Crane Rating Manual. Any of the above can cause a tipping condition, or boom and jib failure.
10. These capacities apply only to the crane as originally manufactured and normally equipped by Link-Belt Construction Equipment Company.

LIFT CRANE OPERATION:

1. Capacities shown are in pounds and are not more than 75% of the tipping loads with the crane standing level on firm supporting surface. A deduction must be made from these capacities for weight of hook block, hook ball, sling, grapple, etc. When using main hook while jib is attached, reduce capacities by values shown on Capacity Deductions For Lifting Off Main Boom Hook With Jib Installed. When using main hook while 5 foot tip extension or pile driver lead adapter is attached, reduce capacities by values shown on Capacity Deductions For Lifting Off Main Boom Hook With 5 Foot Tip Extension or Pile Driver Lead Adapter Installed. See Operator's Manual for all limitations when raising or lowering attachment.
2. The crane capacities in the shaded areas are based on structural strength. The crane capacities in the non-shaded areas are based on stability.
3. For recommended reeving, parts of line, wire rope type, and wire rope inspection, see Wire Rope Capacity Chart, Operator's Manual, and Parts Manual. Rated lifting capacities are based on correct reeving. Deduction must be made for excessive reeving. Any reeving over minimum required (see Wire Rope Capacity Chart) is considered excessive and must be accounted for when making lifts. Use Working Range Diagram to estimate the extra feet of rope. See Wire Rope Capacity for the weight to deduct for each extra foot of wire rope before attempting to lift a load.
4. Rated lifting capacities in this Crane Rating Manual are based on freely suspended loads and make no allowances for such factors as the effect of ground conditions and operating speeds. The operator shall therefore reduce load ratings in order to take these conditions into account.
5. Rated lifting capacities do not account for the effects of wind on a suspended load or boom.

Lifting capacities should be considered acceptable for wind speeds less than 20 mph and appropriately reduced for wind speeds greater than 20 mph. (See General Wind Restrictions Guide.)

6. The capacities listed are for the crane equipped with or without live mast and with the gantry in the raised position.
7. The least stable rated condition is over the side.
8. Booms should be erected and lowered over the end for maximum stability. See Liff-off Capabilities before erecting or lowering boom.
9. Do not operate at radii and boom lengths where the Crane Rating Manual lists no capacity. Do not use longer booms or jibs than those listed in this Crane Rating Manual. Any of the above can cause a tipping condition, or boom and jib failure.
10. These capacities apply only to the crane as originally manufactured and normally equipped by Link-Belt Construction Equipment Company.

FOR OVER END BLOCKED CAPACITIES ONLY:

1. These capacities can be lifted over either end with the crane standing level on a firm supporting surface with adequate blocking placed under the tread member sprockets/idlers, to prevent rocking.
2. Do not travel with a load.

TRAVELING WITH A LOAD:

1. All 360° Rotation Capacities listed in this Crane Rating Manual are pick and carry capacities.
2. The boom must be pointing straight over one end of the crawler lower. If the load was lifted over the side, swing the load over the end and/or if the load was lifted at a long radius and the load is at or near capacity for that radius, boom up to obtain a greater lifting capacity before beginning travel.
3. Engage the swing lock and apply swing brake.
4. Travel slowly and cautiously on a firm and level-supporting surface.

DEFINITIONS:

1. Load Radius: Horizontal distance from a projection of the axis of rotation to the supporting surface, before loading, to the center of the vertical hoist line or tackle with load applied.
2. Boom Angle: The angle between the boom base section and horizontal with freely suspended load at the rated radius.
3. Working Area: Area measured in a circular arc about the centerline of rotation as shown on the Working Area Diagram.
4. Freely Suspended Load: Load hanging free with no direct external force applied except by the hoist line.
5. Side Load: Horizontal side force applied to the lifted load either on the ground or in the air.

WIRE ROPE CAPACITY

Parts of Line	1"			3/4"	
	Type "CC"	Type "RB"	Type "DB"	Type "DB"	Notes
1	30,760	22,700	29,500	16,800	Capacities shown are in pounds and working loads must not exceed the ratings on the capacity charts in this Crane Rating Manual. Study Operator's Manual for wire rope inspection procedures.
2	61,520	45,400	59,000	33,600	
3	92,280	68,100	88,500	50,400	
4	123,040	90,800	118,000	67,200	
5	153,800	113,500	147,500	84,000	
6	184,560	136,200	177,000	100,800	
7	215,320	158,900	206,500	117,600	
8	246,080	181,600	236,000	134,400	
Rope weight per foot	2.03	2.00	1.85	1.04	
LBCE Type	Description				
DB	6 x 26 (6 x 19 Class) – Warrington Seale – Extra Improved Plow Steel – Preformed – Right Lay – Regular Lay – I.W.R.C.				
RB*	19 x 19 Rotation Resistant – Extra Extra Improved Plow Steel – Preformed – Right Lay – Regular Lay. Swaged – SF = 5:1				
CC	36 x 7 Class – Non-Rotating – Extra Extra Improved Plow Steel – Right Lay – Regular Lay – S.F. = 5:1				
* Use of swivel end with 1 part of line is not recommended.					
**Weight to be deducted from main capacities when using extra reeving.					

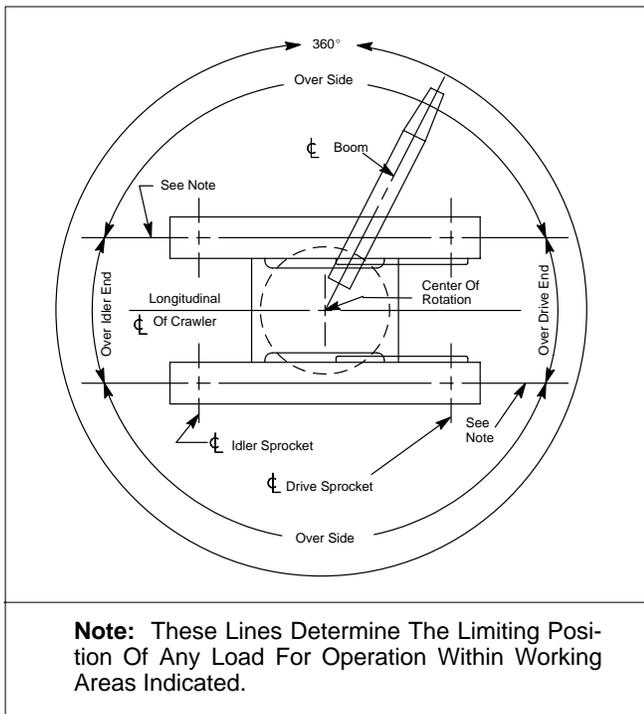
LIFTOFF CAPABILITIES

Counterweight (Side Frames)	Over End / Over Side (Gantry In Raised Position)	
	Maximum Boom (ft.)	Maximum Boom + Jib (ft.)
NO (RETRACTED)	90	N/A
NO (EXTENDED)	120	N/A
A (RETRACTED)	120	N/A
A (EXTENDED)	150	N/A
AB (EXTENDED)	150	150 + 60

NOTES:

1. For maximum boom stability, booms must be erected or lowered over the end with no load – hook block on ground.
2. Crane on firm and level surface.
3. Gantry pins must be installed with the gantry in the raised position.
4. For 140 ft. + 60 ft. or 150 ft. + 60 ft. (side frame extended) with "AB" counterweight only – Adequate blocking must be placed under both treadmembers sprockets (or idler rollers) at the end that the boom is to be lifted to prevent rocking. Lutoff over end with 140 ft. + 60 ft. and 150 ft. + 60 ft. boom. The ramps supplied with the crane are considered to be adequate blocking.

WORKING AREAS



GENERAL WIND RESTRICTIONS GUIDE

WARNING

Failure to follow these wind speed restrictions may result in structural failure of the boom, which would cause property damage and/or bodily injury.

1. The effects of the wind force on the hook load are the responsibility of the user and are not taken into account. When hoisting any load in windy conditions, the load wind area and load controllability must be considered for safe crane operation.
2. Wind speed is to be determined at the boom top section.

WIND SPEED CHART

Boom Lengths: 40' to 250'	
DESCRIPTION	ALLOWABLE WINDSPEEDS
1. Normal Lifting Operation. (See Capacity Charts.)	0–20 m.p.h.
2. Reduced Operation. Capacities must be reduced by 20%.	21–30 m.p.h.
3. Reduced Operation. Capacities must be reduced by 40%.	31–40 m.p.h.
4. Reduced Operation. Capacities must be reduced by 70%.	41–45 m.p.h.
4. No Operation. Store Attachment On Ground.	Over 45 m.p.h.

CRANE ASSEMBLY COMPONENT WEIGHTS

Component	Weight	
	lbs.	kg
1. 20 Ft. Top Section With Sheave Machinery	3,646	1 654
2. 20 Ft. Top Section With Sheave Machinery and 5 Ft. Tip Extension	4,286	1 944
3. 20 Ft. Base Section	2,695	1 222
4. Boom Extensions		
• 10' Boom Extension With Pendants	823	373
• 20' Boom Extension With Pendants	1,318	598
• 30' Boom Extension With Pendants	1,845	837
5. Upper Counterweights		
• Counterweight "A"	25,350	11 499
• Counterweight "B"	25,350	11 499
6. Side Frames (Each)	23,561	10 687
7. Tube Jib Including Strut, Head Machinery, and Pendants		
• 30' Tube Jib Assembly	1,965	891
• 15' Extension With Pendants	290	132

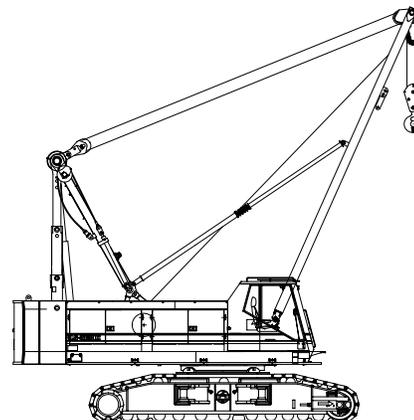
LIVE MAST LIFTING CAPACITIES

Live Mast		Load (lbs.) (See Note 10)
Radius (ft.)	Angle (deg)	
10	78.0	30,000
11	75.7	30,000
12	73.4	30,000
13	71.1	25,000
14	68.8	20,000
15	66.4	20,000
16	64.0	15,000
17	61.5	15,000
18	59.0	15,000
19	56.4	15,000
20	53.7	15,000
21	50.9	10,000
22	48.0	10,000
23	44.9	10,000
24	41.7	10,000
25	38.3	10,000

NOTES:

1. Refer to the Operator's Manual.
2. Live mast backstops must be in position and operative.
3. Assemble track frames to carbody prior to assembly of counterweights to upper frame.
4. Reeve hoist rope with three (3) parts of 1" diameter wire rope on rear drum.
5. The crane shall be leveled on a firm supporting surface.
6. All capacities are listed in pounds and are not more than 75% of the tipping loads.
7. For self-assembly of counterweights, boom extensions, and side frames only. See Crane Assembly Component Weights chart for weight of components for crane assembly.
8. Rated capacities for 360° rotation.
9. Gantry must be in the high (working) position.
10. Mast capacities apply to the following conditions:

	COUNTERWEIGHTS		
	NONE	A	AB
ON CARBODY JACKS	✓	N/A	N/A
SIDE FRAMES RETRACTED	✓	✓	N/A
SIDE FRAMES EXTENDED	✓	✓	✓



DUTY CYCLE NOTES FOR ANGLE BOOM

1. The capacities included in the “Duty Cycle Capacities – Angle Boom” chart are the maximum allowable, and are based on an LS-218H II crawler crane with counterweight standing level on firm supporting surface under ideal job conditions.
2. Capacities are based on 75% of minimum tipping loads for dragline; 67.5% for clamshell.
3. Capacities are maximum recommended by PCSA Standard #4. Operator must make allowances for soft or uneven supporting surfaces, rapid cycle operations, bucket suction, or other unfavorable conditions which may require smaller buckets for most efficient operation.
4. Weight of bucket plus load, must not exceed these capacities.
5. Dragline operation is not recommended with boom angles less than 35°.
6. Boom length for dragline/clamshell attachment operation should not exceed 100 ft.
7. Retractable high gantry must be pinned in the raised position for all capacities on the “Duty Cycle Capacities – Angle Boom” chart.
8. These capacities apply to the crane as originally manufactured and normally equipped by Link-Belt Construction Equipment Company.

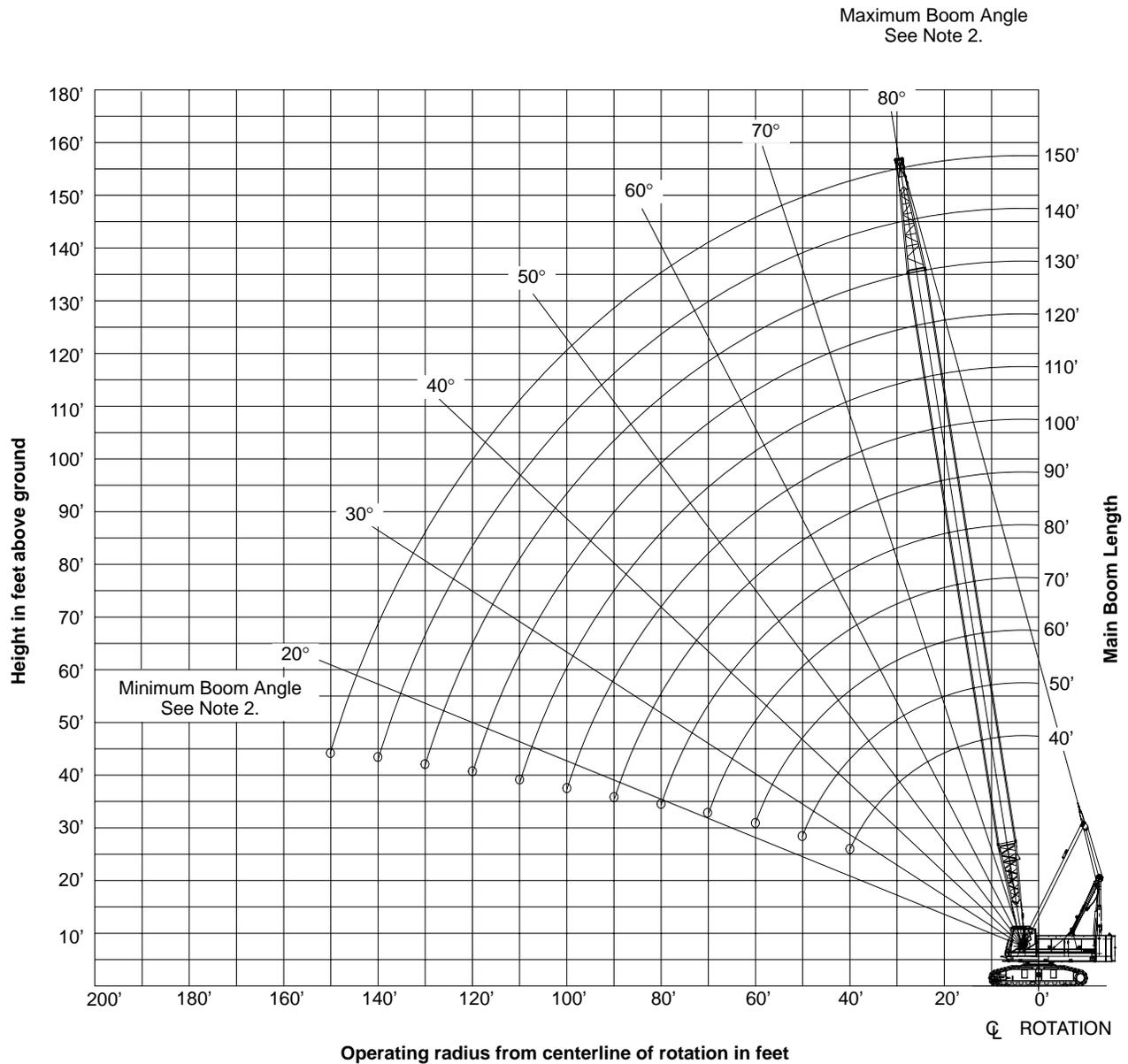
DUTY CYCLE CAPACITIES – ANGLE BOOM

Load Radius (ft.)	Boom Length (ft.)	Boom Angle (deg)	Side Frames Extended “A” Counterweight (All capacities listed are in pounds)			
			Dragline		Clamshell / Magnet	
			“A” cwt	“AB” cwt	“A” cwt	“AB” cwt
40	11	80.8	----	----	29,500	29,500
40	12	79.3	----	----	29,500	29,500
40	13	77.9	----	----	29,500	29,500
40	14	76.4	----	----	29,500	29,500
40	15	74.9	----	----	29,500	29,500
40	16	73.4	----	----	29,500	29,500
40	17	71.9	----	----	29,500	29,500
40	18	70.4	----	----	29,500	29,500
40	19	68.9	----	----	29,500	29,500
40	20	67.3	----	----	29,500	29,500
40	25	59.3	29,500	29,500	29,500	29,500
40	30	50.6	29,500	29,500	29,500	29,500
40	35	40.5	29,500	29,500	29,500	29,500
40	40	27.7	----	----	28,530	29,500
50	12	81.5	----	----	29,500	29,500
50	13	80.3	----	----	29,500	29,500
50	14	79.2	----	----	29,500	29,500
50	15	78.0	----	----	29,500	29,500
50	16	76.8	----	----	29,500	29,500
50	17	75.6	----	----	29,500	29,500
50	18	74.4	----	----	29,500	29,500
50	19	73.3	----	----	29,500	29,500
50	20	72.1	----	----	29,500	29,500
50	25	65.9	----	----	29,500	29,500
50	30	59.5	29,500	29,500	29,500	29,500
50	35	52.5	29,500	29,500	29,500	29,500
50	40	44.9	28,710	29,500	28,710	29,500
50	50	24.8	----	----	20,800	29,500
60	13	81.9	----	----	29,500	29,500
60	14	81.0	----	----	29,500	29,500
60	15	80.0	----	----	29,500	29,500
60	16	79.0	----	----	29,500	29,500
60	17	78.1	----	----	29,500	29,500
60	18	77.1	----	----	29,500	29,500
60	19	76.1	----	----	29,500	29,500
60	20	75.1	----	----	29,500	29,500
60	25	70.1	----	----	29,500	29,500
60	30	64.9	----	----	29,500	29,500
60	35	59.6	29,500	29,500	29,500	29,500
60	40	53.8	28,710	29,500	28,710	29,500
60	50	40.8	20,800	29,500	20,880	29,500
60	60	22.6	----	----	15,930	23,220
70	15	81.5	----	----	29,500	29,500
70	16	80.6	----	----	29,500	29,500
70	17	79.8	----	----	29,500	29,500
70	18	79.0	----	----	29,500	29,500

Boom Length (ft.)	Load Radius (ft.)	Boom Angle (deg)	Side Frames Extended “A” Counterweight (All capacities listed are in pounds)			
			Dragline		Clamshell / Magnet	
			“A” cwt	“AB” cwt	“A” cwt	“AB” cwt
70	19	78.1	----	----	29,500	29,500
70	20	77.3	----	----	29,500	29,500
70	25	73.1	----	----	29,500	29,500
70	30	68.7	----	----	29,500	29,500
70	35	64.3	----	----	29,500	29,500
70	40	59.6	28,620	29,500	28,620	29,500
70	50	49.6	20,790	29,500	20,790	29,500
70	60	37.7	15,930	25,700	15,930	23,130
70	70	20.9	----	----	12,510	18,630
80	16	81.8	----	----	29,500	29,500
80	17	81.1	----	----	29,500	29,500
80	18	80.4	----	----	29,500	29,500
80	19	79.6	----	----	29,500	29,500
80	20	78.9	----	----	29,500	29,500
80	25	75.2	----	----	29,500	29,500
80	30	71.5	----	----	29,500	29,500
80	35	67.7	----	----	29,500	29,500
80	40	63.7	----	----	28,440	29,500
80	50	55.4	20,610	29,500	20,610	29,500
80	60	46.2	15,750	25,600	15,750	23,040
80	70	35.2	12,420	20,600	12,420	18,540
80	80	19.5	----	----	9,900	15,210
90	18	81.4	PROHIBITED	----	PROHIBITED	29,500
90	19	80.8	PROHIBITED	----	PROHIBITED	29,500
90	20	80.1	PROHIBITED	----	PROHIBITED	29,500
90	25	76.9	PROHIBITED	----	PROHIBITED	29,500
90	30	73.6	PROHIBITED	----	PROHIBITED	29,500
90	35	70.3	PROHIBITED	----	PROHIBITED	29,500
90	40	66.8	PROHIBITED	----	PROHIBITED	29,500
90	50	59.7	PROHIBITED	29,500	PROHIBITED	29,430
90	60	52.0	PROHIBITED	25,400	PROHIBITED	22,860
90	70	43.4	PROHIBITED	20,400	PROHIBITED	18,360
90	80	33.1	PROHIBITED	----	PROHIBITED	15,030
90	90	18.4	PROHIBITED	----	PROHIBITED	12,510
100	19	81.7	PROHIBITED	----	PROHIBITED	29,500
100	20	81.1	PROHIBITED	----	PROHIBITED	29,500
100	25	78.2	PROHIBITED	----	PROHIBITED	29,500
100	30	75.3	PROHIBITED	----	PROHIBITED	29,500
100	35	72.3	PROHIBITED	----	PROHIBITED	29,500
100	40	69.3	PROHIBITED	----	PROHIBITED	29,500
100	50	63.0	PROHIBITED	----	PROHIBITED	29,250
100	60	56.4	PROHIBITED	25,100	PROHIBITED	22,590
100	70	49.2	PROHIBITED	20,200	PROHIBITED	18,180
100	80	41.1	PROHIBITED	16,500	PROHIBITED	14,850
100	90	31.3	PROHIBITED	----	PROHIBITED	12,330
100	100	17.4	PROHIBITED	----	PROHIBITED	10,350

WORKING RANGE DIAGRAM

40' TO 150' MAIN BOOM



Notes:

1. Boom geometry shown is for unloaded condition and crane standing level on firm supporting surface. Boom deflection, subsequent radius, and boom angle change must be accounted for when applying load to hook.
2. Maximum and minimum boom angles are equal to the values listed in the capacity chart for each boom length.

CAPACITY DEDUCTIONS FOR LIFTING OFF MAIN BOOM HOOK WITH JIB INSTALLED

When using main boom hook, while jib is attached, reduce boom capacities by the values in the following chart:

Jib Length (ft.)	Capacity Deduction (lb)
30	2,000
45	2,400
60	3,200

CAPACITY DEDUCTIONS FOR LIFTING OFF MAIN BOOM HOOK WITH 5 FOOT TIP EXTENSION OR PILE DRIVER LEAD ADAPTERS INSTALLED

When using main boom hook, while 5 foot tip extension or pile driver lead adapter is attached, reduce boom capacities by the values in the following chart:

Extension/Adapter	Capacity Deduction (lb)
5 (ft.)	700
Pile Driver Lead Adapter	200

MAXIMUM ALLOWABLE CAPACITIES FOR 5 FOOT TIP EXTENSION

LIFTING CAPACITY TO BE THE SMALLEST OF THE FOLLOWING VALUES:

- 18,000 lb (Maximum).
- The standard crane lift capacity minus 700 lb for the crane configuration in use.

NOTES:

- All notes are to be adhered to as listed on the standard lift crane capacity charts .
- Reduce the main boom lift capacities by 700 lb when the tip extension is installed.
- The maximum boom length on which the tip extension can be installed is 150 ft.
- Do not lift or suspend a load from the boom tip extension and main boom at the same time.

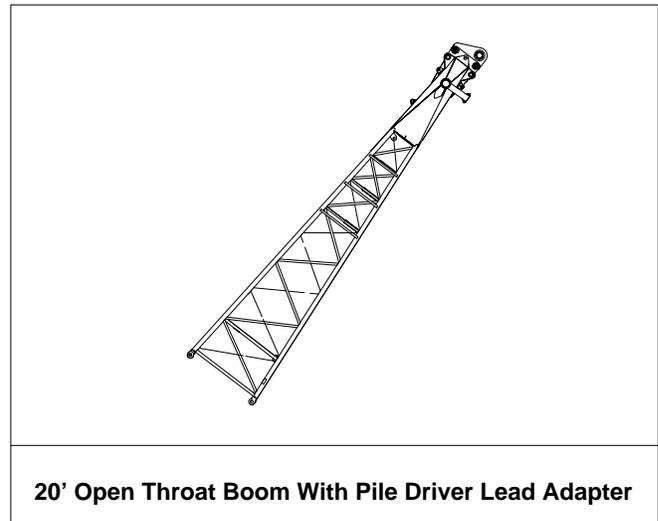
MAXIMUM ALLOWABLE CAPACITIES FOR PILE DRIVER LEAD ADAPTER

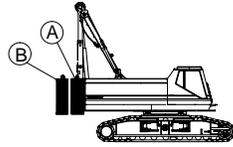
LIFTING CAPACITY TO BE THE SMALLEST OF THE FOLLOWING VALUES:

- 70,000 lbs.
- The standard crane lift capacity minus 200 lbs. for crane configuration in use.

NOTES:

- All notes are to be adhered to as listed on the standard lift crane capacity charts.
- Reduce the main boom lift capacities by 200 lb when the pile driver lead adapter is installed.
- The maximum boom length on which the pile driver lead adapter can be installed is 150 ft.





Note: Refer To Page 7 For “Capacity Deductions” Caused By Any Attachment At The Boom Tip.

MAIN BOOM CAPACITIES – 40 FT OPEN THROAT ANGLE BOOM							
Load Radius (Ft.)	Boom Angle (deg)	Over End Blocked	360° Rotation				
			Side Frames Extended			Side Frames Retracted	
			AB CTWT (lb)	AB CTWT (lb)	A CTWT (lb)	0 CTWT (lb)	A CTWT (lb)
11	80.8	200,000	200,000	199,600	179,600	139,600	85,500
12	79.3	200,000	200,000	184,200	165,700	119,900	73,200
13	77.9	190,600	190,600	171,000	137,100	105,000	63,900
14	76.4	177,900	177,900	159,500	115,700	93,200	56,500
15	74.9	166,600	166,600	149,400	100,000	83,800	50,600
16	73.4	156,700	156,700	133,500	87,900	76,000	45,800
17	71.9	147,800	147,800	119,200	78,300	69,500	41,700
18	70.4	139,900	139,900	107,500	70,500	63,900	38,200
19	68.9	132,700	132,700	97,900	64,000	59,100	35,200
20	67.3	126,300	123,500	89,800	58,600	55,000	32,600
25	59.3	101,200	87,200	63,000	40,700	40,300	23,500
30	50.6	80,400	66,900	48,000	30,600	31,400	17,900
35	40.5	64,100	53,800	38,400	24,200	25,400	14,100
40	27.7	52,900	44,800	31,700	19,600	21,000	11,300

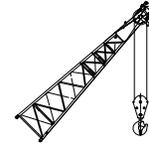
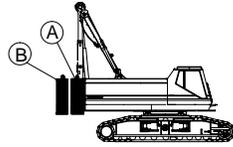
MAIN BOOM CAPACITIES – 70 FT OPEN THROAT ANGLE BOOM							
Load Radius (Ft.)	Boom Angle (deg)	Over End Blocked	360° Rotation				
			Side Frames Extended			Side Frames Retracted	
			AB CTWT (lb)	AB CTWT (lb)	A CTWT (lb)	0 CTWT (lb)	A CTWT (lb)
15	81.5	165,300	165,300	148,200	100,900	83,900	50,800
16	80.6	155,500	155,500	134,300	88,600	76,100	45,900
17	79.8	146,800	146,800	119,800	78,900	69,500	41,700
18	79.0	138,900	138,900	108,100	71,000	63,900	38,200
19	78.1	131,800	131,800	98,300	64,500	59,100	35,200
20	77.3	125,300	123,900	90,200	59,000	54,900	32,600
25	73.1	100,300	87,300	63,200	40,800	40,200	23,300
30	68.7	80,600	66,900	48,100	30,700	31,200	17,700
35	64.3	64,200	53,900	38,400	24,200	25,200	14,000
40	59.6	53,100	44,800	31,800	19,700	20,900	11,300
50	49.6	38,900	33,100	23,100	13,800	15,200	7,600
60	37.7	30,200	25,700	17,700	10,200	11,400	5,200
70	20.9	24,300	20,700	13,900	7,600	8,800	3,500

MAIN BOOM CAPACITIES – 50 FT OPEN THROAT ANGLE BOOM							
Load Radius (Ft.)	Boom Angle (deg)	Over End Blocked	360° Rotation				
			Side Frames Extended			Side Frames Retracted	
			AB CTWT (lb)	AB CTWT (lb)	A CTWT (lb)	0 CTWT (lb)	A CTWT (lb)
12	81.5	200,000	200,000	183,800	165,400	120,200	73,500
13	80.3	190,300	190,300	170,600	137,800	105,300	64,100
14	79.2	177,500	177,500	159,200	116,300	93,500	56,800
15	78.0	166,300	166,300	149,100	100,500	84,000	50,800
16	76.8	156,400	156,400	134,000	88,300	76,200	45,900
17	75.6	147,600	147,600	119,600	78,600	69,600	41,800
18	74.4	139,700	139,700	107,900	70,800	64,000	38,400
19	73.3	132,500	132,500	98,200	64,300	59,300	35,400
20	72.1	126,100	123,800	90,100	58,900	55,100	32,800
25	65.9	101,000	87,400	63,200	40,900	40,400	23,600
30	59.5	80,600	67,000	48,200	30,800	31,500	18,000
35	52.5	64,300	54,000	38,600	24,300	25,500	14,200
40	44.9	53,100	45,000	31,900	19,800	21,200	11,500
50	24.8	38,900	33,200	23,200	13,900	15,300	7,800

MAIN BOOM CAPACITIES – 80 FT OPEN THROAT ANGLE BOOM							
Load Radius (Ft.)	Boom Angle (deg)	Over End Blocked	360° Rotation				
			Side Frames Extended			Side Frames Retracted	
			AB CTWT (lb)	AB CTWT (lb)	A CTWT (lb)	0 CTWT (lb)	A CTWT (lb)
16	81.8	154,900	154,900	134,300	88,700	76,000	45,700
17	81.1	146,200	146,200	119,800	78,900	69,400	41,600
18	80.4	138,400	138,400	108,100	71,000	63,800	38,100
19	79.6	131,300	131,300	98,300	64,400	59,000	35,100
20	78.9	124,800	123,900	90,100	58,900	54,800	32,400
25	75.2	99,900	87,200	63,000	40,700	40,000	23,200
30	71.5	80,500	66,800	47,900	30,500	31,000	17,500
35	67.7	64,100	53,700	38,300	24,000	25,000	13,800
40	63.7	52,900	44,700	31,600	19,500	20,700	11,100
50	55.4	38,700	32,900	22,900	13,700	15,000	7,400
60	46.2	30,100	25,600	17,500	10,000	11,200	5,100
70	35.2	24,200	20,600	13,800	7,500	8,600	3,400
80	19.5	19,900	16,900	11,000	5,600	6,700	2,100

MAIN BOOM CAPACITIES – 60 FT OPEN THROAT ANGLE BOOM							
Load Radius (Ft.)	Boom Angle (deg)	Over End Blocked	360° Rotation				
			Side Frames Extended			Side Frames Retracted	
			AB CTWT (lb)	AB CTWT (lb)	A CTWT (lb)	0 CTWT (lb)	A CTWT (lb)
13	81.9	189,700	189,700	170,100	138,300	105,300	64,200
14	81.0	177,000	177,000	158,700	116,700	93,500	56,800
15	80.0	165,900	165,900	148,700	100,700	84,000	50,900
16	79.0	156,000	156,000	134,200	88,500	76,200	46,000
17	78.1	147,200	147,200	119,700	78,800	69,600	41,800
18	77.1	139,300	139,300	108,000	71,000	64,000	38,300
19	76.1	132,200	132,200	98,300	64,400	59,200	35,300
20	75.1	125,700	123,900	90,200	59,000	55,000	32,700
25	70.1	100,700	87,400	63,200	40,900	40,300	23,500
30	64.9	80,600	67,000	48,200	30,800	31,400	17,900
35	59.6	64,300	54,000	38,600	24,300	25,400	14,100
40	53.8	53,100	44,900	31,900	19,800	21,100	11,400
50	40.8	39,000	33,200	23,200	14,000	15,300	7,800
60	22.6	30,300	25,800	17,700	10,200	11,500	5,300

MAIN BOOM CAPACITIES – 90 FT OPEN THROAT ANGLE BOOM							
Load Radius (Ft.)	Boom Angle (deg)	Over End Blocked	360° Rotation				
			Side Frames Extended			Side Frames Retracted	
			AB CTWT (lb)	AB CTWT (lb)	A CTWT (lb)	0 CTWT (lb)	A CTWT (lb)
18	81.4	137,900	137,900	108,000	70,900	63,600	37,900
19	80.8	130,800	130,800	98,200	64,400	58,800	34,900
20	80.1	124,300	123,800	90,000	58,800	54,600	32,200
25	76.9	99,400	87,100	62,900	40,600	39,800	22,900
30	73.6	80,300	66,600	47,800	30,400	30,800	17,300
35	70.3	63,900	53,500	38,100	23,900	24,800	13,500
40	66.8	52,700	44,500	31,400	19,300	20,500	10,800
50	59.7	38,500	32,700	22,700	13,500	14,700	7,200
60	52.0	29,900	25,400	17,300	9,800	11,000	4,800
70	43.4	24,000	20,400	13,600	7,300	8,400	3,200
80	33.1	19,800	16,700	10,900	5,500	6,500	2,000
90	18.4	16,600	13,900	8,800	4,000	5,000	—



MAIN BOOM CAPACITIES – 100 FT OPEN THROAT ANGLE BOOM								
Load Radius (Ft.)	Boom Angle (deg)	Over End Blocked	360° Rotation					PROHIBITED
			Side Frames Extended			Side Frames Retracted		
			AB CTWT (lb)	AB CTWT (lb)	A CTWT (lb)	0 CTWT (lb)	A CTWT (lb)	
19	81.7	130,200	130,200	98,100	64,300	58,600		
20	81.1	123,800	123,700	89,900	58,700	54,400		
25	78.2	98,900	86,900	62,700	40,400	39,600		
30	75.3	80,200	66,400	47,600	30,200	30,600		
35	72.3	63,700	53,300	37,900	23,600	24,600		
40	69.3	52,500	44,200	31,200	19,100	20,200		
50	63.0	38,300	32,500	22,500	13,200	14,500		
60	56.4	29,600	25,100	17,000	9,600	10,800		
70	49.2	23,800	20,200	13,400	7,100	8,200		
80	41.1	19,600	16,500	10,700	5,200	6,300		
90	31.3	16,400	13,700	8,600	3,800	4,800		
100	17.4	13,800	11,500	6,900	2,700	3,600		

MAIN BOOM CAPACITIES – 130 FT OPEN THROAT ANGLE BOOM								
Load Radius (Ft.)	Boom Angle (deg)	Over End Blocked	360° Rotation					PROHIBITED
			Side Frames Extended			Side Frames Retracted		
			AB CTWT (lb)	AB CTWT (lb)	A CTWT (lb)	0 CTWT (lb)	A CTWT (lb)	
25	81.0	82,900	73,500	62,200				
30	78.7	72,500	62,500	46,900				
35	76.5	62,500	52,600	37,200				
40	74.2	51,900	43,500	30,500				
50	69.6	37,600	31,700	21,700				
60	64.8	28,900	24,400	16,300				
70	59.8	23,000	19,400	12,600				
80	54.5	18,800	15,700	9,900				
90	48.9	15,600	13,000	7,800				
100	42.8	13,100	10,800	6,200				
110	35.8	11,100	9,000	4,900				
120	27.4	9,500	7,600	3,800				
130	15.3	8,000	6,300	2,900				

MAIN BOOM CAPACITIES – 110 FT OPEN THROAT ANGLE BOOM								
Load Radius (Ft.)	Boom Angle (deg)	Over End Blocked	360° Rotation					PROHIBITED
			Side Frames Extended			Side Frames Retracted		
			AB CTWT (lb)	AB CTWT (lb)	A CTWT (lb)	0 CTWT (lb)	A CTWT (lb)	
20	81.9	120,600	120,600	89,800	58,600	54,100		
25	79.3	98,400	86,700	62,600	40,200	39,300		
30	76.6	80,000	66,200	47,400	30,000	30,300		
35	74.0	63,500	53,100	37,700	23,400	24,300		
40	71.2	52,300	44,000	30,900	18,900	20,000		
50	65.6	38,100	32,200	22,200	13,000	14,200		
60	59.8	29,400	24,900	16,800	9,300	10,500		
70	53.5	23,600	19,900	13,100	6,800	7,900		
80	46.7	19,300	16,300	10,400	5,000	6,000		
90	39.1	16,200	13,500	8,400	3,600	4,500		
100	29.8	13,600	11,300	6,700	2,500	3,300		
110	16.6	11,600	9,500	5,400	—	2,400		

MAIN BOOM CAPACITIES – 140 FT OPEN THROAT ANGLE BOOM								
Load Radius (Ft.)	Boom Angle (deg)	Over End Blocked	360° Rotation					PROHIBITED
			Side Frames Extended			Side Frames Retracted		
			AB CTWT (lb)	AB CTWT (lb)	A CTWT (lb)	0 CTWT (lb)	A CTWT (lb)	
25	81.6	65,200	62,800	62,000				
30	79.5	55,400	52,600	46,700				
35	77.5	52,100	44,700	37,000				
40	75.4	45,600	39,100	30,200				
50	71.1	34,800	28,300	21,400				
60	66.7	26,500	21,900	16,000				
70	62.1	21,200	17,000	12,300				
80	57.4	16,900	13,600	9,600				
90	52.4	14,000	11,200	7,500				
100	47.0	11,500	9,500	5,900				
110	41.2	9,800	7,800	4,600				
120	34.5	8,500	6,700	3,500				
130	26.4	7,300	5,800	2,600				
140	14.7	4,500	4,500	—				

MAIN BOOM CAPACITIES – 120 FT OPEN THROAT ANGLE BOOM								
Load Radius (Ft.)	Boom Angle (deg)	Over End Blocked	360° Rotation					PROHIBITED
			Side Frames Extended			Side Frames Retracted		
			AB CTWT (lb)	AB CTWT (lb)	A CTWT (lb)	0 CTWT (lb)	A CTWT (lb)	
25	80.2	93,400	86,600	62,400	40,000	39,100		
30	77.8	79,800	66,000	47,200	29,800	30,100		
35	75.3	63,300	52,900	37,400	23,200	24,000		
40	72.8	52,100	43,800	30,700	18,600	19,700		
50	67.8	37,800	32,000	22,000	12,700	13,900		
60	62.5	29,200	24,600	16,500	9,100	10,200		
70	57.0	23,300	19,600	12,800	6,500	7,600		
80	51.1	19,100	16,000	10,100	4,700	5,700		
90	44.6	15,900	13,200	8,100	3,300	4,300		
100	37.3	13,400	11,100	6,500	2,200	3,100		
110	28.6	11,400	9,300	5,200	—	2,100		
120	15.9	9,700	7,800	4,000	—	—		

MAIN BOOM CAPACITIES – 150 FT OPEN THROAT ANGLE BOOM								
Load Radius (Ft.)	Boom Angle (deg)	Over End Blocked	360° Rotation					PROHIBITED
			Side Frames Extended			Side Frames Retracted		
			AB CTWT (lb)	AB CTWT (lb)	A CTWT (lb)	0 CTWT (lb)	A CTWT (lb)	
30	80.2	46,600	46,600	46,500				
35	78.3	40,200	40,200	36,700				
40	76.3	35,200	35,200	29,900				
50	72.4	25,800	25,800	21,200				
60	68.3	20,300	20,300	15,700				
70	64.1	16,000	16,000	12,000				
80	59.8	12,700	12,700	9,300				
90	55.3	10,300	10,300	7,200				
100	50.5	8,500	8,500	5,600				
110	45.4	7,200	7,200	4,300				
120	39.7	6,000	6,000	3,300				
130	33.3	5,100	5,100	2,300				
140	25.5	4,300	4,300	—				
150	14.2	3,200	3,200	—				