



**Milestone Business Park
Building #4
Germantown, Maryland**

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Construction Management

Dr. Riley

Technical Assignment I

October 5, 2007



Technical Assignment I

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Executive Summary

Milestone Business Park is located in Germantown, Maryland, approximately 30 miles NNW of the nation's capital. The Business Park is a 55 acre site will be constructed in three phases. Concentrating on Building #4, this is the second phase and third of five buildings in the development.

Milestone Building #4 is a LEED Core and Shell project with a total proposed score of 33 points or Silver Certification. The design team utilizes all five LEED categories; Sustainable Sites (8 points), Water Efficiency (5 points), Energy and Atmosphere (3 points), Material and Resources (3 points) and Indoor Environmental Quality (10 points). The project will also receive four (4) points for Innovation in Design which includes a LEED AP, Exemplary performance, Education/Outreach and Green Housekeeping.

The purpose of this assignment is to become familiar with the construction conditions and the project's scope of work. The information analyzed throughout this assignment will provide opportunities and threats on the design and construction of Milestone Building #4. This document discusses cost, schedule, site conditions, project delivery and client information.

Cost

The actual cost for Milestone Building #4 is ~19.5 million or \$117/sf. When compared to D4Cost2002 and RS Means SF Estimate, the costs came to \$169/sf and \$125/sf respectively.

Schedule

The owner and construction team agreed to a 12-14 month schedule with substantial completion in September 2008. However due to complication obtaining permits, construction was put on hold with a new substantial completion date in late October 2008. Currently Milestone Building #4 is not leased out. Once tenants have been selected and their move in date set, the substantial completion date for this scope may change.

Site Conditions

Milestone Business Park is not fully developed leaving much room for parking, trailers and storage. Building #4 is located adjacent to Building #2. This is a concern for noise, safety and disturbance to tenants in that building.

Client Information

Kennedy Associate and Trammel Crow have high expectations for Milestone Business Park and in particular Building #4. Building #4 is a speculative office building with a financial return of 10-12%. Both parties expect the contractor to deliver on time and within budget.



Project Summary Schedule

Milestone Building #4 went to bid in early May 2007 and received Noticed to Proceed at the end of June 2007. However, there were many issues regarding permits and was unable to break ground until Mid-September. The construction schedule had an original schedule of 12-14 months; with substantial completion in September 2008. Due to permit problems, the Buch Construction hopes to complete Milestone Building #4 late October 2008. A one summary schedule can be found in Appendix A.

Foundation

The site of Building #4 was previously landscaped during phase one due to its close proximity of Building #2. Therefore there is removal of trees and very little excavation is needed. The foundation consists of spread footings and concrete piers topped with a 5" slab on grade.

Structural

Steel will be erected by a mobile crane in four sections; south (floors 1-3), north (floors 1-3), south (floors 4-6, roof), north (floors 4-6, roof). Please see attached drawing in Appendix B for sequencing. Once steel has erected, decking and concrete will follow. Concrete will be placed with a pump and each floor will have two pours. Upon completion of all elevated slabs and roof, roof will be sealed and closed in.

Finishes

Due to Milestone Building #4 being a Core and Shell building, the finishes are limited to elevator lobbies and bathrooms. Finishes will be done in a typical ceiling to floor fashion; starting after passing ceiling close-in inspection. Finishes will start on the first floor and move up to the sixth floor.



Building Systems Summary

Building Systems Summary		
Work Scope	Yes	No
Demolition		X
Structural Steel Frame	X	
Cast In Place Concrete	X	
Precast Concrete		X
Mechanical System	X	
Electrical System	X	
Masonry	X	
Curtain Wall		X
Support of Excavation		X

Structural Steel Frame

The structural steel will be erected in four sections by a mobile crane (Sequencing plan is located in Appendix B.). The steel was designed for dead, live, snow, wind and seismic load according to IBC and ASCE. All 'W' shapes are composed of ASTM A992 steel and all other shapes are conformed to ASTM A36. The structural steel is mainly made up of W21 or W16 shapes carrying a 3 1/4" lightweight concrete slab on top a 3" metal deck.

Cast In Place Concrete

Cast in place concrete is used for the foundation, SOG and elevated slabs. It will be placed directly (foundation and SOG) and by pump (elevated slabs). The footings and grade beams will use 3000 psi concrete and formed with plywood. The slab on grade is of 4000 psi while the elevated slabs are of 3500 psi. Concrete was designed to IBC, ASTM and ACI.

Mechanical System

The rooftop mechanical equipment is housed in the penthouse and another mechanical room is located on the first floor. The mechanical system is an air water system designed for 76°F/40%RH for summer months and 72°F for winter months. There are two 1700 GPM cooling towers located on the roof.

Electrical System

The main switchboard providing power is designed at 4000A, 277Y480V, 3φ, 4 wire. For emergency power, there is a 350KW diesel generator located outside of the south wall. There



are six transformers at 150KVA, while all others range from 15-45KVA. The lighting in the building is typically 277V fluorescent fixtures.

Masonry

Milestone Building #4 will be ornamented with masonry brick veneer to match Buildings #1 and #2 of Phase I. The primary brick pattern is ½ running bond, broken up with a soldier brick window head. The use of a tower scaffolding system will be incorporated on Building #4 and the brick veneer will be laid by elevation; south, west, north, east.

Project Cost Evaluation

Actual Cost

Milestone Building #4 was bid in early May 2007 with a lump sum of ~\$19 million (\$144/sf). Once the general contractor was selected, LEED revisions were completed causing a change order of ~\$478,000. The construction cost breakdown and total building costs are located in the tables below.

Actual Construction Cost

CSI Division	Cost	Cost/SF
Site Construction	\$2,228,986	\$14/sf
Concrete	\$1,380,000	\$8/sf
Masonry	\$1,359,116	\$8/sf
Metals	\$3,223,000	\$19/sf
Woods and Plastics	\$316,000	\$2/sf
Thermal and Moisture Protection	\$1,181,779	\$7/sf
Door, Frames and Hardware	\$1,517,200	\$9/sf
Finishes	\$1,548,577	\$9/sf
Specialties	\$104,687	\$1/sf
Furnishings	\$61,190	\$1/sf
Conveying Systems	\$975,000	\$6/sf
HVAC/Plumbing	\$2,200,790	\$13/sf
Fire Protection	\$288,759	\$2/sf
Electrical	\$1,201,000	\$7/sf
Total	\$17,586,084	\$106/sf

**LEED Change Order**

Item	Cost	Cost/SF
LEED Coordinator	\$43,866	\$0.26
Waste Management	\$182,249	\$1.10
Materials Protection	\$8,500	\$0.05
Materials Hoist	\$43,525	\$0.26
Concrete	\$4,400	\$0.03
Millwork	\$13,998	\$0.08
Blocking/Rough Carpentry	\$43,000	\$0.26
Moisture Protection	\$3,530	\$0.02
Doors and Hardware	\$225	\$0.00
Glazing	\$1,000	\$0.01
Gypsum Board	\$68,000	\$0.41
Tile and Stone	\$17,372	\$0.10
Carpet	\$212	\$0.00
Paint	\$1,200	\$0.01
Toilet Accessories	\$1,095	\$0.01
Mechanical	\$39,860	\$0.24
Electrical	\$23,169	\$0.14
Subtotal	\$434,401	\$2.61
Fee (10% OH&P)	\$43,440	\$0.26
Total	\$477,841	\$2.87

Total Building Cost

Category	Cost	Cost/SF
Construction Cost	\$17,586,084	\$106/sf
General Conditions	\$700,000	\$4/sf
Bond, Insurance, Misc.	\$720,716	\$4/sf
LEED Change Order	\$477,841	\$3/sf
Total	\$19,484,641	\$117/sf

D4 Cost Estimate

When using D4Cost 2002, there was not exact project match for Milestone Building #4. Instead, four building were extracted from D4Cost 2002 and an average was taken. Building #4 was



averaged at \$169/sf, which is much higher than the actual cost. This increased cost is mainly due to the included furnishing and doors, frames and hardware. Milestone Building #4 is a core and shell building and does not require much finishing. The cost for these items will be included during tenant finish-outs. Details of the four buildings and the average findings are located in the following table. Another large difference in price is due to the additional concrete in the D4 Cost estimate.

D4 Cost Estimate

Building Name	Size	Floors	Cost	Cost/SF
Westchase Corporation Center	308,500 sf	6	\$10,492,634	\$34/sf
Ha-Lo Headquarters	267,334 sf	7	\$34,643,382	\$129/sf
Netplex Plaza	171,809 sf	4	\$7,643,636	\$44/sf
Rio San Diego Plaza	198,000 sf	6	\$11,209,795	\$57/sf
Milestone Building #4	166,292 sf	6	\$28,075,954	\$169/sf

RS Means SF Estimate

RS Means 2007 was used to provide a square foot estimate of Milestone Building #4. Using a 5-10 story office building, it was found that Building #4 was estimated at \$125/sf. This is only \$8/sf higher than the actual cost/sf at \$117/sf. This difference can decrease if the cost of interior finishes was removed from the RS Means SF estimate. Also, adjustments had to be made to the square foot estimate providing in RS Means. The building perimeter and story height needed to adjust for more accurate results. Elevator and smoke alarms were added into the estimate as well. Below are detailed tables for RS Means SF estimate, Adjustments and Additives.

Perimeter Adjustment (LF) Cost/SF

Adjustment Case	Design Case			
		520'	600'	720'
100'	\$3.40	\$2.55	\$1.28	
138'	\$4.69	\$3.52	\$1.77	

Story Height Adjustment (Ft) Cost/SF

Adjustment Case	Design Case			
		520'	600'	720'
12'	\$1.45	\$1.20	\$0.83	
13' 4"	\$1.93	\$1.60	\$1.11	



Additives

Item	Unit	Cost/Unit	Quantity	Total Cost
Elevator (3500#, 6 stops)	Each	\$138,475	4	\$553,900
Fire/Smoke Alarm	Each	\$171	94	\$16,074

RS Means - Office, 5-10 Stories

SF Area	150,000	200,000	166,292	Building Cost
LF Perimeter	520	600	738	166,292 SF
Cost/SF	\$125.05	\$122.65	\$118.51	\$19,707,265
Adjustments				
Perimeter	\$4.69	\$3.52	\$1.77	\$294,337
Story Height	\$1.93	\$1.60	\$1.11	\$184,584
Additives				
Elevator			\$3.33	\$553,900
Fire/Smoke Alarms			\$0.10	\$16,074
Total Cost/SF			\$124.82	\$20,756,160

Comparison

Building Cost Comparison

	Total Cost	Total Cost Difference	Cost/SF	Cost/SF Difference
Actual Building Cost	\$19,484,641		\$117/sf	
D4 Cost Estimate	\$28,075,954	\$8,591,313	\$169/sf	\$52/sf
RS Means SF Estimate	\$20,756,160	\$1,271,519	\$125/sf	\$8/sf

Site Plan of Existing Conditions (check list)

Milestone Business Park is a 55 acre site located in Germantown, Maryland. Building #4 is considered the second of three phases. A detailed site plan of existing conditions is to be found in Appendix D.



Local Conditions

Milestone Building #4 is located on a 55 acre site in a developed suburb northwest of Washington, DC. Since the Business Park is fully developed yet, a congested site is not an issue. With future development in the design phase, future buildings and parking lots provide adequate space for storage, lay down areas, parking, trailers, etc.

One concern the project team has with the site are the existing tenants and buildings. Building #4 will be built directly next to Building #2. Safety to the existing building and its tenants are of utmost concern. Noise is also a concern to the tenants of Building #2. Construction will began long before the typical work day and limits the use of construction, which causes louder noises, during peak tenant work hours. Deliveries will be limited to non-peak traffic hours (morning, lunch and evening) and will be rerouted through the back entrance.

There are three primary types of soils located on site; topsoil, silty sands/sandy silts and rock. The topsoil averages 5"-6" deep; which allows most of the soils to fall into the medium dense (silty sands/sandy silts) category. Rock begins mainly between 18'-20', however, hitting rock is still a concern at spots due to its depth from surface.

Client Information

Milestone Business Park includes three phases with five buildings. Building #4 is a part of the second phase and third building. Along with the construction of building #4, more surface parking will be added due to the expansion and potential growth.

Kennedy Associates has started Milestone Business Park as a speculative office development with a financial return of 10-12%. The LEED design was an initiative of Kennedy Associates and building #4 is the first in the Business Park. Located outside of the nation's capital, it is felt many companies are expanding their service radius. This business park hopes to accommodate the expanding companies that would like another office to a region outside of Washington, DC.

Trammell Crow Company has place high expectations on Buch Construction through cost, quality, schedule and safety. The cost of the job is what they expected to pay and will hold Buch Construction to it. Safety and quality is of utmost importance on any job. Milestone Building #4 can be classified as Value Engineering, Class A. Trammell Crow and Buch Construction have agreed to a schedule of 12-14 months. As of now, building #4 will be complete late October 2008. Milestone Building #4 is a core and shell building and currently has no tenants. Once a tenant has been found, the substantial competition date may be altered to satisfy the needs of the tenant. Kennedy Associates and Trammell Crow hope to have building #4 fully leased within



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12 months of competition. As of now, there is a brochure used to market Milestone Building #4. A more in-depth marketing strategy is in the works. Upon completion, Trammell Crow will be satisfied with the job completed on time and within budget.

Project Delivery System

Trammell Crow Company has made Milestone Building #4 a competitive bid, inviting five General Contractors to bid. Buch Construction was one of two finalists. Buch Construction was ultimately chosen for their competitive price, professional business relationships and past experience with the company. Trammell Crow Company and Buch Construction have a guaranteed maximum cost contract with a 4% fee.

While Milestone Building #4 was in bidding phase, it was a non-LEED rated building. However, it was always the intention of Trammell Crow Company and Kennedy Associates to make the building LEED Certified. This played little role in selecting the general contractor. Once the job was awarded, Buch Construction would then wait for the LEED design to finalize and send the changes to their subcontractors. The LEED design was noted as revisions in the drawings and was priced as a change order. The contract amount does not include the LEED revisions.

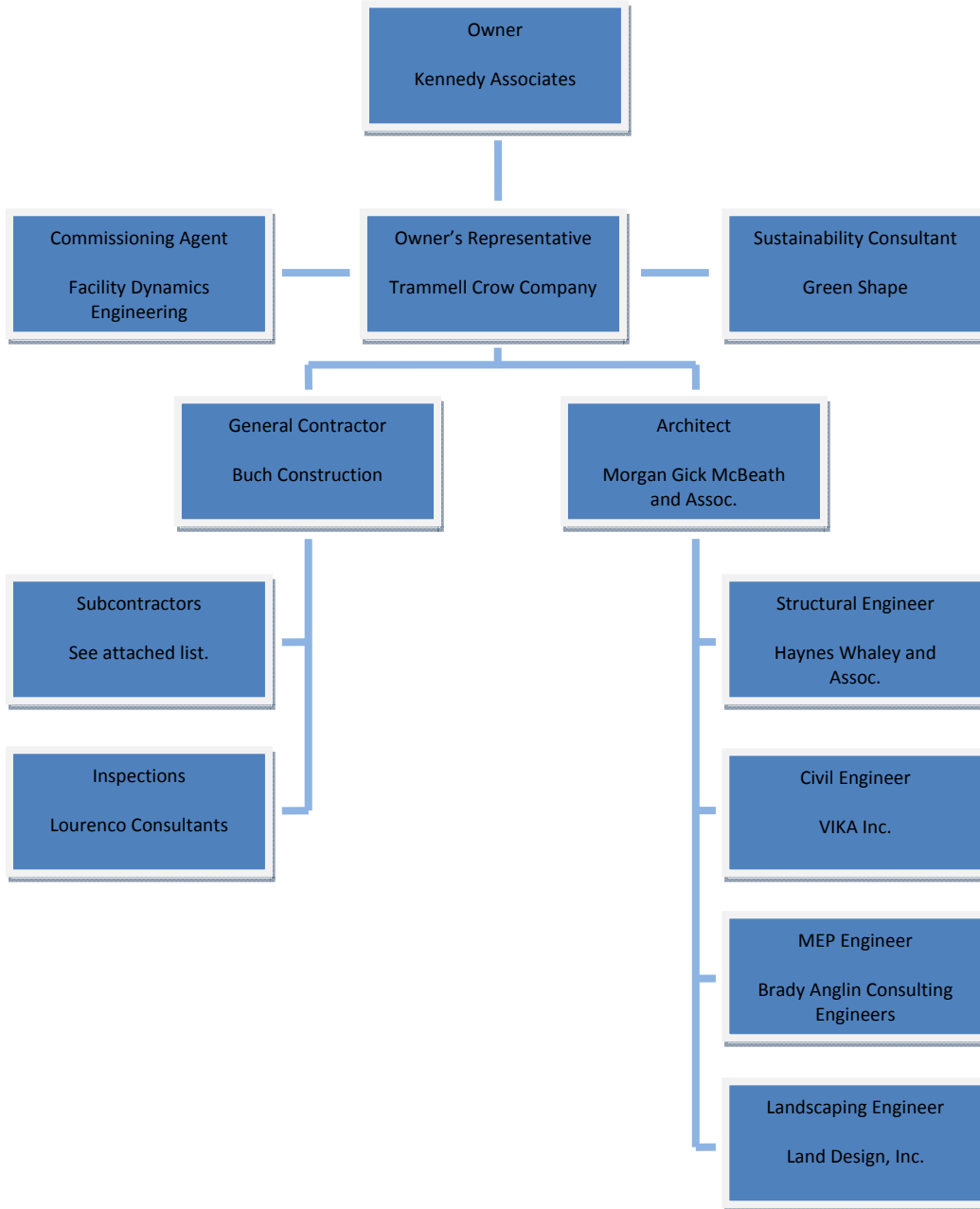
Buch Construction invited three subcontractors of each trade to bid on Milestone Building #4. Since Buch Construction highly values healthy business relationships, selecting which subcontractors to bid the job was based on previous experience with the company. Hence, selecting the ultimate subcontractor was primarily based on price. The contract provides a list of insurance and bonds that Buch Construction should have on all subcontractors.

An organizational chart is on the next page.



Organizational Chart

Please see Appendix D for Contact Information.



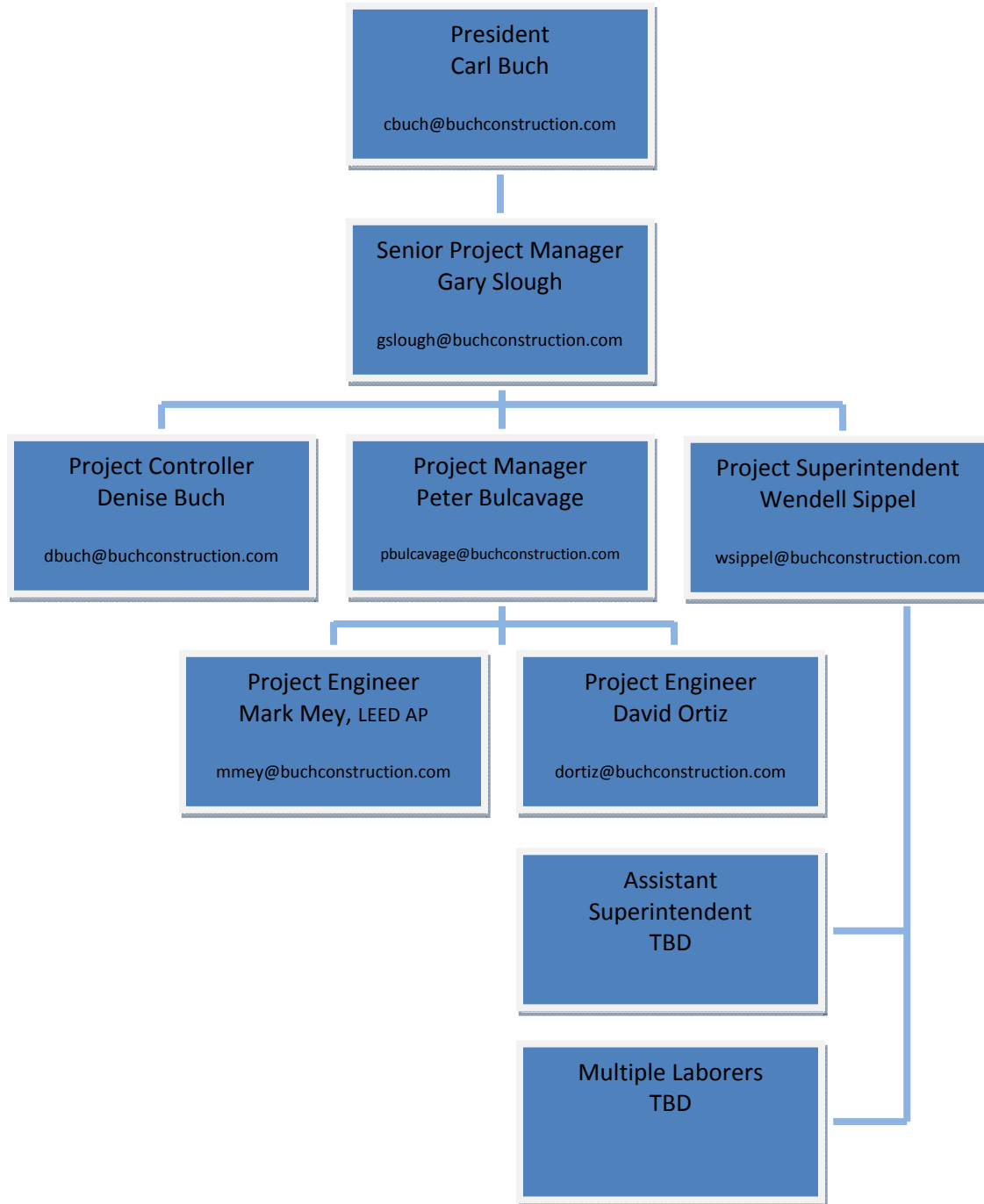


Staffing Plan

Buch Construction follows a typical staffing plan for each job the company is awarded. However, this is one of the larger projects and the first to obtain LEED certification. Due to the unfamiliarity of LEED construction, Buch Construction compensated for this by allocating additional staff. There are two project engineers that will share the duties of RFIs, submittals, and communication with other parties. Mark Mey (Project Engineer) received LEED accreditation, and will serve as the LEED representative for Buch Construction and communicates directly with the LEED Consultant; Green Shape. Gary Slough (Senior Project Manager) oversees three parties; Peter Bulcavage (Project Manager), Wendell Sippel (Project Superintendent) and Denise Buch (Project Controller). Even though Slough makes most of the final decisions, there is open communication throughout the staff at Buch Construction and are equally included in all decision making. Once Milestone Building #4 is heavily underway, Sippel (Project Superintendent) will be granted an Assistant Superintendent to divide the responsibilities. Also, under the supervision of Sippel, additional available laborers will arrive onsite as needed.



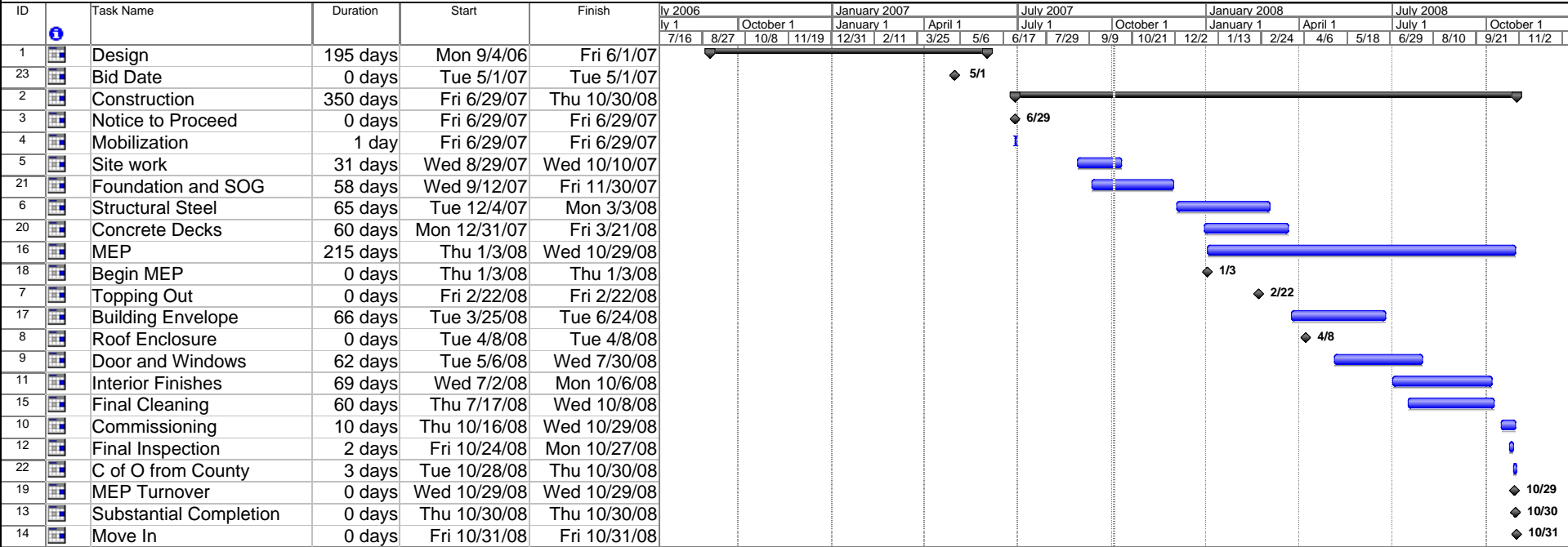
Buch Construction Staffing Chart





Appendix A
Summary Schedule

Milestone Building #4

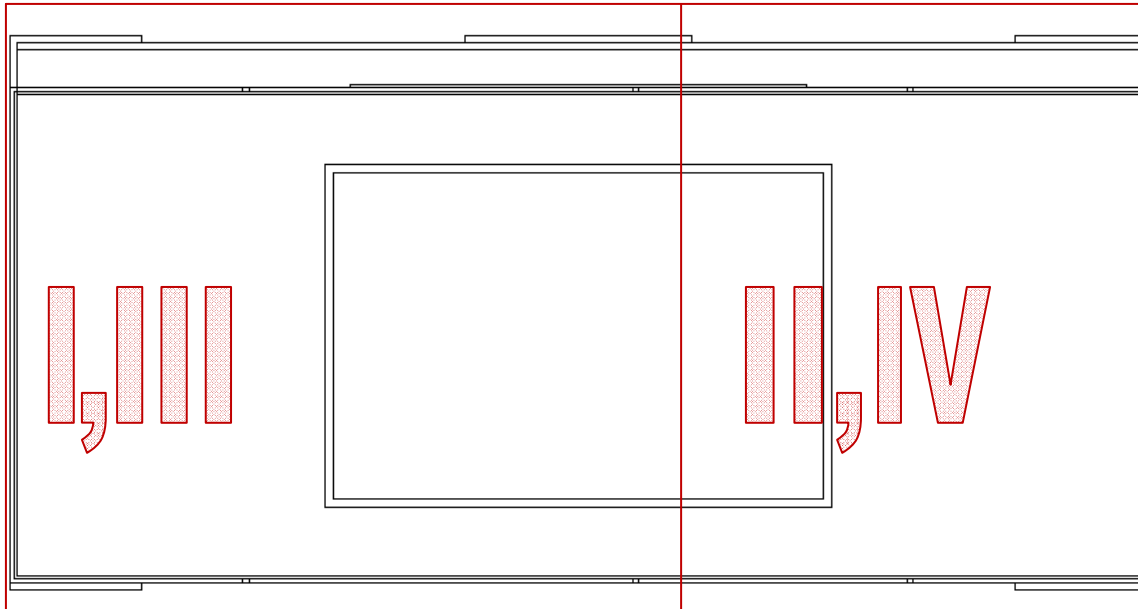


Project: Milestone_Summary Schedule
Date: Wed 10/3/07

	Task		Summary		External Tasks		Deadline
	Split		Project Summary		External Milestone		
	Milestone						



Appendix B
Building Sequencing



BUILDING PLAN



Appendix C

D4 Cost Estimate

Estimate of Probable Cost

Milestone Building #4.2 - Jun 2007 - MD - Rockville

Prepared By: Kristen Hlopick Penn State University 825 South Allen Street Apartment #8 State College, PA 16801 Fax: Building Sq. Size: 236410 Bid Date: 6/1/2007 No. of floors: 6 No. of buildings: 1 Project Height: 84.75 1st Floor Height: 13.333 1st Floor Size: 27716	Prepared For: Dr. Riley PSU AE Department 104 Engineering Unit A University Park, PA 16802 Fax: Site Sq. Size: 156796 Building use: Office Foundation: PIL Exterior Walls: MAS Interior Walls: GYP Roof Type: EPD Floor Type: CON Project Type: NEW
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Division		Percent	Sq. Cost	Amount
00	Procurement and Contracting Require	1.13	1.34	317,202
	Procurement and Contracting Require	1.13	1.34	317,202
01	General Requirements	8.70	10.34	2,443,388
	General Requirements	8.70	10.34	2,443,388
02	Site Work	3.51	4.16	984,435
	Site Work	3.51	4.16	984,435
03	Concrete	21.05	25.00	5,909,869
	Concrete	21.05	25.00	5,909,869
04	Masonry	2.24	2.66	628,205
	Masonry	2.24	2.66	628,205
05	Metals	10.56	12.55	2,966,203
	Metals	10.56	12.55	2,966,203
06	Wood & Plastics	0.47	0.56	131,484
	Wood & Plastics	0.47	0.56	131,484
07	Thermal & Moisture Protection	1.75	2.08	491,408
	Thermal & Moisture Protection	1.75	2.08	491,408
08	Doors & Windows	15.19	18.04	4,265,928
	Doors & Windows	15.19	18.04	4,265,928
09	Finishes	4.91	5.83	1,377,370
	Finishes	4.91	5.83	1,377,370
10	Specialties	2.11	2.50	591,895
	Specialties	2.11	2.50	591,895
11	Equipment	0.06	0.07	16,524
	Equipment	0.06	0.07	16,524
12	Furnishings	0.72	0.85	200,745
	Furnishings	0.72	0.85	200,745
13	Special Construction	0.08	0.09	21,894
	Special Construction	0.08	0.09	21,894
14	Conveying Systems	4.22	5.01	1,184,513
	Conveying Systems	4.22	5.01	1,184,513
15	Mechanical	6.19	7.36	1,738,836
	Mechanical	6.19	7.36	1,738,836
16	Electrical	2.47	2.93	693,490
	Electrical	2.47	2.93	693,490
21	Fire Suppression	1.07	1.27	299,779
	Fire Suppression	1.07	1.27	299,779

22	Plumbing	0.77	0.92	216,518
	Plumbing	0.77	0.92	216,518
23	HVAC	5.32	6.31	1,492,926
	HVAC	5.32	6.31	1,492,926
26	Electrical	4.10	4.87	1,152,308
	Electrical	4.10	4.87	1,152,308
31	Earthwork	0.74	0.88	208,610
	Earthwork	0.74	0.88	208,610
32	Exterior Improvements	1.80	2.14	505,457
	Exterior Improvements	1.80	2.14	505,457
33	Utilities	0.84	1.00	236,966
	Utilities	0.84	1.00	236,966
Total Building Costs		100.00	118.76	28,075,954
Total Non-Building Costs		100.00	0.00	0
Total Project Costs		--	--	28,075,954



Appendix D

Site Plan of Existing Conditions

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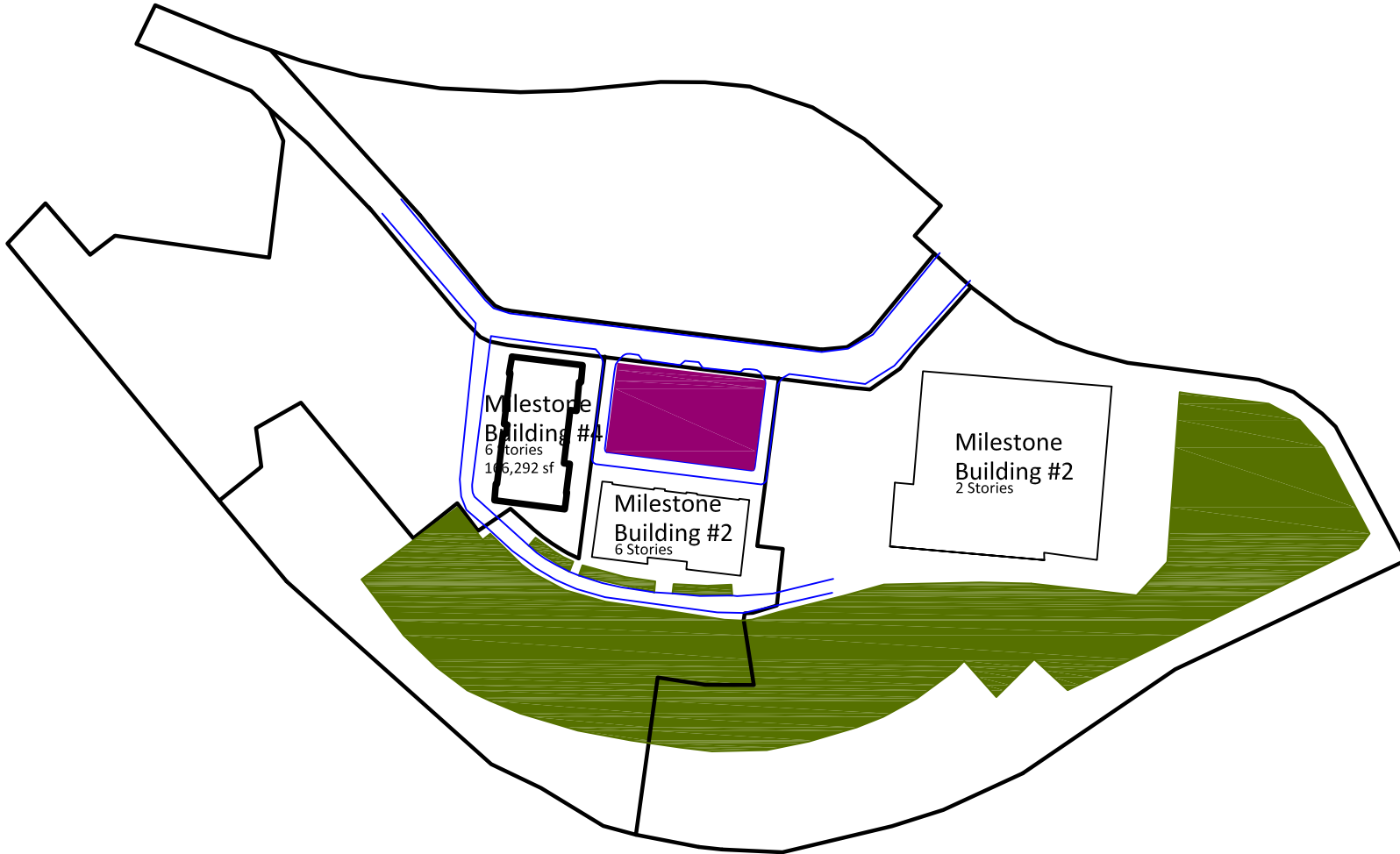
October 5, 2007

Milestone Buisness Park
Building #4
Germantown, MD

Revisions

Site Plan
Existing Condition

Civil-001
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Legend

Courtyard	—	Roads	—
Electric	—	Sanatary Sewer	—
Fence	—	Storm Drain	—
Parking	—	Water Pipe/Struc.	—
Property Line	—		



Kristen Hlopick

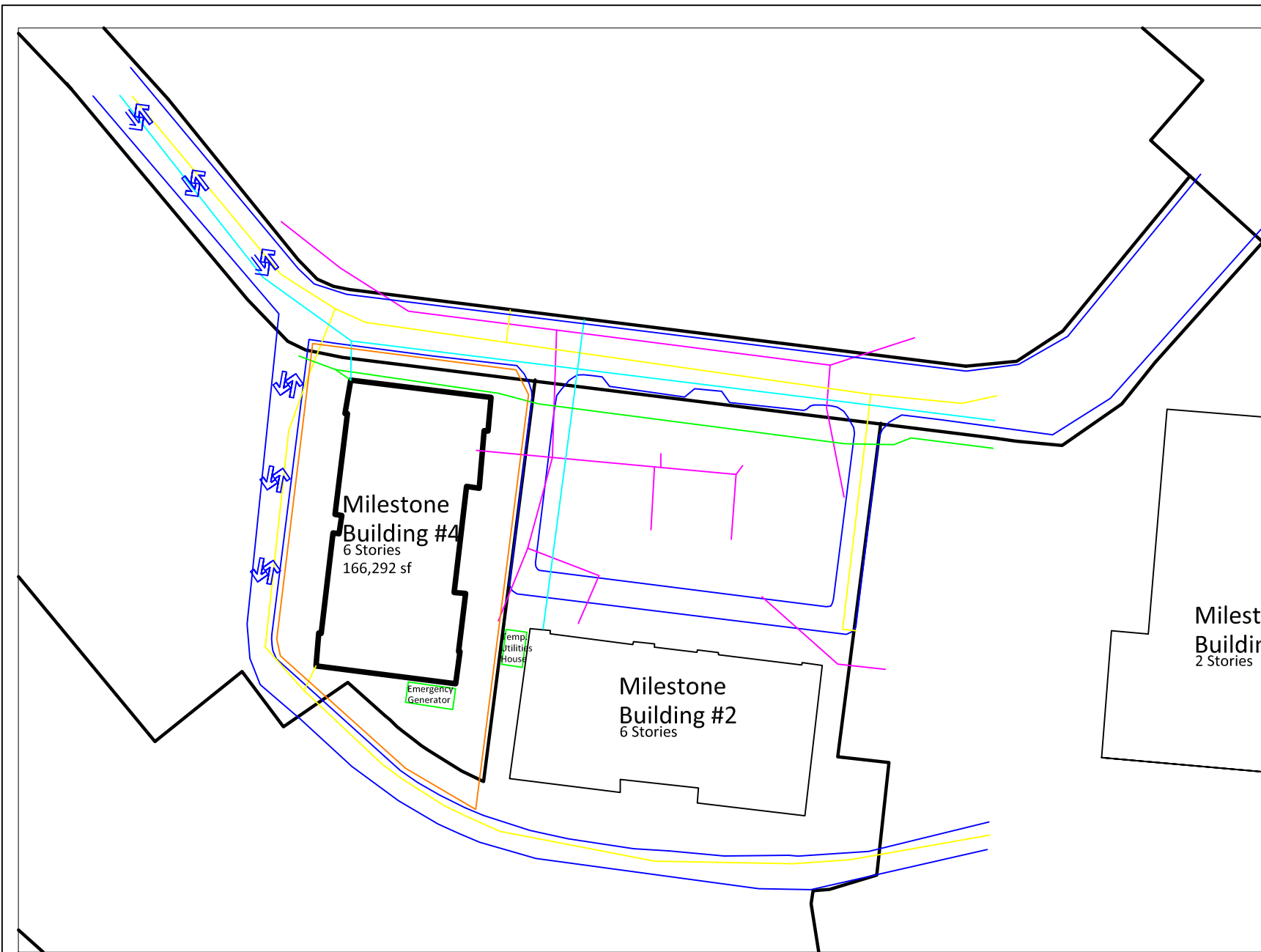
October 5, 2007

Milestone Buisness Park
Building #4
Germantown, MD

Revisions

Site Plan
Existing Condition

Civil-002
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Legend

Courtyard	—	Roads	—
Electric	—	Sanitary Sewer	—
Fence	—	Storm Drain	—
Parking	—	Water Pipe/Struc.	—
Property Line	—		





Appendix E
Contact Information



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Primary Team's Contact Cards

Owner
Kennedy Associates

Owner's Representative
Trammell Crow Company

Jennifer Keating-Dix
jdix2@trammellcrow.com

Architect
Morgan Gick McBeath and Assoc.

Michael Gick
mgick@morgangick.com

General Contractor
Buch Construction

Gary Slough
gslough@buchconstruction.com

Structural Engineer
Haynes Whaley and Assoc.

Dustin Wakefield
dustin.wakefield@hayneswhaley.com

Civil Engineer
VIKA Inc.

Randa Khouri
rkhour@vika.com

MEP Engineer
Brady Anglin Consulting Engineers

Richard Paillet
rpaillet@bradyanglin.com

Landscaping Engineer
Land Design, Inc.

Steve Jordan
sjordan@landdesign.com

Sustainability Consultant
Green Shape

Mark Chambers
202-544-1400

Inspection Agency
ECS Mid-Atlantic, LLC

Duane D. Schestag
301-668-4303

Commissioning Agent
Facility Dynamics Engineering

David Rush
410-290-0900

Subcontractor's Contact Cards

Site Work and Utilities
Driggs

Jim Blazek
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Concrete Forming
Form Services

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410-247-9500

Electrical
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Klon O. Row

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Painting
Mid-Atlantic Interiors

Sean Conto
sconto@midatlanticinteriors.com

Elevator
Otis Elevator

Ken Bernard
ken.bernard@otis.com



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Subcontractor's Contact Cards

Millwork
Patella Woodworking

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Prime Coatings

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Phil Ranneberger
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