

## **TECHNICAL ASSIGNMENT #2**COST AND METHODS ANALYSIS

#### TABLE OF CONTENTS

A.	Executive Summary	1
B.	Detailed Project Schedule	2 - 3
C.	Site Layout Planning: Steel / Concrete Phase	4
D.	Assemblies Estimate	5
E.	Detailed Structural Systems Estimate	6 - 7
F.	General Conditions Estimate	8
G.	Appendix A	9 - 18
H.	Appendix B	19 - 20
I.	Appendix C	21 - 22
J.	Appendix D	23 - 28
K.	Appendix E	29 - 32



#### A. EXECUTIVE SUMMARY

This technical assignment provides an introduction to the construction project management techniques for Medlar Field at Lubrano Park which is located in University Park, Pennsylvania. In this assignment, the project is analyzed in terms of a detailed project schedule, site layout planning, assemblies estimating, structural system estimate, and general conditions estimating all which affect the project's execution.

Medlar Field at Lubrano Park is a fast-track traditional project delivery system. The first item analyzed in this assignment is a detailed construction schedule for the project. The schedule shows construction beginning June 1, 2005 and substantial completion reached by May 31, 2006. There are also important milestone dates highlighted throughout the schedule that are important to achieving the project substantial completion on time. Next, the site layout plan is analyzed during the steel / concrete phase of the project. A 100 ton crawler crane will be used to erect steel with multiple mobilizations and a concrete pump is used to place concrete throughout the site. Medlar Field at Lubrano Park contains many added furnishings and equipment which were summarized in an assemblies estimate. Some of the items included are food service equipment, stadium seating, distributed television/sound system and the scoreboard/videoboards. Because Lubrano Park is a very intense structural system, an estimate of one of the more challenging structural bays was performed. This detailed estimate included different length steel columns, steel beams and joists, a full-height cast-in-place concrete retaining wall, and thickened slab areas at non-load bearing walls. Lastly, a detailed general conditions estimate was calculated for the total project length of 16 months. The general conditions estimate included staff costs with an integrated fee value.



#### **B. DETAILED PROJECT SCHEDULE**

Please see Appendix A for Detailed Project Schedule.

#### **Key Project Dates**

June 1, 2005 Begin On-Site Construction BP #1 Substantial Completion October 1, 2005 FRP Footings Area D July 20, 2005 Load Bearing Wall Construction October 1, 2005 Structural Steel Erection November 1, 2005 MEP Distribution System February 1, 2006 **Building Enclosure** February 20, 2006 Playing Field Substantial Completion April 20, 2006 **Project Substantial Completion** May 31, 2006 First Minor League Baseball Game June 2006

#### **Foundation Sequence**

Medlar Field at Lubrano Park is constructed on a conventional spread footing foundation system. Foundation construction began in area D and moved to area E and B. Concurrent construction of the field wall and area A foundation also occurred. Before foundation construction could begin, there was eight (8) weeks of mass excavation to the entire project site.

#### **Structural/Exterior Phases**

The current steel erection sequence is divided into seven (7) phases by areas of the stadium; the stadium is divided into areas A, B, C, D, and E which are arranged in a counter-clockwise direction around the building. Steel erection will begin in area D, and then move to area B, followed by area C, and then finish with area A and E. Steel erection will finish with the erection of the light towers and scoreboard structure. All of the steel will be erected with a Manitowoc 10000. This crane features a 100 ton lift capacity with a 250' fixed jib on heavy lift boom and a 41,000 pound maximum line pull. The concrete floor slab construction will follow the structural steel erection sequence. Each floor slab will be placed using a concrete pump with the needed hose length. The masonry sequence begins with construction of load bearing walls in areas B and E and then will follow with areas C and D. It is important to note that the electrical also has a vital role in the masonry wall construction, because his conduit must be concealed in the CMU walls. Once all load bearing walls are erected and the slabs-on-grade are poured, the mason will begin to install the CMU non-load bearing walls and brick veneer.



#### **B. DETAILED PROJECT SCHEDULE**

#### Finish Sequence

Finishes were sequenced through the building from area D to C and finishing in area B. The majority of finishes in area D are in the basement level while area B and C are at the suite level.

Currently, the HVAC rough-in will begin at the ends of the suite level and work towards the center (area C); however, since the main air handling units are located in area C, there is a good chance the schedule will be shifted to accommodate the HVAC mains to be run first directly out of the air handling units. After HVAC and other major overhead equipment are in place, the finishes will be phased in the following manner:

- Metal studs
- MEP Rough-In
- Ceiling Grid
- Electrical Fixtures and Diffusers
- Ceiling Tiles
- Insulation
- Gypsum Board
- Electrical/Telecommunications work
- Painting
- Carpeting and Other Floor Installations
- Furniture

#### Landscaping/Playing Field

Due to the project requirements set forth by the owner, the landscaping contract only allows for six (6) weeks for installation which is highly related to the weather since the start date is March 1, 2006. However, the project schedule allows for some extra time, if preferred by the contractor, to begin screeding and spreading topsoil throughout the site during the fall of 2005. If the weather permits, the schedule also allows for installation of project plantings in the parking lot islands during the fall of 2005. Similarly to the landscaping contractor, the playing field contractor also has a quick contract installation time. The playing field area will be fenced off on October 1, 2005 and no contractors other than the playing field contractor will be able to access the playing field with equipment. This limitation will allow for the playing field drainage system to be installed this fall without any disturbance.



### C. SITE LAYOUT PLANNING

Please see Appendix B for Detailed Site Layout Plan.

The detailed site plan considers the site conditions that will be visible during the structural steel erection and SOG / SOD phase of the project. Access to the site is available at places along Porter Road: one entrance is just south of the Bryce Jordan Center entrance and another entrance is located east of the Joe Paterno statue outside Beaver Stadium. Both of these entrances will be heavily used during this phase of the project for many steel and concrete material deliveries. The steel staging area is strategically located in the already paved (base-course only) north and south parking lots. This will allow the steel contractor to have a nice, clean laydown and handling area for his material. As describe in the steel sequencing narrative and noted on the site layout drawing, the crane will require several mobilizations around the perimeter of the structure. It is also important to note that the crane will have to remobilize for the erection of the scoreboard structure and each of the light towers. There is also a hazardous area located in the south parking lot for the storage of welding tanks, so they do not disturb travel areas on site. The placing of concrete slab-on-grade and slab-ondeck will mostly require the use of the concrete pump. The drawing notes several locations for the concrete pump which will be easily accessible for the concrete trucks to supply the "hopper" with concrete. Due to site limitations, there is not an area immediately near the structure for formwork laydown and a carpenter tool shed. The concrete contractor is required to keep his tools and materials in the storage/trailer compound on the east end of the site.



### **D. ASSEMBLIES ESTIMATE**

Please see Appendix C for Detailed Assemblies Estimate.

ASSEMBLIES I	ESTIMATE	
Summary We	orksheet	
Project Name:	Penn State Ballpark	
Construction Duration:	May 1, 2005 - August 31, 200	06 (16 Months)
Equipment Summary		Amount
SECURITY/VAULT		\$ 14,925
LAUNDRY/DRY CLEANING		\$ 24,612
THEATER/STAGE EQUIPMENT		\$ 352,300
LOADING DOCK EQUIPMENT		\$ 19,512
SOLID WASTE HANDLING EQUIPMENT		\$ 39,350
FOOD SERVICE EQUIPMENT		\$ 84,500
ATHLETIC/RECREATIONAL EQUIPMENT		\$ 681,985
SUBTOTAL EQUIPMENT		\$ 1,217,184
Furnishings Summary		Amount
FIXED MULTIPLE SEATING		\$ 2,856,000
FURNISHINGS		\$ 13,340
SUBTOTAL FURNISHINGS		\$ 2,869,340
GRAND TOTAL	\$	4,086,524

Medlar Field at Lubrano Park contains many added furnishings and equipment not usually contained in building. The assembly estimate total of \$4.1 million is 13.3% of the total project cost of \$30.8 million. The estimate is compared to the total project cost because many of the items noted in the assembly estimate take-off are part of the fixture, furnishing, & equipment budget which is not part of the \$23.8 million construction cost. Unfortunately, R.S. Means had a limited selection of associated equipment and furnishings. However, the estimate does contain the security teller windows at the ticket areas, some of the food service equipment, and a stadium seating cost. Also included is a lump sum costs for the distributed television/sound system and scoreboard and videoboard package.

#### E. DETAILED STRUCTURAL SYSTEMS ESTIMATE

Please see Appendix D for Detailed Structural System Estimate.

Column Lines 40-44 between C & D

DETAILED STRUC	TURAL SYSTEM	I ESTI	MATE
Sum	mary Worksheet		
Project Name:	Penn State Ballpark		
Construction Duration:	May 1, 2005 - August	t 31, 200	6 (16 Months)
Floor Summary			Amount
SHEET 1.1D		\$	57,404
SHEET 1.2D		\$	-
SHEET 2.2D		\$	60,302
SHEET 2.3D		\$	44,085
SHEET 2.4D		\$	28,014
GRAND TOTAL		\$	189,805

This area contains concrete SOG, SOD, a retaining wall, structural steel columns and joists along with the associated reinforcing materials. Please note that a masonry take-off was not performed because the masonry walls are non-load bearing for this area. This area was picked because it is the most varied area in the stadium. There is a basement level, main concourse level, and a suite level within this area which is not common throughout the structure. In addition, this area contained different length steel columns, steel beams and joists, a full-height cast-in-place concrete retaining wall, and thickened slab areas at non-load bearing walls.

#### Take-Off Notes

#### Assumptions

- SOG & SOD concrete is 4000psi.
- All SOG footings are earth formed.
- For the critiqued area, no control joints are needed.
- SOG, SOD, and Retaining Wall area placed using a concrete pump.
- Calculated cost for retaining wall formwork is not accurate. The actual system
  used was a Siemens climbing system which allows for quick, accurate control
  joints and vertical accuracy. Once this system is built for one area, it can easily
  be re-used for the rest of formation.
- Masonry in this area is non-load bearing and is not calculated for the structural system estimate.



## E. DETAILED STRUCTURAL SYSTEMS ESTIMATE

DETAILED STRU	CTURAL SYSTEM ES'	TIMAT	E
Division	n Summary Worksheet		
Project Name	: Penn State Ballpark		
Construction Duration	: May 1, 2005 - August 31, 2	2006 (16 N	(Ionths)
CONCRETE	Notes	Aı	nount
SHEET 1.1D		\$	52,194
SHEET 1.2D		\$	-
SHEET 2.2D		\$	2,226
SHEET 2.3D		\$	3,228
SHEET 2.4D		\$	-
SUB-TOTAL CONCRETE		\$	57,648
MACONINA	Notes		nount
MASONRY SHEET 1.1D	Notes	\$	Houlit
SHEET 1.1D		\$	
SHEET 1.2D SHEET 2.2D			-
SHEET 2.3D		\$	
		\$	-
SHEET 2.4D		\$	-
SUB-TOTAL MASONRY		\$	-
STEEL	Notes	Aı	nount
SHEET 1.1D	_	\$	-
SHEET 1.2D		\$	-
SHEET 2.2D		\$	56,488
SHEET 2.3D		\$	39,269
SHEET 2.4D		\$	28,014
SUB-TOTAL STEEL		\$	123,771
THERMAL & MOISTURE PRO	OTECTION		nount
SHEET 1.1D		\$	5,211
SHEET 1.2D		\$	-
SHEET 2.2D		\$	1,588
SHEET 2.3D		\$	1,588
SHEET 2.4D		\$	-
SUB-TOTAL THERMAL & MOIST	URE PROTECTION	\$	8,386
AP 137	TOTAL T		100.00
GRAND	TOTAL	\$	189,805

The total steel tonnage for this area is 35 tons. The total "tonnage" for the project is 635 tons which means this area accounts for 5.5% of the total "tonnage." The combined cost of the structural steel and concrete package is approximately \$4.2 million which is significantly more than the \$190,000 cost of the estimated area.



## **F. GENERAL CONDITIONS ESTIMATE**

Please see Appendix E for Detailed General Conditions Estimate.

Summary Worksheet	
Project Name: Penn State Ballpark	
Construction Duration: May 1, 2005 - August 31, 2	006 (16 Months)
Description	Amount
PERSONNEL	\$ 747,782
FIELD OFFICE SUPPORT	\$ 108,460
RELOCATION, TRAVEL & MEALS	\$ 64,800
TEMPORARY UTILITIES-TEMPORARY HEAT	\$ -
TEMPORARY FACILITIES, FENCES AND BARRICADES	\$ 1,050
WEATHER PROTECTION	\$ -
SAFETY AND SECURITY	\$ 1,750
CLEAN-UP	\$ 26,154
PROTECTION OF FINISHED AND EXISTING WORK	\$ -
TOOLS AND EQUIPMENT	\$ 5,000
MATERIAL HANDLING AND HOISTS	\$ -
CONSULTANT AND PROFESSIONAL SERVICES	\$ 10,000
PERMITS AND FEES	\$ -
INSURANCE AND BOND PREMIUMS	\$ 74,448

The detailed general conditions estimate was calculated using current industry unit/cost compiled by Barton Malow Company. The total cost for general conditions is \$1,039,443 which is approximately 4.2% of the total construction cost for the project. The staffing costs, which include the CM fee, reflect the staffing plan which was illustrated in Technical Assignment #1. As noted within the detailed general conditions estimate worksheet located in Appendix E, there are several items that might normally be supplied by the construction manager which have been bought through contract with various subcontractors.



## APPENDIX A

Medlar Field at Lubrano Park
Detailed Project Schedule

Act ID	Description	Orig Dur	Rem Dur			1 85 555		2005		055	00-	LNev	LBES		LEES		455	MAN	200					_
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1020320	10 Day D.E.P. Review Period	10	0			1		l ¦		l 1		l I	l I		l I	 		l I	l I		1	 		1
1020310	Submit for Demolition & Sitework Permits	0	0	+ <del>i</del>		<del>-</del>	<u>-</u>	i				<u>i</u>	<del>-</del>		i – –						i	<del>-</del>		÷.
1020350	Obtain Demo & Site Permit	1	0	+ †	-	<del> </del>	<u> </u>	<del> </del>	<del> </del>	¦		¦	<del> </del>		<del> </del>	<u> </u>		<del> </del>			{ ·	<del> </del>		+ -
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1020085	Start of On Site Construction	0	0			I	<b> </b>		 	 		l I	 		l I	 		l I	l I		1	 		I
1020080	Erosion & Sediment Control Procedures	10	0	† † - ·		<del>-</del>		<del>i</del>				<u> </u>	<del> </del>		i – –						i	<del> </del>		Ť-
1020090	Relocate Effluent, Water, & Gas Line	40	0	††		<u> </u>						<u>'</u>	<u> </u>		!			<u></u>			;	<u> </u>		†-
1020285	Storm & Bioretention Facilities	5	0	† † - ·		<del> </del>		1	⊢	— — - 		 	+		l — —	 		 			— — · 	<del> </del>		† - 
1020120	Excavation & Grading - N Parking Lot	30	0	† † - ·		<del>+</del>	<u>-</u>			—  —  -		I	+		1	 		 			1	+		† -
1020170	Mass Excavation & Grading	30	0	††		<del>-</del>		<u> </u>				i	<del>-</del>		i						j	<del>-</del>		÷-
1020180	Bldg Pad Ready	0	0	++	-   :	<del> </del>		<u> </u>		¦		<u> </u>	<u> </u>		!	<u> </u>					¦	<u> </u>		†-
1020220	Excavation & Grading - S Parking Lot	5	0	+ †	-	<del>+</del>	<u> </u>		⊢	— — - 		 	+ I		l — —	 		 	— — 		 	<del> </del>		<b>+</b> -
1020190	Water and Fire Main Service	10	0	+ +		<del>+</del>	F	+		— — - 			+		1	 					1	+		† -
1020155	Asphalt Paving (Base Only) - N Parking Lot	7	0	† † - ·		<del>-</del>		<del> </del>				i	<del>-</del>		i – –						i	<del>-</del>		÷-
1020255	Asphalt Paving (Base Only) - S Parking Lot	5	0	++	-   :	<del> </del>			<u>-</u>	— — <u>-</u>		<u> </u>	<del> </del>		!	<u> </u>		<u> </u>			¦	<u> </u>		1 -
1020340	BP 1 Substantial Completion	0	0	+ †		<del>+</del>	<b>⊢</b> – –	1	⊢	— - 		 	+			 		 			— — ·	<u> </u>		+ -
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3030175	UG PL & EL Beneath Seating Bowl Area A	4	0	† † - ·		<u> </u>		i i				<u>-</u>	<u> </u>		<u> </u>						<u> </u>	<u> </u>		Ť.
3030165	Prep & Pour Slab on Grade Area A	10	4	† †		<del>-</del>		:				 	+			I— — - I		 			1	<del>-</del>		† -
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3030140	FRP Dugout Area B	20	2	T †		<del>-</del>	i	:					†			i		i				i		Ť
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3020560	UG Utilities Beneath Main Concs Slab Area B	15	12	T T	-	T		] <u> </u>		ı —	<b>—</b>	i	T		i – –	 			i		1	r		T -
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8020220	Underdrain System Area C	3	0	- i		<u>i</u>	<u>.</u>		L	i		.i	<u> </u>			i	i					L		<u>i</u> _
1020560	New UG Utilities Area C	25	22	- +	.	<u> </u>	 		I ⊢	 		-1	 +		- 	 			1			  -		  -
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1030070	FRP Retaining Wall Area D	30	0	<u> </u>		<u> </u>	<u> </u>					i	I I		i	i			! !			! !		I I
1030030	FRP Retaining Wall/Foundations/Footings Area D	39	0	[		ī						1 -	T			[				;		i		ī -
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1040030	Load Bearing Masonry Service Level Area D	20	17	¦		I	I I		l I	l I		ı¦	I I		I	I I	ļ		l I			l I		I I
8150410	MEP Finishes Service Level & Dugout Lvl D	5	5	† †		<u> </u>			<u> </u>	i – – .		<u> </u>	<u> </u>		-i									i –
1040070	Masonry Chase Walls Service Level Area D	10	10			1			L I	'		i'	<u> </u>			<u></u>	:		'			L		1 -
1150190	In-Wall PL & EL Rough-In Service Level Area D	10	10	- +		+ 1	⊢		⊢	1 — — - I	-	-1   <sub>1</sub>	+		 	I	1		1			⊦ – – I		+ - I
1095110	Ceiling Grid Serv Lvl Area D	10	10	- <u>-</u>		Ţ			г – -	1		<u>–</u> –	T		¬	<u> </u>	!		1	<sub>!</sub>		г — —		Ţ -
1160320	Light Fixtures Serv Lvl Area D	15	15	- <del>†</del>		<del>-</del>		:	<u>-</u>	{·			<del>-</del>		-i		;		i			<del>-</del>		<del>-</del> -
1050040	Steel Joists & Metal Deck Service Lvl Area D	15	15	- +	-	<del> </del>			L I	!		·	<u> </u>		۱ – –		!		ı 	'		L I		ļ —
1150270	Fixtures/Grilles/Registers Serv Lvl Area D	10	10	+ +	-	+	H		⊢ – – ı	1		· [	+			<u> </u>	1		1			+		+ -
1099130	Finish Paint Serv Lvl Area D	15	15	<del> </del>	-	<del>i</del>				i		i-E	<del>.</del>			<u>-</u>	;		i					<del>-</del> -
1160330	EL/FP/Control Trim-Out Serv Lvl Area D	15	15		-	<del> </del>			<u>-</u>	¦		\- <u>-</u>	<u> </u>				¦		¦	¦		<del> </del>		<del> </del> -
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1099140	Acrylic Floor Topping/Ceramic Tile Serv Lvl D	5	5	- +	-	<del>'</del>			ı г – -	¦		¦	<del>-</del> -		-¦		¦		¦			- 		¦ -
1080115	Doors & Hardware Serv Lvl Area D		)   4	- <u>+</u>	-	<u> </u>			<u> </u>	!		¦ '	<u> </u>				!		!			<u> </u>		<u> </u>
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Data date 060CT05

Page number 2A
Project name Penn State Ball...

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1040130	Ext Masonry Serv>Suite Lev Piers/Walls Area D	20	20			i	I		I	i		I		1	I	i			1		i	i		Ī
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Run date 270CT05

Data date 060CT05

Page number 3A
Project name Penn State Ball...

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Run date 270CT05

Data date 060CT05

Page number 5A
Project name Penn State Ball...

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	4062210	Casework Suite Level Area C	20	20			<del> </del>			⊥	!		'	<u> </u>		ل ا	_			]		¦	<u> </u>		
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Run date 270CT05

Data date 060CT05

Page number 6A
Project name Penn State Ball...

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4150070	Plumbing Rough In Suite Level Area D	8	8	  - +		 	 		 	-	IJ.,	-	+	-	-  -	  -	<b>↓</b>	 	1		1	I +		
4040030	Exterior Masonry Suite Level Area D	15	15	ļ		<u> </u>			<u>i</u>		IJ.,	_!	Ţ.,		i		ļ	<u>.</u>				1		
4093010	Layout/Metal Studs Suite Level Area D	15	15	<u> </u>		<u> </u>	<u>.</u>		ı ∟		∐	_!			j		J	' '	]		!	<u> </u>		
4160070	OH/In-Wall Elec Rough In Suite Level Area D	15	15	I		l 4 – –	<u> </u>		I L	  -	Ш.	-1	<u>  </u>			  -	1	I I	I J		l .l. – –	1		
4150150	OH FP Rough In Suite Level Area D	5	5	İ		<u> </u>			i	į		i	Ī		i	į.	$\prod$		i			Ī		
4040070	Masonry Chase Walls Suite Level Area D	2	2	- +		T	I	1	l	-1	Ϊ- ΄	-	1		Ϊ, .	-	1	i	1			1		
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3040090	Set Picnic Concession Area E	5	5	i		i	i		i	i		i	i 🖪		i	i		i	i		i	i		
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3040110	Picnic Concession Interior Finishes Area E	10	10	- T		Ţ	Γ	1	Ι	7	1 - '	-,	T		ļ		1		]		1	T		
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5051040	Str Steel/Detail Light Tower Area B	3	3	1		I	I		I	I I		1	11		I	1		l I	I I		I .	I .		
5074010	Roofing - Low & High Roof Area B	25	25			ī		]	i -	i -	Π- ΄	-i	ī	<del>-</del> -	1	i -	T	i	1		i – –	ī		
5074140	Light Tower Elect Rough In Area B	5	5	+		† i		1	i	-1	1-	-1	† 0		1	- I	1	 	1			+		
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3030160	FRP Seating Bowl Area B	30	18	_		<u> </u>	<u> </u>		I L	<u> </u>		<b>=</b>   -	. <u>.</u>		<u> </u>	. i	l	! !	! !			1 1		
8028210	Dugout Railings & Fence Area B	5	5	1		1			I	1		1	I		1	0			1		1	I		
8099110	Painting - Dugout Area B	5	5	i				]	į	i	Π	-i	1		1	<u> </u>	T	i				Ī		
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8060120	Dugout Millwork/Benches Area B	5	5	T	.	Ţ		1	Γ	7	<b>1</b>  −	-1	T		ļ - ·		<b>-</b>		i		i – –	T		
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Data date 060CT05

Page number 7A

Project name Penn State Ball...

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3028110	Stadium Backstop	10	10	+ +		<del> </del>			<u> </u>			¦	<u> </u>			<u>-</u>	'		!		¦	<u> </u>		<del> </del> -
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8060220	Dugout Millwork/Benches Area D	5	5	+ +		<u> </u>			<u> </u>	-!		<u>-</u> -	<u>+</u>		-!	<u></u>	!				!	+		4 -
8028310	Dugout Railings & Fence Area D	5	5	<del> </del>		<del>-</del>	<u></u>		<u>-</u> -	-;		i	<del>-</del>		-i				i – –		i – –	<del>-</del>		<del>-</del> -
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8030385	Aluminum Bleacher Seating Area E	20	20	+ +		<del> </del>			<u> </u>	-¦		¦	<u> </u>			<u> </u>	'		¦		¦ :	<del> </del>		<del> </del> -
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8030380	Video Board Underground Conduit	10	10	+ +					<u>-</u> -	-i		i	+		-i	i	i		. – –		i – –	+		÷ -
8030400	Message Board Installation	5	5	+ +		<del> </del>	<u>-</u>		L -	-¦		¦		·	<del>-</del>	<u>-</u>			' '		¦	¦		¦ -
	Outfield Fence		<u> </u>	<u> </u>		<u> </u>			<u> </u>				<u> </u>			<u>-</u> -	¦		¦		!	<u> </u>		<del> </del> -
8028200		5	5	- i		<u>i</u>	<u>.</u>		<u>.</u>	-j		<u>   </u>	<u> </u>			'					i – – .	<u>i</u>		<u> </u>
8030360	FRP Outfield Fence Footings Area F	5	5			<del> </del>			 <del> </del>	<del> </del>		ļ	! <del>!</del>		<del> </del>				-			+		+-
3104011	FF & E Installation	20	I 0	-		I I	I I		I I	1		I I	I I		I I	I I	1		l I		I I	I I		I
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3165120	Aim/Test Stadium Lighting	10	10	- +		<u> </u>	<u> </u>		! + - ·	_		<u> </u>	+ – –			 			i i – –		! ! :	+		- -
3055610	Handrails	25	25	- <del>-</del>		<u> </u>			I T	-¦		<u>-</u> -	I T – –		- 	<u> </u>			l 1 – –		¦	 		  -
3104010	Signage & Graphics	30	30	ļ		<u> </u>			<u> </u>	<u> </u>		<u>-</u>	<u> </u>		<u> </u>	<u>-</u>	'				!	<u> </u>		<u> </u>
3099100	Paint Structure	34	34	ļ¦		<u> </u>	<u>'</u>		<u>.</u>			i	<u>'</u>		<u>'</u>	' 					! !	<u>'</u>		Ţ_
3126010	Stadium Seating	40	40			 	 		I ← – •	  -		I	l +		 	 			I I – –		 	 +		 + −
3150420	Landscaping	30	30	Li		<u>i</u>	<u>.</u>		i 	_i			i 		i 							<u> </u>		i
1034120	Aluminum Grandstand System Area D	20	20			<u> </u>			<u> </u>	<u>.</u>		<u> </u>				<u> </u>	'		!			<u> </u>		1
3051010	Steel Stairs All Areas	20	20			1			i — i			<u> </u>			۔ ا	ı			I J		I	1		i -
8115010	Scoreboard Installation	25	25	T :		<u> </u>		]		!	$\  - \ $	1			 !									ī
1034160	Aluminum Grandstand System Area F	20	20	T †		 i		]	·	-1	T	1	; =		 I	<u>-</u>	!		ı — — I		. – –	 I		1
3140100	Install Elevators - Stadium	30	30	T T		Ţ			L	-ı ·	t	i – –	T	i		<u> </u>			)   		ı — — ·	T		т - 1
3114010	Stadium Ready for Concessions Fit-out	0	0	† †		ī			ī - ·		tl	ļ	ī		<b>\</b>									<u> </u>
3160520	Sound System Installation	37	37	† † <i></i>		<u> </u>			L	_'		! I	т — — І		J				/ — — 		' ·	<u> </u>		1 -

Run date 270CT05

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Project name Penn State Ball...

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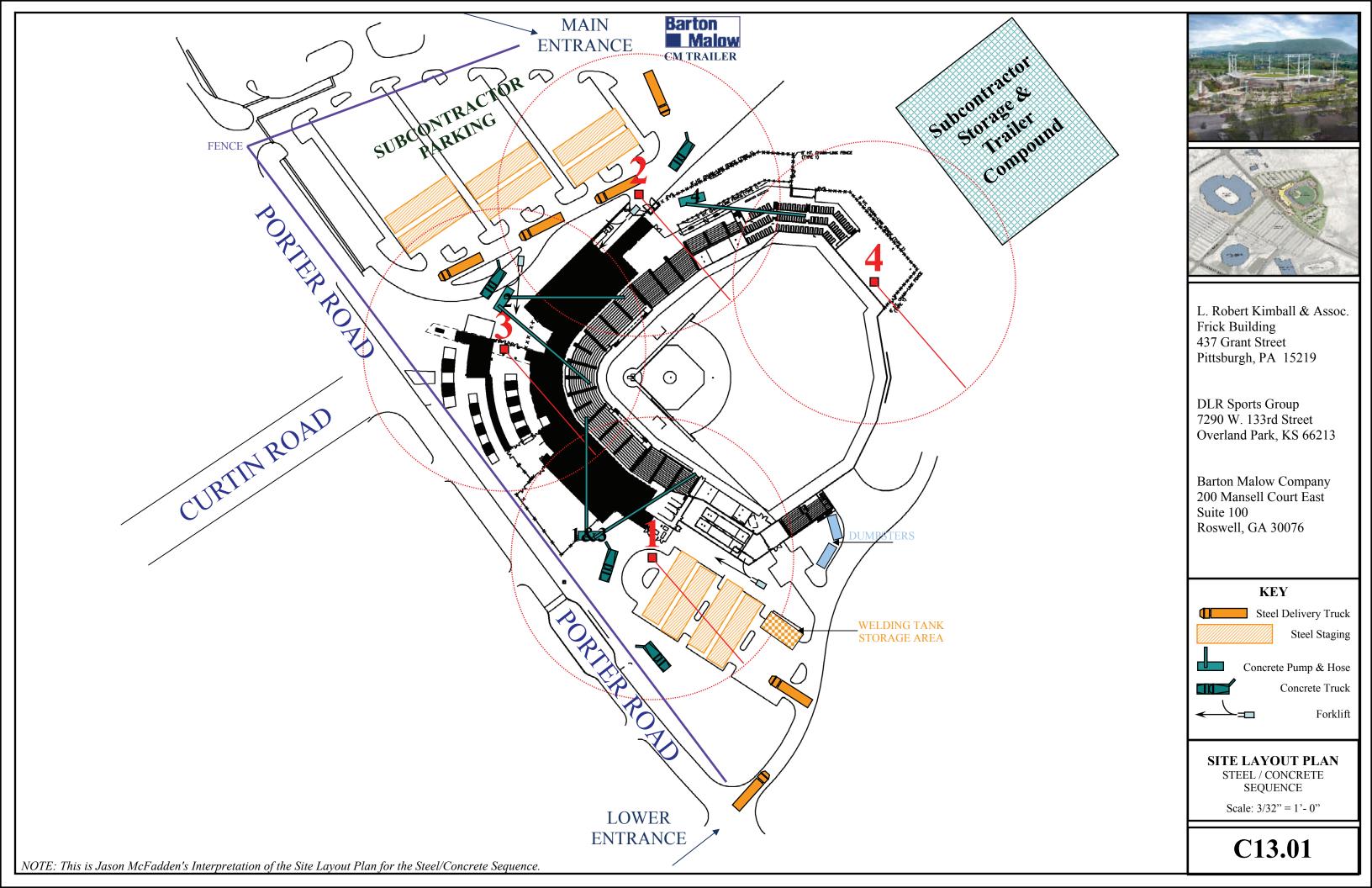
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3150410	Test & Balance Mech Systems	25	25	L i		<u> </u>		. <u>L</u> _	.i	Ш	<u>.</u>	' 		<u> </u>		_	' '	! !		' '	<u> </u>		<u>'</u> _
8114100	Field Wall Pads & Fence Pads	5	5	I				I	I		1	I I		I I				1		I .	I		I
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8020500	Field Cleared	0	0	Li		<u>i i</u> .		. <u>i</u> _	_i <b>♦</b> _	Ⅱ	i	<u>.</u>		<u>.</u>		i		!		i	i		i.
8020510	Install Field Drainage System	10	0	_ T		I – – –		L	_¦ <b>_</b>	<u> </u>	1 = =	T		]				1		I	T		T L
8020530	Install Infield Base/Root Zone/Subbase	15	15	!				Ī	1		!	Ī		i				!			Ī		Ī
8020520	Install Field Watering System	11	11	- +		† F		1	-	1 - 6	=	+		1		1					†		1
8020540	Install Warning Track/Cut-In Infield	10	10	т		1 – – F		. L _	-ı	1	1 -	T I		ן ר ו	ı 1 I	= - ¦	ı ı	ı – –		ı — —	T I		T I
8020550	Fine Grade Field	8	8	- <del>-</del>		i i-		- <del>-</del> -	-1	†	<u>-</u> -	<u> </u>		i		!		i			<u> </u>		Ī
8020560	Install Turf Grass/Sod	3	3			1		- <del>-</del> -	-;	†	;	†						í – –		¦ – –	†		1
8020570	Turf Grass Grow-In Period	21	21	- +		+ <del> </del>		- + -	-1	†  –  –	1	+ I		 	 	1		1 – – I		I — — I	+		+ 
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3160410	Start-up Bldg Automation/Controls Systems	15	15					 	į		1	İ		! [	_					! ! !	 		1 1 1
3160410 3160420	Start-up Bldg Automation/Controls Systems Electrical Testing & Inspections	15	15	- +		   			  - 		 	: +		 	<u> </u>	 	     	! ! – –		  - 	  -  - 		
3160420			<u> </u>	+				 	  -  -    -  -	 	 	     		 			  -   	     		   	    - 		<del></del> .
3160420	Electrical Testing & Inspections		<u> </u>	- +				 	 	 	   	     		 			   	     		   	 		·
3160420	Electrical Testing & Inspections		<u> </u>	- +				 	 	 	 			 			           			 	 		
3160420	Electrical Testing & Inspections		<u> </u>	- +			_	 			     	 						 	           		 		·
3160420	Electrical Testing & Inspections  T / CLOSEOUT	20	20	- +							 			'									! ! ! !
3160420 NCHLIS 9017560	Electrical Testing & Inspections  T / CLOSEOUT  Certificate of Occupancy - Stadium	0	20											                 				 				  	·
3160420 NCHLIS 9017560 9017599	Electrical Testing & Inspections  T / CLOSEOUT  Certificate of Occupancy - Stadium  Punchlists & Cleanup	0 45	0 45										·							   		  	·

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## APPENDIX B

Medlar Field at Lubrano Park
Detailed Site Layout Plan: Steel / Concrete Phase





## **APPENDIX C**

Medlar Field at Lubrano Park
Detailed Assembly Estimate

## ASSEMBLIES ESTIMATE

#### **Detailed Worksheet**

Project Name: Penn State Ballpark

Construction Duration: May 1, 2005 - August 31, 2006 (16 Months)

	EQUIPMENT				
SECURITY / VAULT	Notes	Qty	Unit	Price	Amount
E1010.110 Bullet Proof Teller Window	ticket windows	3	EA	\$4,375.00	\$ 13,125
E1010.110 Office Safe	4 hour rating	1	EA	\$1,800.00	\$ 1,800
SUB-TOTAL SECURITY/VAULT					\$ 14,925
LAUNDRY / DRY CLEANING	Notes	Qty	Unit	Price	Amount
E1010.610 Commercial Dryer	locker room area	4	EA	\$2,989.00	\$ 11,956
E1010.610 Commercial Washer	locker room area	4	EA	\$3,164.00	\$ 12,656
SUB-TOTAL LAUNDRY/DRY CLEANING					\$ 24,612
THEATER AND STAGE EQUIPMENT	Notes	Qty	Unit	Price	Amount
E1020.310 Electric Project Screen	media/all purpose room	1	EA	\$2,300.00	\$ 2,300
E1020.310 Sound System/Distributed TV		1	LS	\$350,000.00	\$ 350,000
SUB-TOTAL THEATER/STAGE EQUIPMENT					\$ 352,300
LOADING DOCK EQUIPMENT	Notes	Qty	Unit	Price	Amount
E1030.310 Dock Bumpers	rubber blocks	4	EA	\$65.50	\$ 262
E1030.310 Dock Levelers		2	EA	\$9,625.00	\$ 19,250
SUB-TOTAL LOADING DOCK EQUIPMENT					\$ 19,512
SOLID WASTE HANDLING EQUIP.	Notes	Qty	Unit	Price	Amount
E1090.210 Heavy Duty Compactor		2	EA	\$19,675.00	\$ 39,350
SUB-TOTAL SOLID WASTE HANDLING EQU	JIPMENT				\$ 39,350
FOOD SERVICE EQUIPMENT	Notes	Qty	Unit	Price	Amount
E1090.350 Broiler		2	EA	\$3,086.00	\$ 6,172
E1090.350 Semi-Automatic Dishwasher		2	EA	\$7,880.00	\$ 15,760
E1090.350 Food Warmer Counter		4	EA	\$665.00	\$ 2,660
E1090.350 Double Fryer		4	EA	\$1,802.00	\$ 7,208
E1090.350 Range Hood		2	EA	\$3,845.00	\$ 7,690
E1090.360 Walk-In Refrigerator (1)	prefabricated	350	SF	\$128.60	\$ 45,010
SUB-TOTAL FOOD SERVICE EQUIPMENT					\$ 84,500
ATHLETIC / RECREATIONAL EQUIP.	Notes	Qty	Unit	Price	Amount
E1090.810 Delux Weight Lifting Gym	training area	1	EA	\$16,225.00	\$ 16,225
E1090.810 Scoreboard/Videoboard		1	LS	\$650,000.00	\$ 650,000
E1090.350 Semi-Automatic Dishwasher		2	EA	\$7,880.00	\$ 15,760
SUB-TOTAL ATHLETIC/RECREATIONAL EC	QUIPMENT				\$ 681,985
EQUIPMENT TOTAL					\$ 1,217,184
	FURNISHING	S			
FIXED MULTIPLE SEATING	Notes	Qty	Unit	Price	Amount
E2010.510 Deluxe Seating	stadium seating	5250	EA	\$544.00	\$ 2,856,000
SUB-TOTAL FIXED MULTIPLE SEATING					\$ 2,856,000
FURNISHINGS	Notes	Qty	Unit	Price	Amount
E2020.210 Office Furniture Set (std.)	team offices / ticket area	12	EA	\$345.00	\$ 4,140
E2020.210 Office Furniture Set (deluxe)	team offices	4	EA	\$2,300.00	\$ 9,200
SUB-TOTAL FURNISHINGS					\$ 13,340
FURNISHINGS TOTAL					\$ 2,869,340
	GRAND TOTAL				\$ 4,086,524

Technical Assignment #2 Appendix C



## APPENDIX D

Medlar Field at Lubrano Park
Detailed Structural Estimate



# DETAILED STRUCTURAL SYSTEM ESTIMATE Sheet S1.1D

Project Name: Penn State Ballpark

Construction Duration: May 1, 2005 - August 31, 2006 (16 Months)

Construction Duration: May 1, 2005 - August 31, 2006 (16 Mont								
CONCI	RETE	Notes	Qty	Unit	Price		Amount	
03060	3/4" Aggregate for SOG	material & hauling	32.5	CY	\$31.10	\$	1,011	
03150	3/4" Anchor Bolts		32	EA	\$9.60	\$	307	
03210	#5 Reinforcing Steel	footing & wall rebar	553	LB	\$0.94	\$	520	
03210	#6 Reinforcing Steel	footing rebar	7,771	LB	\$0.94	\$	7,305	
03210	#8 Reinforcing Steel	footing rebar	5,014	LB	\$0.74	\$	3,710	
03220	WWF 6x6 W1.4xW1.4		24	CSF	\$70.50	\$	1,671	
03310	CIP Footers	material only	162	CY	\$84.00	\$	13,608	
03310	CIP Footers	labor & equipment	163	CY	\$17.70	\$	2,885	
03310	CIP SOG	material only	32.5	CY	\$72.50	\$	2,356	
03310	CIP SOG	labor & equipment	33.5	CY	\$28.00	\$	938	
03350	CIP SOG	finishing	33.5	CY	\$0.70	\$	23	
03310	CIP Retaining Wall	material only	68	CY	\$73.50	\$	4,998	
03110	CIP Retaining Wall	formwork	1632	SFCA	\$8.50	\$	13,872	
SUB-TO	TAL CONCRETE					\$	52,194	
MASO!	NRY	Notes	Qty	Unit	Price		Amount	
	**NOTE: CMU Walls are	non-loading bearing in this area and	d add no significa	ance to the struc	tural calculatio	n		
SUB-TO	TAL MASONRY					\$	-	
STEEL		Notes	Qty	Unit	Price		Amount	
	**]	NOTE: Steel Columns in this area a	are noted on shee	t S2.2D				
SUB-TO	TAL STEEL					\$	-	
THERN	MAL & MOISTURE PROT	ECTION	Qty	Unit	Price		Amount	
07130	Waterproofing	walls only	1632	SF	\$2.04	\$	3,329	
07210	Perimeter Insulation	continuous footing only @ C	144	SF	\$2.04	\$	294	
07260	Vapor Retarder	SOG only	126	SQ	\$12.60	\$	1,588	
SUB-TO	TAL THERMAL & MOISTURI	E PROTECTION				\$	5,211	
		GRAND TOTAL				\$	57,404	
		GRAND TOTAL				φ	37,404	

Technical Assignment #2 Appendix D



Dr. Michael Horman October 31, 2005

## DETAILED STRUCTURAL SYSTEM ESTIMATE

## Sheet S1.2D

Project Name: Penn State Ballpark

Construction Duration: May 1, 2005 - August 31, 2006 (16 Months)

	Construction Duration: May 1, 2005 - August 31, 2006 (16 Months)									
CONCRETE	Notes	Qty	Unit	Price	Amount					
SUB-TOTAL CONCRETE					\$ -					
MASONRY	Notes	Qty	Unit	Price	Amount					
SUB-TOTAL MASONRY					\$ -					
STEEL	Notes	Qty	Unit	Price	Amount					
SUB-TOTAL STEEL					\$ -					
THERMAL & MOISTURE PROT	ECTION	Qty	Unit	Price	Amount					
SUB-TOTAL THERMAL & MOISTURI	E PROTECTION				\$ -					
	GRAND TOTAL				<u>s</u> -					
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Technical Assignment #2 Appendix D

## DETAILED STRUCTURAL SYSTEM ESTIMATE

#### Sheet S2.2D

Project Name: Penn State Ballpark

		Construction Duration:	May 1, 2005	- August 31	, 2006 (16 N	Iontl	ıs)
CONC	RETE	Notes	Qty	Unit	Price	A	mount
03310	CIP SOD	material only	22	CY	\$72.50	\$	1,595
03310	CIP SOD	labor & equipment	22	CY	\$28.00	\$	616
03350	CIP SOD	finishing	22	CY	\$0.70	\$	15
	**NOTE: \$	SOD Forms are included in structura	l steel bent plate	calculation			
SUB-TO	TAL CONCRETE					\$	2,226
MASO:	NRY	Notes	Qty	Unit	Price	A	mount
	**NOTE: CMU Walls are no	on-loading bearing in this area and a	dd no significance	to the structur	ral calculation		
SUB-TO	TAL MASONRY					\$	-
STEEL	ı	Notes	Qty	Unit	Price	A	mount
05090	3/16" Fillet Weld	for structural steel joists only	15	LF	\$9.20	\$	138
05120	W12x22	structural beams	52	LF	\$29.00	\$	1,508
05120	W16x26	structural beams	22	LF	\$32.50	\$	715
05120	W21x55	structural beams	22	LF	\$67.75	\$	1,491
05120	W24x62	structural beams	64	LF	\$71.50	\$	4,576
05120	W14x43	structural columns	60	LF	\$51.50	\$	3,090
05120	W14X90	structural columns	172	LF	\$102.00	\$	17,544
05120	W14X132	structural columns	37	LF	\$145.00	\$	5,365
05120	L3" x 3" x 1/4"	structural steel angle	85.25	LF	\$34.50	\$	2,941
05120	L3" x 5" x 3/8"	structural steel bent plate	96	LF	\$42.50	\$	4,080
05210	18LH04	structural steel joists	523	LF	\$18.80	\$	9,832
05120	L1/4" x 1/4" x 1/8"	joist bracing (each direction)	146	LF	\$6.60	\$	964
05310	1-1/2" 22GA Composite Deck	structural steel deck	2067	SF	\$2.12	\$	4,382
SUB-TO	TAL STEEL					\$	56,488
THERN	MAL & MOISTURE PROTEG	CTION	Qty	Unit	Price	A	mount
07260	Vapor Retarder	SOG only	126	SQ	\$12.60	\$	1,588
SUB-TO	TAL THERMAL & MOISTURE F	PROTECTION				\$	1,588
		GRAND TOTAL				\$	60,302

Technical Assignment #2 Appendix D

## DETAILED STRUCTURAL SYSTEM ESTIMATE

## Sheet S2.3D

Project Name: Penn State Ballpark

		Construction Duration:	May 1, 2005	- August 31	, 2006 (16 N	Montl	ıs)
CONCRETE		Notes	Qty	Unit	Price	A	mount
03310 CIP SOD		material only	31.9	CY	\$72.50	\$	2,313
03310 CIP SOD		labor & equipment	31.9	CY	\$28.00	\$	893
03350 CIP SOD		finishing	31.9	CY	\$0.70	\$	22
	**NOTE: SO	DD Forms are included in struct	ural steel bent pla	ate calculation			
SUB-TOTAL CON	CRETE					\$	3,228
MASONRY		Notes	Qty	Unit	Price	A	mount
**NC	TE: CMU Walls are non-	loading bearing in this area and	d add no significa	ance to the struc	tural calculatio	n	
SUB-TOTAL MAS	ONRY					\$	-
STEEL		Notes	Qty	Unit	Price	A	mount
05090 3/4" Anch	or Bolts		186	EA	\$24.00	\$	4,464
05120 W12x16		structural beams	212.5	LF	\$23.00	\$	4,888
05120 W27x84		structural beams	128.25	LF	\$94.50	\$	12,120
05120 W30x90		structural beams	42.75	LF	\$100.00	\$	4,275
05120 W30x108		structural beams	63.75	LF	\$120.00	\$	7,650
05120 L3" x 5" x	3/8"	structural steel bent plate	73	LF	\$42.50	\$	3,103
05310 2" 20GA 0	Composite Deck	structural steel deck	2067	SF	\$3.50	\$	7,235
SUB-TOTAL STEE	EL					\$	39,269
THERMAL & N	MOISTURE PROTE	CTION	Qty	Unit	Price	A	mount
07260 Vapor Ret	arder	SOG only	126	SQ	\$12.60	\$	1,588
SUB-TOTAL THE	RMAL & MOISTURE I	PROTECTION				\$	1,588
		GRAND TOTAL				\$	44,085

Technical Assignment #2 Appendix D

## DETAILED STRUCTURAL SYSTEM ESTIMATE

## Sheet S2.4D

Project Name: Penn State Ballpark

Construction Duration: May 1, 2005 - August 31, 2006 (16 Months)

	Construction Duration. May 1, 2003 - August 31, 2000 (10 Months)									
CONC	RETE	Notes	Qty	Unit	Price	A	mount			
	**NOTE: C	oncrete is not calculated for are	a because this is	the roof area						
SUB-TO	TAL CONCRETE					\$	-			
MASO	NRY	Notes	Qty	Unit	Price	A	mount			
	**NOTE: CMU Walls are non-	loading bearing in this area and	d add no significa	ince to the struc	ctural calculation	on				
SUB-TO	TAL MASONRY					\$	-			
STEEL	,	Notes	Qty	Unit	Price	A	mount			
05090	3/4" Anchor Bolts		186	EA	\$24.00	\$	4,464			
05120	W8x31	structural beams	18	LF	\$37.50	\$	675			
05120	W16x31	structural beams	128.25	LF	\$38.50	\$	4,938			
05120	W18X35	structural beams	213.75	LF	\$44.00	\$	9,405			
05120	W24x62	structural beams	63.75	LF	\$71.50	\$	4,558			
05120	HSS 20" x 8" x 1/2"	structural steel bent plate	85.5	LF	\$38.50	\$	3,292			
05310	1-1/2" 20GA Roof Deck	structural steel deck	2067	SF	\$2.49	\$	5,147			
SUB-TO	TAL STEEL					\$	28,014			
THERN	MAL & MOISTURE PROTE	CTION	Qty	Unit	Price	A	mount			
	**NOTE: Roofing is not	calculated for area because roo	fing is not part of	f the structural	calculation					
SUB-TO	TAL THERMAL & MOISTURE I	PROTECTION				\$	-			
		GRAND TOTAL				\$	28,014			

Technical Assignment #2 Appendix D



## APPENDIX E

*Medlar Field at Lubrano Park*Detailed General Conditions Estimate



## GENERAL CONDITIONS / REIMBURSABLE ESTIMATE

#### **Detailed Worksheet**

Project Name: Penn State Ballpark

					MATERI	AL (	OR SUB
Code	Description	Notes	Qty	Unit	Price		Amount
PERSON	NEL		Weeks	Hr/Wk	Hrs.		
1020	Project Director	\$78.00/hr	69	8	554	\$	43,231
1021	Project Administrator		-	0	-	\$	-
1021	Senior Project Manager		-	0	-	\$	-
1022	Project Manager	\$49.00/hr	69	40	2,771	\$	135,789
1023	Project Engineer - A/S/C	\$28.00/hr	69	40	2,771	\$	77,594
1024	Project Superintendent	\$57.25/hr	69	40	2,771	\$	158,651
1024	Assistant Superintendent	\$47.00/hr	30	40	1,212	\$	56,983
1043	Field Accountant	\$32.00/hr	69	6	416	\$	13,302
1042	Secretary/Clerk	\$20.75/hr	69	40	2,771	\$	57,502
	SUB-TOTAL				13,267	\$	543,051
1601	Payroll Taxes and Insurance (PRTFB)	PTI Factor for PA		37.70%		\$	204,730
	Fee (100% of W-2)			100%		\$	543,051
SUB-TO	TAL-PERSONNEL					\$	747,782
FIELD C	DFFICE SUPPORT	Notes	Qty	Unit	Price		Amount
1501	Office Trailer Rental	2 - 12x60 trailers	16	MO	\$800.00	\$	12,800
1501	Office Space or Trailer Setup	Trailer Setup/removal	1	LS	\$8,000.00	\$	8,000
					*		
1501	Maintain Field Office		16	MO	\$150.00	\$	2,400
1501 1501	Maintain Field Office Security System		16 1	MO LS	\$150.00 \$500.00	\$	2,400 500
						l '	
1501	Security System	\$70.00 per month*3 persons	1	LS	\$500.00	\$	500
1501 1501	Security System Office Cleaning	\$70.00 per month*3 persons	1 16	LS MO	\$500.00 \$150.00	\$	500 2,400
1501 1501 1504	Security System Office Cleaning Radios - Nextel	\$70.00 per month*3 persons	1 16 16	LS MO MO	\$500.00 \$150.00 \$210.00	\$ \$ \$	500 2,400 3,360
1501 1501 1504 1508	Security System Office Cleaning Radios - Nextel Electric Usage - Trailers and Office	\$70.00 per month*3 persons	1 16 16 16	LS MO MO MO	\$500.00 \$150.00 \$210.00 \$300.00	\$ \$ \$ \$	500 2,400 3,360 4,800
1501 1501 1504 1508 1509	Security System Office Cleaning Radios - Nextel Electric Usage - Trailers and Office Water Usage - Trailers and Office	\$70.00 per month*3 persons	1 16 16 16 16	LS MO MO MO MO	\$500.00 \$150.00 \$210.00 \$300.00 \$150.00	\$ \$ \$ \$	500 2,400 3,360 4,800 2,400
1501 1501 1504 1508 1509 1524	Security System Office Cleaning Radios - Nextel Electric Usage - Trailers and Office Water Usage - Trailers and Office Telephone/Network Setup	\$70.00 per month*3 persons	1 16 16 16 16	LS MO MO MO MO LS	\$500.00 \$150.00 \$210.00 \$300.00 \$150.00 \$15,000.00	\$ \$ \$ \$ \$	500 2,400 3,360 4,800 2,400 15,000
1501 1501 1504 1508 1509 1524 1524 1602	Security System Office Cleaning Radios - Nextel Electric Usage - Trailers and Office Water Usage - Trailers and Office Telephone/Network Setup Telephone Monthly Costs Office Furniture/Furnishings Fax Machines/Supplies	\$70.00 per month*3 persons	1 16 16 16 16 1 16 16	LS MO MO MO MO LS MO MO LS	\$500.00 \$150.00 \$210.00 \$300.00 \$150.00 \$15,000.00	\$ \$ \$ \$ \$ \$	500 2,400 3,360 4,800 2,400 15,000 9,600 4,000
1501 1501 1504 1508 1509 1524 1524 1602	Security System Office Cleaning Radios - Nextel Electric Usage - Trailers and Office Water Usage - Trailers and Office Telephone/Network Setup Telephone Monthly Costs Office Furniture/Furnishings	\$70.00 per month*3 persons	1 16 16 16 16 1 1	LS MO MO MO MO LS MO	\$500.00 \$150.00 \$210.00 \$300.00 \$150.00 \$15,000.00 \$600.00 \$250.00	\$ \$ \$ \$ \$ \$ \$ \$	500 2,400 3,360 4,800 2,400 15,000 9,600
1501 1501 1504 1508 1509 1524 1524 1602	Security System Office Cleaning Radios - Nextel Electric Usage - Trailers and Office Water Usage - Trailers and Office Telephone/Network Setup Telephone Monthly Costs Office Furniture/Furnishings Fax Machines/Supplies	\$70.00 per month*3 persons	1 16 16 16 16 1 16 16	LS MO MO MO MO LS MO MO LS	\$500.00 \$150.00 \$210.00 \$300.00 \$150.00 \$15,000.00 \$600.00 \$250.00	\$ \$ \$ \$ \$ \$	500 2,400 3,360 4,800 2,400 15,000 9,600 4,000
1501 1501 1504 1508 1509 1524 1524 1602 1602	Security System Office Cleaning Radios - Nextel Electric Usage - Trailers and Office Water Usage - Trailers and Office Telephone/Network Setup Telephone Monthly Costs Office Furniture/Furnishings Fax Machines/Supplies Office and Miscellaneous Supplies Copier/Supplies Cameras/Film and Processing	\$70.00 per month*3 persons  Include aerial	1 16 16 16 16 1 16 16	LS MO MO MO MO LS MO MO LS MO	\$500.00 \$150.00 \$210.00 \$300.00 \$150.00 \$15,000.00 \$600.00 \$250.00 \$250.00	\$ \$ \$ \$ \$ \$ \$ \$	500 2,400 3,360 4,800 2,400 15,000 9,600 4,000
1501 1501 1504 1508 1509 1524 1524 1602 1603 1604	Security System Office Cleaning Radios - Nextel Electric Usage - Trailers and Office Water Usage - Trailers and Office Telephone/Network Setup Telephone Monthly Costs Office Furniture/Furnishings Fax Machines/Supplies Office and Miscellaneous Supplies Copier/Supplies		1 16 16 16 16 1 16 16 -	LS MO MO MO LS MO MO LS MO	\$500.00 \$150.00 \$210.00 \$300.00 \$150.00 \$15,000.00 \$600.00 \$250.00 \$250.00 \$150.00	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	500 2,400 3,360 4,800 2,400 15,000 9,600 4,000 - 4,000 2,400
1501 1501 1504 1508 1509 1524 1524 1602 1602 1603 1604 1607	Security System Office Cleaning Radios - Nextel Electric Usage - Trailers and Office Water Usage - Trailers and Office Telephone/Network Setup Telephone Monthly Costs Office Furniture/Furnishings Fax Machines/Supplies Office and Miscellaneous Supplies Copier/Supplies Cameras/Film and Processing	Include aerial	1 16 16 16 16 1 16 16 - 16 16	LS MO MO MO LS MO LS MO MO MO	\$500.00 \$150.00 \$210.00 \$300.00 \$150.00 \$15,000.00 \$600.00 \$250.00 \$250.00 \$150.00 \$300.00	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	500 2,400 3,360 4,800 2,400 15,000 9,600 4,000 2,400 3,000
1501 1501 1504 1508 1509 1524 1524 1602 1602 1603 1604 1607	Security System Office Cleaning Radios - Nextel Electric Usage - Trailers and Office Water Usage - Trailers and Office Telephone/Network Setup Telephone Monthly Costs Office Furniture/Furnishings Fax Machines/Supplies Office and Miscellaneous Supplies Copier/Supplies Cameras/Film and Processing Drawing Reproduction	Include aerial	1 16 16 16 16 1 16 16 - 16 16 10	LS MO MO MO LS MO MO LS MO MO Allow	\$500.00 \$150.00 \$210.00 \$300.00 \$150.00 \$15,000.00 \$600.00 \$250.00 \$200.00 \$300.00 \$300.00	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	500 2,400 3,360 4,800 2,400 15,000 4,000 - 4,000 2,400 3,000 20,000 5,000
1501 1501 1504 1508 1509 1524 1524 1602 1603 1604 1607 1608	Security System Office Cleaning Radios - Nextel Electric Usage - Trailers and Office Water Usage - Trailers and Office Telephone/Network Setup Telephone Monthly Costs Office Furniture/Furnishings Fax Machines/Supplies Office and Miscellaneous Supplies Copier/Supplies Cameras/Film and Processing Drawing Reproduction Computers/Printers	Include aerial	1 16 16 16 16 1 16 16 16 16 10 1	LS MO MO MO LS MO MO LS MO MO Allow	\$500.00 \$150.00 \$210.00 \$300.00 \$150.00 \$150.00 \$600.00 \$250.00 \$250.00 \$150.00 \$300.00 \$20,000.00 \$5,000	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	500 2,400 3,360 4,800 2,400 15,000 9,600 4,000 - 4,000 2,400 3,000 20,000

Technical Assignment #2 Appendix E

RELOCA	ATION, TRAVEL & MEALS	Notes	Qty	Unit	Price		Amount
1615	Local Travel-Field Personnel-Mileage		28	Trip	\$75.00	\$	2,100
1616	Out-of-Town Travel		32	Trip	\$750.00	\$	24,000
1616	Field Staff Housing		14	MO	\$2,000.00	\$	28,000
1617	Staff Relocation Expenses		1	LS	\$10,000.00	\$	10,000
1719	Business Meals/Working Lunches		14	MO	\$50.00	\$	700
SUB-TO	TAL RELOCATION, TRAVEL & MEALS						\$64,800
TEMPO:	RARY UTILITIES-TEMPORARY HEAT						
	**ALL TEMPORARY UTILITIES	PURCHASED FROM SUBCONT	RACTORS A	S PART OF	F BASE BID		
SUB-TO	TAL TEMPORARY UTILITIES-TEMPORA	RY HEAT					\$0
TEMPO	RARY FACILITIES, FENCES AND BARR	ICADES	Qty	Unit	Price		Amount
1632	Drinking Water		14	MO	\$75.00	\$	1,050
SUB-TO	TAL-TEMPORARY FACILITIES, FENCE	S AND BARRICADES				\$	1,050
WEATH	ER PROTECTION						
	**ALL WEATHER PROTECTION	N PURCHASED FROM SUBCONT	RACTORS A	S PART O	F BASE BID		
SUB-TO	TAL-WEATHER PROTECTION						\$0
SAFETY	AND SECURITY	Notes	Qty	Unit	Price		Amount
1606	Safety Incentives		1	LS	\$500.00	\$	500
1606	Extinguishers	Bought from Subcontractor	-	EA	\$100.00	\$	-
1606	First Aid Kit		1	LS	\$500.00	\$	500
1606	Hard Hats and Rain Gear	Including Body Harness	1	LS	\$500.00	\$	500
1606	Safety Signs		1	LS	\$250.00	\$	250
SUB-TO	TAL-SAFETY AND SECURITY						\$1,750
CLEAN-	UP	Notes	Qty	Unit	Price		Amount
1511	Clean-up Supervision	2 lab/16 hours per week	17	wk	\$480.00	\$	8,314
1511	Periodic Clean-up	Bought from Subcontractor	-	SF	\$0.13	\$	-
1512	Final Clean-up		107,000	SF	\$0.12	\$	12,840
1512	Final Glass Cleaning	Bought from Subcontractor	-	SF	\$0.50	\$	-
1513	Pick Up Truck / golf cart		1	LS	\$5,000.00	\$	5,000
1513	Dumpsters	Bought from Subcontractors	-	EA	\$275.00	\$	-
1513	Dump Fees with Dumpsters	Bought from Subcontractors	-	LS	\$0.00	\$	-
1513	Rubbish chutes-install/maintain/remove	Bought from Subcontractor	-	LS	\$4,000.00	\$	-
	Dump carts	Bought from Subcontractor	-	LS	\$2,000.00	\$	
	TAL-CLEAN-UP						\$26,154
PROTEC	CTION OF FINISHED AND EXISTING WO		Name v See See	10.5	DED D. 22		
CLID TO	**PROTECTION OF WORK AREAS IS RE		DNTRACTOR	AS OUTL	INED IN CONT	RAC	
	TAL-PROTECTION OF FINISHED AND E					T =	\$0
	AND EQUIPMENT	Notes	Qty	Unit	Price \$5,000,00	\$	Amount
1622	Small Tools		1	LS	\$5,000.00	\$	5,000
SOR-10	TAL-TOOLS AND EQUIPMENT						\$5,000

Technical Assignment #2 Appendix E

MATERIAL HANDLING AND HOISTS						
**ALL MATERIAL HANDLING/HO	ISTS PURCHASED FROM SUBCO	ONTRACTOR	S AS PAR	T OF BASE BIL	)	
SUB-TOTAL-MATERIAL HANDLING AND HOIS	TS					\$0
CONSULTANT AND PROFESSIONAL SERVICES		Qty	Unit	Price	A	mount
1638 Surveyors	Initial Building Layout	1	LS	\$10,000.00	\$	10,000
SUB-TOTAL-CONSULTANT AND PROFESSION	AL SERVICES					\$10,000
PERMITS AND FEES						
**ALL PERMITS AND FE	EES PURCHASED BY OWNER AN	ID/OR SUBC	ONTRACT	ORS		
SUB-TOTAL-PERMITS AND FEES						\$0
INSURANCE AND BOND PREMIUMS	Notes	Qty	Unit	Price	A	mount
1610 General/Umbrella Liability Ins.	3.96/1000 on \$15.7M	1	LS	\$74,448	\$	74,448
SUB-TOTAL-INSURANCE AND BOND PREMIUM	1S				\$	74,448

Technical Assignment #2 Appendix E