

Technical Assignment One

Ryan Korona

Construction Management - David Riley Ph. D.

Executive Summary

Technical Assignment One describes the basic construction management practices used on the New Indian Valley High School. The report contains brief descriptions, figures and tables pertaining to the building systems scope of work, project cost evaluations, site plans of existing conditions, local conditions, client information, project delivery methods and staffing concerns. Many characteristics of the project were discovered upon investigation and for instance, when comparing cost estimates from RS Means and D4Cost to the actual costs of the building, it was discovered that the RS Means estimate was substantially lower than the actual costs. D4 Cost estimating was more accurate due to its ability to look at more specific detail topics. Costs differences were mainly as a result the inability to account for special equipment and changing economic times. Through the creation of the site plan of existing conditions, the true constraints of the building site were made more visible, and will assist in highlighting the nature of workflow and contractor coordination and cooperation to complete the project on time and on budget.

Acting as construction manager, Reynolds Construction is based out of Harrisburg, Pennsylvania, roughly 60 miles from the site. Highly Experienced in educational buildings, Reynolds Construction comes with a successful track record. Experience and tending to owner expectations assures quality throughout the progression of construction.

LEED certification was not achieved, nor was a main area of concern during the building's design process, due in part to escalated costs. However, the building is equipped with *Ivany* walls, geothermal heating and cooling systems, and utilizes motion sensitive lighting to help conserve energy. The *Ivany* walls provide a value engineered alternative to cast-in-place concrete

The owners expectations are addressed as the report familiarizes one with the site and surrounding area. It provides background into how the project came to life, to where it is today, and will go in the future. Providing a quality facility that can keep up with today's ever changing educational programs, achievable on rural budget with Longevity/Integrity.

Information contained within the report provides a major focus for upcoming thesis research which will be directed towards the phasing and scheduling of the project.

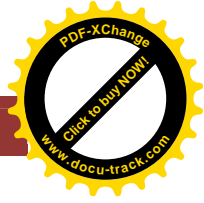
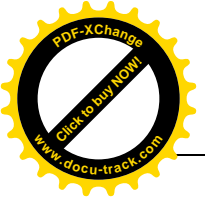
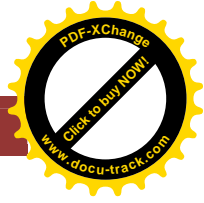
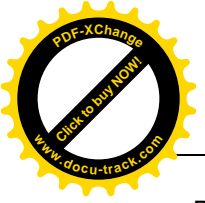


Table of Contents

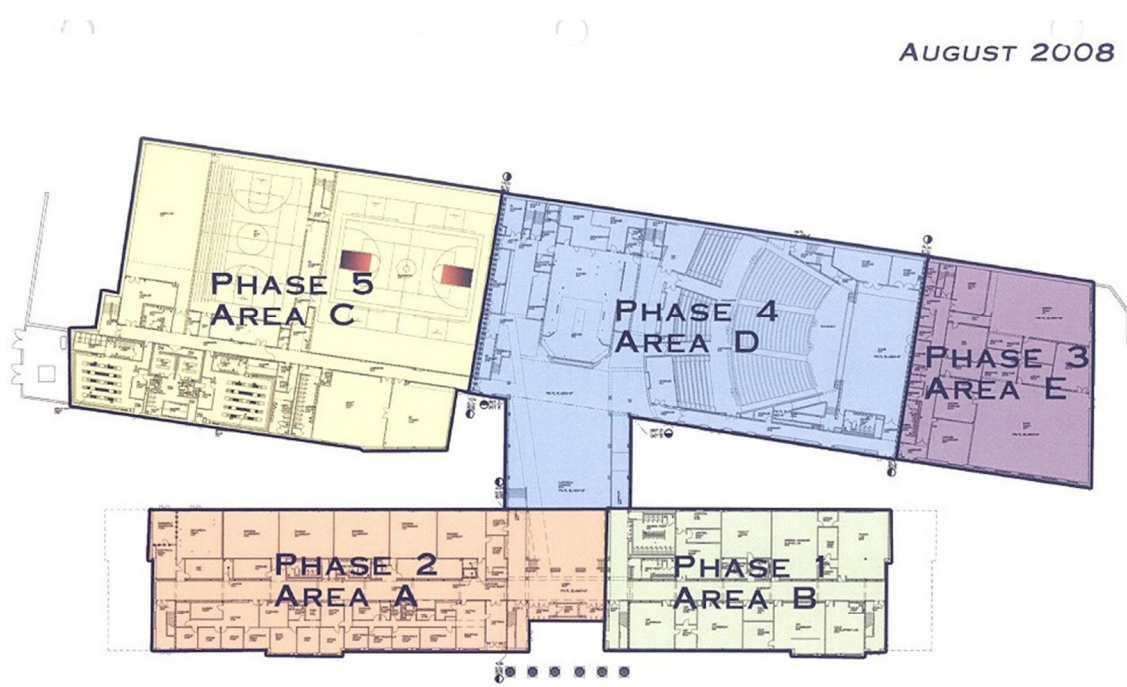
Executive Summary	2
Table of Contents	3
Project Schedule Summary	4
Building Systems Summary	6
Project Cost Evaluation	8
Site Plan of Existing Conditions	11
Local Conditions	12
Client Information	13
Project Delivery Method	14
Staffing Plan	15
Appendix A - Summary of Schedule	17
Appendix B - RS Means Cost References	19
Appendix C - D4 Costs Evaluation Report	22
Appendix D - Existing Conditions Site Plan	25



Project Schedule Summary

* Refer to Appendix A for Project Summary Schedule

The first breath of life of the New Indian Valley High School construction project was taken late in 2005. Then a kick-off meeting was held between the Mifflin County School Board along with representatives from Hayes-Large Architects and Reynolds Construction. Early 2006 saw planning and designing from architects, administrators, teachers and students. Investigation into surrounding areas that have recently built new schools combined with compiled design ideas let to the early stages of the decision process. After years in the preconstruction phase and school board reviews, bidding opened on July 1, 2008.



KEY:

DESIGNATES AREA BY PHASE AND PHASE COMPLETION DATES






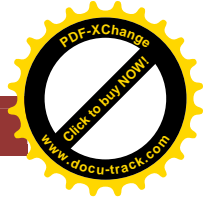
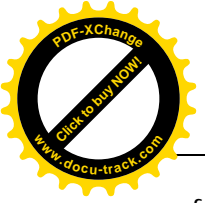
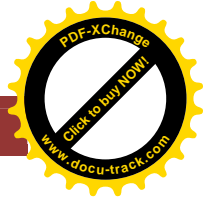
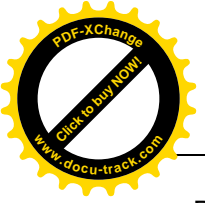
	PHASE 1 AREA B 9/14/10		PHASE 2 AREA A 11/16/10		PHASE 3 AREA E 2/22/10		PHASE 4 AREA D 11/02/10		PHASE 5 AREA C 11/23/10
---	------------------------------	---	-------------------------------	---	------------------------------	--	-------------------------------	---	-------------------------------

Fig. 1 Phasing Plans Provided by Reynolds Construction

The schedule addresses five different phases of construction. Phases A and B are the classroom areas of the building. These two together make up what is the front of the school. Phases C, D and E make up the rear wing of the building. Separated from the classrooms, are the gymnasium, wrestling room, fitness center, library, cafeteria, auditorium music suite and wood shops. Areas that cause either high volume of sound or disturbance themselves, or with traffic. The schedule illustrates the progression of work



from the foundations, structure, enclosure, MEP systems and building finishes for each building area. The summary schedule can be found in Appendix A.



Building Systems Summary

Building System Checklist		
Yes	No	Work Scope
	x	Demolition
x		Structural Steel
x		Cast-in-Place Concrete
x		Precast Concrete
x		Mechanical System
x		Electrical System
x		Masonry
x		Curtain Wall
x		Excavation Support

Table 1. Building System Checklist

Structural Steel

Structural steel rests upon 8" CMU walls throughout a majority of the building. Framing makes way for metal decking and concrete slabs. Steel grid like frames that hold the elevated slabs of the building are comprised with an array of different beams, most commonly W10x12 and W21x44. Primarily found in Areas A and B.

Truss and joist members carry the roof load of the new school with Truss "M" and "N" which span the entire width of Areas C, D and E, which ranges from 173' to 121' in width.



Fig. 2 Steel Framing

Cast-in-Place Concrete

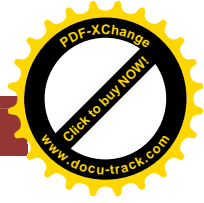
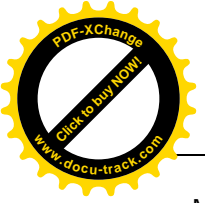
Reinforced cast-in-place concrete in the structure is found in footings, slab-on-grade(SOG) and elevated slabs. The sequencing of placement was separated into five phases [see Fig. 1 above]. The same plan is followed for SOG as elevated slabs. Elevated slabs are placed on composite metal decking; A bed of stone provides the base for SOG.



Precast Concrete

A system of precast concrete risers give shape to the new auditorium of the high school. Each precast riser is 4" thick. The risers provide a tunnel entry effect with two different levels of risers approaching the stage.

Fig. 3 Precast Auditorium Risers



Mechanical System

A pair of geothermal fields border the building to Southwest. The two fields are 135'x245' and 165'x135'. Combined the fields consist of over 200 wells approximately 500' deep. Causing the most unforeseen problems on site, the geothermal system provides an economic/sustainable method of heating and cooling. The HVAC systems are powered by five rooftop air handling units (AHU), each assigned to a phase or part of the building. The mechanical room is located on the first floor of "Area A". Units range from approximately 3,500 cpm to 20,000 cpm. Three water pumps supply the high school, but one is stand by and only two are required for the building load.

Electrical System

Inner distribution of power is done among nine different transformers located throughout the building. The building feeds are 480/277V, 3 phase, 4 wire feeds. A 3000kWa emergency generated provides a back-up power source for the building.

Masonry

Enclosing the school is a two toned face brick facade that covers the entire building excluding the glass curtain walls and roof. CMU walls and columns aid in the support in the structural steel framing throughout the building. *Ivanny* walls create the base of the rear of the structure through areas C, D and E. *Ivanny* walls are reinforced CMUs that are meant to imitate cast-in-place walls as a value engineering alternative.



Fig. 4 Face brick facade construction

Curtain Wall

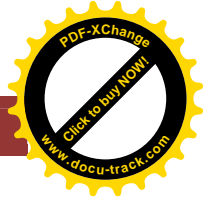
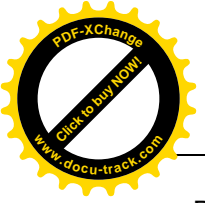
There are three glass curtain walls that provide light to the inner part of the school. The school, shaped like a giant letter "I", middle contains the large aluminum glass curtain wall. This area houses the cafeteria and extends to the floor above. The fitness center in area C also has an aluminum glass curtain wall that can look into the cafeteria.



Excavation Support

The extreme slope of the hill called for grading activities to level and prepare the site. The huge retaining wall spans the whole length of the site. The wall is drilled and tied back deep within the ridge the new site sites on. There is a cosmetic stone covering over the original wall with a safety fence guarding the top.

Fig. 5 Retaining Wall



Project Cost Evaluation

The actual construction costs of the build are based on a detailed cost estimate supplied by Reynolds Construction. The amounts may be altered and rounded for comparison purposes. All costs shown do not represent actual bid costs for the project.

Project Parameters

Square Footage: 251,095

Building Perimeter (ft): 2,532.3

Construction Costs

Actual: \$51,580,000

Per SF: \$205.42

Total Costs

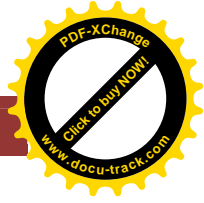
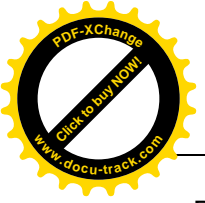
Actual: \$60,588,000

Per SF: \$241.29

Major Building Systems Cost Estimate

MAJOR BUILDING SYSTEMS		
System	Actual	Per SF
Electrical	\$5,084,613.23	\$20.10
Mechanical	\$9,046,322.00	\$36.03
Plumbing	\$1,999,304.00	\$7.96
Masonry	\$7,213,821.00	\$28.73
Concrete	\$2,449,238.00	\$9.75
Structural	\$4,652,897.00	\$18.53

Table 2. Major Building Systems Cost Estimate



RS Means Square Foot Estimate

* Refer to Appendix B for RS Means reference material

RS Means SF Estimate		
System	Unit Cost per SF	Cost
Electrical/ Mechanical	\$42.00	\$10,546,003.31
Equipment	\$6.68	\$1,677,316.72
Plumbing	\$9.05	\$2,272,412.62
Masonry	\$17.40	\$4,369,058.51
HVAC	\$14.15	\$3,552,998.73
Electrical	\$14.05	\$3,527,889.20
Total Project	\$132.00	\$33,144,581.83

Table 3. RS Means SF Cost Data

Assumptions: The project is closest, in regard to location factor, to State College, Pennsylvania
The Value for masonry was taken from Middle/Jr. high school take off

Location Factor

Applying location factors, our RS Means estimate is:

$\$33,144,581.83 * .932 = \$30,890,750$ Actual

$\$132 * .932 = \123.02 Per SF

D4 Cost Estimating

* Refer to Appendix C for D4 Cost Evaluation Data

Building Construction Cost (Case Study - state funded College of Pharmacy and Health Sciences, Detroit Michigan)

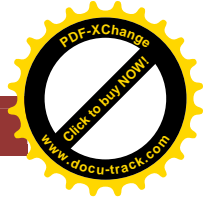
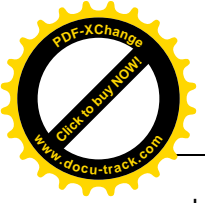
Actual: \$51,000,000

Per SF: \$185.00

Cost Comparison

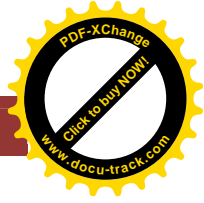
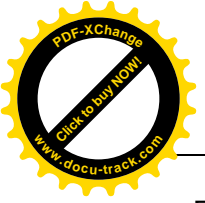
When comparing the three different cost estimates the cost of construction was chosen to compare against the other two. This value represents a better comparison to the RS Means and D4 Cost estimates due to their lacking of site work, contingencies and fees.

The RS Means data is 20 million lower than the actual building construction costs [approximately \$80 per SF]. Reasons for discrepancy include reference material utilized to focus on median unit costs. The



higher end of the unit cost spectrum placed SF estimates off by only \$40 per SF. RS Means take offs are primarily used as "ballpark" estimates. There is no way to take into account specialty equipment, high-end finishing etc. for such broad SF cost category [SCHOOLS Sr. High].

D4 Cost proved to be the more accurate estimator. The 51 million is less than million off the actual building construction costs, SF estimate only differing \$20 per SF. D4 Costs allows for more building specific comparing [i.e. number of stories, location, SF, systems, etc.] that allows the user to pick a building from a large database with several similar project sizes, types and costs. The difference between the two cost estimates is likely to do with the date of construction and the number of floors. The estimate for the case study was done in 1999 and has 6 stories instead of only 3.



Existing Conditions Site Plan

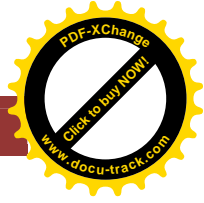
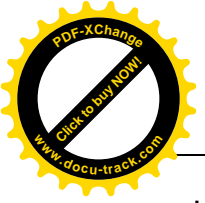
* Refer to Appendix D for Existing Conditions Site Plan

The site for the New Indian Valley High School is located north of the existing high school. It will stand on formerly vacant land owned majorly by the school district, only a small portion needed to be bought in the Northeast corner.



Fig. 6 Site Plan

The existing high school is to be renovated and turned into the Indian Valley Middle School to create a "campus" type feel to the schools. This also brings all after school activities to one centralized location, making travel easier and cheaper. Creating a campus setting was strived for in the design process. Six options were reduced to three, then finally to this one. Option one (building a new high school and renovating the current high school for middle school) was the final decision. This setting allows for the schools to correct overcrowding problems and facility issues, with the ability to grow and adapt to new educational programs.



LOCAL CONDITIONS

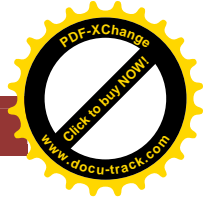
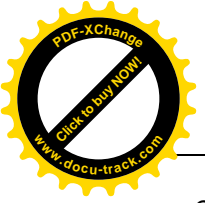
The New Indian Valley High School is located, north of the existing high school at 501 Sixth Street, Lewistown Pennsylvania, is approximately 35 miles south State College. The lot, owned by the Mifflin County School District is roughly 41 acres. This small rural town does not often build buildings of this magnitude, nor is there a real precedence to follow. The construction site is immediately surrounded by quiet country roads, positioned north and west of busier roads, being busiest hours of school days/operation. The construction site shown below and surrounding rural areas leave adequate room for construction parking with little to no traffic on the roads during most of the day. The site is tucked back in behind any major road ways. Construction traffic caused by the site is a greater concern.



Fig. 7 Aerial View of site 10-26-08

The borehole data results reported that the first 68' feet were that of clay or gravel. The next 4' were shale followed by 46' of limestone. The bore produced water at 5 gpm at 125'.

Joe Krentzman and Sons Inc. is a local recycling facility that is able to be utilized and local land owners allow clean fill dumping on private property for a fee.



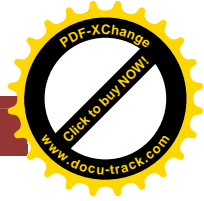
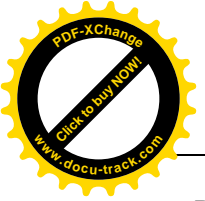
CLIENT INFORMATION

Indian Valley High School is one of two public high schools in Mifflin County, Pennsylvania, in the Mifflin County School District. The decision to build a new high school has been in deep thought of the minds of school board members since 1999, when the first feasibility studies were conducted for schools within the district. The Mifflin County School District consists of two high schools, three middle schools and eight elementary schools today, along with being a part of the Mifflin-Juniata Vocational Career and Technology Center. In 1999 however, the school district consisted of more elementary schools; Seventh Ward and Derry Elementary Schools. These buildings were addressed first. A second feasibility study was completed as an update in February 2004. This time the study was directly geared at addressing the Indian Valley High and Middle Schools. The Indian Valley Middle School was constructed in 1952 with an addition in 1962. The building is approximately 96,000 square feet. The Pennsylvania Department of Education (PDE) Full Time Equivalent (FTE) capacity for the building is 739, in 2004 when the study was conducted, was found to be 810. The high school, old but not as in as bad condition, also over crowded needed, to address serious concerns. Doors not being ADA compliant, single pain windows and cracked brick facades were only the beginning of the buildings' physical problems. Indoors equipment was failing after forty years of use. The schools were ill equipped structurally and physically, and let no room for growth to accommodate the changing educational programs.

Mifflin County is a rural/Amish county consisting of roughly 45,000 people. The decision to build a high school is a major decision for the small community making cost and quality driving factors. Indian Valley High School, formerly Chief Logan Area (current site of Indian Valley High School) and Kishacoquillas Valley High Schools (current site of Indian Valley Middle School)e, until the two high schools merged into the Indian Valley in 1988. Indian Valley High School has never had its own NEW high school so a quality product must be delivered.

The New Indian Valley High School construction site is located on the hill just north of the current high school. Completing the project timely is expected due to the heavier than normal traffic, along with the construction site periodically taking over athletic fields. Provisions have been taken to address such matters, however, failing behind schedule is not an option.

As any construction process, all parties involved are committed to designing, constructing and maintaining a safe facility. All necessary codes and regulations have been followed to help ensure the quality and safety of the project, and all within its environment.



Project Delivery Method

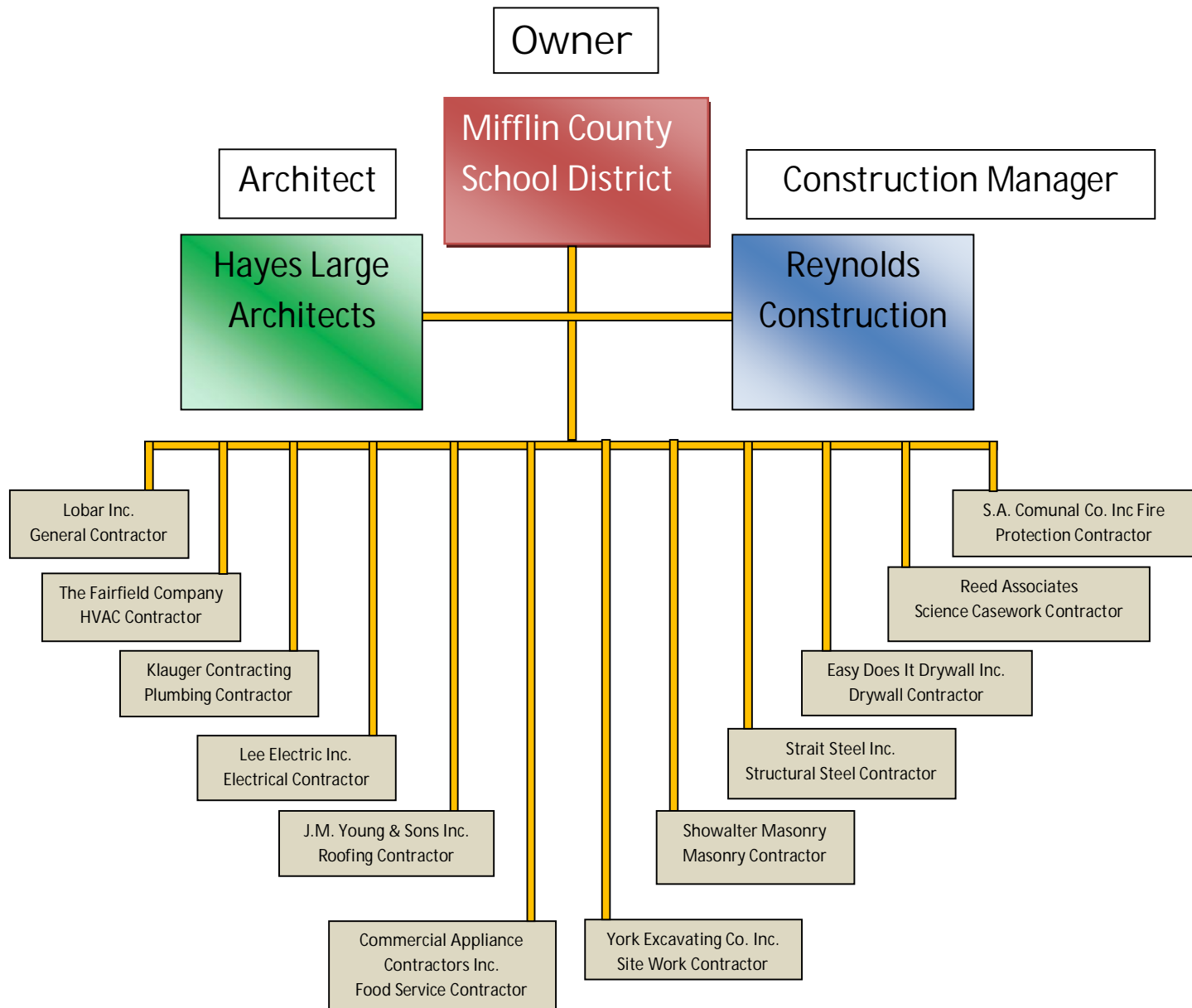
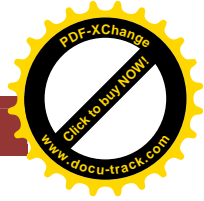
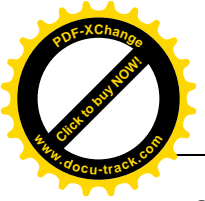


Fig. 8 Project Delivery Method Organizational Chart

The New Indian Valley High School project utilizes a *Design-Bid-Build* project delivery method with a construction manager. The owner holds industry standard AIA contracts for the architect, construction manager and all contractors [AIA B141 CMA, AIA B801 CMA and AIA A101 respectively]. This is a typical project delivery method for state funded school projects. A construction manager, provides a party with knowledge of the process at hand, directly to the owner.



Staffing Plan

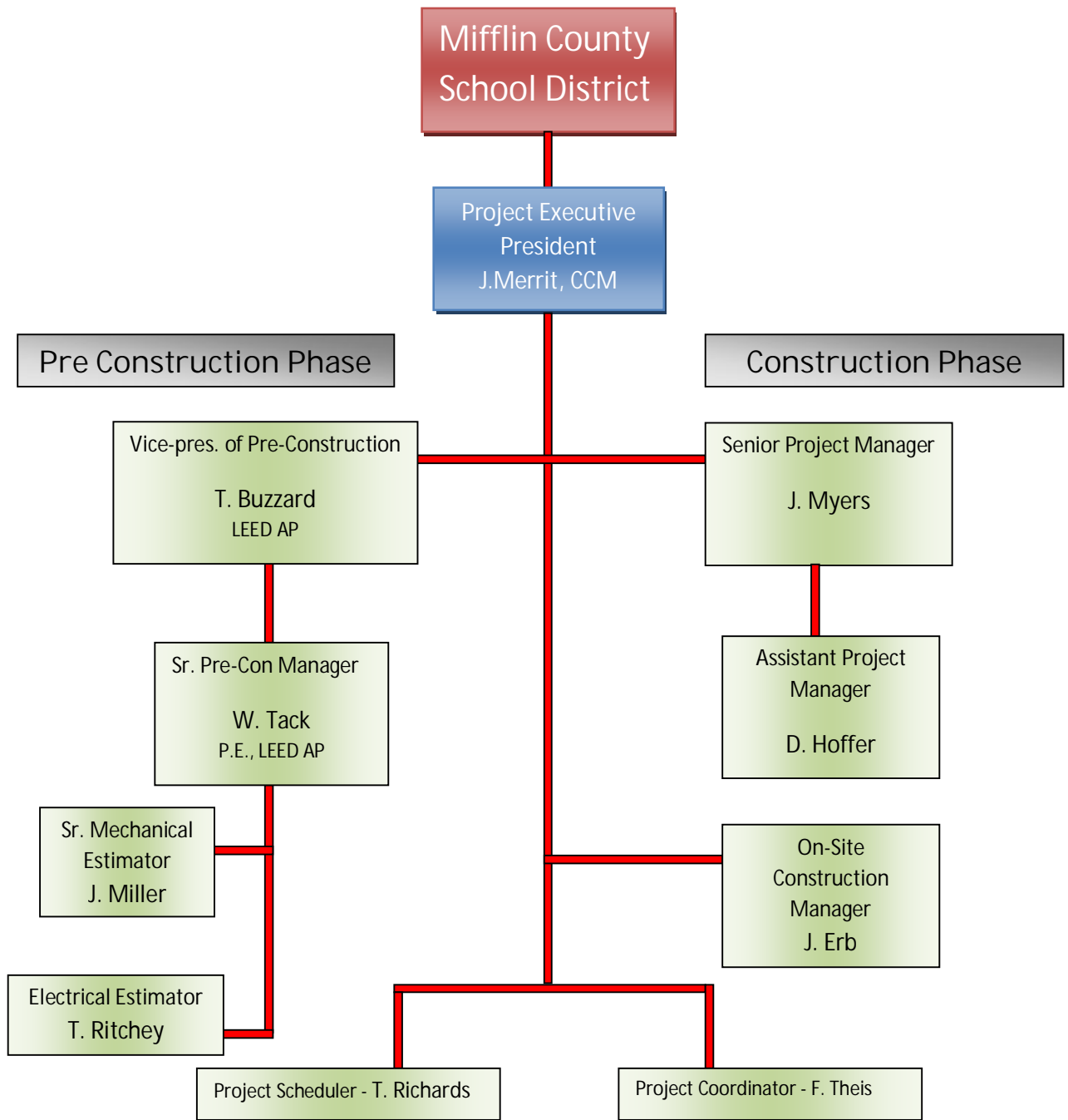
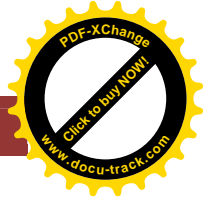
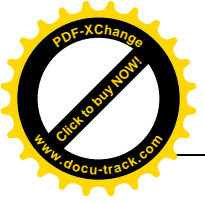
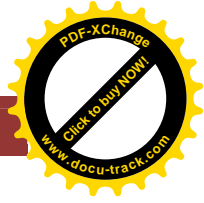
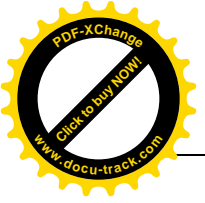


Fig. 9 Staffing Plan - Provided Reynolds Construction

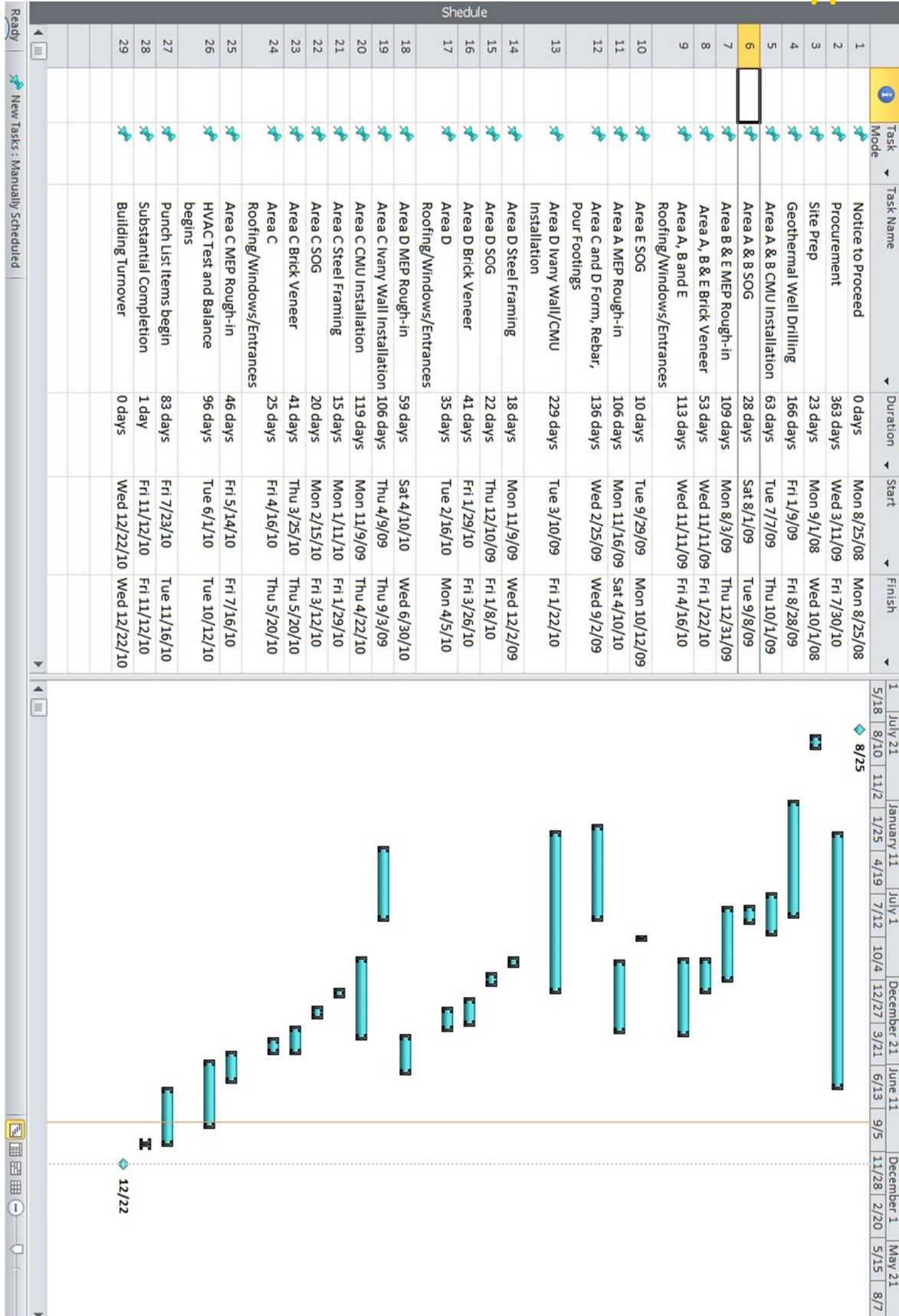
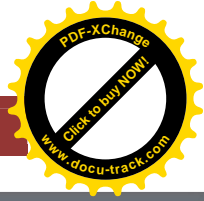
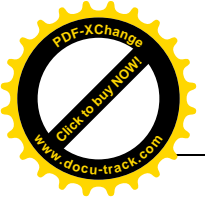
Reynolds Construction staffs their projects based on availability, experience and need of the particular project. Project executives and senior project managers typically will oversee several projects, where the

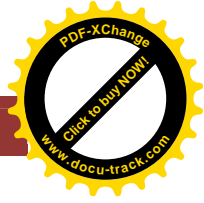
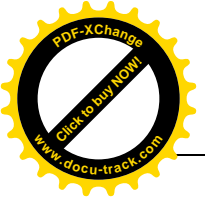


assistant project manager fills in during their absence. On-site construction managers are the day-to-day overseers of projects.

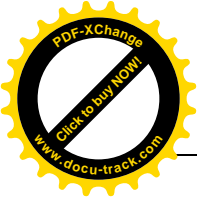


Appendix A - Project Summary Schedule

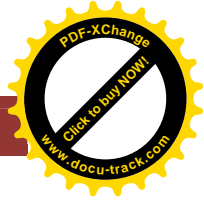
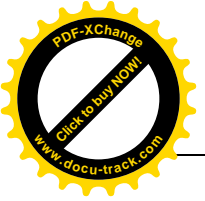




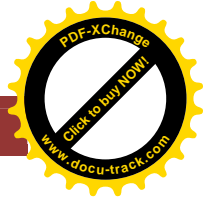
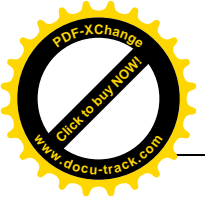
Appendix B - RS Means Cost References



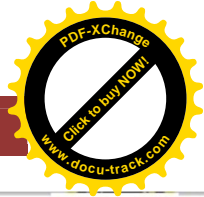
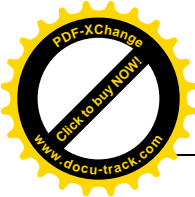
50 17 Square Foot Costs									
50 17 00 S.F. Costs		UNIT	UNIT COSTS			% OF TOTAL			
			1/4	MEDIAN	3/4	1/4	MEDIAN	3/4	
74	0010 SCHOOLS Elementary	S.F.	99.50	123	152				74
	0020 Total project costs	C.F.	6.60	8.40	10.90				
	0500 Masonry	S.F.	9	15.50	23	5.80%	11%	14.95%	
	1800 Equipment		2.75	4.68	8.65	1.89%	3.52%	4.71%	
	2720 Plumbing		5.80	8.15	10.90	5.70%	7.15%	9.35%	
	2730 Heating, ventilating, air conditioning		8.65	13.80	19.25	8.15%	10.60%	14.90%	
	2900 Electrical		9.45	12.50	15.75	8.40%	10.05%	11.70%	
	3100 Total: Mechanical & Electrical		33.50	42.50	52	25%	27.50%	30%	
	9000 Per pupil, total cost	Ea.	11,500	17,100	49,500				
	9500 Total: Mechanical & Electrical	*	3,250	4,125	14,300				
76	0010 SCHOOLS Junior High & Middle	S.F.	104	127	155				76
	0020 Total project costs	C.F.	6.60	8.50	9.55				
	0500 Masonry	S.F.	13.25	17.40	20.50	3.60%	11.60%	14.35%	
	1800 Equipment		3.31	5.35	8.05	1.79%	3.09%	4.36%	
	2720 Plumbing		6.05	7.45	9.25	3.30%	6.80%	7.25%	
	2770 Heating, ventilating, air conditioning		12.05	14.65	26	8.90%	11.05%	14.20%	
	2900 Electrical		10.15	12.25	15.80	7.90%	9.35%	10.50%	
	3100 Total: Mechanical & Electrical		33	42.50	52.50	23.50%	27%	29.50%	
	9000 Per pupil, total cost	Ea.	13,100	17,200	23,200				
78	0010 SCHOOLS Senior High	S.F.	107	132	165				78
	0020 Total project costs	C.F.	6.50	9.60	15.40				
	1800 Equipment	S.F.	2.83	6.65	9.40	1.86%	2.91%	4.30%	
	2720 Plumbing		6.05	9.05	16.60	3.60%	6.97%	8.37%	
	2770 Heating, ventilating, air conditioning		12.35	14.15	27	8.95%	11.65%	15%	
	2900 Electrical		10.85	14.05	20.50	8.65%	10.11%	12.35%	
	3100 Total: Mechanical & Electrical		36	42	70.50	21.50%	26.5%	29%	
	9000 Per pupil, total cost	Ea.	10,200	20,700	25,900				
80	0010 SCHOOLS Vocational	S.F.	87.50	127	157				80
	0020 Total project costs	C.F.	5.40	7.80	10.75				
	0500 Masonry	S.F.	5.10	12.65	19.35	3.53%	6.70%	10.95%	
	1800 Equipment		2.73	6.80	9.45	1.24%	3.10%	4.25%	
	2720 Plumbing		5.60	8.30	12.25	5.40%	6.90%	8.55%	
	2770 Heating, ventilating, air conditioning		7.80	14.55	24.50	8.60%	11.90%	14.65%	
	2900 Electrical		9.10	11.90	16.35	8.45%	10.95%	13.20%	
	3100 Total: Mechanical & Electrical		31.50	35	60	23.50%	27.50%	31%	
	9000 Per pupil, total cost	Ea.	12,200	32,500	48,500				
83	0010 SPORTS ARENAS	S.F.	76.50	102	157				83
	0020 Total project costs	C.F.	4.14	7.40	9.55				
	2720 Plumbing	S.F.	4.42	6.70	14.15	4.35%	6.39%	9.40%	
	2770 Heating, ventilating, air conditioning		9.50	11.25	15.65	8.80%	10.29%	13.55%	
	2900 Electrical		7.95	10.80	13.95	6.60%	9.99%	12.25%	
	3100 Total: Mechanical & Electrical		19.75	34.50	45.50	21.50%	25%	27.50%	
85	0010 SUPERMARKETS	S.F.	70.50	81.50	95.50				85
	0020 Total project costs	C.F.	3.92	4.74	7.20				
	2720 Plumbing	S.F.	3.93	4.96	5.75	5.40%	6%	7.45%	
	2770 Heating, ventilating, air conditioning		5.80	7.70	9.40	8.60%	8.65%	9.60%	
	2900 Electrical		8.80	10.15	12	10.40%	12.45%	13.60%	
	3100 Total: Mechanical & Electrical		22.50	24.50	32	20.50%	26.50%	31%	
86	0010 SWIMMING POOLS	S.F.	114	191	405				86
	0020 Total project costs	C.F.	9.15	11.40	12.45				
	2720 Plumbing	S.F.	10.55	12.05	16.30	4.80%	9.70%	20.50%	
	2900 Electrical		8.55	13.90	20	5.75%	6.40%	7.60%	



586	Dickinson	101.3	57.7	82.0	189	Doylestown	94.8	122.6	107.1
587	Minot	101.5	64.6	85.2	190-191	Philadelphia	100.3	134.2	115.3
588	Williston	99.6	57.7	81.1	193	Westchester	96.4	127.0	109.9
					194	Norristown	95.4	132.6	111.8
					195-196	Reading	97.9	101.5	99.5
OHIO									
430-432	Columbus	96.9	89.8	93.7	PUERTO RICO				
433	Marion	92.9	80.6	87.5	009	San Juan	121.2	24.5	78.5
434-436	Toledo	97.1	97.1	97.1					
437-438	Zanesville	93.3	80.0	87.5	RHODE ISLAND				
439	Steubenville	94.9	89.6	92.6	028	Newport	99.0	112.8	105.1
440	Lorain	97.7	91.5	95.0	029	Providence	100.2	112.8	105.8
441	Cleveland	98.0	100.2	99.0					
442-443	Akron	98.7	91.9	95.7	SOUTH CAROLINA				
444-445	Youngstown	98.1	89.6	94.3	290-292	Columbia	98.3	51.2	77.5
446-447	Canton	98.2	83.7	91.8	293	Spartanburg	96.5	50.8	76.3
448-449	Mansfield	94.9	87.1	91.5	294	Charleston	98.1	59.7	81.2
450	Hamilton	94.6	83.6	89.7	295	Florence	96.3	51.2	76.4
451-452	Cincinnati	94.9	86.4	91.1	296	Greenville	96.3	50.8	76.2
453-454	Dayton	94.7	82.9	89.5	297	Rock Hill	95.6	48.9	74.9
455	Springfield	94.6	84.3	90.1	298	Aiken	96.5	72.0	85.7
456	Chillicothe	93.1	89.1	91.3	299	Beaufort	97.3	44.1	73.8
457	Athens	95.6	78.4	88.0					
458	Lima	96.0	83.3	90.4					
					SOUTH DAKOTA				
OKLAHOMA					570-571	Sioux Falls	99.8	57.8	81.2
730-731	Oklahoma City	98.6	61.7	82.3	572	Watertown	98.0	53.1	78.2
734	Ardmore	95.1	61.2	80.2	573	Mitchell	96.8	53.0	77.4
735	Lawton	97.9	61.7	81.9	574	Aberdeen	100.0	54.0	79.7
736	Clinton	96.6	59.8	80.3	575	Pierre	99.3	54.2	79.4
737	Enid	97.7	59.8	80.9	576	Mobridge	97.5	53.2	77.9
738	Woodward	95.3	59.9	79.6	577	Rapid City	99.8	54.2	79.7
739	Guymon	96.4	30.8	67.4					
740-741	Tulsa	97.7	54.8	78.8	TENNESSEE				
743	Miami	93.8	62.6	80.1	370-372	Nashville	97.5	73.9	87.1
744	Muskogee	96.9	39.6	71.6	373-374	Chattanooga	98.6	66.9	84.6
745	Mcalester	93.5	51.0	74.7	375,380-381	Memphis	96.4	71.6	85.5
746	Ponca City	94.2	59.2	78.8	376	Johnson City	97.9	54.2	78.6
747	Durant	94.2	58.6	78.5	377-379	Knoxville	94.9	61.8	80.2
748	Shawnee	95.9	57.4	78.9	382	Mckenzie	96.4	55.6	78.4
749	Poteau	93.2	61.1	79.0	383	Jackson	98.4	56.0	79.7
					384	Columbia	94.9	62.3	80.5
					385	Cookeville	96.3	60.5	80.5
OREGON					TEXAS				
970-972	Portland	101.1	96.8	99.2	750	Mckinney	98.8	51.2	77.8
973	Salem	101.0	95.0	98.4	751	Waxahackie	98.7	56.4	80.0
974	Eugene	100.9	94.3	98.0	752-753	Dallas	99.6	66.8	85.2
975	Medford	102.7	92.9	98.4	754	Greenville	98.8	40.0	72.9
976	Klamath Falls	102.4	92.7	98.1	755	Texarkana	98.3	52.6	78.1
977	Bend	101.2	94.4	98.2	756	Longview	98.9	41.0	73.4
978	Pendleton	95.5	94.7	95.1	757	Tyler	99.3	55.6	80.0
979	Vale	93.1	86.3	90.1	758	Palestine	95.1	41.5	71.4
					759	Lufkin	95.8	45.6	73.6
PENNSYLVANIA					760-761	Fort Worth	98.2	62.7	82.6
150-152	Pittsburgh	97.7	102.1	99.6	762	Denton	97.1	49.2	76.0
153	Washington	94.3	102.1	97.7	763	Wichita Falls	98.4	56.5	79.9
154	Uniontown	94.6	100.4	97.2	764	Eastland	96.8	40.8	72.1
155	Bedford	95.6	91.0	93.6	765	Temple	95.1	51.0	75.6
156	Greensburg	95.6	100.6	97.8	766-767	Waco	97.8	58.1	80.3
157	Indiana	94.4	99.4	96.6	768	Brownwood	97.9	38.6	71.7
158	Dubois	96.1	94.7	95.5	769	San Angelo	97.4	49.3	76.2
159	Johnstown	95.6	94.9	95.3	770-772	Houston	100.0	70.3	86.9
160	Butler	92.2	101.6	96.3	773	Huntsville	98.1	39.3	72.2
161	New Castle	92.2	98.9	95.2	774	Wharton	99.6	42.9	74.6
162	Kittanning	92.7	102.6	97.1	775	Galveston	97.4	70.1	85.3
163	Oil City	92.2	95.6	93.7	776-777	Beaumont	98.1	62.1	82.2
164-165	Erie	94.7	93.1	94.0	778	Bryan	94.4	63.0	80.6
166	Altoona	94.9	90.3	92.9	779	Victoria	99.6	45.2	75.6
167	Bradford	96.6	93.0	94.9	780	Laredo	94.9	53.0	76.4
168	State College	95.2	90.7	93.2	781-782	San Antonio	95.3	63.7	81.3
169	Montoursville	96.3	96.3	94.9	783-784	Corpus Christi	97.8	52.7	77.9
170-171	Harrisburg	98.5	95.1	97.0	785	Mc Allen	97.2	48.0	75.5
172	Chambersburg	95.8	89.7	93.1					
173-174	York	96.5	95.4	96.0					



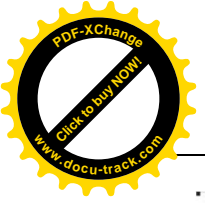
Appendix C - D4 Cost Evaluation Report



College Pharmacy & Health Sciences - Jun 1999 - MI - Detroit

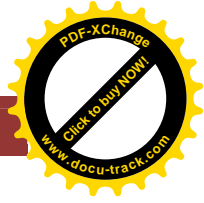
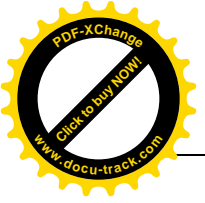
<p>Prepared By: Neumann/Smith & Associates 400 Galleria Officentre, Ste 555 Southfield, MI 48034 Fax: Building Sq. Size: 270000 Bid Date: 3/1/2000 No. of floors: 6 No. of buildings: 1 Project Height: 102.8 1st Floor Height: 14.8 1st Floor Size: 42000</p>	<p>Prepared For: Site Sq. Size: 78408 Building use: Educational Foundation: CON Exterior Walls: PRE Interior Walls: GYP Roof Type: MET Floor Type: CAR Project Type: NEW</p>
--	--

Division		Percent	Sq. Cost	Amount
00	Procurement and Contracting Require	11.55	21.60	5,832,248
	Bonds & Certificates	0.65	1.21	327,656
	General Conditions	9.47	17.71	4,782,389
	Misc Bidding Requirements	1.43	2.67	722,203
03	Concrete	9.83	18.39	4,966,459
	Cast-In-Place	6.13	11.47	3,097,160
	Precast	3.70	6.92	1,869,299
04	Masonry	1.84	3.44	928,261
	Masonry & Grout	1.84	3.44	928,261
05	Metals	7.90	14.77	3,987,529
	Fabrications	0.94	1.76	476,045
	Hydraulic Structures	0.01	0.02	6,466
	Structural Framing	6.94	12.98	3,505,018
06	Wood, Plastics, and Composites	1.35	2.53	683,139
	Finish Carpentry	1.35	2.53	683,139
07	Thermal and Moisture Protection	2.00	3.74	1,010,393
	Fireproofing	0.67	1.25	337,922
	Firestopping	0.08	0.14	38,013
	Manufactured Roofing & Siding	1.02	1.90	513,977
	Water Repellents	0.24	0.45	120,481
08	Openings	4.31	8.07	2,177,865
	Glazed Curtainwalls	1.84	3.44	929,872
	Glazing	1.49	2.78	751,094
	Metal Doors & Frames	0.96	1.80	486,269
	Special Doors	0.02	0.04	10,630
09	Finishes	10.51	19.66	5,308,587
	Gypsum Board	7.59	14.19	3,831,583
	Misc Finishes	0.14	0.26	69,003
	Painting	0.94	1.75	472,189
	Resilient Flooring	0.99	1.85	500,286
	Special Coatings	0.16	0.29	78,430
	Stone Facing	0.00	0.00	713
	Tile	0.71	1.32	356,383
10	Specialties	0.83	1.56	419,873
	Compartments & Cubicles	0.06	0.12	31,228
	Lockers	0.11	0.20	53,325
	Operable Partitions	0.03	0.05	14,180
	Toilet & Bath Accessories	0.10	0.19	51,395
	Visual Display Board	0.53	1.00	269,745



11	Equipment	4.45	8.33	2,249,263
	Darkroom	0.03	0.06	17,419
	Laboratory	2.07	3.87	1,045,662
	Loading Dock	0.01	0.02	6,567
	Medical	1.43	2.67	719,750
	Misc Equipment	0.91	1.70	459,865
12	Furnishings	0.25	0.47	126,639
	Multiple Seating	0.07	0.12	33,004
	Window Treatment	0.19	0.35	93,635
13	Special Construction	0.16	0.30	81,038
	Sound, Vibration & Seismic Control	0.16	0.30	81,038
14	Conveying Systems	1.11	2.08	561,489
	Elevators	0.92	1.71	462,721
	Misc Conveying Systems	0.19	0.35	94,823
	Transportation Systems	0.01	0.01	3,945
21	Fire Suppression	1.98	3.70	999,986
	Fire Protection	1.98	3.70	999,986
22	Plumbing	9.12	17.05	4,603,665
	Plumbing	9.12	17.05	4,603,665
23	HVAC	17.92	33.51	9,048,549
	HVAC	17.92	33.51	9,048,549
26	Electrical	14.88	27.83	7,513,582
	Basic Materials & Methods	14.86	27.80	7,504,794
	Controls	0.02	0.03	8,788
Total Building Costs		100.00	187.03	50,498,565
02	Existing Conditions	34.81	10.74	842,293
	Misc Site Work	27.15	8.38	657,017
	Preparation	7.66	2.36	185,276
31	Earthwork	60.39	18.64	1,461,303
	Earthwork	50.40	15.55	1,219,503
	Paving & Surfacing	9.99	3.08	241,800
32	Exterior Improvements	4.80	1.48	116,208
	Landscaping	4.80	1.48	116,208
Total Non-Building Costs		100.00	30.86	2,419,804
Total Project Costs		--	--	52,918,369

|



Appendix D - Existing Conditions Site Plan

