



## *2. Technical Report #1: Existing Construction Conditions*

### *2.1 Executive Summary*

This technical assignment covers the existing conditions of the Penn State Fayette's Community Center located in Uniontown PA. Within this document, a summary of the project delivery system, contractual agreements, schedule, cost of the project, local market conditions, and client information can be found.

The project method is a standard design/bid based. The contracts to the architectural firm Burt Hill Rittelmann Kosar are a fee, where as the contractors all hold a lump sum agreement with Penn State. Mucci Construction is the CM @ risk on the project and all contractors report to them. A major concern for this Multi-Purpose Community Center is the accelerated schedule and complexity of the project. Penn State has a highly detailed Commissioning Plan to try and alleviate any issue that may arise with such a project.

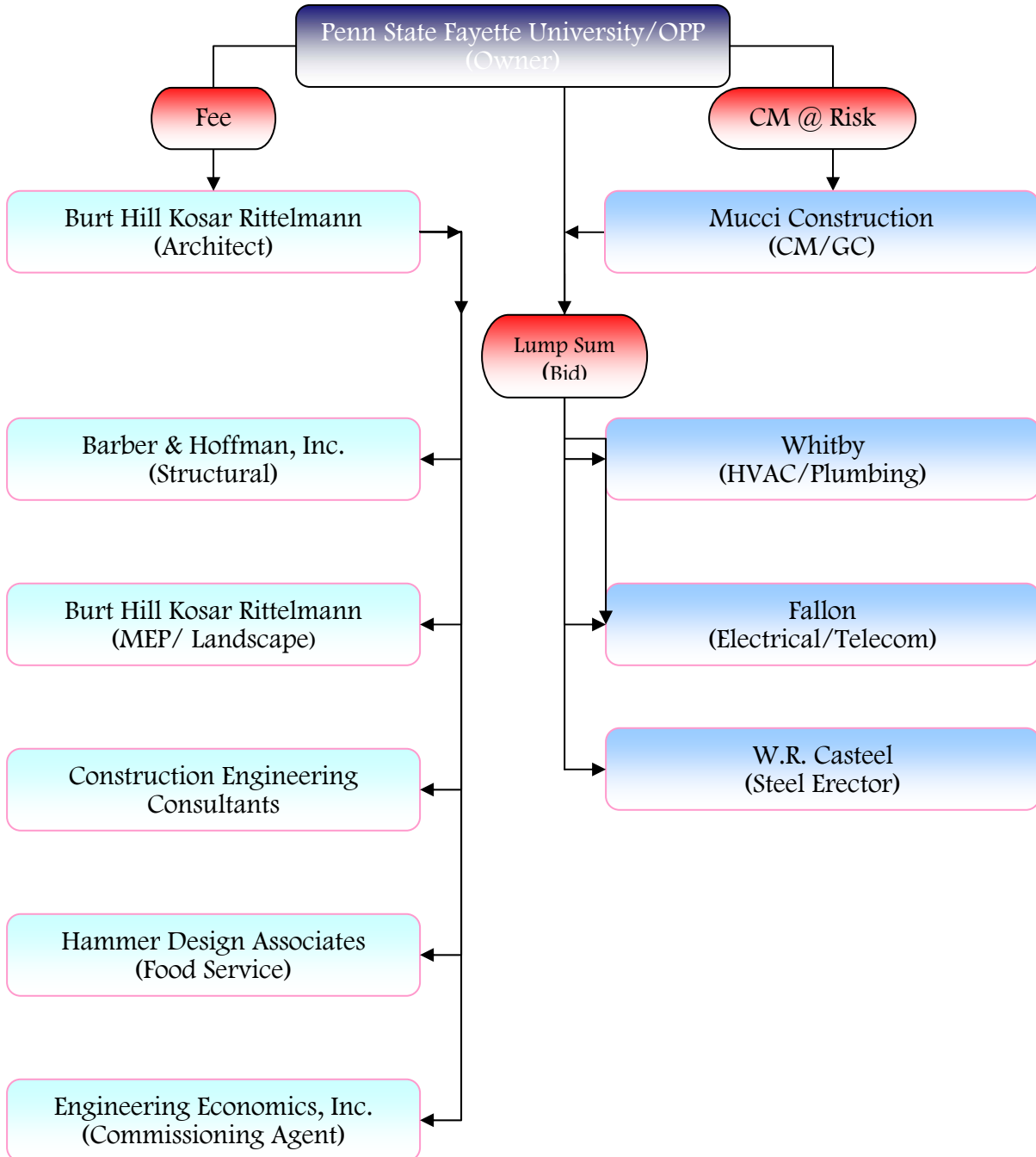
The actual construction site allows for easy ingress/egress as well as large lay down, staging, storage, and parking areas. Unfortunately no site plans are available to me at this time to demonstrate the existing site conditions. From the geotechnical reports it has been determined that the existing soil conditions can support the 56,000 sq.ft. structure by the use of spread footings as a foundation and that subsurface water can be dealt with accordingly.

Due to the expected usage of the Multi-Purpose Community Center, it was hard to grasp a quality estimate from both R.S. Means and D4. The Community Center Architectural design is Architecture Design is a 56,000 square feet, holds a 2,000-retractable seat NCAA-sized arena with a floating floor to provide better safety and support, a theater with the ability to raise and lower the 500 seats and an orchestra pit; a state-of-the-art fitness center, one competition basketball court, one competition volleyball court, two auxiliary courts, two racquetball courts, training rooms, locker rooms that can be divided into two sections for tournaments, and a multipurpose room with a dividing wall for meetings. It also features an outdoor courtyard and plaza and outdoor tennis court, sand volleyball court, basketball courts, intramural practice fields and lighted walking areas. R.S. Means and D4 would be unable to adjust for such a wide variety of specialty construction.

From this Technical Assignment #1, a basic understanding of the existing construction conditions can be gained.



*2.2 Project Delivery System:*





### *2.3 Project Directory*

*Owner:*

Pennsylvania State University  
Penn State Fayette Campus  
Multi-Purpose Community Center  
Rt. 119 North  
Uniontown, PA 15401

John Hays  
Phone: 724.430.4170

*Architect:*

Burt Hill Kosar Rittelmann Associates  
101 East Diamond St.  
400 Morgan Center  
Butler, PA 16001

Vince Fazzoni  
Phone: 724.394.7000

*Commissioning Agent*

Engineering Economics, Inc.  
1911 Memorial Ave. SW  
Roanoke, VA 24015

James Sledd (Project Manager)  
James Coleman (Principal in Charge)  
Phone: 540.344.5200

*Landscape Architect:*

Burt Hill Kosar Rittelmann Associates  
650 Smithfield St.  
Suite 2600  
Pittsburgh, PA 15222

Phone: 412.396.7000

*Structural Engineer:*

Barber & Hoffman, Inc.  
215 Executive Drive  
Suite 202  
Cranberry Twp, PA 16066

Michael R. Miller, P.E.  
Phone: 724.741.0848



*MEP Engineer*

Burt Hill Kosar Rittelmann Associates  
101 East Diamond St.  
400 Morgan Center  
Butler, PA 16001

Phone: 724.285.4761

*Food Service:*

Hammer Design Associates  
1106 Ohio River Boulevard  
Suite 606  
Sewickley, PA 15143

Gary C. Hammer  
Phone: 412.749.0749

*Geotechnical Engineer:*

Construction Engineering Consultants Inc.  
2018 Waverly Street  
Pittsburgh, PA 15218-2402

Mr. Ralph Artuso  
Phone: 412.351.6465

*Topographical Survey:*

Fayette Engineering Company Inc.  
P.O. Box 1030  
2200 University Drive  
Uniontown, PA 15401-1030

Phone: 724.438.5573

Standard procedure project delivery system – design/bid/build

- PSU and Burt Hill Kosar Rittelmann have a full service Owner/Professional agreement between them.
- PSU and Mucci Construction have an Owner/Contractor agreement between them. Jim Nichols is the Project Superintendent for Mucci. All sub contractors are responsible to him and Mucci Construction Co.
- Kent Crossland is the on-site representative for Penn State Fayette.
- Bruce Rohrbach is the Project Manager for OPP. Paul Shirer is the Project Coordinator and the on-site inspector.
- Vince Fazzoni is the Project Architect for Burt Hill.



**2.4 Project Schedule Summary:**

Activity Name	Start Date	Finish Date	Days	4th Quarter 02	1st Quarter 03	2nd Quarter 03	3rd Quarter 03	4th Quarter 03	1st Quarter 04	2nd Quarter 04	3rd Quarter 04	
Design/Bidding	11/15/02	3/5/03	110	█								
Mobilization	3/28/03	4/3/03	6		█							
Underground Utilities/Tie-ins	4/1/03	4/15/03	14		█							
Foundation Excavation	4/16/03	4/25/03	9		█							
Spread Footings	4/25/03	5/10/03	15		█							
Slab Rough-In	5/8/03	5/14/03	6		█							
Slab on Grad	5/15/03	5/22/03	7		█							
Steel Structure	6/1/03	8/1/03	61		█							
CMU Walls	8/4/03	10/22/03	79		█							
Steel Joists	10/23/03	11/10/03	18		█							
MEP Rough-in	11/11/03	2/10/04	91		█							
Curtain Wall and Storefront	11/14/03	1/10/04	57		█							
Roof Decking	11/15/03	11/23/03	8		█							
Roof Membrane	11/24/03	12/31/03	37		█							
Masonry	3/10/04	6/20/04	102			█						
FF & E	4/15/04	7/30/04	106			█						
Site work	2/20/04	9/17/04	210			█						
Finishes	7/15/04	8/9/04	25			█						
Commissioning	8/1/04	8/30/04	29			█						
Punch list	9/1/04	9/17/04	16			█						
Turnover	9/17/04	9/17/04	0			█						



## *2.5 Building System Summary*

- Demolition Required: N/A (Basic cleaning and grubbing)
- Structural Steel Frame: Structural steel framing consisting mainly of simple bolted A325 Slip Critical moment connections. E70XX welded connections where applicable. All structural steel, W and S shapes ASTM572/50 or ASTM 992, hosted into position by a 25 ton crawler crane with a hydraulic boom, specific model unknown at this time.
- Cast in Place Concrete: Typical ACI 301 form braced against excavation for isolated spread footings supporting columns. Fastest and cheapest method used for placement of concrete which would be dumping off the back of the truck. Specific method was used due to the vast amount of unused space.
- Precast Concrete: N/A
- Mechanical System: Fire suppression – standard wet style system monitored by the campus system. Maximum sprinkler spacing for all occupancy type is 130 sq.ft.  
Air-Cooled Liquid Chiller Model number RTA C 225  
Unit heaters are Trane Model 38-S.  
Fan Coil Units  
Split System Air Conditioning Units  
Radiant Heating Panels  
Air Handling Units/Indirect Gas Fired
- Electrical System: Main Distribution panels are 277/480 V 3P, 4W 1200 A  
Emergency Generator – 140kW  
Feeders (54), with the largest ones being 1600A – 3P/ 4W  
Lighting Fixtures – 277V Columbia or Lithonia
- Masonry: Veneer masonry consisting of field brick, 2” air space, 2’ rigid insulation, and 12” masonry units. Brick veneer held in place by standard lintels, flashing, and dovetail masonry anchors. Scaffolding was typical all around construction (building was broken-up in various sectors and therefore was not a true all around system. Scaffolding was moved various times to accomplish a speedy and efficient construction)
- Curtain Wall: Glazed aluminum curtain wall, insulated 1” clear annealed translucent wall panels with 3 way adjustable anchors. Design responsibility requires structural framing to absorb the lateral wind forces. The glass panels’ size and length are limited due to the flexural properties of glass which in-turn limits the distance between lateral and vertical supports.



Support of Excavation: Standard Excavator. Perforated drain at footing level as well as a dewatering system which consists of a series of well-points around the general area. Excess water removed by suction pump. Note - water retention was not an original problem by due to an excessive amount of rainfall in the area measures needed to be taken.

## *2.6: Project Cost Evaluation*

### CONSTRUCTION

Base Bid	\$7,886,456.00
Alternate 1 / Automated Logic Controls	209,000.00
Alternate 2 / Lift Station & Force Main	70,500.00
Alternate 3 / Ceramic Tile	53,895.00
Alternate 4 / Roadway Improvements & Walkway to Campus	67,437.00
Alternate 5 / Aluminum Entry Systems	4,300.00
Alternate 6 / Built-Up Roofing System	48,000.00
Alternate 7 / Racquetball Courts	73,247.00
<b>Total</b>	<b>\$8,412,835.00</b>

### PROFESSIONAL FEES

Architect's Fees	\$667,500.00
Architect's Expenses	36,000.00
Architect's Additional Services	37,751.00
<b>Total</b>	<b>\$741,251.00</b>

### FURNISHINGS AND EQUIPMENT

Includes Food Service Equipment & PSU/OTC Electronics

**Total** **\$575,000.00**

### OTHER COSTS

APR / High Voltage	25,000.00
EI / Commissioning	80,000.00
FPN / Sanitary Sewer Tap-in Fee	108,000.00
L&I / Review Fee	3,000.00
OPP / Construction Inspection	65,000.00
OPP / Feasibility Study	15,430.00
OPP / Miscellaneous Costs and Expenses	17,484.00
TNR / Peer Review of Estimate	12,000.00
<b>Total</b>	<b>\$325,914.00</b>



CONTINGENCIES

6.1% of Construction Total Project	\$512,500.00 44,500.00
Total	557,000.00
<b>TOTAL PROJECT BUDGET</b>	<b>\$10,612,000.00</b>

The funding plan supporting the above TPE is as follows:

Original Allocation	\$10,200,000.00
Penn State Fayette / Additional	150,000.00
Central / Lift Station & Force Main	262,000.00
<b>TOTAL PROJECT FUNDING</b>	<b>\$10,612,000.00</b>

Actual Construction Cost (CC) - \$8,412,835 and (CC/SF) - \$150.25/sq.ft.

Total Cost (TC) - \$10,612,000 and (TC/SF) - \$189.50/sq.ft.

Design - \$ 741, 251 and (CC) / (Design) - 11.35%

Mechanical System Cost - \$2,045,000

Electrical System Cost - \$2,580,000

Structural System - \$1,067,000





### 2.7: D4 Parametric Estimate

	Division	Square Foot Cost	Projected Cost
00XX	General Condition	\$8.55	\$478,800.00
02XX	Site Work	\$18.25	\$1,022,000.00
03XX	Concrete	\$1.50	\$84,000.00
04XX	Masonry	\$6.78	\$379,680.00
05XX	Metals	\$7.50	\$420,000.00
06XX	Woods and Plastics	\$4.11	\$230,160.00
07XX	Thermal and Moisture Protection	\$4.95	\$277,200.00
08XX	Doors and Windows	\$7.10	\$397,600.00
09XX	Finishes	\$10.72	\$600,320.00
10XX	Specialty Items	\$12.53	\$701,680.00
11XX	Equipment	\$6.98	\$390,880.00
12XX	Furnishings	\$12.45	\$697,200.00
13XX	Special Construction	\$8.34	\$467,040.00
14XX	Conveying Systems	\$3.56	\$199,360.00
15XX	Mechanical	\$14.00	\$784,000.00
16XX	Electrical	\$16.75	\$938,000.00
<b>Total Building Cost</b>			<b>\$8,067,920.00</b>

\*Based upon the smart average of 4 similar buildings i.e. usage/type, size, floors as well as being adjusted for time and location the D4 software produced a number relatively close to the actual building cost for the Multi-Purpose Community Center. (I had actually chosen various project types such as recreational and educational, to receive an accurate estimate to meet the criteria of the Multi-Purpose Community Center). This was a little unexpected due to the lack of similar buildings in the data base. For the full print out of the D4 estimating software please contact Joe Kifus at jak354@psu.edu.

### 2.8: R.S. Means

Based upon the R.S. Means 2000 edition, the median cost per square foot of a community center is approximately \$ 85.05 as opposed to the actual cost \$150.25. If you take this \$85.05 times the actual square footage of the center this equates to a total building cost of \$4, 762,800. There is obviously a great variance between the actual of cost of \$10,612,000 and the R.S. Means estimate of approximately 5 million. This is most likely due to a variety of legitimate reasons. Whither the discrepancy was cause by the recent, dramatic increase in steel material prices or the lack of ability to take into account that the community center as a multi-purpose center having various specialty construction and features such as a cafeteria, basketball arena, and theatre the exact reason has yet to be determined. Another valid rationale would include that the Means catalog had the typical square footage for a community center as 9,400 square feet; where as the Penn State Fayette Multi-Purpose Community Center had a square footage of 56,000. But regardless of the reason the R.S. Means was not able to provide as accurate of an estimate as the D4 software did.

\*Note- Location and Time factors were used to adjust the numbers.



### *2.9: Local Conditions*

There is no preferred method of construction in the Fayette County area. The population of contractors seems to be very well rounded in several different types of construction methods and knowledge of the specific systems used throughout. Construction parking will not be an issue either. The Community Center is located on the Fayette Campus in Uniontown which has vast area for future expansion. The surrounding areas are relatively flat and excessive in size for any type of construction parking, staging, lay down etc. The Community Center project also has provisions for a new parking lot consisting of approximately 100 additional spaces, this was the general area used for construction parking throughout the construction process.

There are no requirements for recycling or tipping fees on this specific project, anything of this nature was left under the discretion of the CM. As stated before, through boring samples and general knowledge of the region, quality bearing soil was found throughout the site and was determined acceptable to support the load of the new Multi-Purpose Community Center through the use of spread footings. As for any subsurface water conditions, this was also determined not to be a major issue as well by the geotechnical engineers.

### *2.10: Client Information*

Penn State University is a very experienced owner. They are constantly working on improving their campus as well as branch campuses regularly. Penn State Fayette is constructing this new Multi-Purpose Community Center to basically replace a few out dated building such as the Williams Building and Rec. Hall. Penn State Fayette would like to construct this new center to serve as what its name implies; the center of campus and the figure head of that campus. They would like to attract new students and athletes from across the country while expanding there schools base at the same time. Penn State wants to group and expand on the out dated cafeteria, gymnasium, and weight rooms, all in one new and unique building.

Penn State has some of the highest quality of standard around. Penn State has OPP to manage the job site. Penn State has also hired a commissioning agent to test, balance, and demand the utmost quality from all of their contractors with the extensive mechanical and electrical equipment found thought the building Penn State demands that the building come in on time (at beginning of the fall '04 school year), with-in schedule and require that a safe and tightly site is maintained thought out this process, on time, within budget and to the clients satisfaction. As well as the above mentioned information, Penn State wants a quality building that is astatically pleasing and will last a good number of years.