

Manoa Elementary School

Havertown, Pennsylvania

Architect

McKissick Associates

Manoa elementary school can accommodate four classrooms per grade level with a total capacity of 850 pupils. With limited open space in this Philadelphia streetcar suburb the only available site was 3.1 acres of a 10-acre community sports complex. The building and site circulation pattern is intentionally compact to maximize the amount of athletic field space that will remain available to the community for sports including lacrosse, soccer, field hockey and football. This necessitated a three story-building plan, the use of subsurface storm water detention as well as the hard surface playground for event overflow parking further this goal.

A sub divisible gymnasium room, cafeteria, two music rooms, art room, and fourteen flexible learning spaces provide support for the Districts enrichment and special needs programs. Spatial efficiency is maximized through using the cafeteria as both stage and sub divisible large group instructional area. A reinforced masonry bearing and pre-cast concrete plank structural system was utilized for the classroom wing to substantially reduce construction time and permit the overall height of the building to be limited to 30-feet to meet local zoning requirements. To further reduce the buildings apparent mass within the residential neighborhood the exterior skin utilizes a mixture of reflective zinc colored metal panels which allows the three-story building and gymnasium wing to assume the color of the surrounding environment.

Internally the building features an integrated data fiber optic backbone with wireless networking and a complete modern voice over IP communication. In addition to portable wireless labs, each classroom has four computers, as well as a mounted LCD projector and smart board capability.

Green components of the building are cost-effective and protective of the environment. Sustainable features include insulated glass windows and doors, lighting occupancy sensors, high efficiency indirect/direct lighting and daylighting. The acid-etched and sealed concrete floor in circulation areas require minimal maintenance while avoiding the use of manmade products. Corridors have a wainscot of bamboo wood - a renewable resource. The high-tech heating and cooling system provides dehumidification capability to controls mold and



allows for superior heating and cooling recovery with the use of energy recovery ventilators.

The emphasis on sustainability was reinforced by development of interior design themes based upon the Greek elements. Floors became part of an integral design element throughout the school, and each of the three floors has a different visual theme based upon the five elements of Ether (main entry), Fire (library and 1st Floor administration & gymnasium wing), Water (1st Floor classrooms) Earth (2nd Floor classrooms) and Air (3rd Floor classrooms). These themes are reinforced by the choice of flooring, wall colors, cabinets, vinyl tiles and stair treads in the stair towers allowing for the children to wayfind their floor by color. The multipurpose space in the Cafeteria and Stage incorporate all of the themes. A multi-colored earth-toned floor

has a star on the stage level and a sun on the cafeteria level. An acid etched hand-print border using the handprints of last year's students and staff imparts immediate ownership.

Manufacturers

- DIV. 3:** *Precast:* High Concrete Structures, Inc.; *Concrete Stain:* Lithochrome® by L.M. Scofield
- DIV. 7:** *Metal Panel:* Kingspan ASI; *Modified Bituminous Membrane Roofing:* Tremco.
- DIV. 8:** *Wood Windows:* Pella; *Aluminum Windows:* EFCO Corporation; *Rolling Shutter & Overhead Security Grills:* Cornell; *Wood Doors:* Graham.
- DIV. 9:** *Paint:* Sherwin Williams; *Ceilings:* Armstrong.
- DIV. 10:** *Folding Partitions:* Modernfold.

Photos Courtesy of McKissick Associates

EDUCATIONAL EU0907XX

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Architect

McKissick Associates
317 N. Front Street, Harrisburg, PA 17111
www.mckissickassociates.com

Construction Team

Structural Engineer:

Baker Ingram & Associates, Inc.
1547 Oregon Pike, Lancaster, PA 17601

General Contractor:

John S. McManus, Inc.
P.O. Box 418, 9 Smithbridge Road, Chester Heights, PA 19017

MEP & Fire Protection Engineer:

H. F. Lenz
1407 Scalp Avenue, Johnstown, PA 15904

Civil Engineer:

H. F. Lenz
1407 Scalp Avenue, Johnstown, PA 15904



Project General Description

Location: Havertown, Pennsylvania

Date Bid: Jan 2007

Construction Period: May 2007 to Nov 2008

Total Square Feet: 85,355 **Site:** 3.8 acres.

Number of Buildings: One; 37 classrooms, 850 pupil seating capacity.

Building Size: First floor, 57,755; second floor, 13,800; mechanical mezzanine, 13,800; total, 85,355 square feet.

Building Height: First floor, 12'8"; second floor, 12'8"; mechanical mezzanine, 11'6"; total, 36'10".

Basic Construction Type: New/Type 2 Non Combustible.

Foundation: Cast-in-place. **Exterior Walls:** Brick, metal panel.

Roof: Modified bitumin. **Floors:** Concrete, concrete plank.

Interior Walls: CMU, metal stud drywall.



C.S.I. Divisions

		COST	% OF COST	SQ.FT. COST	
1.	1.	PROCUREMENT & CONT. REQ.	301,400	1.81	3.53
		GENERAL REQUIREMENTS	46,200	0.28	0.54
3.	3.	CONCRETE	1,600,000	9.63	18.75
4.	4.	MASONRY	2,176,000	13.10	25.49
5.	5.	METALS	1,300,000	7.83	15.23
6.	6.	WOOD, PLASTICS & COMPOSITES	130,000	0.78	1.52
7.	7.	THERMAL & MOISTURE PROTECTION	1,600,000	9.63	18.75
8.	8.	OPENINGS	600,000	3.61	7.03
9.	9.	FINISHES	1,050,000	6.32	12.30
10.	10.	SPECIALTIES	200,000	1.20	2.34
11.	11.	EQUIPMENT	350,000	2.11	4.10
12.	12.	FURNISHINGS	470,000	2.83	5.51
14.	14.	CONVEYING SYSTEMS	70,000	0.42	0.82
15.	21.	FIRE SUPPRESSION	256,000	1.55	3.00
15.	22.	PLUMBING	762,000	4.59	8.93
15.	23.	HVAC	2,724,000	16.40	31.91
16.	26.	ELECTRICAL	2,002,542	12.06	23.46
16.	27.	COMMUNICATIONS	607,597	3.66	7.12
16.	28.	ELECTRONIC SAFETY & SECURITY	362,861	2.19	4.25
		TOTAL BUILDING COSTS	16,608,600	100%	\$194.58
2.	2.	EXISTING CONDITIONS	83,500		
2.	31.	EARTHWORK	321,000		
2.	32.	EXTERIOR IMPROVEMENTS	796,800		
2.	33.	UTILITIES	412,500		
		TOTAL	18,222,400		

SPECIFICATIONS

Mobilization, supervision, general conditions, bond.
Price & payment procedures, administrative requirements, quality requirements, temporary facilities & controls, product requirements, execution & closeout requirements.
Forming & accessories, reinforcing, cast-in-place, precast, cast decks & underlayment, grouting, cutting & boring (concrete breakdown: 473 cubic yards foundation, 11 cubic yards walls, 1,866 cubic yards floors including slab on grade and precast decks).
Unit, manufactured masonry.
Structural metal framing, joists, decking, fabrications.
Rough carpentry, finish carpentry, architectural woodwork, structural plastics, plastic fabrications.
Dampproofing, membrane roofing, flashing & sheet metal, roof & wall specialties & accessories, fire & smoke protection, joint protection.
Doors & frames, entrances, storefronts, & curtainwalls, windows, hardware.
Plaster & gypsum board, tiling, ceilings, flooring, wall finishes, painting & coating.
Information, interior, metal building assembly.
Food service, athletic & recreational, other.
Casework, other.
Elevators.
Water-based fire-suppression systems, fire-extinguishing systems.
Piping & pumps, equipment, fixtures.
Piping & pumps, air distribution, air cleaning devices, central heating equipment, central cooling equipment, central HVAC equipment, decentralized HVAC equipment.
Medium-voltage distribution, low-voltage transmission, facility electrical power generating & storing equipment, electrical & cathodic protection, lighting.
Structured cabling, data, voice, audio-video, distributed communications & monitoring systems.
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Earthmoving.
Bases, bollards, & paving, improvements, planting.
Water, sanitary sewerage, storm drainage, electrical.
(Excluding architectural and engineering fees)

UPDATED ESTIMATE TO AUGUST 2009: \$218.91 PER SQUARE FOOT

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