

# Western Technical College Public Safety Training Facility

Sparta, Wisconsin

## Architect

Millennium Architects & Designers

Western Technical College's existing Sparta Facility was constructed as a training facility for police and fire professionals. Built in three phases the original building was constructed in the early 1990s.

Today with the latest renovations and additions the Western Technical College's Public Safety Training Facility is a self-sustaining environment receiving LEED® Gold Certification.

The facility's number one priority is the education of safety and a large portion of the professional student body is centered on teaching fire protection skills. This allows for numerous opportunities to integrate actual building life-cycle costs measures with actual learning opportunities.

With water as a central theme, a natural recycling system has been engineered to model the earth's own natural water recycling process. Water is extracted through a naturally occurring artesian well, utilized for domestic purposes and discharged back into the earth through a combination of ponds and infiltration fields. Located above the aquifer of origin, the water slowly cleanses itself through layers of engineered soils covered in native water tolerable vegetation until it finds its way back to replenishing the aquifer. During periods of temperate climate, when no additional heating or cooling needs are required to provide for a comfortable working environment, the water by passes the building and discharges directly into the pond and infiltration fields.

A major component of the design includes an open-loop geo-thermal heating and cooling system whose 50-degree baseline temperature is locally tempered through a zoned distribution of VAV boxes to meet the different thermal comfort needs of the building areas.

Due to the naturally flowing water supply that fills the pond and infiltration fields, a pressurized water supply is set up and maintained as a sprinkler system reservoir. This water level is balanced in a nearby satellite sprinkler house where the water is held back for reserve emergency fire fighting procedures. When needed, a large fire pump inside the sprinkler house extracts the water from the reservoir providing additional water pressure to the fire suppression system. Whether it is supplying the facility's fire suppression system, filling the emergency fire fighting vehicles and practice site fire hydrants, or maintaining the building grounds through a grey water site irrigation and plumbing fixture supply systems, the entire facility becomes a living, natural occurring training environment for educating its area first responder professionals.

This reservoir also provides for a large diversification of hands-on water training exercises. Designed with a compacted gravel drive extending from an access road, automobiles can be lowered into the pond to different levels of submersion, providing students with opportunities to conduct controlled dive rescues in preparation for real life situations. In the winter, the frozen pond allows for break through type rescues.

To complement the geo-thermal system energy efficiency, the exterior walls are constructed of insulated concrete



Photos Courtesy of Western Technical College  
and Millennium Architects & Designers



Water reuse system location in apparatus bay.



Geo-thermal system on second floor.

forms. These ICFs consist of a dense high R rigid insulated outer shell with a 10-inch wide reinforced concrete structural wall within. A cool roof and window orientation atop optimize natural day light adding to the building's passive solar design.

The majority of the facilities ICF wall system is clad in a single wythe, split face insulated concrete block creating a bearing wall condition for the metal joist and roof deck above.

LEED® Points Achieved	63 Total
Sustainable Sites	15
Water Efficiency	8
Energy & Atmosphere	23
Materials & Resources	3
Indoor Environmental Quality	10
Innovation & Design Process	4

### LEED® GOLD

#### Product Information

Insulated Concrete Forms (ICF):  
TF Systems

Metal Roofing: **The Garland Company**

Windows, Entrances & Storefronts,  
Daylighting: Tubelite

VCT: Armstrong Carpet: Interface

Lighting: Lithonia



**Architect**

Millennium Architects & Designers  
 1263 Main Street, #122, Green Bay, WI 54302  
 www.millenniumarch.com

**Project Team**

**Structural Engineer:**

Larson Engineering, Inc.  
 2801 E. Enterprise Ave., #200, Appleton, WI 54913

**General Contractor:**

Market & Johnson  
 1652 Lakeshore Drive, LaCrosse, WI 54603

**Mechanical & Electrical Engineer:**

Harwood Engineering Consultants, Ltd.  
 255 N. 21st Street, Milwaukee, WI 53233

**Civil Engineer:**

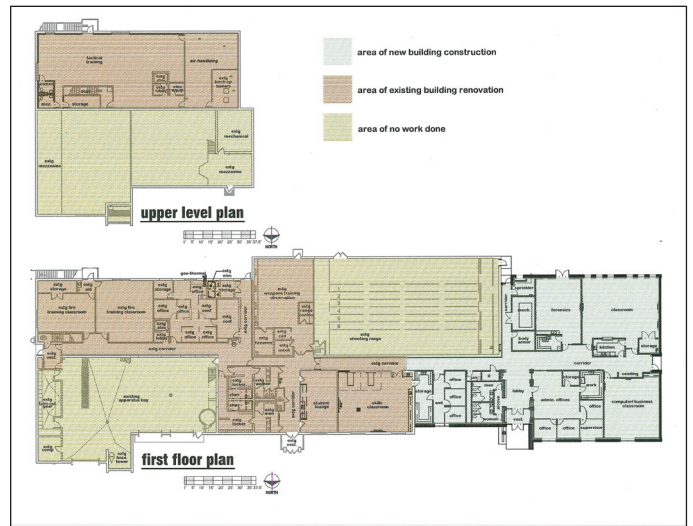
DP Engineering, Inc.

**LEED Consultant:**

Madison Environmental, LLC  
 1914 Monroe St., #101, Madison, WI 53711

**Project General Description**

**Location:** Sparta, Wisconsin  
**Date Bid:** Mar 2010 **Construction Period:** May 2010 to Sept 2010  
**Total Square Feet:** 9,420 **Site:** 80 acres.



**Number of Buildings:** One.  
**Building Sizes:** First floor, 9,420; total, 9,420.  
**Building Height:** First floor, 14'4"; total, 14'4".  
**Basic Construction Type:** III B/New.  
**Foundation:** Cast-in-place.  
**Exterior Walls:** CMU, ICF's/concrete & metal studs.  
**Roof:** Metal. **Floors:** Concrete.  
**Interior Walls:** CMU, metal stud drywall.

DIVISION	COST	% OF COST	SQ.FT. COST	SPECIFICATIONS
GENERAL REQUIREMENTS	87,216	8.13	9.26	Solicitation, procurement forms and supplements, contracting forms and supplements, project forms, conditions of the contract, revisions, clarifications, and modifications.
CONCRETE	69,731	6.50	7.40	Forming and accessories, reinforcing, cast-in-place, mass, cutting and boring.
MASONRY	116,368	10.85	12.35	Unit, manufactured.
METALS	24,986	2.33	2.65	Joists, decking, cold-formed framing, fabrications.
WOOD, PLASTICS & COMPOSITES	43,905	4.09	4.66	Rough carpentry, finish carpentry, casework.
THERMAL & MOISTURE PROTECTION	179,519	16.74	19.06	Dampproofing and waterproofing, thermal protection, weather barriers, roofing and siding panels, flashing and sheet metal, roof and wall specialties and accessories, joint protection, EIFS.
OPENINGS	35,314	3.29	3.75	Doors and frames, specialty doors and frames, entrances, storefronts, and curtain walls, windows, hardware, glazing.
FINISHES	159,799	14.90	16.96	Plaster and gypsum board, tiling, ceilings, flooring, wall finishes, acoustic treatment, painting and coating.
SPECIALTIES	9,376	0.87	1.00	Interior specialties, safety specialties.
FIRE SUPPRESSION	18,368	1.71	1.95	Water-based fire-suppression systems, fire pumps, fire-suppression water storage (pond).
PLUMBING	82,072	7.65	8.71	Piping and pumps, equipment, fixtures.
HVAC	109,137	10.18	11.59	Piping and pumps, air distribution, central heating equipment, central cooling equipment, central equipment.
ELECTRICAL	136,703	12.76	14.51	Medium-voltage distribution, electrical and cathodic protection, integrated automation network equipment, integrated automation instrumentation and terminal devices, integrated automation facility controls, integrated automation control sequences, structured cabling, data communications, voice communications, audio-video communications, distributed communications and monitoring systems, electronic access control and intrusion detection, electronic surveillance, electronic detection and alarm, electronic monitoring and control.
<b>TOTAL BUILDING COSTS</b>	<b>1,072,494</b>	<b>100%</b>	<b>\$113.85</b>	
EXISTING CONDITIONS	542,919			Demolition, structural moving.
EARTHWORK	203,347			Earth moving, excavation support and protection.
EXTERIOR IMPROVEMENTS	341,008			Bases, bollards, and paving, site improvements, irrigation, planting.
UTILITIES	101,520			Water, wells, sanitary sewerage, storm drainage, sprinkler pump house.
<b>TOTAL PROJECT COST</b>	<b>2,261,288</b>			(Excluding architectural and engineering fees)

**UPDATED ESTIMATE TO DECEMBER 2013: \$125.04 PER SQUARE FOOT**

**Regional Cost Trends**

*This project, updated to December 2013 in the selected cities of the United States.*

EASTERN U.S.	Sq.Ft. Cost	Total Cost	CENTRAL U.S.	Sq.Ft. Cost	Total Cost	WESTERN U.S.	Sq.Ft. Cost	Total Cost
Atlanta GA	\$100.03	\$942,296	Dallas TX	\$96.77	\$911,569	Los Angeles CA	\$129.39	\$1,218,839
Pittsburgh PA	\$126.13	\$1,188,112	Kansas City KS	\$130.48	\$1,229,082	Las Vegas NV	\$118.52	\$1,116,416
New York NY	\$160.92	\$1,515,868	Chicago IL	\$135.91	\$1,280,294	Seattle WA	\$129.39	\$1,218,839

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