

# T.C. Williams High School

## Alexandria, Virginia

### PROJECT TEAM:

Owner: Alexandria City Public Schools

General Contractor: Hensel Phelps  
Construction Co.

Architect / MEP Engineers:

Moseley Architects

Civil Engineers: Adtek Engineers

Food Service Consultants:

L.J. Huber & Associates, Inc.

Acoustical Consultants: Orpheus Acoustics

Landscaping Consultants: Edaw, Inc.

### ARCHITECTURAL FEATURES:

- Thermoplastic Polyolefin (TPO) & Ethylene Propylene Diene Monomer (EPDM) membrane roofing systems with prefinished metal at entries & on roof garden clerestories.
- Prefinished aluminum curtain wall.
- Aluminum composite panel facia.
- Precast concrete coping.
- Face brick veneer.

### CONSTRUCTION OVERVIEW:

Site: 3330 King Street  
Alexandria, Virginia 22302

Function: Educational Facility

Size: 469,507 sq. ft. (school only)

Cost: \$90 Million

Construction Timeline: December 2004-August 2008

Stories Above Grade: 3 floor levels

Classroom towers 45'-8" high

Project Delivery Method: Originally Design-Bid-Build, changed to Design-Build at 100% design completion.

### MECHANICAL SYSTEMS:

- Variable Air Volume (VAV) System with (305) terminal units equipped with reheat coils.
- (17) rooftop & (4) indoor air handling units (AHU) ranging from 1,400 to 23,295 cfm with enthalpy wheels to recover total energy.
- Four pipe system supplies / returns hot & chilled water to (12) fan coil units.
- Variable speed control pumps drive the variable flow hot & chilled water plant of (4) 1.68 million BTUH natural gas-fired condensing boilers and (2) 600 ton water cooled electric driven centrifugal chillers.
- (2) 750 ton cooling towers condense the R-123 refrigerant that re-circulates through the chillers.

### STRUCTURAL SYSTEMS:

- Foundation is comprised of continuous and spread footings.
- First floor level is slab on grade
- Classroom towers are a structural steel moment frame.
- 4-1/2" thick elevated concrete slabs on composite metal decking
- Technology wing, gymnasium and auditorium are single level, multi-height spaces with load bearing CMU walls.
- Roof structure is metal roof decking on k-series open web joists.

### FIRE PROTECTION SYSTEMS:

- Five zone wet sprinkler system.
- Each zone covers 49,855 to 51,000 sq. ft.
- 100 HP vertical in-line fire pump produces a flow rate of 1,000 GPM with a total head pressure of 120 psi.
- Mixture of sidewall, pendant and concealed sprinkler heads.

### ELECTRICAL SYSTEMS:

- 480 Y / 277, 3 phase, 4 wire primary feed.
- (2) main 4000 amp. 3 phase switchboards
- Direct feed from utility service to chiller switchboards.
- (2) 800 kW, 480 V, 3 phase, 60 Hz, diesel fueled generators for life safety.

### CISTERN:

- Reduces the buildings non-potable water load by circulating collected rainwater.
- Constructed of a 20" thick reinforced mat slab, 15" thick cast-in-place concrete walls, and a 15" thick cap slab supported by (24) 20"x 20" concrete columns.



**Kyle Conrad - Construction Management**

CPEP Website: <http://www.arche.psu.edu/thesis/eportfolio/2007/portfolios/KAC357/>