

EXISTING CONSTRUCTION CONDITIONS

Fairfax High School Renovation & Addition
3500 Old Lee Highway
Fairfax, VA 22030



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A. EXECUTIVE SUMMARY

This technical assignment provides an introduction to the construction project management techniques for the Fairfax High School Renovation and Addition which is located in Fairfax, VA. Included in this assignment is an analysis of the project schedule, a building systems summary, a project cost evaluation, a site plan of existing conditions, and an analysis of local conditions, client information, project delivery system and staffing plan.

Fairfax High School is a design-bid-build project delivery system. With design-bid-build, the owner has the option to get a fair value for the work at a low price while still being selective about the General Contractor. The Contractors achieve the lowest competitive pricing from the sub-contractors and can pass that value on to the owner. However, the project was value engineered at contract time, to remove various items of scope and the overall value of the project was reduced from \$56 million to \$45 million. There was \$1.2 million in contingency allowances for change order work.

The primary reason for the renovation was due to the increased class sizes. The school was forced to rent classroom trailers and place them in the back parking lot. The renovation also added more updated classrooms. Safety is also a big issue with all of the students occupying the school during construction. The GC was required to build a floor to deck, drywall partition between all work areas, and occupied school areas.

The schedule is outlined in the phasing documents, and is part of the contract, so the CPM has to mirror the contract phasing. They continue to work with the school administrators to coordinate all work activities and turnover dates and in most cases, work areas are being provided earlier than expected to help facilitate the completion dates.

B. PROJECT SUMMARY SCHEDULE

The project summary schedule is for a typical phase in the construction process. There are 30 items starting with permitting and pre-construction, notice to proceed and ending with completion. The work in a typical phase includes removal of the existing loose furniture, installing the temporary construction partitions, MEP, demolition work and all of the preparations for the specialty finishes. The project summary schedule is included on the following page.

PROJECT SCHEDULE SUMMARY

11.07.06

ID	TASK NAME	DURATION	START	January	April	June	July	August	September	October	November	December			
1	Permitting	120	1/10/2005	[Blue bar spanning from Jan 10 to Dec 10]											
2	Design/Pre-Construction	110	1/20/2005	[Blue bar spanning from Jan 20 to Dec 10]											
3	Notice to Proceed	0	4/6/2005	▶ 4/6/05											
4	Mobilization	19	4/21/2005	[Blue bar spanning from Apr 21 to May 10]											
5	Remove Loose Furniture to Storage	3	6/28/2005	[Blue bar spanning from Jun 28 to Jul 1]											
6	Install Temporary Construction Partitions	4	6/28/2005	[Blue bar spanning from Jun 28 to Jul 2]											
7	Cut, Cap and Layout MEP	1	7/1/2005	[Blue bar spanning from Jul 1 to Jul 2]											
8	Interior Demolition	7	7/7/2005	[Blue bar spanning from Jul 7 to Jul 14]											
9	Layout, Excavate, Pour footings	3	7/7/2005	[Blue bar spanning from Jul 7 to Jul 10]											
10	Set Structural Steel	13	7/12/2005	[Blue bar spanning from Jul 12 to Aug 5]											
11	Underground Plumbing Work	6	7/20/2006	[Blue bar spanning from Jul 20 to Jul 26]											
12	Install Roof	6	7/25/2005	[Blue bar spanning from Jul 25 to Jul 31]											
13	Patch Slab at Underground Plumbing	5	7/27/2005	[Blue bar spanning from Jul 27 to Aug 1]											
14	Set Curbs for Rooftop Units	4	7/27/2005	[Blue bar spanning from Jul 27 to Aug 1]											
15	Set Rooftop Unit	3	8/1/2005	[Blue bar spanning from Aug 1 to Aug 4]											
16	MEP Ceiling Rough-in	16	8/3/2005	[Blue bar spanning from Aug 3 to Aug 19]											
17	Rough-in Sprinkler	10	8/22/2005	[Blue bar spanning from Aug 22 to Sep 1]											
18	Drywall Framing/Set Door Frames	14	8/24/2005	[Blue bar spanning from Aug 24 to Sep 7]											
19	MEP Wall Rough-in	14	8/26/2005	[Blue bar spanning from Aug 26 to Sep 9]											
20	Install Panel boards and feeders	10	8/29/2005	[Blue bar spanning from Aug 29 to Sep 8]											
21	Electrical/Fire Alarm Rough-in	16	9/6/2005	[Blue bar spanning from Sep 6 to Sep 22]											
22	Close-in Inspections	2	9/16/2005	[Blue bar spanning from Sep 16 to Sep 18]											
23	Install Ceramic Tile	2	9/28/2005	[Blue bar spanning from Sep 28 to Sep 30]											
24	Pour Locker Curbs	4	9/30/2005	[Blue bar spanning from Sep 30 to Oct 4]											
25	Set Lockers	4	10/6/2005	[Blue bar spanning from Oct 6 to Oct 10]											
26	Finish Paint	16	10/21/2005	[Blue bar spanning from Oct 21 to Nov 6]											
27	Set Casework	3	10/24/2005	[Blue bar spanning from Oct 24 to Oct 27]											
28	Install Finishes	17	11/2/2005	[Blue bar spanning from Nov 2 to Nov 19]											
29	Fire Alarm Test & Inspection	1	11/25/2005	[Blue bar spanning from Nov 25 to Nov 26]											
30	Completion	10	12/2/2005	▶ 12/2/05											

NOTE: This schedule is typical per phase.

C. BUILDING SYSTEMS SUMMARY

YES	NO	WORK SCOPE
X		Demolition Required?
X		Structural Steel Frame
X		Cast-In-Place Concrete
X		Pre-cast Concrete
X		Mechanical System
X		Electrical System
X		Masonry
X		Curtain Wall
X		Support of Excavation

Architecture

The renovation is designed to modernize the existing building aesthetically, electrically, and mechanically. Once complete, the building will be equipped with top of the line equipment and technology, making it a great student facility for years to come. There will be abuse resistant gypsum wallboard throughout the facility. New classrooms will be added, the administration area and library will be rebuilt and relocated, and significant improvements will be made to science labs, locker rooms, the auditorium, media room and the school's athletic facility. The 70,000 S.F. of additional space being constructed will accommodate the growth in the area and eliminate the need for some local students to travel further distances to go to high school.

Building Envelope

The project has CMU and brick exterior wall systems. There is metal roof decking with expansion control and bituminous waterproofing

Construction

The project will occur in phases, and students will occupy the building during the entire renovation.

Electrical

This project has a 1000 A capacity within a 120V system. There is an underground electrical service, dry-type transformers and an emergency back-up generator.

Lighting

Performance based specification with a minimum 10 year life cycle cost. The project utilized Sports Field Lighting for the baseball and football fields. Interior Fluorescent, Incandescent, and High Intensity Discharge lighting used in the school interior.

Mechanical

The Special System room contains its own unique Air Conditioning Unit. The rooftop heating and cooling unit uses multi-zone gas heating and DX cooling. The project contains domestic gas & electric water heaters.

Structural

CMU and Brick exterior wall systems with steel framing used for new construction. Metal Roof Decking system with expansion control and bituminous waterproofing

Fire Protection

A hydraulically designed wet-pipe system is being installed to cover the entire building.

Transportation

The project contains both hydraulic elevators and surface mounted vehicle lifts and alignment systems. The main purpose of the elevators is to meet ADA disability requirements.

Telecommunications

A cable television/Broadband distribution system will be put in place during the renovation and addition. The contractor is furnishing and installing a sound and intercommunications, master clock and program systems. They will install a microprocessor controlled voice communication system with all low voltage wiring and equipment.

Special Systems

There is a detailed engineering design of a steel support structure, point supported structural glass and accessory parts performed by the glazed steel structure contractor. This structure must support a 30 psf live load and a 30 psf superimposed dead load.

Demolition

The demolition portion of the project is extremely planned out due to the phasing and sequencing of which areas they are able to work in. The demolition work varies from phase to phase depending on what portions of the school are included, but the electrical, mechanical and specialty furnishings must all be removed prior to work starting in those areas.

Concrete

Both cast-in-place and pre-cast concrete are utilized on this project. A structural plant cast is pre-cast to be used on site.

Support of Excavation

Temporary shoring put in place to support the foundation during excavation for the addition.

D. PROJECT COST EVALUATION

Building Details

Size (total square feet)
Renovation ~ 340,000 SF
Addition ~ 70,000 SF

Number of stories: 2

Actual Building Construction Cost

Construction Cost: \$45,000,000
Note: Not including land costs, site work, permitting, etc.

Construction Cost/Sq. Ft.: \$109.76/Sq. Ft.

Total Project Costs

Total Cost: \$45,000,000
Note: The total cost includes the overhead, profit, fee, and also the contingency.

Total Cost/Sq. Ft.: \$109.76/Sq. Ft.

Building Systems Cost

Site Work: \$2,300,000
Cost/Sq. Ft.: \$19.57/SF

Electrical: \$6,545,000
Cost/Sq. Ft.: \$6.88/SF

Mechanical: \$9,470,000
Total Mechanical/Sq. Ft.: \$4.75/SF

Plumbing/HVAC: \$7,099,000
Cost/Sq. Ft.: \$6.34/SF

Fire Protection: \$990,000
Cost/Sq. Ft.: \$45.45/SF

Structural: \$7,600,000
Total Structural/SF: \$5.92/SF

Concrete: \$650,000
Cost/SF: \$9.65/SF

Masonry: \$1,370,000
Cost/SF: \$32.85/SF

Steel: \$ 2,660,000
Cost/SF: \$16.92/SF

Parametric Estimate via D4Cost 2002 Estimating

The D4Cost Database had several projects that were similar to the Fairfax High School project; however, the closest project cost found was approximately \$28,000,000 for Jordan High School. This project was selected due to its similarity to the Fairfax High School project. The overall selection process was based on the square footage and number of stories with direct comparison to the cost.

The results yielded for Fairfax High School: \$41,871,960

Square Foot Estimate via R.S. Means

Source: *RS Means Building Construction Cost Data – 63rd Annual Addition – 2005 (pg.512)*

The following Square Foot Estimate was completed through the RS Means source listed above.

Floor Area

Cost per square foot of floor area = \$108.85

Square Foot Cost = \$108.00 * 410,000 SF = \$44,280,000

RS Means Cost Estimate: \$44,280,000

Compare differences between your estimates and the actual project costs.

Total Actual Cost: \$45,000,000

D4Cost Estimate result yielded for Fairfax High School: \$41,871,960

RS Means Cost Estimate: \$44,280,000

After both estimates were compiled and compared to the actual cost, minimal difference was shown. The D4 Cost estimate came in less than \$4,000,000 lower than the actual cost. D4 Cost's database had a lot of educational projects to compare to, which helped when doing the estimate. The selection process for the source buildings dealt with building use, size, number of floors, and building cost. The program then adjusted the time and location factors for construction. The RS Means Square Foot Estimate came in less than \$1,000,000 lower than the actual cost. Although the two estimates were a little low, they were still fairly accurate compared to the actual project cost. The discrepancies more than likely resulted due to all of the specialty equipment for the various areas of the school.