

# How to Manage Major Construction Projects

*NAIS Annual Conference  
February 27, 2003  
New York, NY*

St. Christopher's School  
Richmond, VA



**BRAILSFORD & DUNLAVEY**  
Facility Planning • Project Management

# INTRODUCTION

- Meet the Presenters
  - *Brad Noyes - Vice President*
    - *Brailsford & Dunlavey – Project Consultant*
    - *Independent school practice leader*
    - *8 current independent school assignments*
  - *Ace Ellis – Business Manager*
    - *St. Christopher’s School – 910 day students*
    - *Financial & facilities oversight*
    - *Capital projects oversight*



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# INTRODUCTION

- Three Phases to Manage
  - *Programming*
  - *Design*
  - *Construction*
- Owner (School) Concerns
  - *Form & Function*
  - *Budget*
  - *Schedule*
- Wrap Up
  - *Lessons Learned...the Hard Way*



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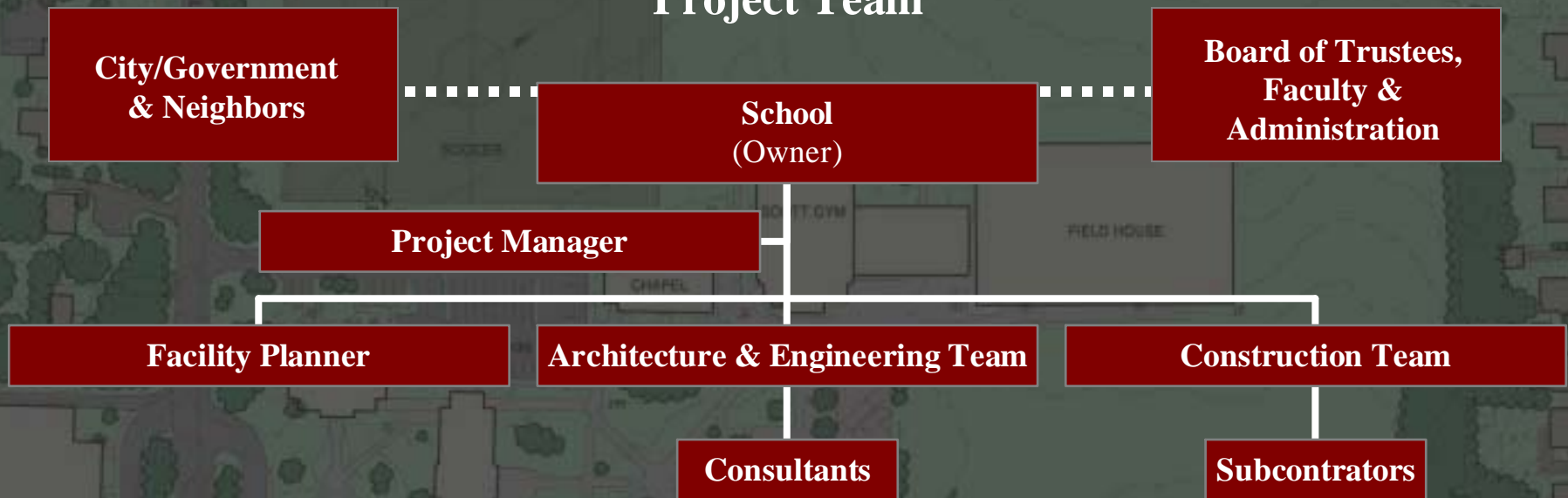
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# PROCESS OVERVIEW

## Project Team



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# PROCESS OVERVIEW



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# PROCESS OVERVIEW

Time →

## Programming

The process of **seeking** and refining the requirements to be met by the final building design.

## Design

## Construction



Deliverable

Architectural Requirements



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# PROGRAMMING

- Deliverables
  - *Space Requirements*
  - *Comprehensive Budget*
    - *Hard Costs*
    - *Soft Costs*
  - *Project Schedule*
  - *Financing Plan*
    - *Fundraising*
    - *Bonds*
    - *Additional Income*
  - *Consensus*



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# PROGRAMMING

- Selecting the Working Group
  - *Role of Group*
    - *Ask Questions*
    - *Represent Users*
    - *Stay Involved*
  - *Size of Group*
  - *Broad Representation*
  - *Significant Time Commitment*
  - *Establish Milestones & Expectations*





# PROGRAMMING

- Required Research
  - *Comparable Schools*
  - *National Trends*
  - *Focus Groups – Students/Parents/Staff*
  - *Schedule Analysis*
  - *Fundraising Parameters*
  - *Financial Analysis*



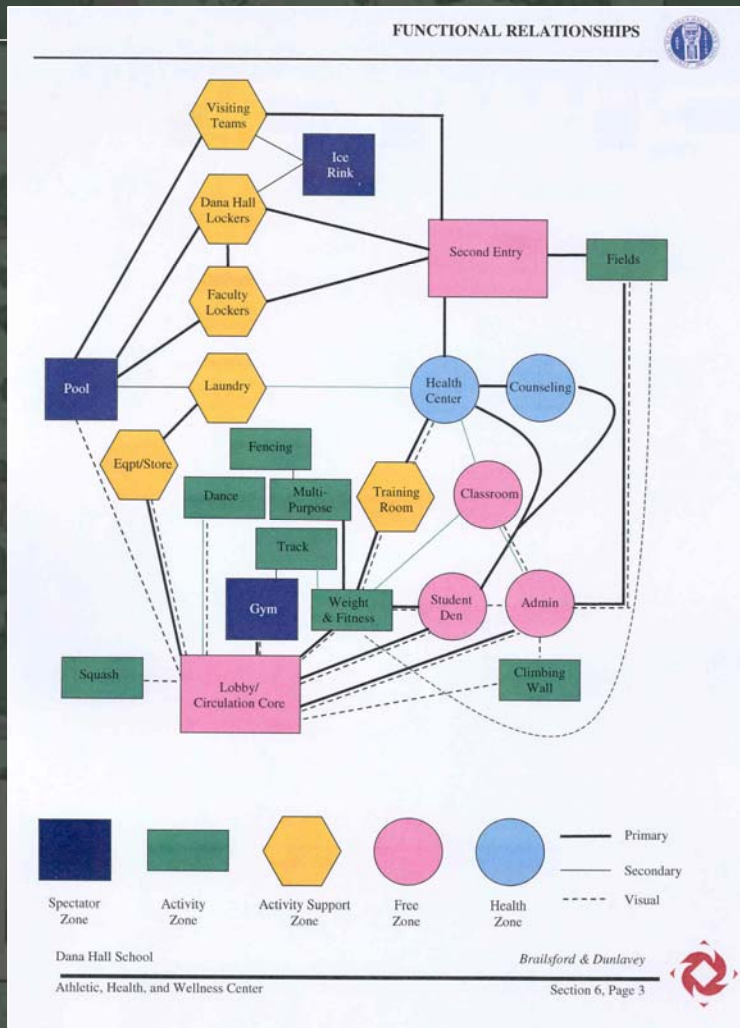
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# PROGRAMMING



**PROGRAM ELEMENT DATA SHEETS**

ZONE	Activity Zone	CODE	AZ.1D
AREA	Specialized Activity Areas		
ELEMENT	Sport Climbing Wall		
<b>DESCRIPTION</b>	High sport climbing walls with pit area		
<b>PURPOSE/USE</b>	To provide a training and recreational facility for skill development in sport climbing.		
<b>SIZE/LOCATION</b>	<i>Net Programmed Linear Wall</i> 640 sq. ft. <i>Minimum Dimensions</i> Flexible <i>Minimum Ceiling Height</i> 35'; 50' would permit the hosting of high level competitions. <i>Location/Relationship</i> Visible from main circulation core and possibly from lobby/entrance.		
<b>FEATURES</b>	<i>Access</i> From primary circulation corridor <i>Occupancy Hours</i> All operating hours <i>Occupancy Numbers</i> Up to 10 participants and 1 supervisor at any time. <i>Occupancy Allocations</i> One rope for each 5' to 8' of linear wall; 2 participants per rope		
<b>ARCHITECTURAL</b>	<i>Ceiling</i> TBD <i>Walls</i> Must meet structural demands, existing codes, and usage demand requirements. <i>Floor</i> Composition with rubber gravel covering for landing area and synthetic flooring for spotting and supervising area. <i>Doors</i> Flush with wall surface <i>Exterior Windows</i> Preferred		
<b>SYSTEMS</b>	<i>Lighting</i> Suspended direct <i>Audio/Intercom</i> Required <i>Computer</i> Not required <i>Telephone</i> Not required <i>Access Control</i> Space should be open but controlled <i>Additional Electric</i> None <i>Additional HVAC</i> Adequate to accommodate the high concentration of participants. <i>Additional Plumbing</i> None		
<b>SPECIAL COMMENTS</b>	To be open only under strict supervision and must remain controlled at all other times for liability reasons.		

St. Christopher's School  
Athletic Facilities Master Plan

Brailsford & Dunlavey  
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# PROGRAMMING

## ST. CATHERINE'S SCHOOL

Comparable School Analysis

08-Nov-99

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School	Total Teams	Total Sports M/W	Cross Country M/W	Field Hockey M/W	Football M/W	Soccer M/W	Volleyball M/W	Diving M/W	Basketball M/W	Ice Hockey M/W	Equestrian M/W	Squash M/W	Swim M/W
The Collegiate School	75	12/12	X/X	-/X	X/-	X/X	-/X	-	X/X	-	-	-	X/X
Episcopal High School	39	11/10	X/X	-/X	X/-	X/X	-/X	-	X/X	-	-	X/X	-
Woodberry Forest School	30	13/-	X/-	-	X/-	X/-	-	X/-	X/-	-	-	X/-	X/-
Virginia Episcopal School	32	10/8	X/X	-/X	X/-	X/X	-/X	-	X/X	-	-	-	-
National Cathedral School for Girls	36	-/12	-/X	-/X	-	-/X	-/X	-/X	-/X	-	-	-	-/X
St. Anne's Belfield School	30	8/7	X/X	-/X	-	X/X	-/X	-	X/X	-	-	-	-
The Maderia School	19	-/12	-/X	-/X	-	-/X	-/X	-/X	X/X	-	-/X	-/X	-/X
St. Christopher's School	NP	11/0	X/-	-	X/-	X/-	-	-	X/-	-	-	-	X/-
<b>TOTAL/TOTAL SCHOOLS</b>	<b>37</b>	<b>11/9</b>	<b>8/8</b>	<b>6/6</b>	<b>5/6</b>	<b>8/8</b>	<b>6/8</b>	<b>3/8</b>	<b>8/8</b>	<b>0/8</b>	<b>1/9</b>	<b>3/8</b>	<b>5/8</b>
<i>St. Catherine's School</i>	<b>33</b>	<b>10</b>	<b>X</b>	<b>X</b>	<b>-</b>	<b>X</b>	<b>X</b>	<b>-</b>	<b>X</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>X</b>

School	Gymnastic M/W	Wrestling M/W	Baseball/Softball M/W	Crew M/W	Golf M/W	Lax M/W	Tennis M/W	Track and Field M/W	F-T Coaches	P-T Coaches	Faculty Coaches	Last Practice
The Collegiate School	-/X	X/-	X/X	-	X/X	X/X	X/X	X/X	9	40	31	5:30
Episcopal High School	-	X/-	X/X	-	X/-	X/X	X/X	X/X	4	NP	NP	NP
Woodberry Forest School	-	X/-	X/-	-	X/-	X/-	X/-	X/-	2	NP	12	6:30
Virginia Episcopal School	-	X/-	X/X	-	X/X	X/X	X/X	X/X	NP	NP	NP	NP
National Cathedral School for Girls	-	-	-/X	-/X	-	-/X	-/X	-/X	6	4	5	6:00
St. Anne's Belfield School	-	X/-	X/X	-	-	X/X	X/X	-	6	23	20	5:30
The Maderia School	-	-	-/X	-	-	-/X	-/X	-	4	NP	NP	6:00
St. Christopher's School	-	X/-	X/-	-	X/-	X/-	X/-	X/-	4	6	50	5:45
<b>TOTAL/TOTAL SCHOOLS</b>	<b>1/8</b>	<b>6/8</b>	<b>8/8</b>	<b>1/8</b>	<b>5/8</b>	<b>8/8</b>	<b>8/8</b>	<b>6/8</b>	<b>5</b>	<b>18</b>	<b>24</b>	<b>5:45</b>
<i>St. Catherine's School</i>	<b>-</b>	<b>-</b>	<b>X</b>	<b>-</b>	<b>X*</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>3</b>	<b>18</b>	<b>7</b>	<b>5:45</b>

Notes:

NA - Not Available/Not Applicable

\* - Instructional Sport (Non-Competitive)

All information is from Peterson's 1999-2000 PrivateSecondary School 20th Edition and Phone Interviews Conducted By B&D

EXHIBIT C - Interscholastic Athletic Teams



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# OWNER CONCERNS - PROGRAMMING

- **Form & Function**

- *Outside Firm? – No Vested Interest in the Outcome*
- *Master Campus Plan Coordination*
- *Establish Clear Link to Strategic Plan/Mission*
- *Faculty/User Input – Quantify Needs*
- *Due Diligence – Competitive & Cost Data*
- *Board/Trustee Endorsement*

- **Budget**

- *Comprehensive, Benchmark Based (Including Inflation Factor)*
- *Identification of Financing Sources*

- **Schedule**

- *Take your Time*



# PROGRAMMING

## Q&A #1



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# PROCESS OVERVIEW

Time →

Programming

Design

Construction

The process of **solving** the requirements established by the program document under the parameters of budget, schedule & quality.



Deliverable

Construction Documents



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# DESIGN

- Selecting a Design Team
  - *Open and Fair Process*
  - *Selection Schedule*
  - *Develop Clear RFP/RFQ*
  - *Site Tour & Interviews*
  - *Key Factors*
    - *Experience*
    - *Approach*
    - *Cost*
    - *Chemistry*



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# DESIGN

- Managing the A/E Team
  - *Negotiating Contracts*
  - *Contract Factors*
    - *Cost*
    - *Schedule*
    - *Program*
  - *Meeting Schedule*
  - *Phases of Design*
  - *Review of Drawings & Specifications*
  - *Cost Estimates*
  - *“Owner” Contracts*



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# DESIGN

- Neighbor Relations & Zoning
  - *Meet with Governing Bodies & Interested Parties*
  - *Open Space & Impervious Surface*
  - *Variance vs. Zoning Compliance*
  - *Divide and Conquer*
  - *Schedule*
    - *Early*
    - *Design Update*
    - *Before Construction*
  - *Identify Point Person*
  - *Contract Key Consultants*



# DESIGN



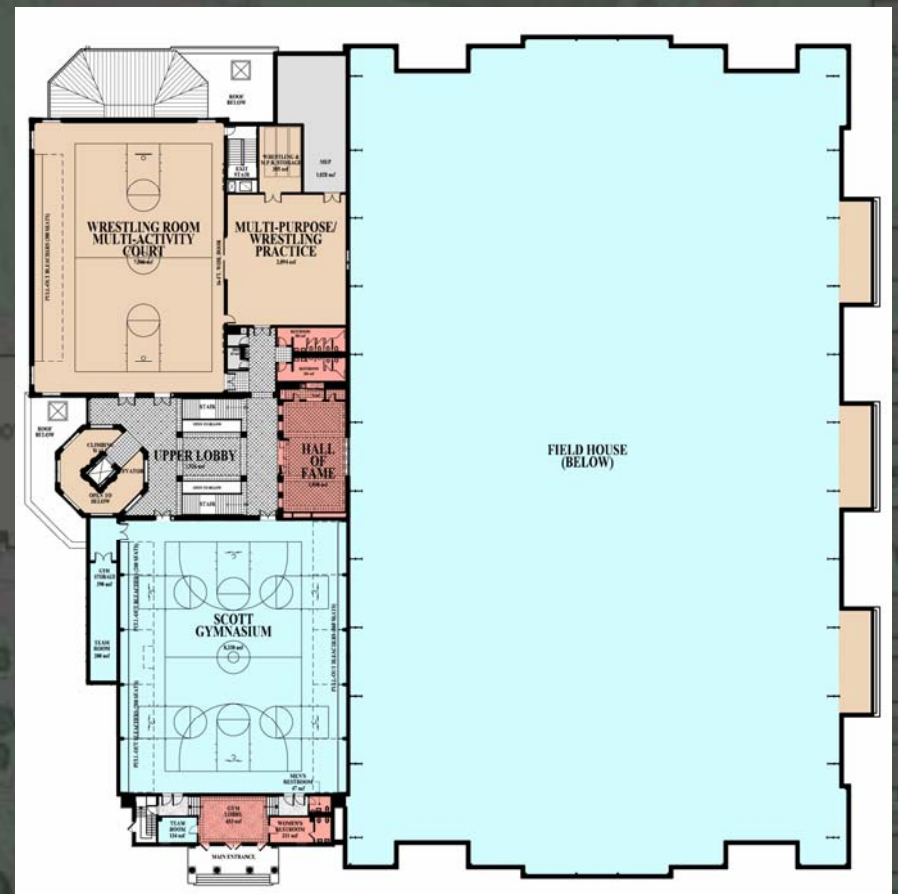
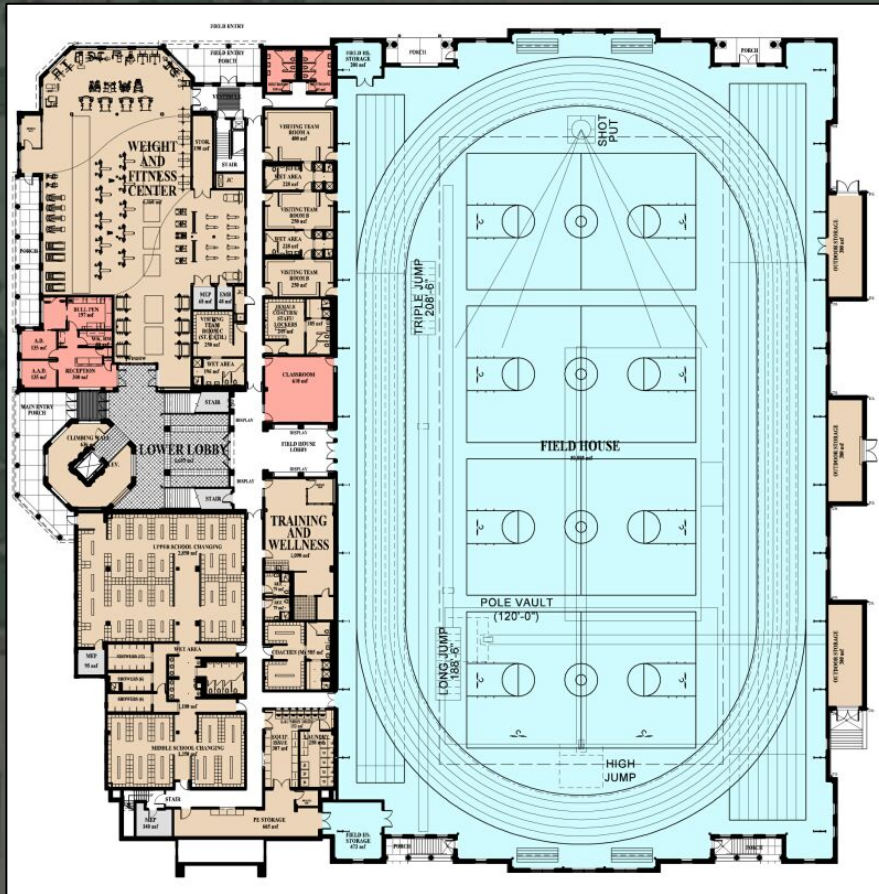
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# DESIGN



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# DESIGN



WEST ELEVATION



SOUTH ELEVATION

BOWIE GRIDLEY ARCHITECTS  
APRIL 11, 2001

NEW ATHLETIC CENTER  
St. Christopher's School

ELEVATIONS  
3/32" = 1'-0"



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# OWNER CONCERNS - DESIGN

- **Budget**

- *Architect Buy-In to Preliminary Cost Estimates - Contractual*
- *Discipline, Avoid Scope Creep (Many Decisions)*
- *Multiple Cost Estimates (Independent)*
- *General Contractor Participation*
- *Finalize Financing Plan*

- **Schedule**

- *Construction Phasing & Timing Considerations*

- **Form & Function**

- *Property/Plant Committee Involvement*
- *Space Users Check-Off at Schematic Design*
- *Third Party Participation in Zoning & Neighborhood Meetings*



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# DESIGN

## Q&A #2



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# PROCESS OVERVIEW

Time →

Programming

Design

Construction

The process of **implementing** the requirements established by the drawings and specifications.



Deliverable

Finished Building/Facility



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# CONSTRUCTION

- Selecting a Builder
  - *Delivery Method – Control vs. Cost*
    - *General Contractor*
    - *Design Build*
    - *Construction Manager*
  - *Selection Process – Qualifications vs. Competitive Bid*
  - *Staging Plan*
    - *Traffic*
    - *Limits of Construction*
    - *Neighbor Relations*
  - *Schedule*



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# CONSTRUCTION

- Negotiating Contracts
  - *Staff Roles*
    - *Project Manager*
    - *Site Superintendent*
    - *Support Staff*
  - *Use of AIA Contract Documents*
  - *Legal Review*
  - *Overhead & Profit*
  - *Damages*
  - *Savings*



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# CONSTRUCTION

- Owner Contracts
  - *Management Approaches*
    - *Internal/External*
    - *Lead Times*
    - *Moving In*
  - *Furniture, Fixtures, Equipment (FF&E)*
  - *Audio Visual*
  - *Technology*
  - *Security*



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# CONSTRUCTION



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# CONSTRUCTION



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# OWNER CONCERNS - CONSTRUCTION

- **Schedule**

- *Active Owner Involvement – Single Point of Contact*
- *Watchdog/Troubleshooter on Team*
- *Architect Construction Administrator Responsiveness*
- *Regular Meetings*

- **Budget**

- *Real Time Tracking System – Set Expectations Early*
- *Align the G/C's Interests with the School's*

- **Form & Function**

- *Third Party Role on Construction Team, Especially if the G/C is a Friend of the School*
- *Minimal User Involvement – Use of Progress Reports*



# CONSTRUCTION

## St. Christopher's School Athletic Facility Construction Project Report January 2003



**January Highlights**

Scott Gym will open from the first home basketball game on January 15th (Holiday) through February 2003 under a temporary certificate of occupancy. While the window landscaping remains completed in the lobby and entrance to Scott Gym temporary wall the structure is operational and partially installed bleachers will be visible upon that the renovation of Scott Gym is still in progress, the newly collected court, new healthards, P.A. system and lighting, in addition to the paint and final inside treatment for the State's 2003 home season as well as the progress of the athletic facilities renovation project itself.

The new water line was installed down the service road behind the backstore to support Scott Gym's line separation system and the road has installed a new domestic water line to be connected to city service behind the Dining Hall. The road extending from there to the front of Scott Gym will have a gravel surface and pavement resurfacing can be completed March 2003.

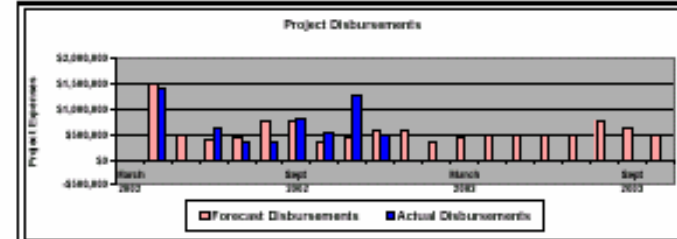
Miscellaneous and service contractors to work to get the addition fully enclosed. The new lobby skylights are installed and TSP is installing windows in the Viewing Area. Work of site the track wall is complete and the masonry continues to make progress in the lobby/dining hall and existing track locker room areas.

With the temporary heat landscaping, finish trades will begin working in the basement of Scott Gym once after the first of the year.



## St. Christopher's School Athletic Facility Project Schedule and Financial Report January 2003

Project Phase	Original Project Schedule	Status/Outlook
Scott Gym Renovation (Updates)	Temporary Occupancy 1/15/2003 (2003 Basketball Season)	Ready for Practice 1/16/2003
Fitness Center Addition	Occupancy 9/1/2003 (Start of School September 2003)	On Schedule
Entrance, Parking & Field Relocations	Summer 2003	Parking Lot & Fields Complete 9/2002 Drop-off Loop and Landscaping 9/2003



**Financial Summary**

Phase I of the athletic facility master plan is currently tracking within the total project budget appropriate the Spring of 2003.

Disbursements to date total just over \$1.8 million towards a total anticipated outlay of \$21.1 million for active projects. Disbursements to date include 20% of \$1.8 million and more than for work originally scheduled for Phase II and not included in T&P's existing O&M contract. These costs are outlined as Phase II expenses in the table to the right.

Project expenditures will be discussed with you credit from the series 2002 tax- exempt bond offering and that from debt to be re-financed with a second tax- exempt bond issue anticipated in 2003.

The budget for "active projects" includes an owner's contingency of \$200K.

**Providing Excellence in Athletics**

Recognizing the importance of athletics in the development of the whole boy, St. Christopher's offers a comprehensive athletic program that is integral to the school and experience in the future. The athletic program leads to fitness and teaches students the rewards of hard work, fair play, and sportsmanship, of dedication, perseverance and loyalty—lessons to be valued for a lifetime.

To ensure that the mandatory program is effective for all students, the athletic program has been expanded to provide a wide range of sports offerings for a diverse population and create more opportunities for individual success. At St. Christopher's the athletic program is as much about building character as it is about health, fitness, and competition. Together participation in an athletic program fosters self-confidence and the development of healthy habits for a lifetime of success.

In the past decade, the School's leaders have focused on enhancements to the academic side of the program. During that time, St. Christopher's made major investments to all the academic buildings and those of the historic campus, constructed a state of the art science center and dramatically upgraded the school's technology throughout all grades. The athletic facility master plan includes upgrades and expansion of all indoor and outdoor facilities necessary to support a student enrollment of 900+ students at the School's single campus location.



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# CONSTRUCTION

## Q&A #3



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# PROJECT PARTICIPATION

CONSTITUENTS	PRIMARY CONCERN	PROJECT PHASE		
		PROGRAMMING	DESIGN	CONSTRUCTION
<b>Internal</b>				
<b>Board/Committees</b>	Program Fit & Aesthetics	✓	✓	
<b>Administration</b>	Function & Cost	✓	✓	✓
<b>Faculty</b>	Function	✓		
<b>Maintenance Staff</b>	Maintainability		✓	✓
<b>Friends</b>				
<b>Alumni</b>	Image/Aesthetics			✓
<b>Fundraisers/Donors</b>	Salability & Image		✓	
<b>Professionals</b>				
<b>Planners</b>	Program Fit & Referrals	✓		
<b>Project Manager</b>	Cost & Schedule		✓	✓
<b>Architects/Engineers</b>	"Cool" Buildings & Referrals		✓	✓
<b>General Contractor</b>	Fees \$'s & Next Project			✓
<b>Other</b>				
<b>Attorneys</b>	Fee Based Service		✓	
<b>City/Government</b>	Code & Neighbors		✓	✓
<b>Neighbors</b>	Property Values & Convenience		✓	✓



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# TRICKS OF THE TRADE

- Up Front Research – No Vested Interest in the Outcome
- Broad Involvement & Build Consensus
- Consistent Leadership/Management
- Hire Experienced Partners – You WILL Get What You Pay For
- Comprehensive and Conservative Budgeting
- Documentation – Memorialize Decisions
- Hire the Best Civil Engineer Around
- Have the G/C Perform a Cost Estimate During Design
- Remember the Big Picture - Enjoy the Process



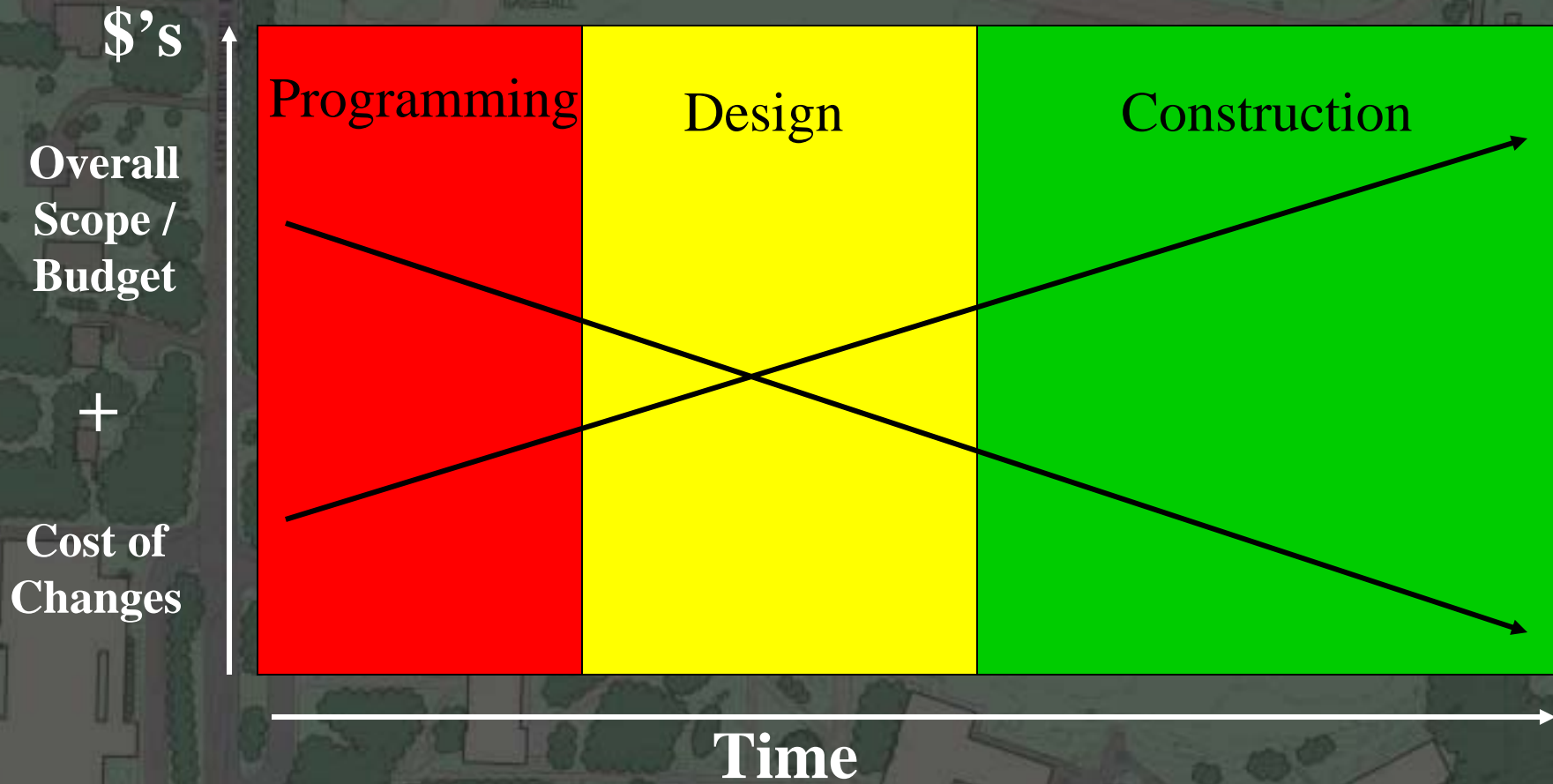
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# PROJECT COST OVERVIEW



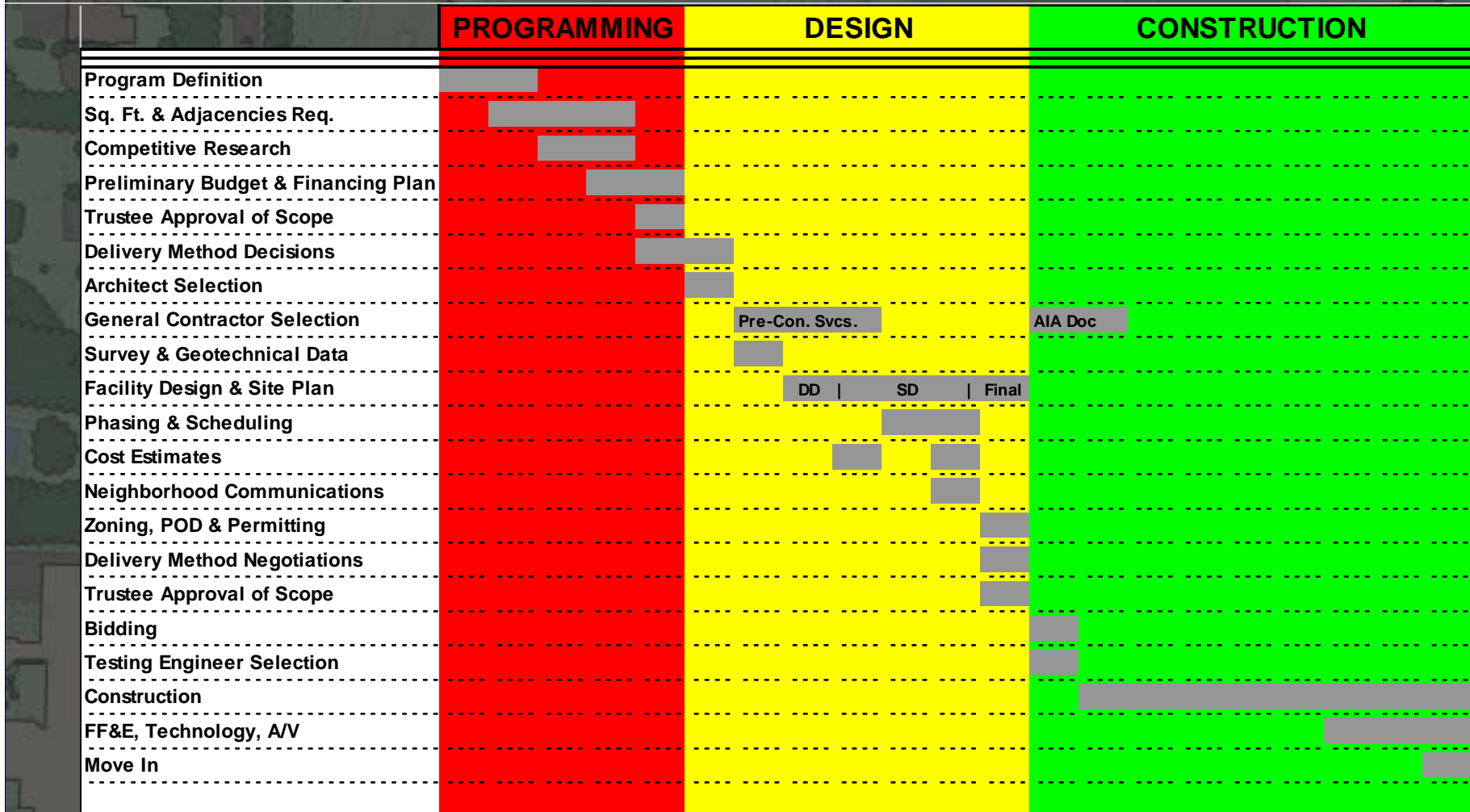
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# SCHEDULE OVERVIEW



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