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# Dover High School & Regional Career Technical Center

- Laura Wernick FAIA, LEED AP—Project Director
- Tina Stanislaski, AIA, LEED AP—Project Manager
- Bobby Williams, AIA, LEED AP—Project Architect



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# Feasibility Study Update

# Completed Tasks

- Existing Conditions Report
- Visioning Study
  - Participants included community members, business leaders, students, and teachers
- Academic and CTE space needs
- Site Exploration
- Selection of Construction Manager
- Cost Estimates

# Site Goals

- Safety (minimizing street crossings, ease of access for emergency vehicles)
- Minimal Impact to students during construction
- Improved traffic conditions
- Plan for flexibility and adaptability as needs change
- Minimized impact on parking and ball fields to reduce replacement costs
- Strong pedestrian access and easy servicing for deliveries
- Solar orientation to optimize natural light

# Site Exploration



# Visioning Session Goals

- Create small learning communities
- Create integrated academic and CTE programs as much as possible
- Create prominent and centralized Town Square that will be used by all students and the public, in addition to being viewed as the heart of the school
- Provide easy public access to the public career tech spaces such as cosmetology, marketing and culinary arts, ideally as part of the central space
- Provide opportunities for hands-on project based learning and interdisciplinary learning throughout the building
- Encourage a high level of visual connection throughout the school and visual connection to the outdoors.
- Provide a range of spaces for different types of learning experiences to take place
- Assure flexibility and adaptability for future needs in all planning

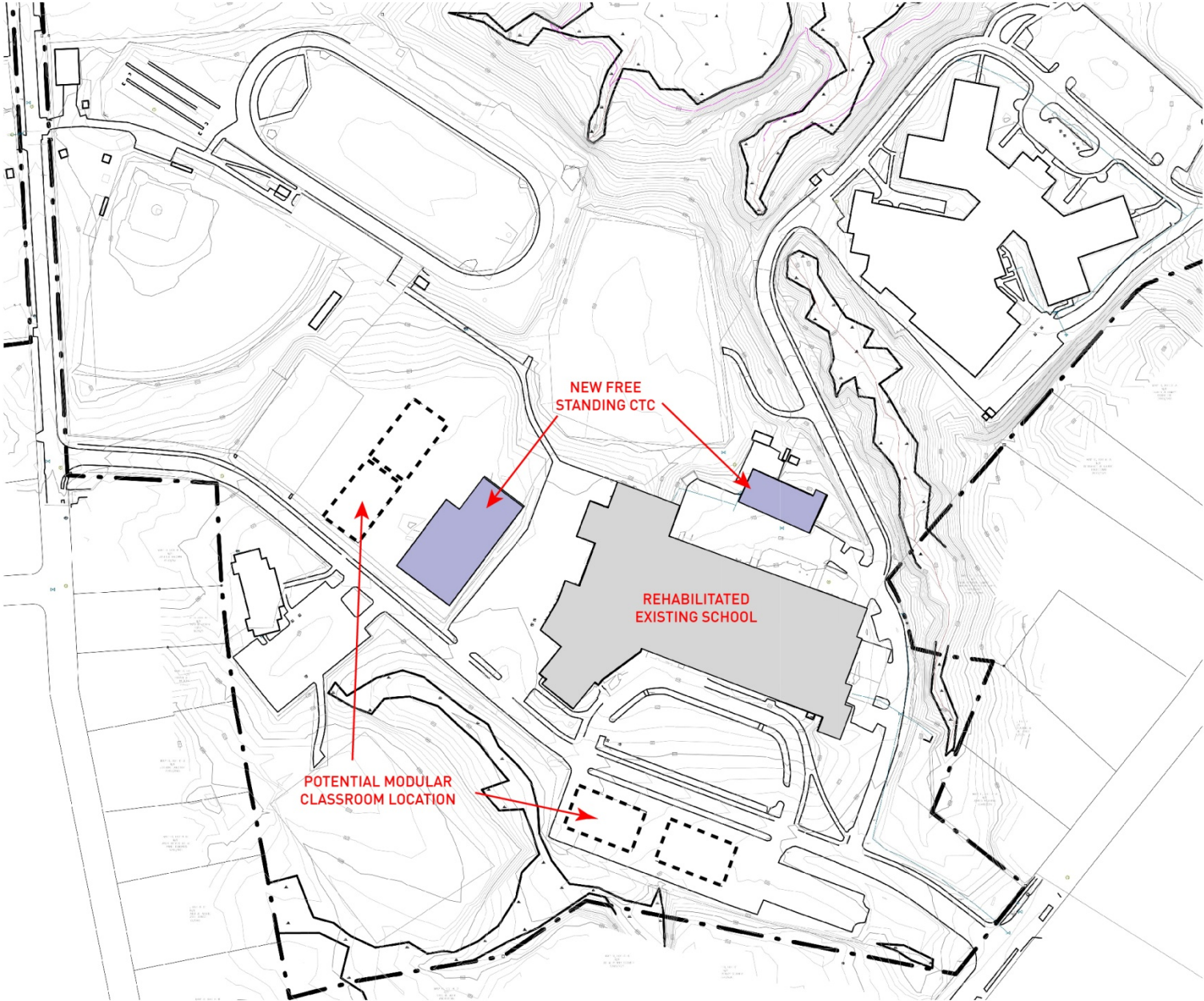
# Current Investigation

1. Base Rehabilitation & CTE Addition
2. Addition and Renovation
3. New Construction

# Base Rehabilitation

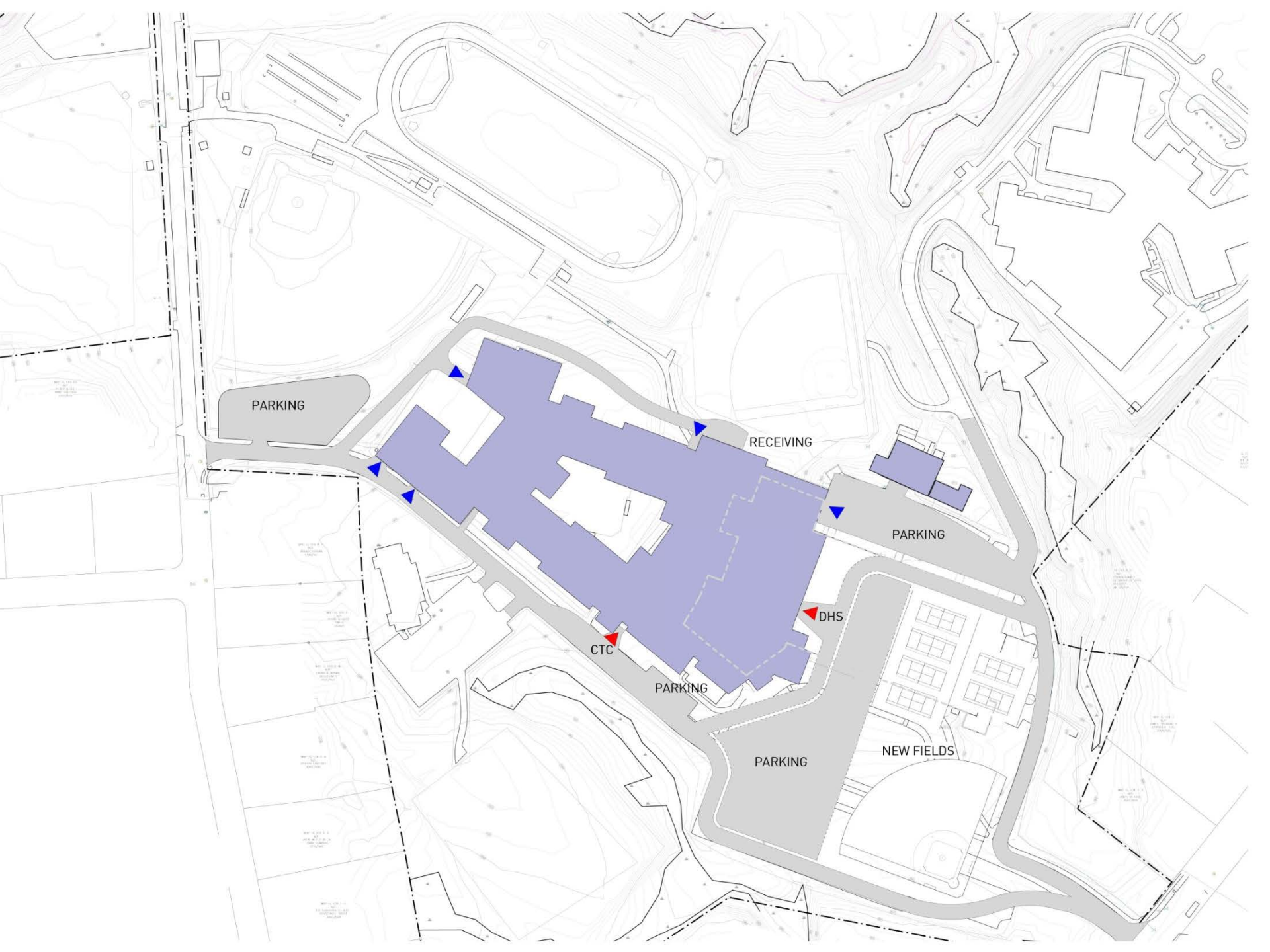
- New interior finishes, with structural, electrical, mechanical, plumbing, fire protection, and technology upgrades to meet current codes.
- Will not meet any of visioning study goals
- Will not meet all site goals
- Most amount of impact to students during construction
- Longest construction time
- Will require a minimum of 16 modular classrooms
- Will create free standing CTE buildings





# Addition and Renovation

- Preserves and Renovates the existing gymnasium and auditorium
- Will meet all visioning study goals
- Will meet all site goals
- Two stories
- Some impact to students during construction



PARKING

RECEIVING

PARKING

DHS

CTC

PARKING

PARKING

NEW FIELDS



SECOND FLOOR

FIRST FLOOR

**COLOR LEGEND**

- Administration
- Community / Shared
- Classroom
- Special Education
- Science
- CTC Integrated
- CTC Public
- CTC Service
- CTC Stand Alone
- Mechanical
- Storage
- Support
- Toilet Rooms
- Circulation
- Learning Commons

	New	Renovation
Ground Floor	-	12,810 sf
First Floor	- 150,581 sf	45,524 sf
Second Floor	- 78,288 sf	7,590 sf
Animal Science	- 8,500	2000 sf
Total	- 303,293 sf	
Net To Gross	- 1.40	

**Reno Add Option - 2B**  
**Dover HS / CTC**  
 Dover, NH  
 UPDATED 05/06/2015



GROUND FLOOR



HMFH Architects Inc.

# New Construction

- Will meet all visioning study goals
- Will meet all site goals
- Three stories
- Least amount of impact to students during construction



**COLOR LEGEND**

- |  |  |
|--|--|
| <span style="color: green;">■</span> Administration            | <span style="color: grey;">■</span> Mechanical       |
| <span style="color: yellow;">■</span> Community / Shared       | <span style="color: grey;">■</span> Storage          |
| <span style="color: orange;">■</span> Classroom                | <span style="color: grey;">■</span> Support          |
| <span style="color: darkorange;">■</span> Special Education    | <span style="color: grey;">■</span> Toilet Rooms     |
| <span style="color: red;">■</span> Science                     | <span style="color: grey;">■</span> Circulation      |
| <span style="color: teal;">■</span> CTC Integrated             | <span style="color: grey;">■</span> Learning Commons |
| <span style="color: blue-teal;">■</span> CTC Public            |  |
| <span style="color: dark-teal;">■</span> CTC Service           |  |
| <span style="color: light-blue-teal;">■</span> CTC Stand Alone |  |

First Floor - 173,884 sf  
 Second Floor - 78,945 sf  
 Third Floor - 43,185 sf  
 Animal Science - 8,500 sf (6,500 new / 2000 existing)

Total - 304,514 sf  
 Net To Gross - 1.42

**New Construction - Option 3A**  
**Dover HS / CTC**  
 Dover, NH  
 UPDATED 05/06/2015





**CONSTRUCTION**



Joe Picoraro – Vice President  
Garret Bertolini – Senior Project Manager  
Scott Blair – Project Manager

## **Dover High School and Career Technical Center Project**

Dover, New Hampshire | June 30, 2015



## FEASIBILITY STUDY ESTIMATE PROCESS

- Kickoff Meeting with HMFH and PM&C
- Questions asked and answered, information shared
- Reconciliation meetings to align estimates
- Prepare Schematic Estimate Book



### Dover High School - Option #1 - Full Renovation - Estimate Comparison

		PC	PM&C	Cost Variance
<b>High School Total</b>		<b>\$64,417,847</b>	<b>\$65,141,515</b>	<b>\$723,668</b>
A1010	Standard Foundations	\$586,118	\$281,788	-\$304,330
A1020	Special Foundations	\$392,400	\$566,000	\$173,600
A1030	Lowest Floor Construction	\$747,368	\$659,778	-\$87,588
B1010	Floor Construction	\$570,000	\$820,825	\$250,825
B1020	Roof Construction	\$276,199	\$448,000	\$171,801
B2010	Exterior Walls	\$1,156,462	\$918,878	-\$237,584
B2020	Windows	\$2,127,120	\$2,052,062	-\$75,058
B2030	Exterior Doors	\$140,785	\$182,490	\$41,705
B3010/3020	Roof Coverings & Openings	\$361,327	\$481,000	\$119,673
C1010	Partitions	\$1,166,993	\$1,423,750	\$256,757
C1020	Interior Doors	\$697,003	\$794,250	\$97,247
C1030	Specialties / Millwork	\$2,135,630	\$2,163,748	\$28,118
C2010	Stair Construction	\$123,729	\$77,000	-\$46,729
C3010	Wall Finishes	\$874,439	\$1,059,000	\$184,561
C3020	Floor Finishes	\$1,914,998	\$2,080,534	\$165,536
C3030	Ceiling Finishes	\$1,182,465	\$1,330,822	\$148,357

City of Dover, New Hampshire  
Dover High School & Career Technical Center  
**DOVER SCHOOL DISTRICT**  
June 23, 2015



Schematic Estimate

## SCHEMATIC ESTIMATE BOOK

### TABLE OF CONTENTS

SECTION 1	SCHEMATIC ESTIMATES  Option 1: Renovation Option 2: Addition/Renovation Option 3: New Construction
SECTION 2	SCOPE OF WORK CLARIFICATIONS  Option 1: Renovation Option 2: Addition/Renovation Option 3: New Construction
SECTION 3	LIST OF DOCUMENTS
SECTION 4	SCHEDULE

## OPTIONS CONSTRUCTION COSTS

	Core Project Cost Elements	Selected Project Cost Drivers*	Total Construction Cost
Option 1: Complete Renovation	\$57,185,564	\$7,232,436	\$64,418,000
Option 2: Partial Renovation with Addition	\$61,305,794	\$6,144,206	\$67,450,000
Option 3: All New Construction	\$65,001,626	\$6,591,374	\$71,593,000

\*Selected Project Cost Drivers include aggregate piers with associated slab-on-grade, asbestos abatement, turf football field, kitchen equipment, baseball field work, stage lighting, linoleum (in lieu of VCT), and courtyard landscaping.



## YOUR PROJECT | PROPOSED OPTION 1 – FULL REHAB

Compare and Contrast							
Pros	Cons						
<ul style="list-style-type: none"> <li>• Least cost</li> <li>• Minimal sitework</li> </ul>	<ul style="list-style-type: none"> <li>• Extremely invasive, most disruptive approach</li> <li>• Prolonged exposure to construction</li> <li>• High risk due to unknowns</li> <li>• Escalation costs unpredictable over extended period</li> <li>• Subcontractor pricing will be increase due to inefficiencies and by length of project</li> <li>• <b>No program / educational environment improvements</b> (Centralized Common Space, Small Learning Centers, Integrating HS &amp; CTS, Flexibility, Visibility, Daylight)</li> <li>• Costly temporary classrooms</li> <li>• Useful life of building less than other options</li> </ul>						
	<table> <tr> <td>Phasing</td> <td>7 phases</td> </tr> <tr> <td>Schedule</td> <td>6+ years</td> </tr> <tr> <td>Cost</td> <td>\$64.4 million</td> </tr> </table>	Phasing	7 phases	Schedule	6+ years	Cost	\$64.4 million
Phasing	7 phases						
Schedule	6+ years						
Cost	\$64.4 million						

## YOUR PROJECT | PROPOSED OPTION – 2B

Compare and Contrast							
Pros	Cons						
<ul style="list-style-type: none"><li>• Keeps best parts of existing facility</li><li>• Second-lowest cost</li><li>• Reduces new construction from Option 3</li><li>• Minimizes disruptions</li><li>• Maintains near-optimal program</li><li>• Ability to work with design team to further decrease costs</li></ul>	<ul style="list-style-type: none"><li>• More precise demolition required</li><li>• More risk than completely new construction</li><li>• Fewer program choices in renovated space</li><li>• Less flexibility in building layout</li></ul>						
	<table><tr><td>Phasing</td><td>2 phases</td></tr><tr><td>Schedule</td><td>6/16 – 9/19 (39 months)</td></tr><tr><td>Cost</td><td>\$67.4 million</td></tr></table>	Phasing	2 phases	Schedule	6/16 – 9/19 (39 months)	Cost	\$67.4 million
Phasing	2 phases						
Schedule	6/16 – 9/19 (39 months)						
Cost	\$67.4 million						

## YOUR PROJECT | PROPOSED OPTION – 3A

Compare and Contrast	
Pros	Cons
<ul style="list-style-type: none"><li>• Least disruptive</li><li>• Most flexible program / building shape</li><li>• All new facilities</li><li>• Maximize program</li><li>• Smaller footprint</li><li>• Longer Building life</li></ul>	<ul style="list-style-type: none"><li>• Most expensive option</li><li>• New gym, auditorium increases square-foot costs</li><li>• Most sitework / site disruption</li></ul>
	<p>Phasing Schedule Cost</p> <p>2 phases 6/16 – 9/19 (39 months) \$71.6 million</p>

# Dover High School and Career Tech Center

## Total Project Cost Review

	Option 1 - All Renovation	Option 2 - Renovation Addition	Option 3 - All New
<b>PC Construction Estimate</b>	64,418,000	67,450,000	71,593,000
<b>Owner's Contingency 1 = 10%, 2 = 6%, 3 = 4%</b>	6,441,800	4,047,000	2,863,720
<b>A. A/E Basic Services Fees 1= 12%, 2= 10%, 3= 9.5%</b>	7,730,160	6,745,000	6,801,335
<b>B. Additional Services Items</b>			
Subtotal	273,000	243,000	233,000
Furniture and Equipment Subtotal	2,000,000	2,000,000	2,000,000
Technology Subtotal	1,700,000	1,700,000	1,700,000
F&E and Technology Subtotal	3,700,000	3,700,000	3,700,000
Total Testing and Monitoring Subtotal	350,000	350,000	350,000
Contingency	100,000	100,000	100,000
<b>B. Additional Services Items</b>	<b>4,423,000</b>	<b>4,393,000</b>	<b>4,383,000</b>
<b>C. Owners Budget for Direct Expenses (all are estimates)</b>			
<b>C. Owners Budget for Direct Expenses</b>	<b>1,158,000</b>	<b>758,000</b>	<b>758,000</b>
<b>Total Project Budget</b>	<b>84,170,960</b>	<b>83,393,000</b>	<b>86,399,055</b>

## **New Dover High School and CTC**

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Original budget for new 1300 student facility	\$68,000,000.00
Escalation per year	4%
Number of years	<u>4</u>
Total % of escalation	0.16
Total escalation	\$10,880,000.00
<b>Total for new 1300 student school in 2015</b>	<b>\$78,880,000.00</b>
Student increase from 1300 to 1500	200
SF per student	203.33
Total increase in SF	40,667
cost per SF	\$222.00
<b>Total additional cost for 200 students</b>	<b>\$9,028,000.00</b>
<b>Cost for new 1500 student facility in 2015</b>	<b>\$87,908,000.00</b>



Dover HS CFC Project  
 Design Development Estimate of 30Jun2015 - Cost Tracking Log  
 Updated June 30, 2015 Rev 0

a. Original Estimate	\$20,000,000	e. Escalation	0.00%	0
b. Original Estimate - Cost of Work	\$18,400,000	f. Building Permit	0.00%	0
c. Selected cost adjustments (status "yes")	(3,013,920)	g. Builder's Risk Insurance	0.00%	0
d. Adjusted cost of work	15,386,080	h. Liability Insurance	0.75%	125,843
		i. Estimating Contingency	5.00%	769,304
		j. Construction Manager/Bond	0.53%	88,090
<b>m. Total revised estimate with selected cost adjustments</b>	<b>\$16,778,000</b>	k. Construction Management Fee	2.50%	409,233
n. Amount over (under) estimate - item "a" above	(\$3,221,000)	l. Not Used		

Div	Item Number	Title/Description	Net Cost of Work	Remarks	Status: Yes/No	Gross Change (status "Yes")
02	1	Reduce landscaping	(\$10,000)		Yes	(\$10,870)
02	2	Change site concrete to bituminous pavement	(\$100,000)		No	
	3	Storm changes	(\$20,000)		Yes	(\$21,739)
	4	Raise building grade to save fill	(\$200,000)		Yes	(\$217,391)
	5	Change fill requirements outside of building footprint	(\$50,000)		Yes	(\$54,348)
	6	Change brick coursing	(\$30,000)		Yes	(\$32,609)
	7	Change wood base to vinyl	(\$20,000)		Yes	(\$21,739)
	8	Retain existing Auditorium floor	(\$158,000)		No	
	9	Delete underdrain at foundations	(\$60,000)		No	
	10	Delete roof at covered riding arena	(\$83,000)		Yes	(\$90,217)
	11	Relocate building footprint to reduce H piles	(\$100,000)		Yes	(\$108,696)
	12	Reduce entrance canopy	(\$100,000)		Yes	(\$108,696)
	13	Firewalls instead of spray fireproofing	(\$50,000)		No	
	14	Use P-lam instead of solid surfacing	(\$40,000)		Yes	(\$43,478)
	15	Change 25% of brick veneer to metal siding (non-visible locations)	(\$110,000)		No	
	16	Change 10% of curtain wall to storefront (entry areas)	(\$64,000)		Yes	(\$69,565)
	17	Use VCT at floors instead of tile/leum	(\$20,000)		Yes	(\$673,913)
	18	Change tile wainscot at corridors to impact-resistant drywall	(\$160,000)		Yes	(\$173,913)
	19	Reuse Gym floor instead of new	(\$133,000)		Yes	(\$144,565)
	20	Painting at Gym roofing structure to remain	(\$27,000)		No	
	21	Eliminate one elevator	(\$100,000)		No	
	22	Take Gym equipment out of scope	(\$105,000)		Yes	(\$114,130)
	23	Reuse existing Theater equipment	(\$175,000)		Yes	(\$190,217)
	24	Reduce casework	(\$231,000)		Yes	(\$251,087)
	25	Remove all student lockers	(\$473,000)		Yes	(\$514,130)
	26	Reuse ductwork in Gym and Auditorium	(\$200,000)		No	
	27	Change cast iron storm piping to PVC	(\$100,000)		Yes	(\$108,696)
	28	Reuse existing boilers	(\$200,000)		Yes	(\$217,391)
	29	Reuse existing stage lighting	(\$375,000)		No	
	30	Reduce courtyard allowance	(\$100,000)		Yes	(\$108,696)
	31	Delete turf field	(\$750,000)		No	
	32					
			<b>(\$4,944,000)</b>	<b>Total selected cost adjustments</b>		<b>(\$3,276,000)</b>

## COST SAVINGS PROCESS

### Categorize Items:

- Product and material choices
- Systems options
- Deferral – Define value and defer to later in the project if budget allows
- Scope reduction – last resort

### Chosen Option – Areas to investigate

- Building siting - shift to reduce soils treatment
- Simplify foot print, more repetition
- Explore systems & materials – Structure & MEP
- Continual exploration of up front versus long term operating costs
- Reduce the square footage if possible





# Next Steps

## Schematic Design

- Further develop plans
- Further geotechnical investigation
- Explore systems options, Select systems
  - Understand energy efficiency/life cycle costs
  - Explore potential re-use of existing boilers
- Engage Dover Agencies
- Develop elevations
- Select major materials
- New cost estimating process



# Comparison of Construction Costs

## Cost Comparison

	School	Bid Date	No. Students	Square Footage	Sq. Ft. Construction cost
NH	<b>Dover HS /CTC</b>	<b>Aug-16</b>	<b>1500</b>	<b>305,000</b>	<b>\$235.00/SF</b>
MA	Essex North Shore Vocational H.S.	Mar-13	1400	417,470	\$264.00/SF
MA	Franklin H.S.	Aug-12	1650	305,543	\$284.00/SF
MA	Marchfield H.S	Aug-12	1310	267,469	\$298.00/SF
MA	Natick H.S.	Sep-10	1300	254,225	\$239.00/SF
MA	Springfield Voc-Tech H.S.	May-10	1400	314,890	\$273.00/SF
MA	West Springfield H.S.	Nov-11	1270	257,525	\$274.00/SF
MA	Winthrop H.S.	Nov-14	970	190,000	\$336.00/SF
ME	Mount Blue H.S.	Nov-11	925	226,000	\$214.00/SF
ME	Sanford H.S.*	Jan-16	1700	323,000	\$230.00/SF

\*Not bid yet



# Comparison of Reno/Add and New Options

## Size of Auditorium and Stage

### **Add/Renovation Option**

8500 square feet Auditorium and Stage (-)

### **New Option**

12,500 square feet Auditorium and Stage (+)



# Comparison of Reno/Add and New Options

## Life Expectancy/Risk

### **Add/Reno Option**

- Reuse of the existing tectum roofs over gym, auditorium and connecting spaces. (-)
- Demolition immediately adjacent to the Auditorium and Gymnasium. (-)
- Re-use any underground utilities below existing Auditorium Locker Rooms and Gymnasium. (-)
- Re-use existing masonry walls at upper levels of Auditorium and Gymnasium. (-)



# Comparison of Reno/Add and New Options

## Life Expectancy/ Risk (continued)

### **New Option**

- Option will have all new roofs (+)
- Option will have demolition completely independent of the new construction. (+)
- Option will have all new underground utilities. (+)
- Option will have new masonry walls. (+)



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# Comparison of Reno/Add and New Options

## Flexibility

Both options have the same potential for expansion. In both cases the any addition would occur as a partial additional floor level. The additional structure and enlarged systems were not included as part of the cost estimating.



# Comparison of Reno/Add and New Options

## Miscellaneous

### **Add/Renovation Option**

- Reuse existing boiler room (+)
- Additional 9,500 square feet of storage space on the lower floor. (+)
- Potential renovation of existing spaces may occur during school use.
- Main entrance will not be available for use for several months after the building is open. Main entrance could be relocated. (-/+)
- Entrance to Auditorium is not directly off of the Town Common and therefore not ideal. (-)





# Comparison of Reno/Add and New Options

## Miscellaneous (continued)

### **New Option**

- Existing boiler will have to be relocated to be re-used. (-)
- No comparable storage space (-)
- Option will have all facilities available when it initially opens. (+)
- Main entrance will be useable immediately (+)
- The entrance sequence for the New Option brings everyone immediately into the Town Square, entrances to both the Gymnasium and Auditorium off the Town Square. (+)