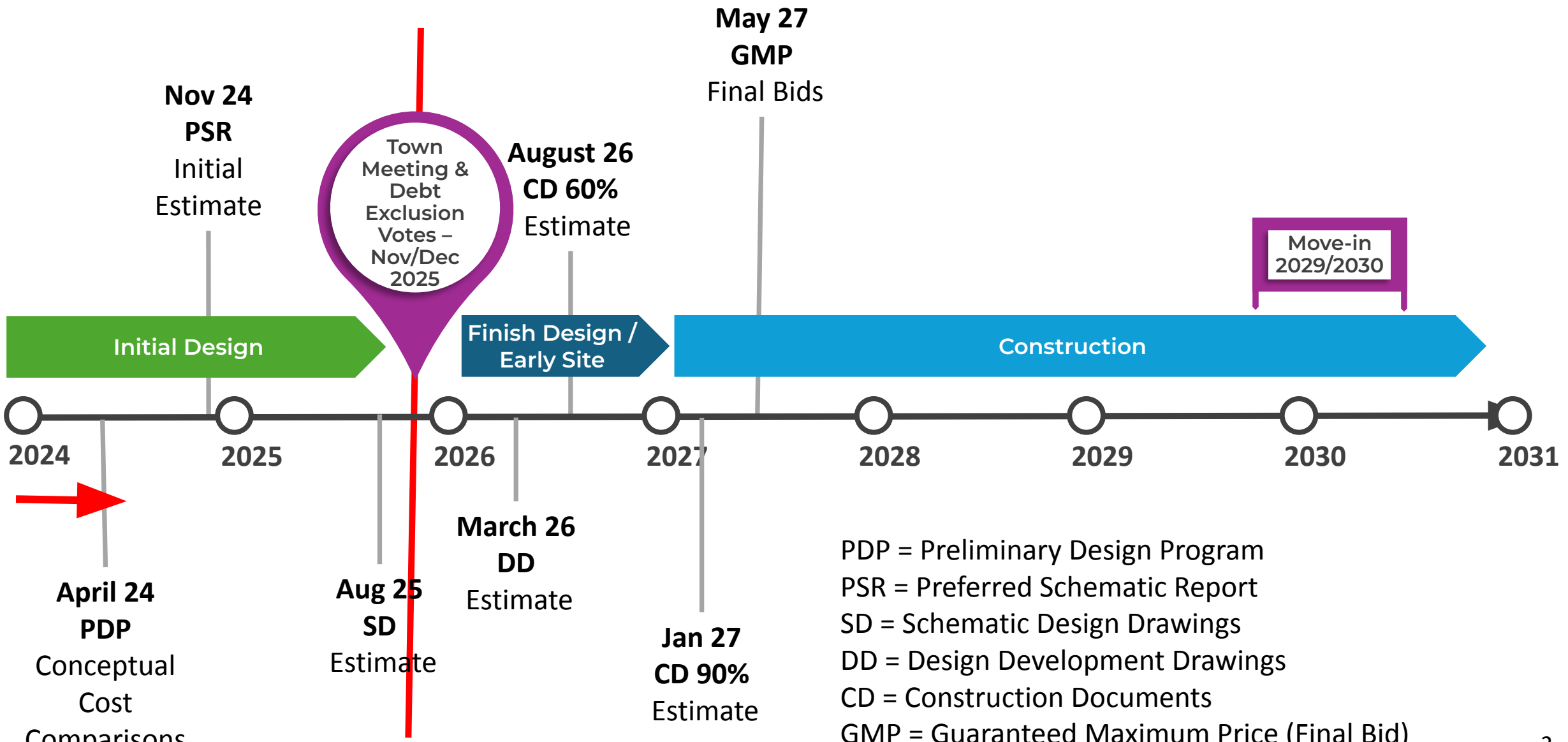
August 12th, 2024

Lexington High School Project

Other High School cost information for School Building Committee

DORE + WHITTIER

LHS Anticipated Project Timeline - Estimating



PDP = Preliminary Design Program
PSR = Preferred Schematic Report
SD = Schematic Design Drawings
DD = Design Development Drawings
CD = Construction Documents
GMP = Guaranteed Maximum Price (Final Bid)

The costs for the various PDP Options indicated below are intended to be an **analysis of the relative costs between options and NOT a prediction of the actual final cost** of any individual option. Major variables such as geotechnical, site grading, wetland determination, structural system and final MEP systems have yet to be designed and costs will vary significantly from the benchmark cost estimating included as part of this PDP cost analysis. **The costs outlined in this report should not be represented as the FINAL construction budget and have a +/- 10% degree** of accuracy.

PDP estimates utilize SF data from all recent high schools

Conceptual Pricing

Table A - Massing Study Alternates

Scope Option	Scope Description	GSF	Construction Costs Only: Average between 2 cost estimators	Structured Parking	Total Construction $psf	Soft cost (20%)	Owner Contingency (5%)	Modulars	Total Project Cost
Option A.1	Base Repair/Code Upgrade - No architetcural	352,000	$ 222,000,000		$ 222,000,000	$ 44,400,000	$ 11,100,000	$ 23,100,000	$ 301,000,000
Option B.1	Add/Reno - Phased in place, retaing buildings G&J structure	440,816	$ 493,000,000		$ 493,000,000	$ 98,600,000	$ 24,650,000	$ 19,250,000	$ 636,000,000
Option B.2	Add/Reno - Addition on fields, retaing building G&J structure	440,816	$ 475,000,000		$ 475,000,000	$ 95,000,000	$ 23,750,000		$ 594,000,000
Option B.3	Add/Reno - 4 story. Includes structure parking. Phased in place retaining buildings C&D	440,816	$ 501,000,000	$ 22,016,250	$ 523,016,250	$ 104,603,250	$ 26,150,813	$ 11,550,000	$ 665,000,000
Option C.1a	New Construction - 3 Story. On fields, 1 phase	440,816	$ 487,000,000		$ 487,000,000	$ 97,400,000	$ 24,350,000		$ 609,000,000
Option C.1b	New Construction - 4 story. On fields, 1 phase	440,816	$ 479,000,000		$ 479,000,000	$ 95,800,000	$ 23,950,000		$ 599,000,000
Option C.1c	New Construction - 5 story. On fields, 1 phase	440,816	$ 478,000,000		$ 478,000,000	$ 95,600,000	$ 23,900,000		$ 598,000,000
Option C.1d	New Construction - Includes structure parking. 4 Story. On fields, 1 phase, reduced wetlands impact	440,817	$ 476,000,000	$ 22,016,250	$ 498,016,250	$ 99,603,250	$ 24,900,813		$ 623,000,000
Option C.2a	New Construction - 3 story. On fields, 1 phase	440,816	$ 485,000,000		$ 485,000,000	$ 97,000,000	$ 24,250,000		$ 606,000,000
Option C.2b	New Construction - 4story. On fields, 1 phase	440,816	$ 478,000,000		$ 478,000,000	$ 95,600,000	$ 23,900,000		$ 598,000,000
Option C.3a	New Construction - 3 story. On fields, 1 phase	440,816	$ 484,000,000		$ 484,000,000	$ 96,800,000	$ 24,200,000		$ 605,000,000
Option C.4a	New Construction - 3 story. On fields, 1 phase	440,816	$ 489,000,000		$ 489,000,000	$ 97,800,000	$ 24,450,000		$ 611,000,000
Option C.4b	New Construction - 4 story. On fields, 1 phase	440,816	$ 481,000,000		$ 481,000,000	$ 96,200,000	$ 24,050,000		$ 601,000,000
Option C.4c	New Construction - Includes structure parking. 4 story. On fields, 1 phase, reduced wetlands impact	440,816	$ 480,000,000	$ 22,016,250	$ 502,016,250	$ 100,403,250	$ 25,100,813		$ 628,000,000
Option C.5	New Construction - 4 story. On fields, 1 phase	440,816	$ 477,000,000		$ 477,000,000	$ 95,400,000	$ 23,850,000		$ 596,000,000
Option C.5b	New Construction - Includes structure parking. 4 story. On fields, 1 phase, reduced wetlands impact	440,816	$ 473,000,000	$ 22,016,250	$ 495,016,250	$ 99,003,250	$ 24,750,813		$ 619,000,000
Option C.6	New Construction - 4 story. On existing building footprint, multiple phases, reduced wetland and Article 97 impacts.	440,816	$ 481,000,000		$ 481,000,000	$ 96,200,000	$ 24,050,000	$ 11,550,000	$ 613,000,000
Option D.1	New Construction - 4 story. On fields, multiple phases	440,816	$ 486,000,000		$ 486,000,000	$ 97,200,000	$ 24,300,000		$ 608,000,000
	New Construction options average (C.1a thru D.1)	440816	$ 481,000,000			$ 96,200,000	$ 24,050,000		$ 601,250,000

Average Construction cost of all new options $1,091psf

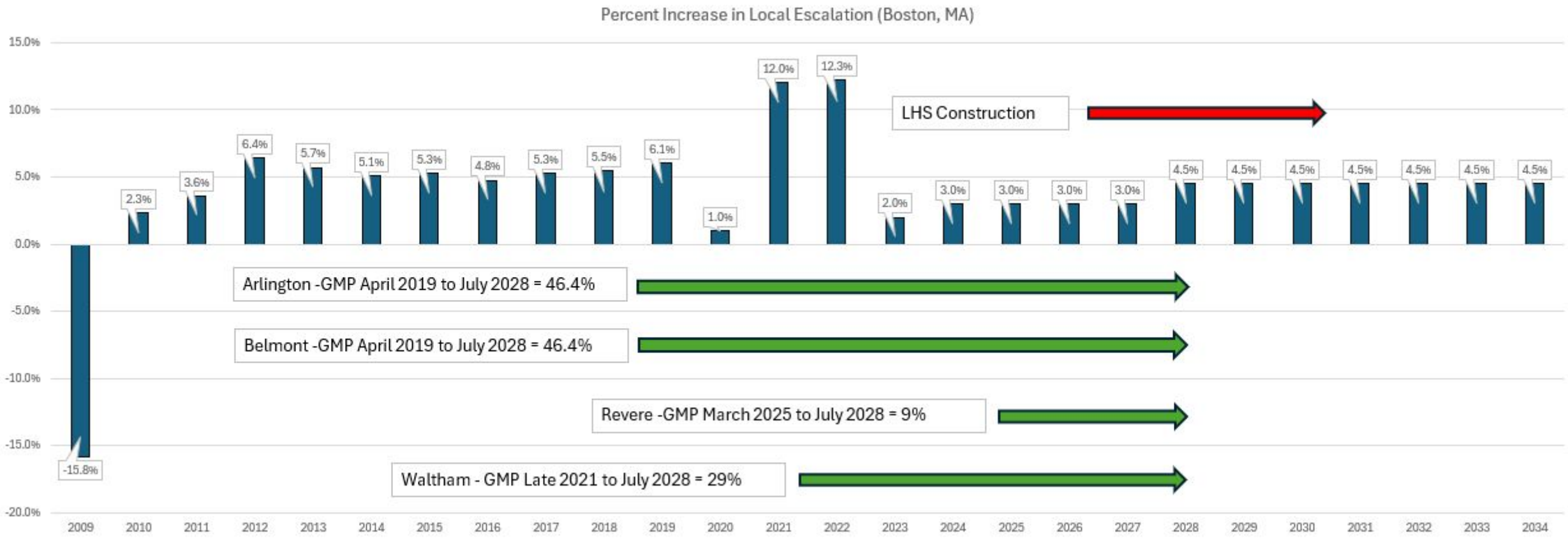
Total project cost $1,364psf

Comparison to other High Schools

	Arlington	Belmont	Revere	Waltham	Lexington
Size	408,590	445,100	422,600	414,854	440,816
Enrollment	1,755	2,215	2,450	1,830	2,395
Construction Cost	$ 235,286,827	$ 236,647,607	$ 412,006,854	$ 298,647,409	$ 481,000,000
Construction $psf	$ 557	$ 560	$ 975	$ 707	$ 1,091
Soft cost	$ 55,564,993	$ 58,511,582	$ 85,511,047	$ 75,919,978	$ 120,250,000
Soft cost % vs construction	24%	25%	21%	25%	25%
Project Cost	**$ 290,851,820**	**$ 295,159,189**	**$ 497,517,901**	**$ 374,567,387**	**$ 601,250,000**
Project $psf	$ 688	$ 698	$ 1,177	$ 886	$ 1,364
Bid Date	April 2019	April 2019	March 2025	End 2021	July 2028

- Using the average $per square foot (psf) of all new construction options, Lexington shown at $1,364psf for project costs
- Other project cost info found on MSBA's April board meeting can be found here
- When comparing you need to consider Size, Student enrollment, when the projects were bid, what the scope of each project includes, etc.

Escalation



Basis of the historical data can be found here

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Project $psf	$ 688	$ 698	$ 1,177	$ 886	$ 1,364
Bid Date	April 2019	April 2019	March 2025	End 2021	July 2028
Project Cost Escalated to 7/2028	$ 425,734,352	$ 432,039,263	$ 542,294,512	$ 482,442,794	N/A
Escalated Project cost $psf	**$ 1,042**	**$ 971**	**$ 1,283**	**$ 1,163**	**$ 1,364**

- Escalation applied to each project to get to same bidding timeline as Lexington High School

Lexington Scope included in PDP estimates

Description	Costs include markups	Required by	$psf
All Electric	$ 4,281,632	Lexington Bylaw (IDP), Stretch Code	$ 10
Solar	$ 16,900,000	Lexington Bylaw (IDP), SBC Goal, Readiness for stretch code	$ 38
Geothermal well system	$ 27,300,000	Lexington Bylaw (IDP)	$ 62
Battery storage	$ 3,250,000	Lexington Bylaw (IDP), SBC Goal, Readiness for stretch code	$ 7
<25 EUI	$ 7,000,000	Lexington Bylaw (IDP)	$ 16
Passive house (Windows and Exterior wall)	$ 5,850,000	Project may also pursue ASHREA	$ 13
Total	$ 64,581,632		
Building SF	440,816		
$psf			**$ 147**
Upfront costs w/out passive house	**$ 58,731,632**		

- Using values from concept pricing for each scope item and dividing by the building square footage results in a Dollar per square foot cost ($psf) for each item.

  - Corrections updated 20240822

Comparison to other High Schools

	Arlington	Belmont	Revere	Waltham	Lexington
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Escalated Project cost $psf	$ 1,042	$ 971	$ 1,283	$ 1,163	$ 1,364
Scope adjustments					
All Electric	10		10	10	
Geothermal	62	280 Wells	236 Wells	62	
PV	Smaller PV	1,350,000 kwh	38	38	3,500,000 kwh
Battery Storage	7	7	7	7	
<25 EUI	25 EUI Target	16	16	16	
Passive House	13	13	13	13	
Scope adjustments total	92	37	85	147	0
Adjusted total project $psf	**$ 1,134**	**$ 1,007**	**$ 1,368**	**$ 1,310**	**$ 1,364**
Adjusted Total project cost	**$ 463,441,939**	**$ 448,295,728**	**$ 578,035,542**	**$ 543,270,802**	**$ 601,250,000**

- Taking the escalated project cost adding $psf for scope items that are currently imagined for Lexington High School to level these other projects to provide more of an apples-to-apples comparison.

Other cost considerations

	Arlington	Belmont	Revere	Waltham	Lexington
Size	408,590	445,100	422,600	414,854	440,816
Enrollment	1,755	2,215	2,450	1,830	2,395
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Multiple phases of construction	X	X			tbd
Site shared w/ existing school	X	X			X
Renovation plus addition		X			tbd
New construction only	X		X	X	tbd
Demolition and abatement	X	X		X	X
Voc/Tech component				X	
Construction Delivery Method (CM/GC)	CM	CM	CM	CM	TBD
Contaminated site/ground improvements	X - Contaminated	X - Contaminated	X - Contaminated		X - Ground improvements

Other cost considerations

Example C2b Estimate Breakdown

Project Cost	$ 600,000,000.00	$ 1,361	440,816 GSF
Construction Cost	$ 478,000,000.00	$ 1,084	

Project Cost Components $ 122,000,000.00

Description	Amount	$psf	% of Construction cost
Feasibility Study	$ 1,825,000	$ 4.14	0.4%
OPM, Designer, Speciality consultants, Construction testing, Permitting	$ 80,000,000	$ 181.48	16.7%
CM Precon	$ 600,000	$ 1.36	0.1%
Misc Proj Cost - Utility backcharges, Moving costs; Swing space	$ 2,000,000	$ 4.54	0.4%
FFE/Tech	$ 9,600,000	$ 21.78	2.0%
Owner Contingencies	$ 28,000,000	$ 63.52	5.9%
	$ 122,025,000		

Construction Cost Components $ 478,000,000.00

Construction Costs	PMC	AMF	Average	$psf	% of Construction cost
SUBSTRUCTURE					
Foundations	$13,422,318	$11,674,500	$12,548,409	$28.47	2.6%
Basement Construction	$0	$0	$0	$0.00	0.0%
SHELL					
Super Structure	$23,269,413	$25,833,740	$24,551,577	$55.70	5.1%
Exterior Closure	$0	$0	$0	$0.00	0.0%
Exterior Walls	$24,516,008	$26,228,552	$25,372,280	$57.56	5.3%
Exterior Windows	$13,723,977	$14,326,520	$14,025,249	$31.82	2.9%
Exterior Doors	$440,816	$613,100	$526,958	$1.20	0.1%
Roofing	$7,502,500	$7,417,500	$7,460,000	$16.92	1.6%
INTERIORS					
Interior Construction	$29,536,833	$27,661,204	$28,599,019	$64.88	6.0%
Staircases	$2,027,250	$1,926,600	$1,976,925	$4.48	0.4%
Interior Finishes	$20,718,352	$20,718,352	$20,718,352	$47.00	4.3%
SERVICES					
Conveying Systems	$1,145,700	$650,000	$897,850	$2.04	0.2%
Plumbing	$14,024,480	$14,024,480	$14,024,480	$31.81	2.9%
HVAC	$64,801,600	$65,081,600	$64,941,600	$147.32	13.6%
Fire Protection	$3,676,528	$4,007,140	$3,841,834	$8.72	0.8%
Electrical	$45,144,952	$45,858,779	$45,501,866	$103.22	9.5%
EQUIPMENT & FURNISHINGS					
Equipment	$6,281,385	$4,507,400	$5,394,393	$12.24	1.1%
Furnishings	$5,785,712	$5,851,986	$5,818,849	$13.20	1.2%
SPECIAL CONSTRUCTION & DEMOLITION					
Special Construction	$150,000	$0	$75,000	$0.17	0.0%
Existing Building Demolition	$3,207,200	$3,696,000	$3,451,600	$7.83	0.7%
In-Building Hazardous Material Abatemen	$2,100,000	$2,050,000	$2,075,000	$4.71	0.4%
Asbestos Containing Floor Material Abate	$0	$0	$0	$0.00	0.0%
Other Hazardous Material Abatement	$1,000,000	$2,050,000	$1,525,000	$3.46	0.3%
BUILDING SITEWORK					
Site Preparation	$15,707,229	$15,834,571	$15,770,900	$35.78	3.3%
Site Improvements	$18,390,279	$19,416,429	$18,903,354	$42.88	4.0%
Site Civil / Mechanical Utilities	$5,069,250	$5,344,000	$5,206,625	$11.81	1.1%
Site Electrical Utilities	$5,124,130	$4,457,000	$4,790,565	$10.87	1.0%
Other Site Construction	$1,000,000	$0	$500,000	$1.13	0.1%
Site Cost over Allowance					
Direct Cost Subtotal	$327,765,912	$329,229,453	$328,497,683	$745.20	68.7%
	PMC	**AMF**	**Average**		
General Conditions	$17,280,000	$16,320,000	$16,800,000	$38.11	3.5%
General Requiremnts	$16,204,747	$17,614,701	$16,909,724	$38.36	3.5%
Design Contingency	$49,164,887	$49,384,418	$49,274,653	$111.78	10.3%
CM/GMP Contingency	$8,994,884	$11,358,416	$10,176,650	$23.09	2.1%
CM Fee/Profit	$13,492,325	$14,117,302	$13,804,814	$31.32	2.9%
Escalation	$28,187,868	$34,075,248	$31,131,558	$70.62	6.5%
Bond & GL Insurance	$11,140,763	$12,594,512	$11,867,638	$26.92	2.5%
Subtotal	$144,465,474	$155,464,597	$149,965,036	$340.20	31.4%
Total Constrcution Cost	$472,231,386	$484,694,050	**$478,462,718**	$1,085.40	100%

We have provided a document that breaks down option C2b so people can have an understanding of how the overall $psf is broken down in uniformat section

We have also provided a similar breakdown for Waltham HS for comparison

MSBA Policies

MSBA reimbursement Caps/limits

- Building cost funding limit up to $550psf of eligible building gross square footage
- Sitework cost funding limit up to $55psf (roughly 10%) of eligible building gross square footage
- Soft cost reimbursement eligible up to 20% of construction cost
- Furniture, Fixtures and Equipment (FFE) up to $1,200 per student
- Technology up to $1,200 per student
- Owner's Contingency Capped at .5%
- Construction Contingency Capped at 1%
- OPM/Designer Fees capped at $550psf of eligible building gross square footage

Ineligible costs

- Any education program SF above MSBA guidelines (Space Summary)
- Designer, OPM, and Commissioning agent fees associated with ineligible SF
- In-Building Hazardous Material Abatement (Existing school)
- Costs associated with Article 97 or MEPA filing
- Legal costs
- Costs associated with temporary modular classrooms
- Anything outside the immediate property line
- "Other" Project costs such as mailing and moving
- Any non educational programs or anything over size limits per MSBA (See next slides)

MSBA Policies

The Following Spaces shall be categorically ineligible for Authority funding

- **Swimming Pools –** MSBA will only allow if separate project, separate funding, and ballot vote
- Skating Rinks
- **Field Houses** (Field houses have a track vs Gymnasium) MSBA will only allow if separate project, separate funding, and ballot vote
- **District Administrative Office Space** – MSBA may allow but will not participate
- Indoor Tennis Courts
- Other spaces as determined ineligible by MSBA

MSBA Policies

The Following Spaces are subject to size limits

- **Auditorium** shall be no more than **13,300 nsf** (based upon upper limit of **1,000 seats**)
- **Gymnasiums** – The district may choose to build a gymnasium and associated spaces, but in no event shall the gymnasium exceed **18,000 nsf**. The MSBA will participate in a gymnasium of up to **12,000 nsf** unless adjusted by the MSBA to increase teaching stations for enrollment and/or the educational plan.
- Areas in excess of the MSBA guidelines will be at the sole expense of the district;
- Community support must be demonstrated prior to MSBA approval of a district's proposed project scope and budget
- The MSBA will exclude from its grant the cost of the total gross square foot ("gsf") above guidelines for these areas. Total NSF over MSBA limits x 1.5* grossing factor. This amount will not change over the term of the grant even if the bids come in at a lower amount.

* Grossing factor to be determined at end of schematic design

Lexington Scope included in PDP estimates

- Corrections updated 20240822

Description	Costs include markups	Required by	$psf
All Electric	$ 4,281,632	Lexington Bylaw (IDP), Stretch Code	$ 10
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<25 EUI	$ 7,000,000	Lexington Bylaw (IDP)	$ 16
Passive house (Windows and Exterior wall)	$ 5,850,000	Project may also pursue ASHREA	$ 13
Total	$ 64,581,632		
Building SF	440,816		
$psf			**$ 147**
Upfront costs w/out passive house	**$ 58,731,632**		

Incentives

- Corrections updated 20240822

Description	Costs include markups
All Electric	$ 4,281,632
Solar	$ 16,900,000
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Battery storage	$ 3,250,000
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Passive house (Windows and Exterior wall)	$ 5,850,000
Total	$ 64,581,632
Building SF	440,816
$psf	
Upfront costs w/out passive house	**$ 58,731,632**

Mass Save	Incentive
<25EUI	$ 950,000
Post occupancy verification	$ 712,500
Ground Source Heat Pumps	$ 7,200,000
Inflation Reduction Act	
Solar	$ 5,070,000
Energy Storage	$ 975,000
Ground Source Heat Pumps	$ 18,090,000
Ground Source Domestic Content	$ 6,030,000
MSBA Additional	
Specialized Stretch Code	$ 15,000,000
Enhanced indoor air quality	$ 5,000,000
Total Incentives	**$ 59,027,500**

Savings (upfront cost vs incentives)	**$**	**295,868**

Preliminary 75-year LCCA Analysis - Systems' Costs

	Heating and Cooling Systems (HVAC)	
	Air Source Heat Pump (ASHP)	**Ground Source Heat Pump (GSHP)**
Estimated Systems Costs ($)	$65,000,000	$81,000,000
Incentives ($) (MassSave)	$3,582,500	$8,862,500
Estimated Payback (years) (MassSave)	1.1	2.2
Incentives ($) (MassSave + IRA)	$3,582,500	$26,952,500
Estimated Payback (years) (MassSave and IRA)	1.1	0.75
Estimated Operational Carbon Reduction	51-53%	

Benefits of Solar, Geothermal, and Battery Storage

- Lower upfront costs (including incentives)
- Lower operational costs
- Lower total life cycle cost than any HS in MA
- Generates revenue from Solar and Storage
- Highest and healthiest air quality standards
- Better productivity of staff and students
- Fewer sick days
- Teacher retention
- Produce its own power during outage
- Insulates town budget from energy cost increases
- Reduce greenhouse gas emissions by over 50mlbs in 30 years

Project Cost

Project Cost	$600M
MSBA Grant amount	-$100M
Incentives and Rebates	-$39M * $20M from MSBA above
Actual cost to town	$461M

TOL Stabilization -$40M

Plus operational savings annually

Thank you