

# Andover High School Building Committee



June 29, 2023

HM  
FH

HMFH ARCHITECTS

# Budget summary

Dated: 6.29.2023

Total Project Budget	MSBA Cost Code	FS & SD Phase 1 Budget (Thru June 2023)	Billed to Date	% Complete (Phase 1)	SD Phase 2 Budget (July'23 - Jan'24)
<b>Feasibility Study Agreement</b>					
OPM Feasibility Study	0001-0000	\$ 323,080	\$ 258,312	80.0%	\$ 201,920
A&E Feasibility Study	0002-0000	\$ 1,741,667	\$ 1,200,000	68.9%	\$ 1,173,333
Env. & Site	0003-0000	\$ 301,175	\$ 98,626	32.7%	\$ -
Other	0004-0000	\$ 83,336	\$ 4,479	5.4%	\$ -
Owner Contingency	0005-0000	\$ 213,909	\$ -	0.0%	\$ -
<b>TOTALS</b>		<b>\$ 2,663,167</b>	<b>\$ 1,561,417</b>	<b>58.6%</b>	<b>\$ 1,375,253</b>

# Project costs

	New Campus 2 w/ Aud
<b>Trade Costs</b>	
Building Costs	\$208,601,000
Demo and HAZMAT	\$5,764,000
Site w/ Surface Parking	\$40,553,000
Design and Pricing Contingency	\$30,590,000
<b>SUBTOTAL Building &amp; Site Trade costs</b>	<b>\$285,508,000</b>
Escalation, Phasing, & Logistics	\$36,551,000
General Conditions and Requirements	\$27,132,000
Bonds and Insurance	\$7,246,000
CM Fee and Contingency	\$16,218,000
<b>Estimated TOTAL Construction Cost</b>	<b>\$372,655,000</b>
Cost/ Square Foot	\$810
Construction Contingency	\$24,220,000
Owner's Contingency	\$4,750,000
All Other Soft Costs (Fees, Testing, etc.)	\$79,222,000
<b>Estimated TOTAL Project Cost</b>	<b>\$480,847,000</b>

**MARKUPS**

Construction Costs Include:

- Construction Manager Fee
- Bonds & Insurance
- Construction Cost Escalation
- Construction Manager's Contingency

**BUILDING**

Division 1 - General Conditions/Requirements

Division 2 - Demolition & Abatement

Division 3 - Concrete

Division 4 - Masonry

Division 5 - Metals (Structural & Misc. Metals)

Division 6 - Millwork & Casework

Division 7 - Roofing, Insulation, Waterproofing

Division 8 - Doors & Windows

Division 9 - Finishes

Division 10 - Partitions, Signage, Accessories

Division 11 - Equipment

Division 12 - Furnishings

Division 14 - Elevators

**SERVICES**

Division 21 - Fire Suppression

Division 22 - Plumbing

Division 23 - HVAC

Division 26 - Electrical

Division 27 - Communications

Division 28 - Electronic Safety/Security

**SITE**

Division 31 - Site Enabling Site Work

Division 32 - Exterior Improvements

Division 33 - Utilities

**SOFT COSTS**

- Construction Contingency
- Owner's Contingency
- Architecture & Engineering Costs
- Owner's Project Manager Costs
- Construction Testing
- Legal Fees
- Utility Company Fees & Temporary Utility Work
- Furniture, Fixtures, and Equipment (FF&E)
- Technology
- Moving Costs
- Construction Manager Pre-construction Services

# Sustainability goals

## HEALTH & WELLBEING

### GOALS

**90% regularly occupied spaces have access to daylight and views**

**Access to fresh air in all regularly occupied spaces**

### STRATEGIES WITHIN BASE PROJECT

#### Focus views on nature

- Connections to nature from inside building

#### Create outdoor learning spaces

- Outdoor classrooms

#### Maximize occupant control

- Operable windows
- Thermostat temperature controls
- Demand control ventilation
- Tunable lighting in select Special Ed classrooms
- Lighting controls
- Window treatment to control glare



# Sustainability goals

## MATERIALS & EQUITABLE DESIGN

### GOALS

**Maximize Red-list Free Materials for touch surfaces**  
**Inclusive and equitable design and process**

### STRATEGIES WITHIN BASE PROJECT

**Gender neutral toilet rooms**  
**Mothers' Room for staff and teachers**  
**Extend concept of healthy materials to landscape**  
**Consider planting from seed**  
**Accessibility/Inclusivity for all needs**  
 (not an exhaustive list)

- Physical
- Visual
- Audio
- Social/emotional

### STRATEGIES NOT WITHIN BASE PROJECT

**Avoid PFAS found in turf fields**  
 Requires further discussion/decision



# Sustainability goals

## WASTE & WATER

### GOALS

Explore comprehensive composting program

No potable water use for irrigation

### STRATEGIES IN BASE PROJECT

Drought tolerant planting and soil biology

Food composting

Requires further discussion/decision

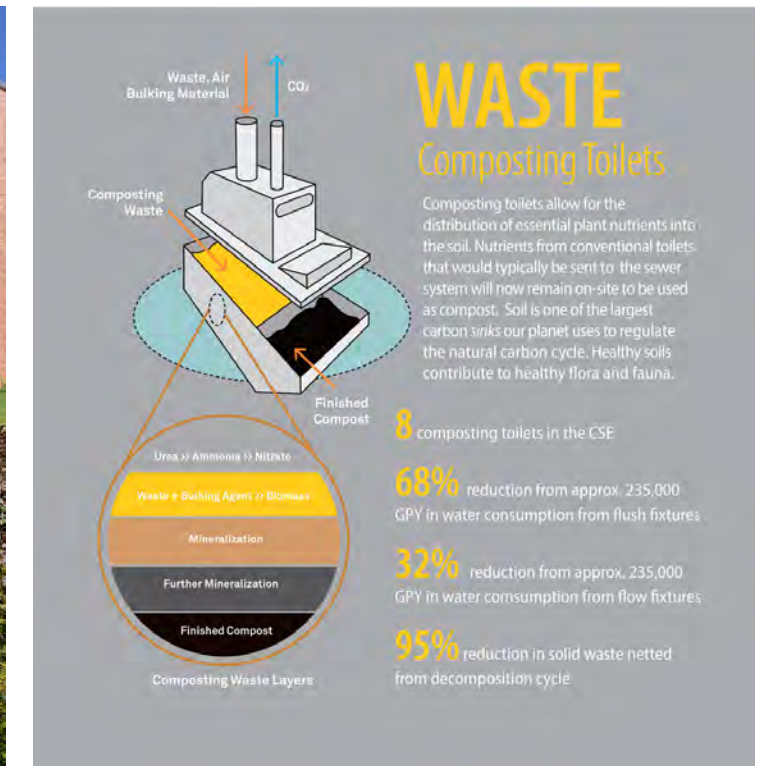
Roof gardens/Green roofs

### STRATEGIES NOT WITHIN BASE PROJECT (POTENTIAL ADDS)

Rain water reuse for irrigation & to recharge the aquifer

Permeable paving

Composting toilets (not costed)



# Sustainability goals

## ENERGY & CARBON

### GOALS

**Zero energy building**

**Maximize incentives and grants**

**Measure embodied carbon at each phase**

**Reduce global warming potential by 5% from baseline**

### STRATEGIES WITHIN BASE PROJECT

**All electric building (no fossil fuels)**

**Target EUI = 25 (25 for highest incentives, 29 for HS second tier)**

**Highly efficient mechanical systems**

**All LED lighting**

**Highly efficient building envelope (insulation and vapor barrier)**

**Triple glazed windows and curtainwall**

**Solar ready (for PPA + off site solar power production purchase)**

**Low carbon concrete mixture**

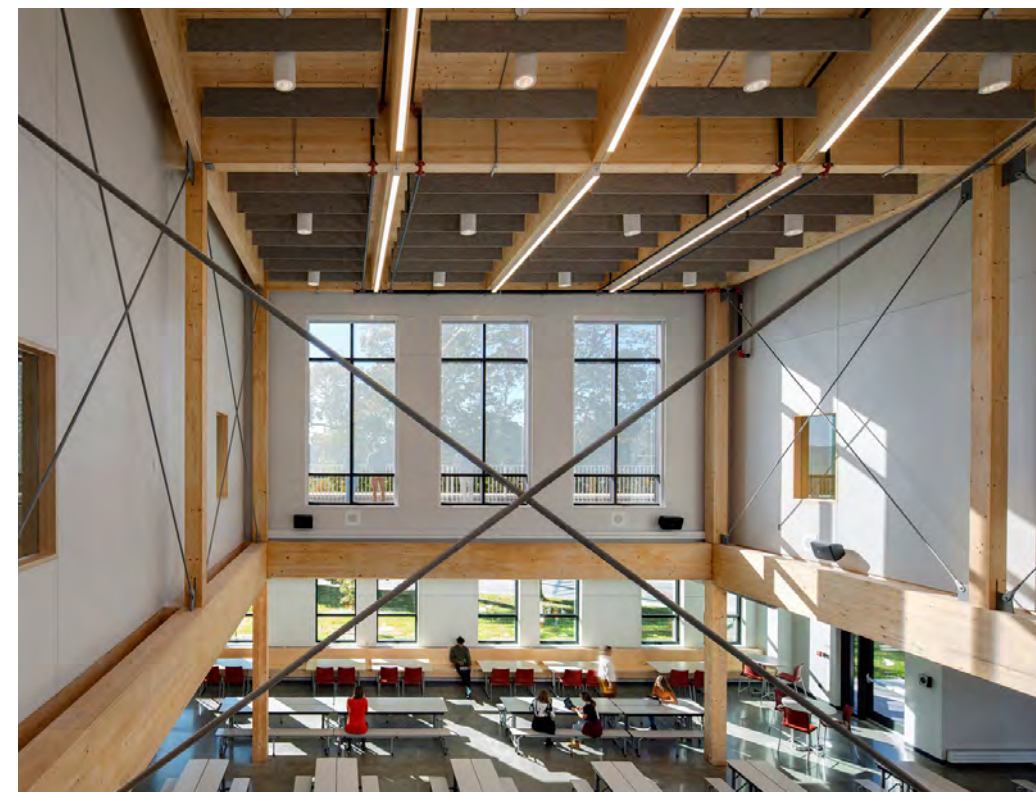
**High recycled content for structural steel**

### STRATEGIES NOT WITHIN BASE PROJECT (POTENTIAL ADDS)

**Geothermal loop for mechanical plant**

**Maximize renewable energy - solar**

**Consider timber structural system**



# Project costs

Estimated total project cost (FS estimate): \$480,847,000

Approximate cost of 3 month delay: \$ 3,600,000

Approximate current budget: **\$484,447,000**

## Potential Savings:

- Material Reductions
- Natural turf in lieu of artificial turf
- Refinement of space summary - to be reviewed with APS/AHS and/or Town

## Potential Adds:

- As previously reviewed - totaling \$132,500,000



# Project costs - potential cost savings

Below is a list of potential cost savings for the project:

Exterior and interior material reduction = ~ \$ 18,000,000  
Primarily masonry facades (brick and CMU) and no terrazzo floors.

No artificial turf athletic fields = ~\$1,500,000

Potential program reductions:  
To be reviewed with APS/AHS administration

- The team has already agreed upon reductions of 18,697 GSF = ~ \$14,500,000
- Refinement of space summary (net square feet) – each 1,000 SF = ~ \$1,150,000
- Remove Andover TV program from the high school building – 3,900 GSF = ~ \$3,000,000

Total potential reduction = \$ 38,150,000

Approximate revised project cost = **\$446,297,000 \***

\* Assumes HS program reduction of 1,000 sf, and none of the potential adds are accepted.

# Potential cost savings - material selection

Interior and Exterior materials:  
Potential savings = ~ \$ 18,000,000

For example:

- Primarily masonry facades in lieu of rain screen system
- Polished concrete or linoleum in lieu of terrazzo floors



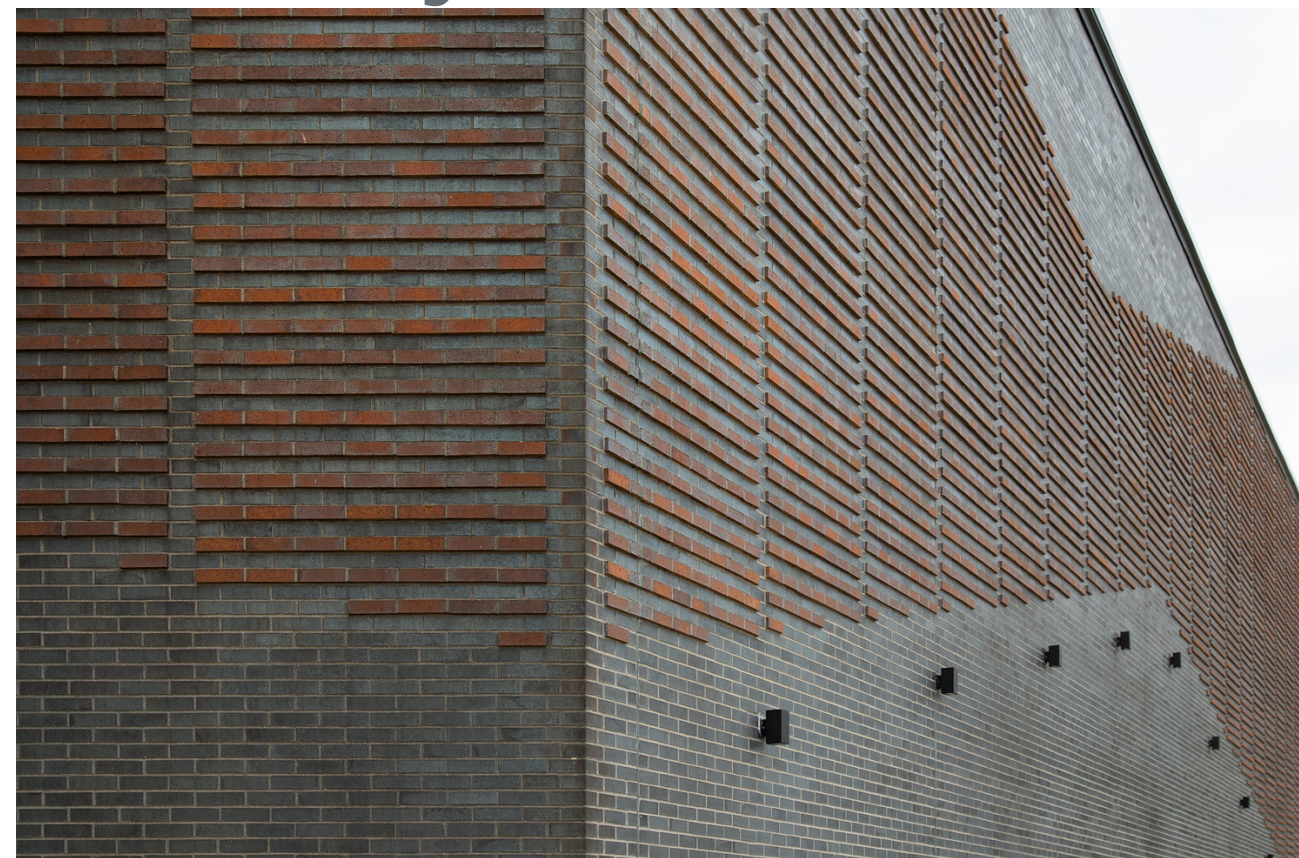
# Potential cost savings - masonry facades

## Pros:

- Low maintenance costs
- Highly durable
- High longevity
- Opportunities for patterning
- Low cost

## Cons:

- Aesthetic considerations



# Potential cost savings - polished concrete

## Pros:

- Low maintenance costs
- Highly durable
- High longevity
- Low cost

## Cons:

- Visible cracks
- Limited colors and difficult to control
- Variation across surface



# Potential cost savings - natural turf

Natural turf in lieu of artificial turf  
Potential savings = ~ \$ 1,500,000\*

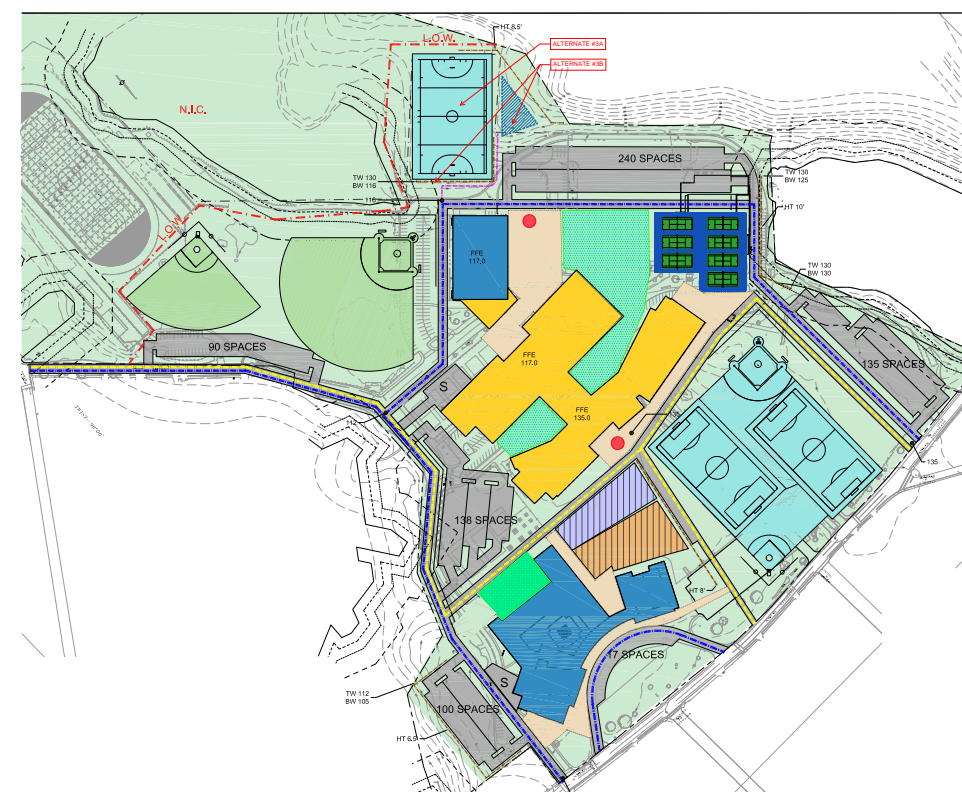
\*Plateau field not included

Pros of natural turf:

- Low initial cost
- Avoids PFAS from artificial turf systems

Cons:

- Needs rest periods to be maintained
- High maintenance costs
- Can not be used in certain conditions (i.e. rain)
- Requires irrigation
- Does not meet athletic director's program



# Project costs - potential adds

The following potential adds may not require further exploration due to project cost realities:

- Solar panels - \$ 17,246,000 (\$ 9,755,000 ground mounted, \$ 7,491,000 roof mounted)
- Heavy Timber structural elements - \$ 7,556,000
- Porous pavement - \$ 6,320,000 at surface parking
- Plateau field - \$ 2,435,000
- Skate park - \$ 4,710,000
- Parking garage - \$ 43,060,000
- Sports lighting - \$5,086,000

# Potential adds - Solar panels

		New Campus 2 w/ Aud
<b>Add on-site photovoltaic</b>	On the ground	<b>\$9,755,000</b>
	Power production:	1.6 megawatts
On the roof		<b>\$7,491,000</b>
	Power production:	1.9 megawatts



Base project includes “solar ready” infrastructure at roofs.  
Potential:

To produce 100% of projected power use:

- ~55% from solar panel on the roof
- ~45% from solar panels mounted on structural canopies
- based on goal of an EUI of 25 (higher EUI = more solar required)
- new federal incentives could pay for 30%+/- of cost for renewable initiatives (further exploration along with Andover is required)

Other benefits:

- fastest return-on-investment
- town realizes full financial benefit of solar production
- visible investment in sustainability
- maximize incentives (assumes federal incentives remain)

How will this be evaluated:

- life cycle cost analysis - maintenance and replacement cost savings over the building’s life and payback period

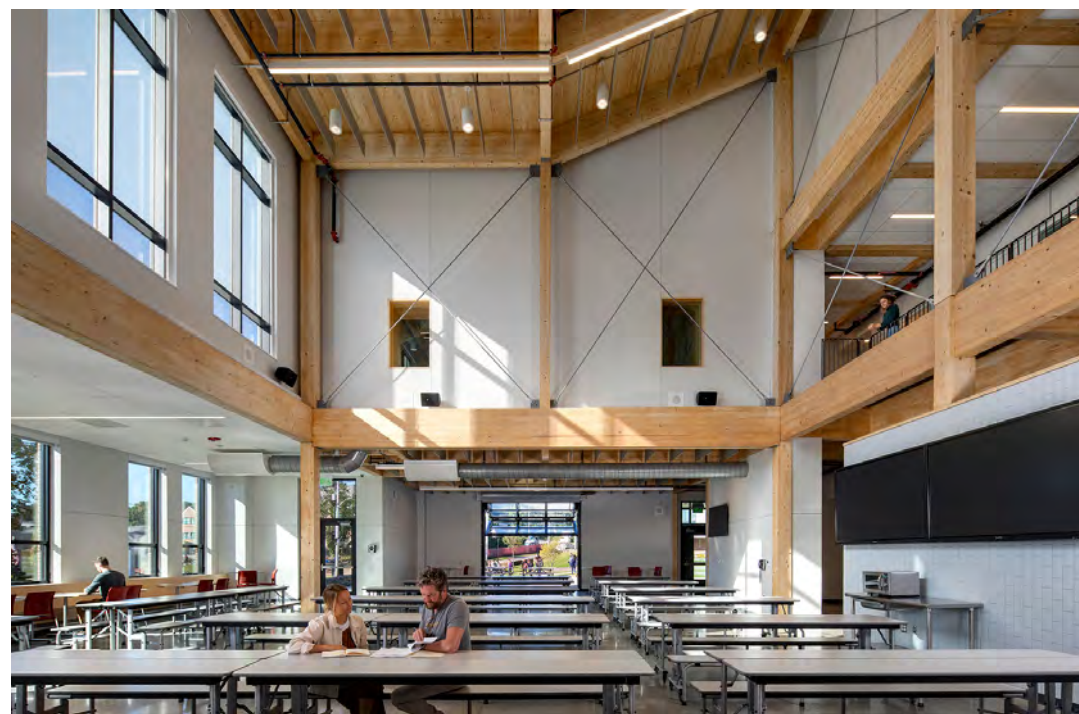
If add is not accepted:

- power purchase agreement for third party ownership of rooftop solar OR solar could be purchased later
- continue town’s solar power agreement which currently produces 90% of power required for the high school

# Potential adds - Heavy timber structure

	New Campus 2 w/ Aud
Provide heavy timber structure floors, beams and roofs at public areas	\$7,556,000

NOTE: Due to structural limitations (span limits, greater structural depth, material movement) for timber structures, this add is for limited use of timber floors, roofs and beams for public areas (about 40% of the total building)



Base project includes steel and concrete structure.

Potential:

- timber structures sequester carbon more carbon that is expended in their production (assuming an end-of-life plan is implemented for the material)
- potentially lighter structure could mean somewhat smaller concrete foundations, further saving carbon

Other benefits:

- aesthetic of wood structure
- biophilic design elements are known to improve health, wellbeing and learning outcomes

How will this be evaluated:

- calculation of potential carbon savings

If add is not accepted:

- low carbon content concrete mixtures will be included to reduce the embodied carbon of structural concrete elements
- structural steel, rebar and structural metal deck will be specified with high recycled content
- building planning efficiency measures to reduce overall use of concrete will be evaluated



# Potential adds - Porous pavement

	New Campus 2 w/ Aud
Provide porous pavement @ parking w/ Parking Garage OR w/ all Surface Parking	\$2,487,000
	\$6,320,000

Base project includes impervious pavement.

Potential:

- provide porous pavement to allow water to pass through it and infiltrate into the subsoil and recharge groundwater

How will this be evaluated:

- in proper conditions, run off diverted from traditional stormwater management systems to recharge groundwater/ aquifers
- maintenance impacts and challenges
- more information, including benefits and challenges
- Note: due to high water table, low soil permeability, extensive ledge on site, and high traffic use, we do not recommend porous pavement for this site.

# Potential adds - Plateau field and skate park

<p><b>Provide new artificial turf field at plateau</b></p>	<p><b>New Campus 2 w/ Aud</b></p> <p><b>\$2,435,000</b></p>	<p>Base project includes ADA access to existing field.</p> <p>Potential:</p> <ul style="list-style-type: none"> <li>to provide a fully functioning artificial turf practice field</li> </ul> <p>How will this be evaluated:</p> <ul style="list-style-type: none"> <li>primarily a financial/scope decision</li> </ul> <p>If add is accepted:</p> <ul style="list-style-type: none"> <li>additional stormwater management will be required</li> </ul>
<p><b>Provide new skate park</b></p>	<p><b>New Campus 2 w/ Aud</b></p> <p><b>\$4,710,000</b></p>	<p>Base project does not include the skate park.</p> <p>Potential:</p> <ul style="list-style-type: none"> <li>to provide a new skate park for Andover Youth Services</li> </ul> <p>How will this be evaluated:</p> <ul style="list-style-type: none"> <li>primarily a financial/scope decision</li> </ul>

# Potential adds - Parking garage

	New Campus 2 w/ Aud
Provide parking garage	\$43,060,000

Base project does not include parking garage.

Potential:

- to provide structured parking for up to 500 cars
- to provide additional space on the site approximately the size of a baseball field
- to provide rooftop athletic use (i.e. tennis)

Other benefits:

- less area for plowing/salting sanding
- less impervious paved area (see porous pavement above)
- reduces heat island effect

How will this be evaluated:

- further information regarding the difference in opportunities in the site will be presented
- other configurations will be explored (i.e. structured parking for just staff and faculty)

If add is not accepted:

- all parking will be surface parking

# Potential adds - Sports lighting

	New Campus 2 w/ Aud
<b>Provide sports lighting</b>	<b>\$5,086,000</b>

Base project does not include sports lighting.

Potential:

- to provide lighting for sports field use after dark

How will this be evaluated:

- this is primarily a financial/scope decision

Other considerations:

- currently, the site does not have sports lighting except at Lovely Field
- potential impact to abutters, including consideration of hours of use
- minimize impact on neighbors, while improving AHS ability to accommodate competitive schedule
- potential impact to local flora and fauna

If add is not accepted:

- the current condition of no sports lighting except at lovely field will be maintained

# Project costs - potential adds (cont.)

Based on Andover's goals, the following adds seem to demand further exploration, including:

- Upgraded mechanical = as much as \$ 41,832,000 –  
Our engineers recommend Air Source Heat Pump or Geothermal HP systems over Air Source Variable Refrigerant Flow as these systems are more energy efficient and have lower maintenance and future replacement costs. Life cycle cost analysis and potential incentives (potential Federal IRA Tax Credits of 30% of the cost)
- Sustainable irrigation/ ground water wells - \$ 311,000  
(Sustainable irrigation w/ rain water harvesting (underground cistern) not recommended for further exploration = \$ 1,187,000)
- Enclosed walkway = \$2,884,000

Sub-total for Potential Adds listed above - \$45,027,000

Total with all cuts and adds above = **\$491,324,000**

# Potential adds - Upgraded mechanical plant

	New Campus 2 w/ Aud
<b>Upgrade mechanical plant</b> Air source heat pump OR	<b>\$17,341,000</b>
Geothermal ground source	<b>\$41,832,000</b>

Base project includes highly efficient variable refrigerant flow system.

Potential:

- air source heat pump - similar system with higher efficiency
- geothermal (ground source) system - ultra efficient - uses constant ground temperature to produce heating and cooling
- new federal incentives could pay for up to 30% of cost for renewable initiatives (further exploration along with Andover is required)

How will this be evaluated:

- life cycle cost analysis will provide energy maintenance cost savings over the life of the building and provide payback period

If add is not accepted:

- variable refrigerant flow system is a highly efficient system that could improve upon the requirements of the current (new) energy code

# Potential adds - Sustainable irrigation

	New Campus 2 w/ Aud
<b>Provide sustainable irrigation</b>	
Provide rainwater harvesting system	<b>\$1,187,000</b>
OR	
Provide groundwater wells	<b>\$311,000</b>

Base project includes irrigation systems from potable water.

Potential:

- rainwater harvesting system stores rainwater in underground cistern for irrigation use:
  - provides all irrigation from non-potable water
  - reduces load on municipal stormwater systems
  - recharges groundwater on-site
- irrigation wells pump groundwater for irrigation use:
  - provides all irrigation from non-potable water

How will this be evaluated:

- more information, including benefits and challenges

If add is not accepted:

- potable water will be used for any necessary irrigation
- (in all cases) strategies to reduce requirement for irrigation will be explored including drought resistant, non-mowed planting

Sustainable irrigation w/ rain water harvesting (underground cistern) not recommended for further exploration = \$ 1,187,000

Sustainable irrigation/ ground water wells recommended for further exploration - \$ 311,000

# Potential adds - Enclosed walkway

	<b>New Campus 2 w/ Aud</b>
<b>Provide enclosed walkway</b>	<b>\$2,884,000</b>

Base project includes covered walkway between new building and field house.

Potential:

- to enclose the passage between buildings

How will this be evaluated:

- security issues will be explored including door and access controls
- all- weather connection promotes enhanced comfort and circulation between buildings

If add is not accepted:

- the connection between buildings will be covered, but not enclosed



# How people can get involved

## COME TO A COMMITTEE MEETING

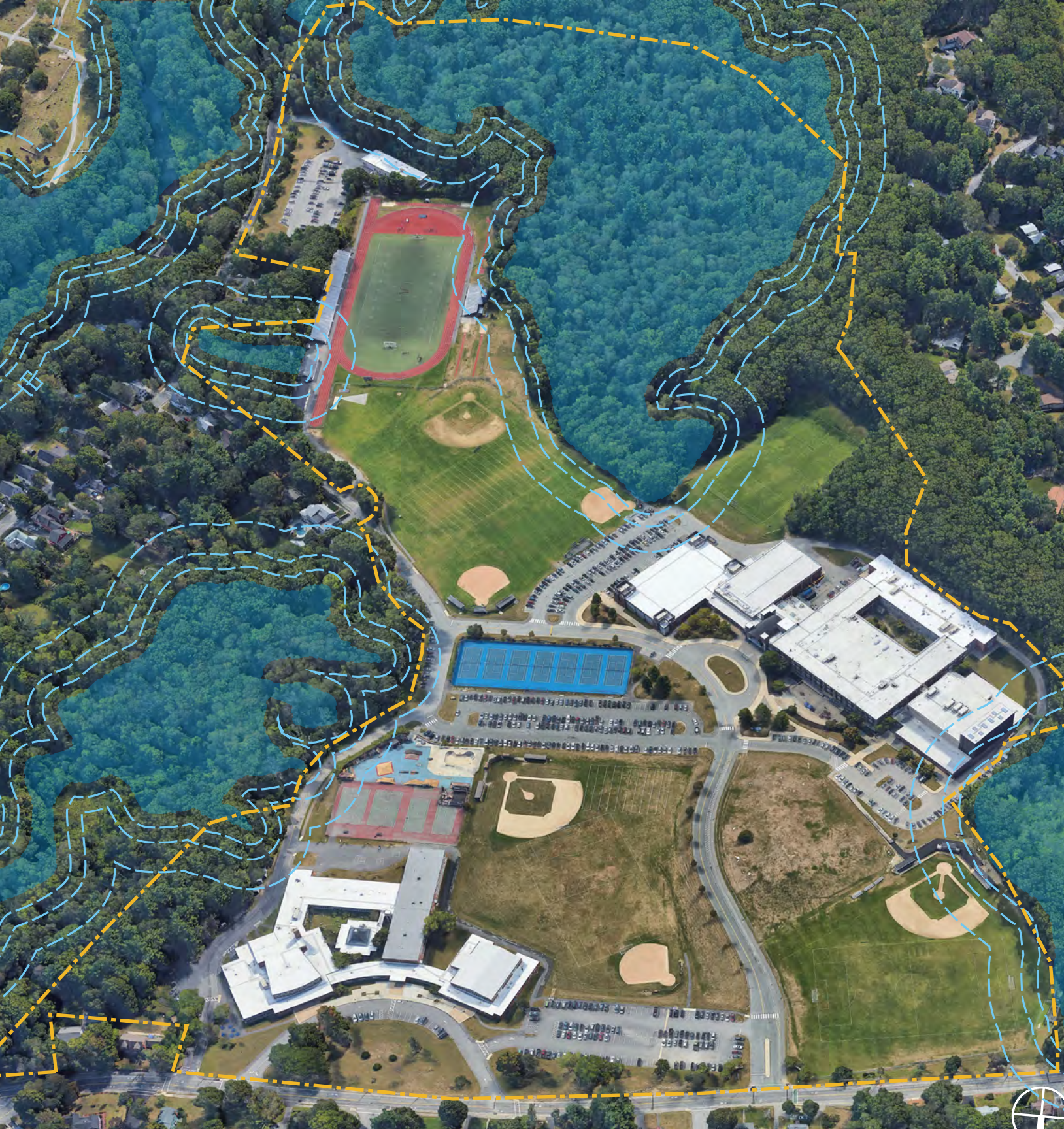
**Web site:** [andoverhighbuildingproject.org](http://andoverhighbuildingproject.org)

**Email:** [andoverhighbuildingproject@andoverma.us](mailto:andoverhighbuildingproject@andoverma.us)

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