ARROWSTREET

DALE STREET SCHOOL

SCHOOL BUILDING COMMITTEE

MEDFIELD, MA

8 JULY 2020

PREPARED FOR

MEDFIELD PUBLIC SCHOOLS

AGENDA /

1 DESIGN PROGRESS

2 EVALUATION OF ALTERNATIVES

3 EVALUATION OF EXISTING CONDITIONS

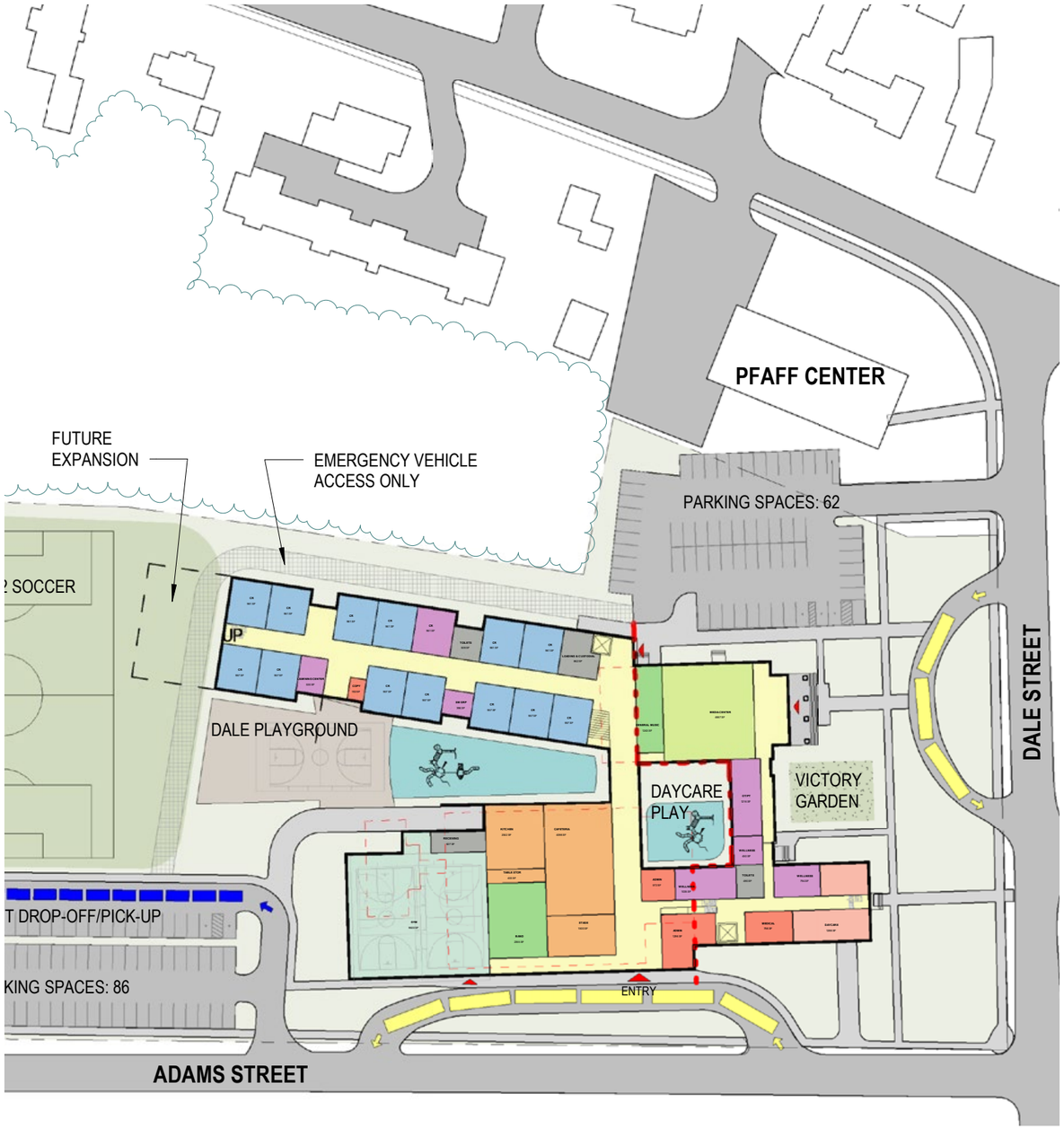
4 SUSTAINABILITY

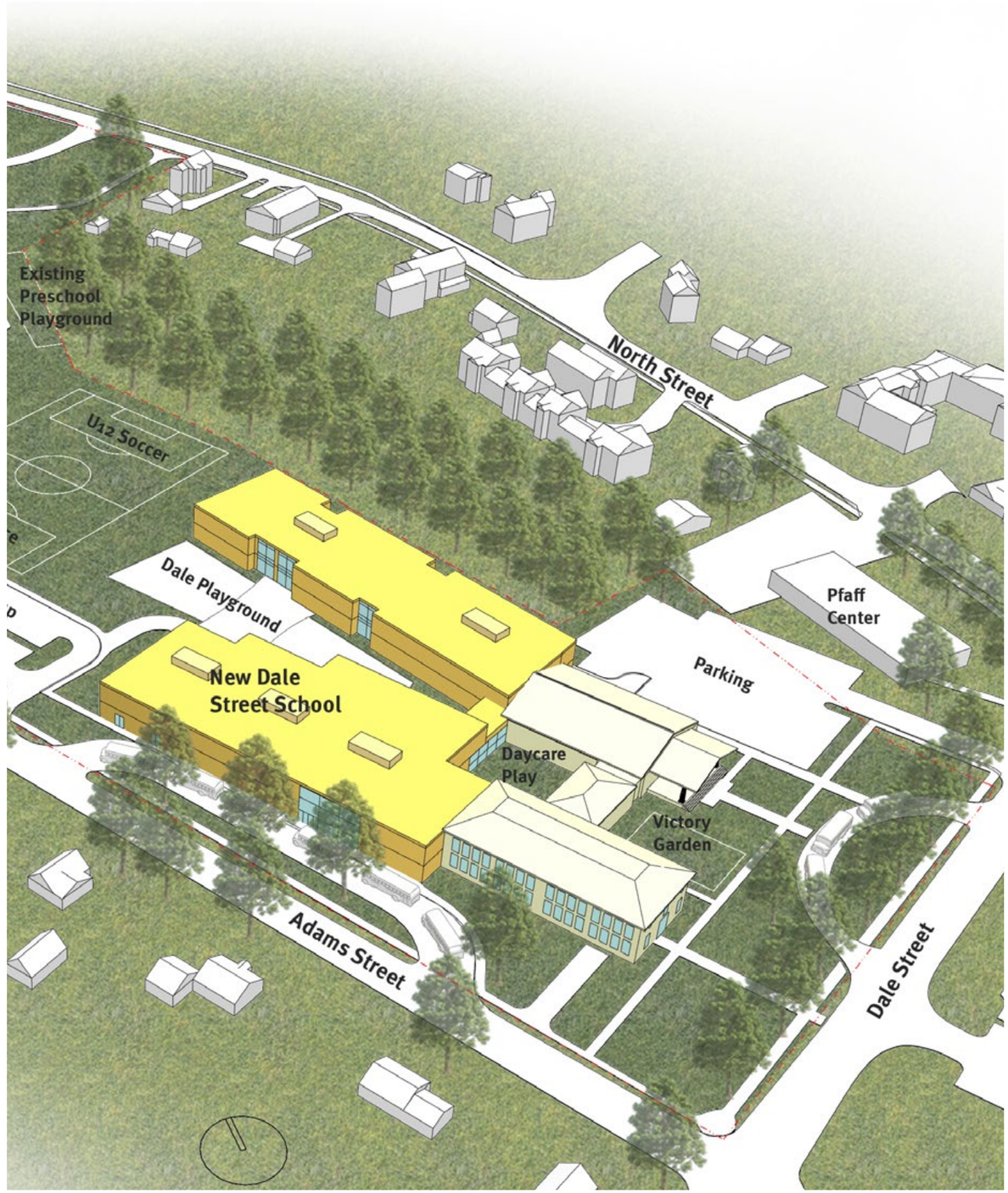
DESIGN PROGRESS

DESIGN PROGRESS

ADDITION/ RENOVATION B1 SITE PLAN

4-5 CONFIGURATION

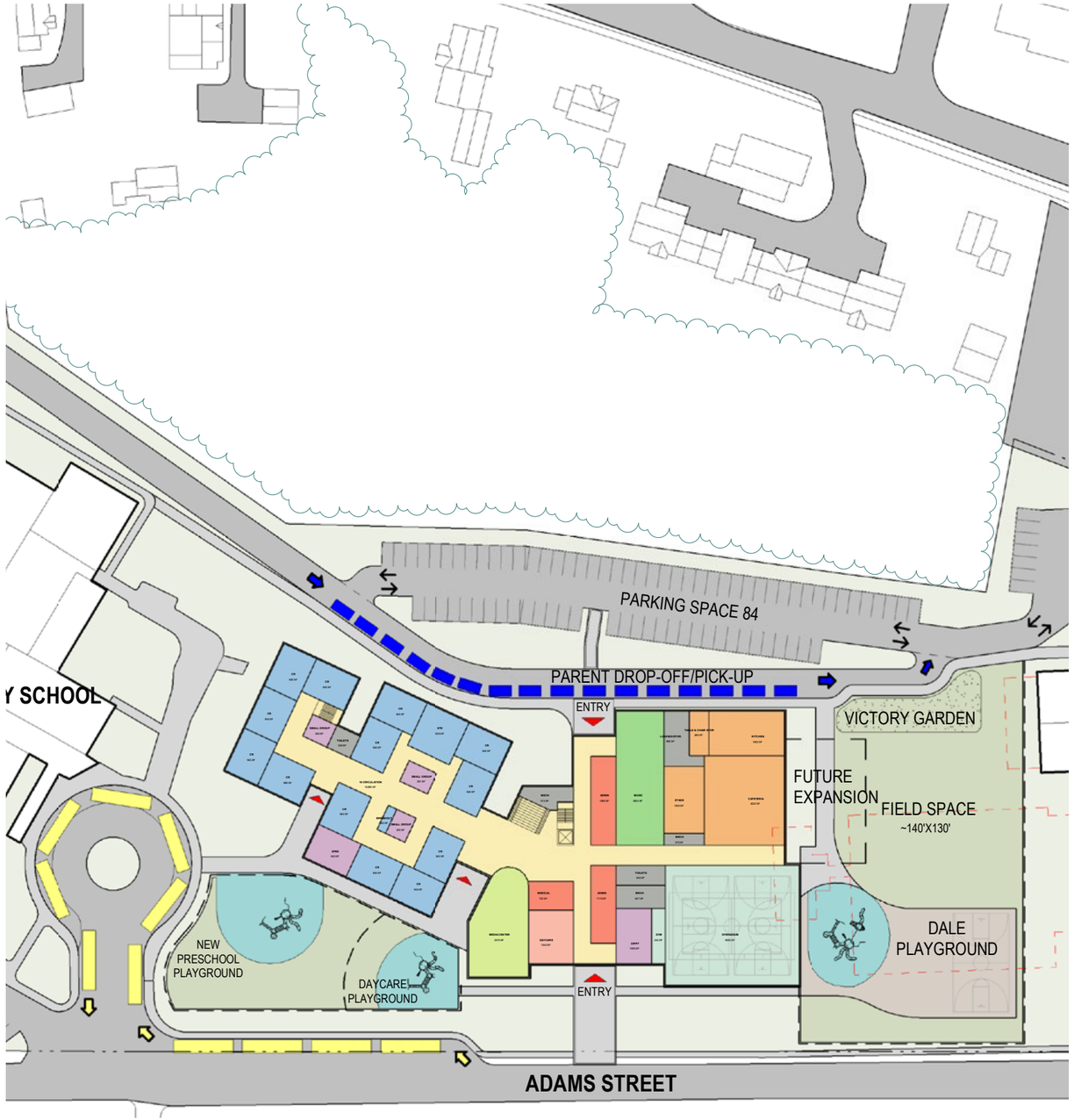


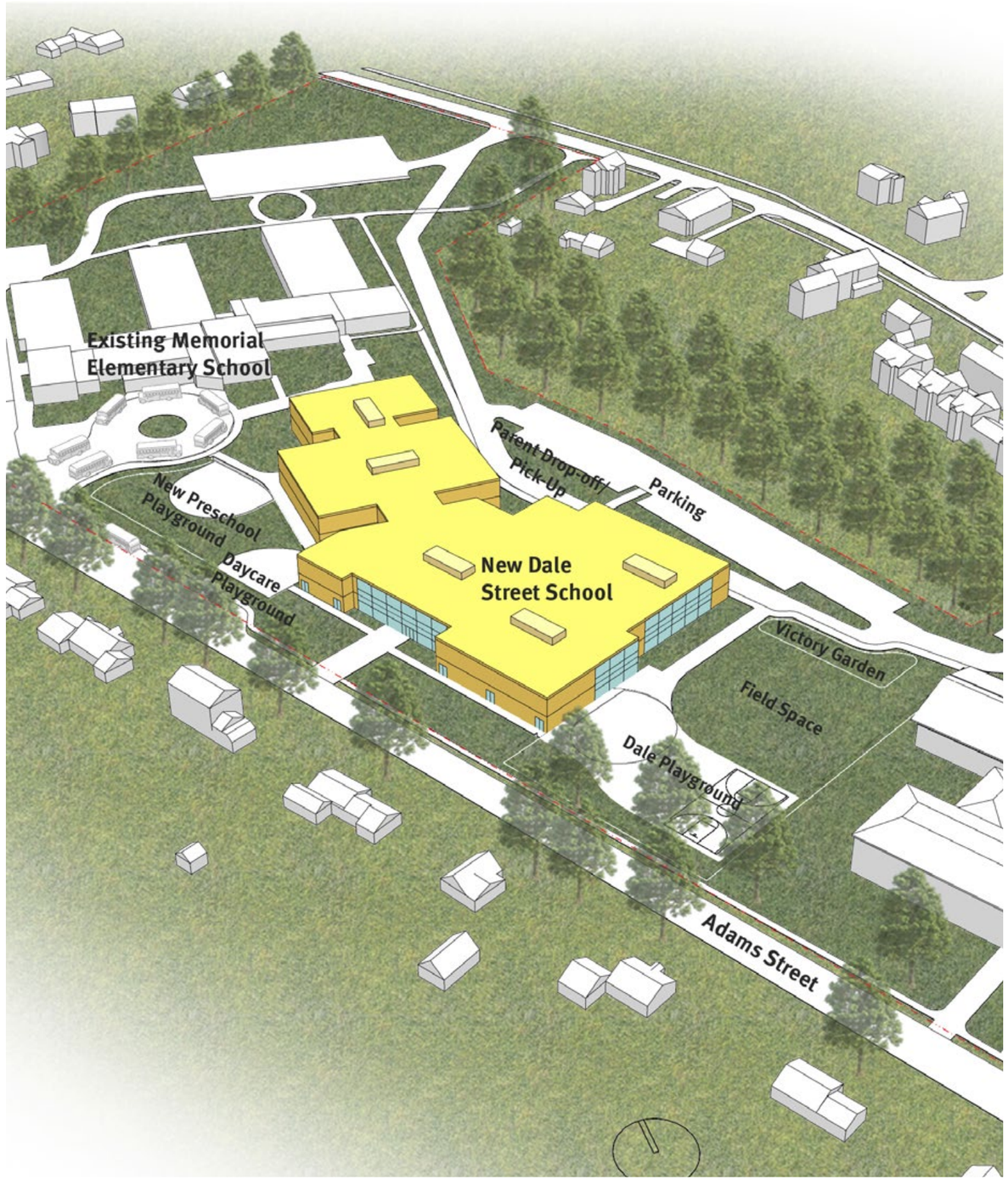


DESIGN PROGRESS

NEW CONSTRUCTION ON DALE E1 SITE PLAN

4-5 CONFIGURATION

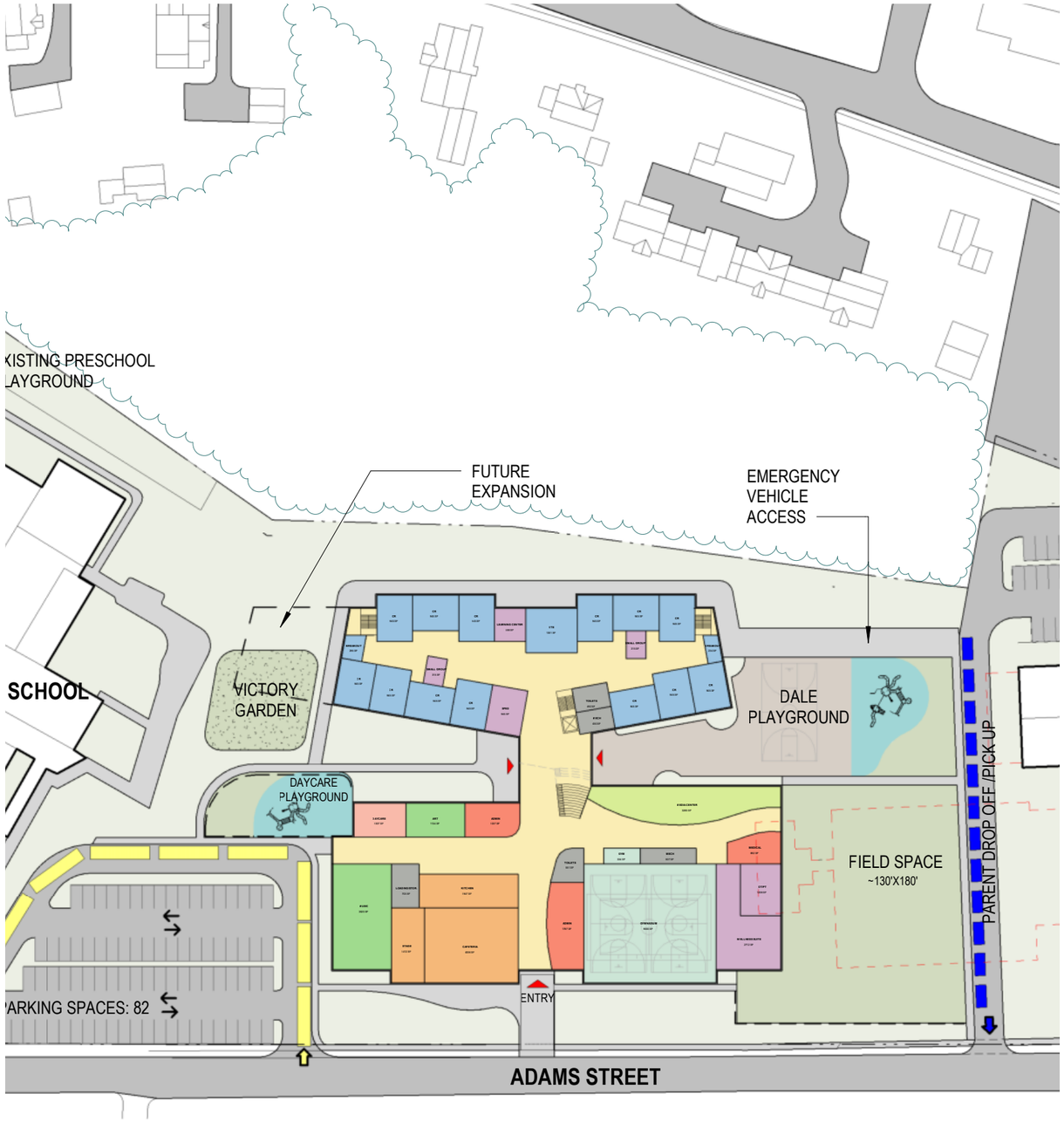


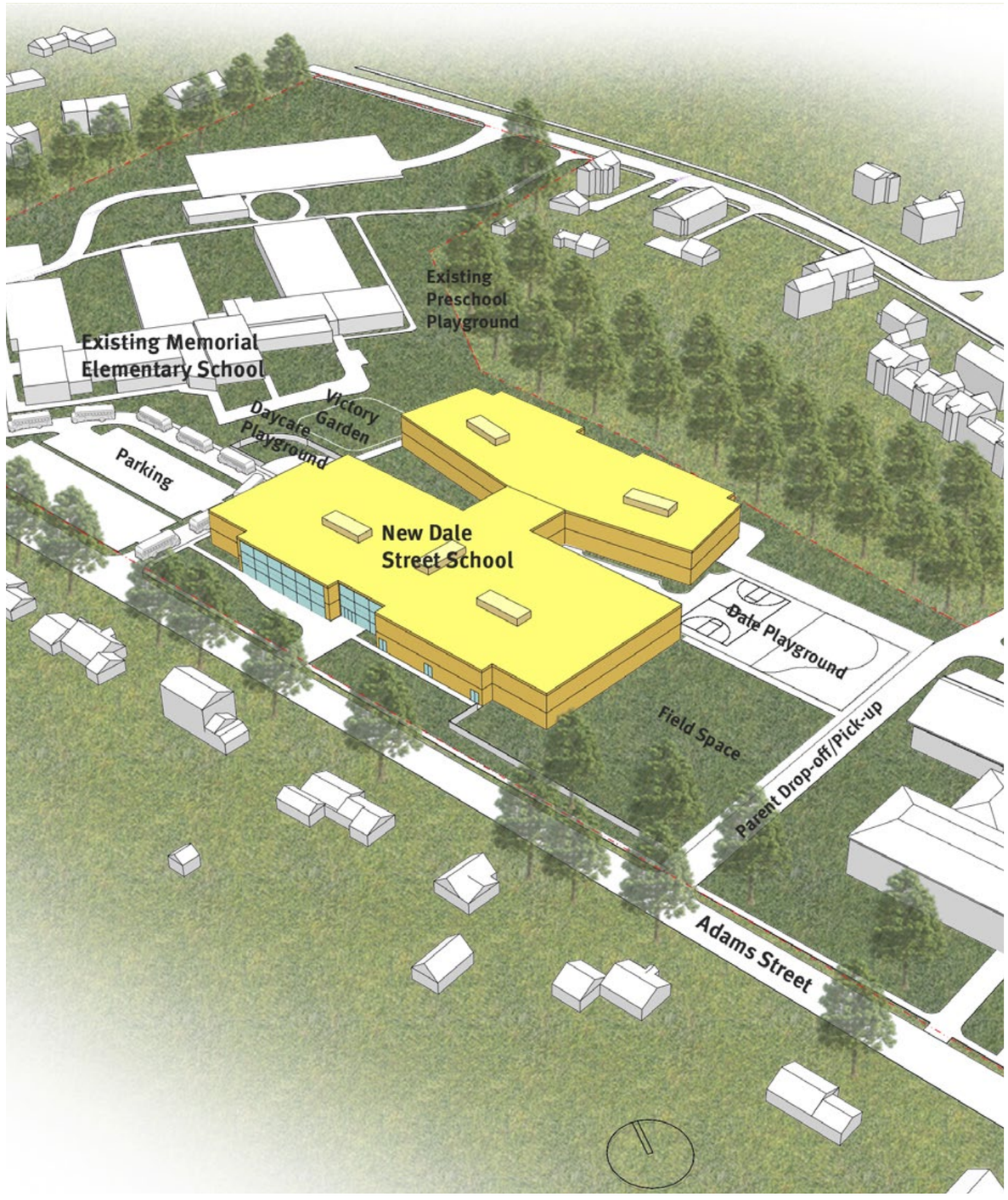


DESIGN PROGRESS

NEW CONSTRUCTION ON DALE E1.3 SITE PLAN

4-5 CONFIGURATION

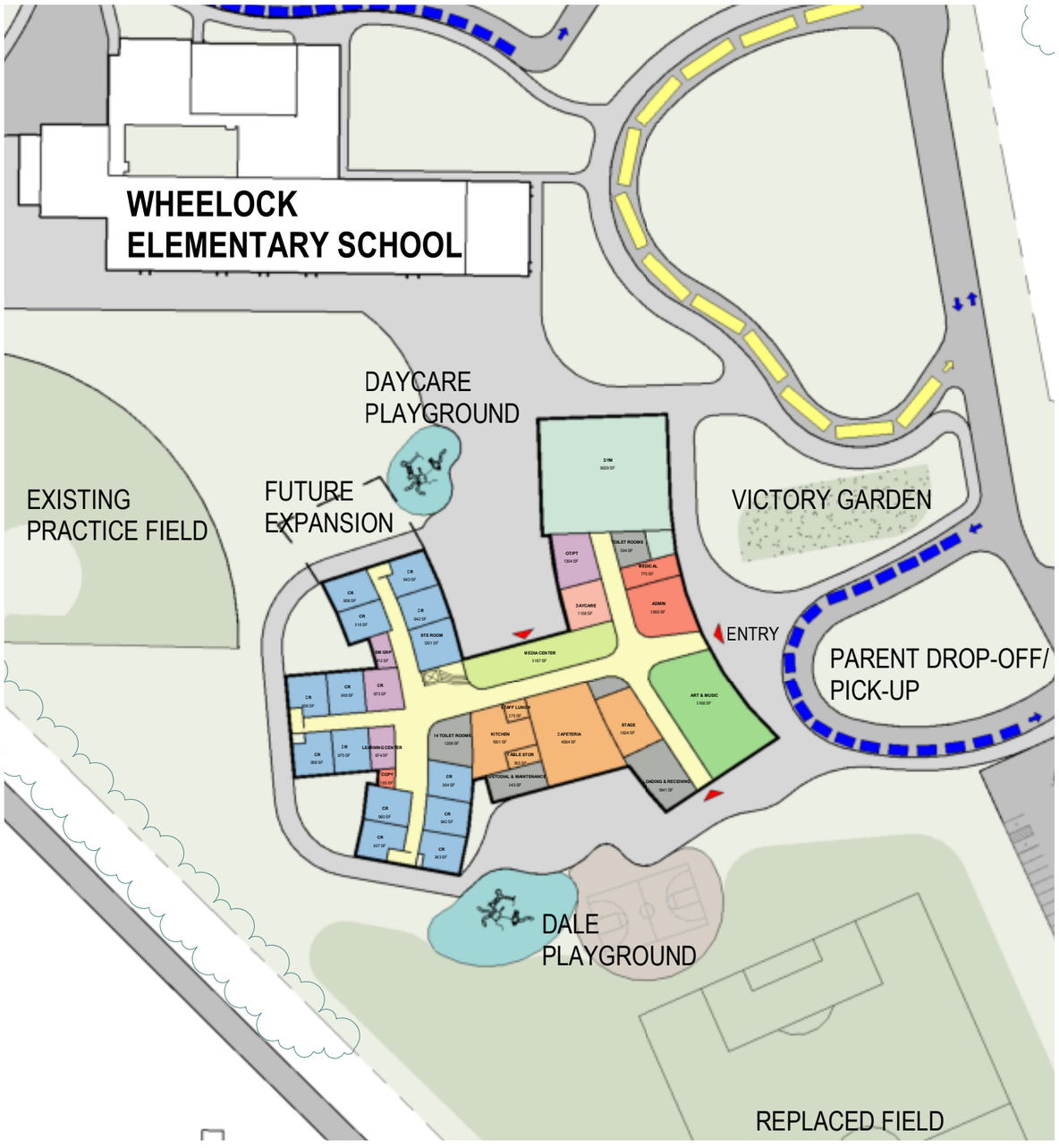


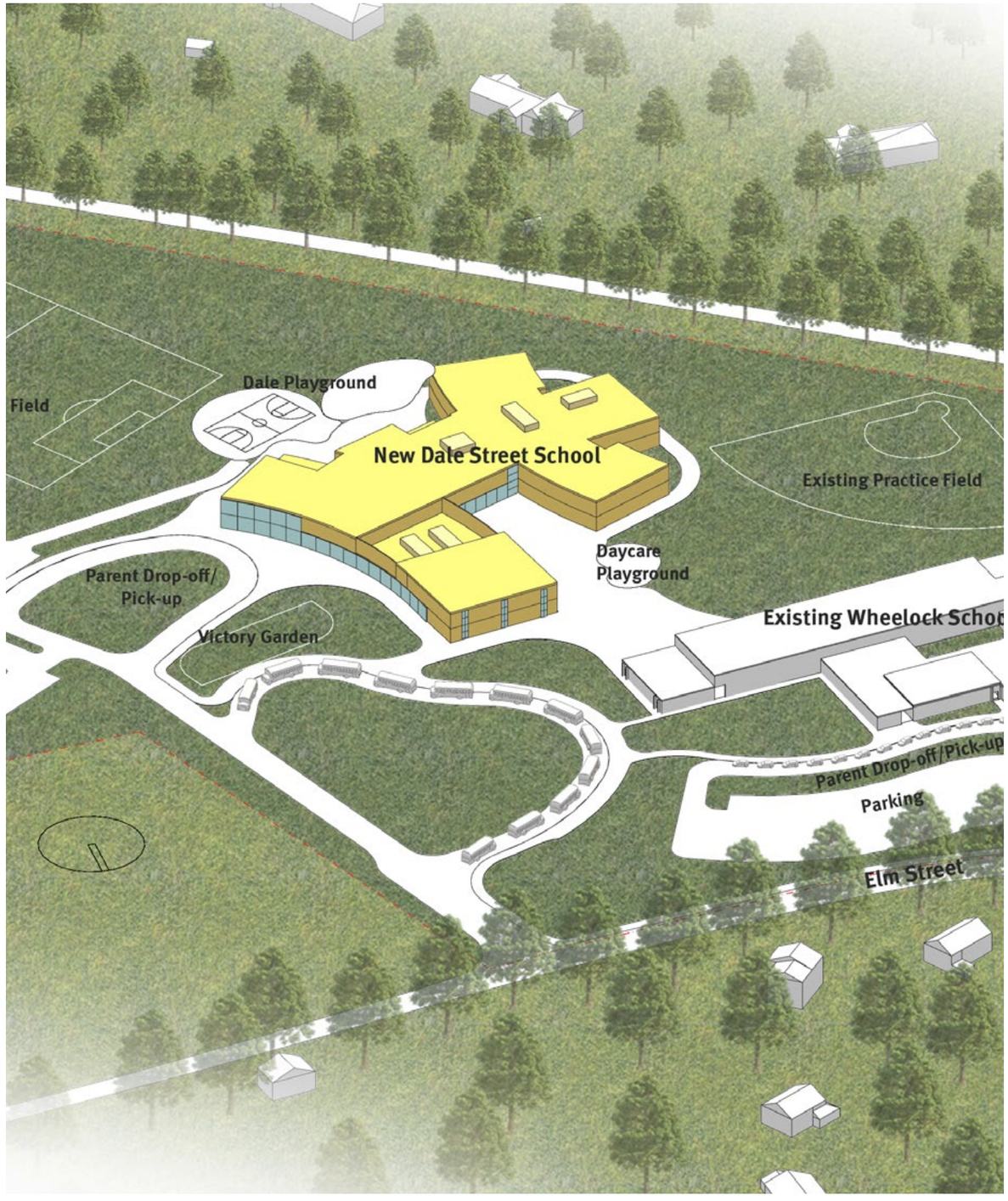


DESIGN PROGRESS

NEW CONSTRUCTION ON WHEELOCK G1 SITE PLAN

4-5 CONFIGURATION

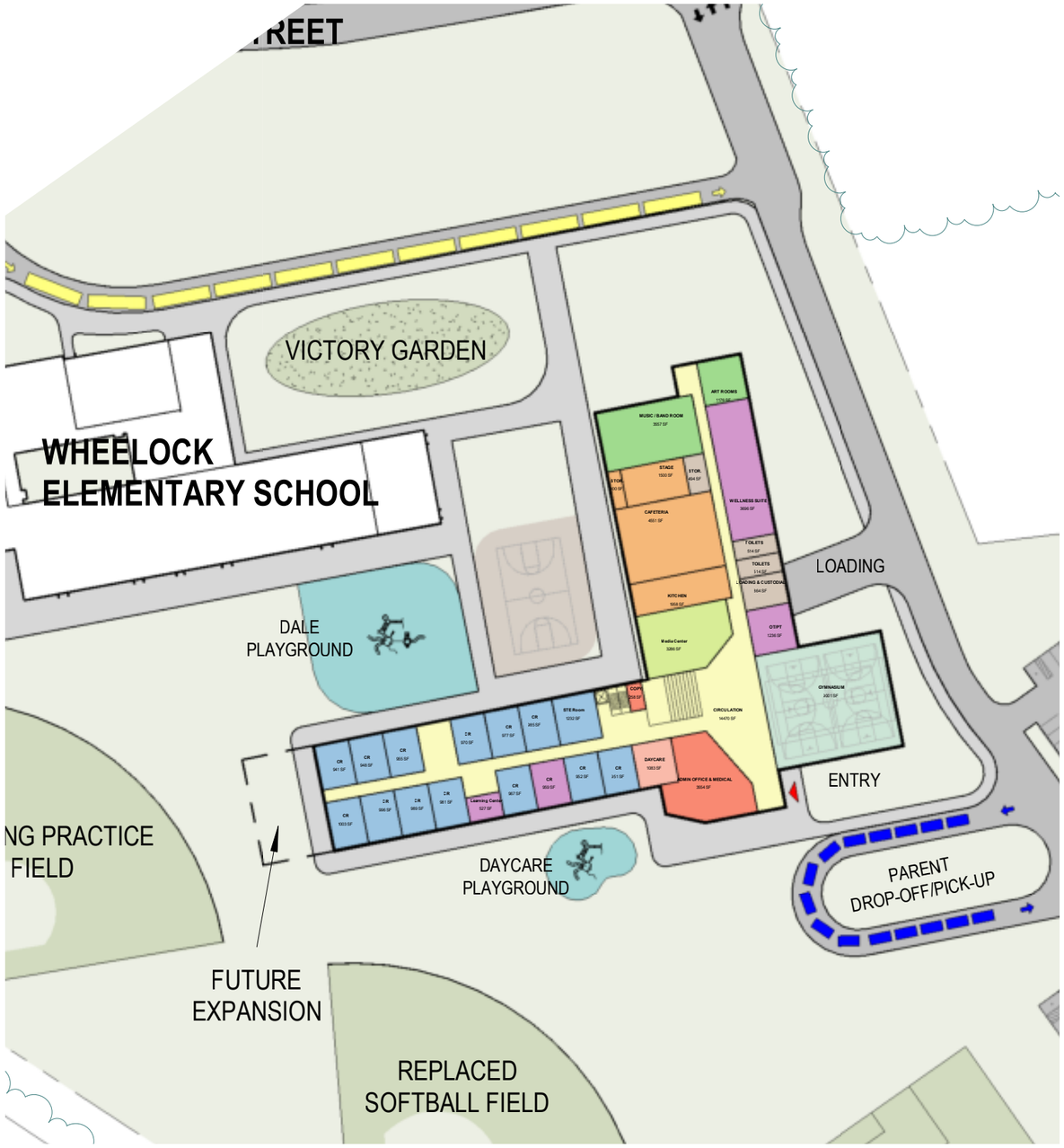


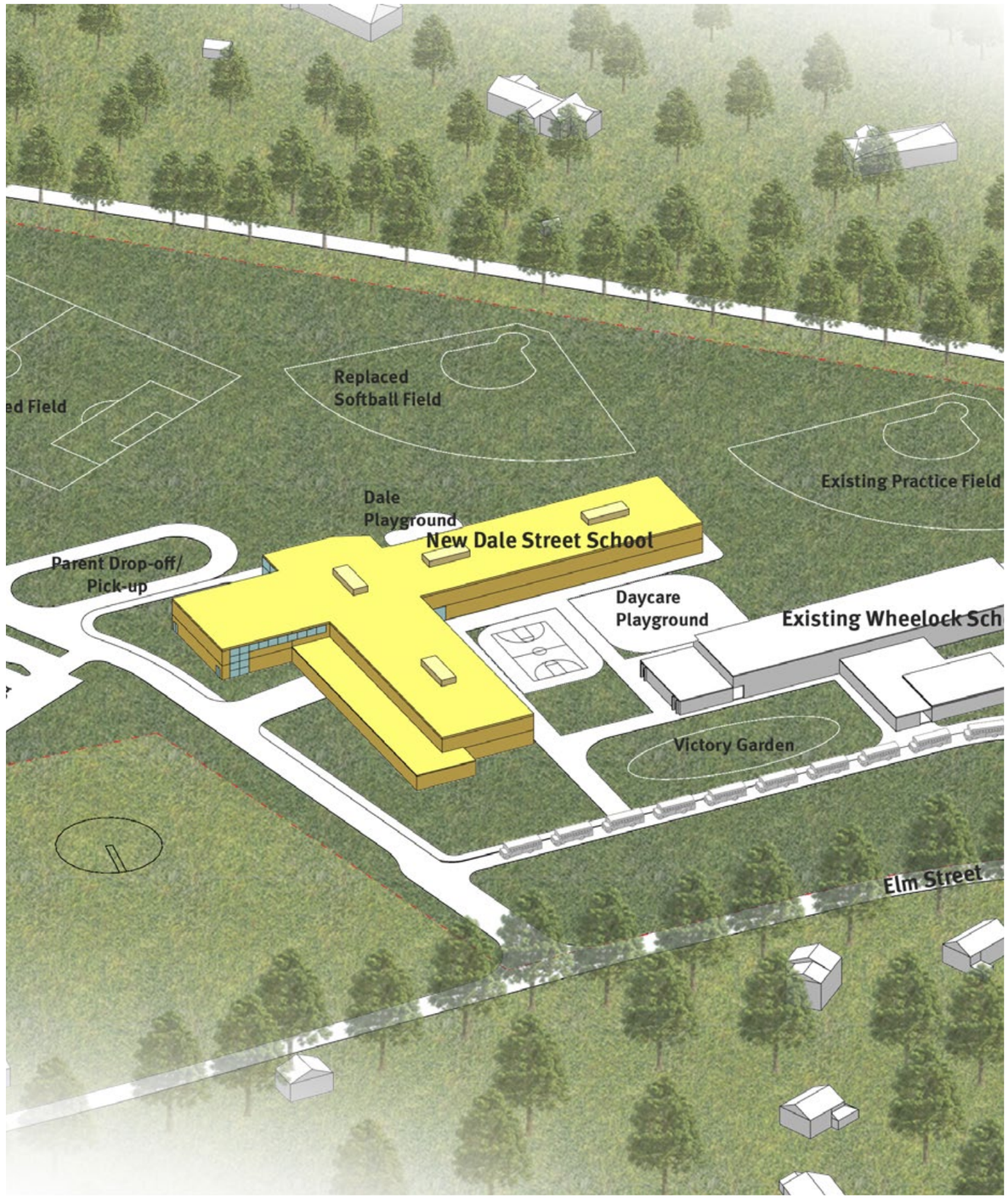


DESIGN PROGRESS

NEW CONSTRUCTION J1 SITE PLAN

4-5 CONFIGURATION



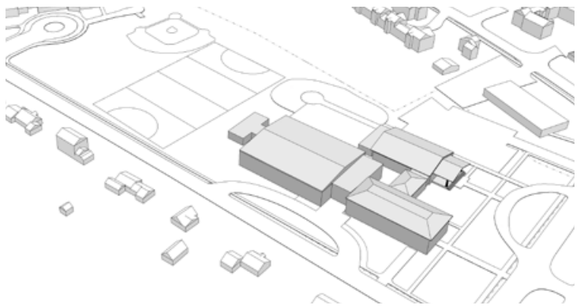


EVALUATION OF ALTERNATIVES

EVALUATION OF ALTERNATIVES: BASE REPAIR & ADDITION/RENOVATION ON DALE SITE

Alternative A

Base Repair/Code Upgrades
(Grades 4-5, 426 students)



Educational Program & Building
- Existing building upgraded to meet building codes
- Does not solve educational program issues
- Future overcrowding
- Limits future flexibility

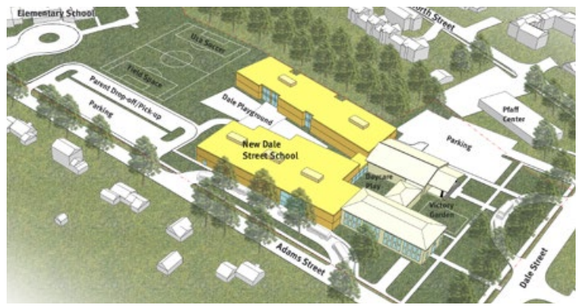
Site
- Existing baseball field remains
- Existing soccer field remains
- Existing parking
- Existing bus queuing
- New playground to include accessibility

Phasing Issues
- Several phases to maintain some of uses of the building while under construction.
- Requires swing space
- Occupied construction site affects two schools
- Extended construction schedule

Gross Area: ~47,341 SF

Alternative B1

Addition/Renovation
(Grades 4-5, 575 students)



Educational Program & Building
- New Classrooms
- New Gymnasium
- New Cafeteria
- Reconfigured existing building
- 2-story building
- 1941 building facade is retained

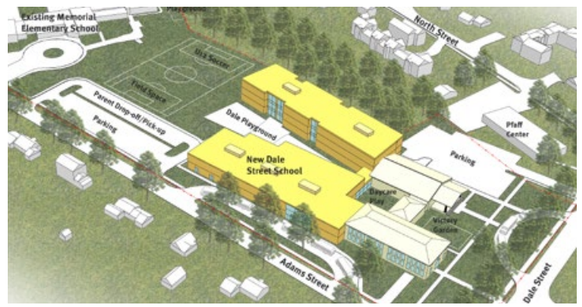
Site
- Relocates baseball field
- Retains a U12 soccer field
- Increases parking and provides separate parent drop-off/pick-up queuing
- Increases bus queuing
- New playground

Phasing Issues
- Gymnasium would be unavailable during construction
- Playground would be unavailable
- Baseball field would be unavailable
- Temporary modular building needed

Gross Area: ~104,200 SF

Alternative B2

Addition/ Renovation
(Grades 3-5, 860 students)



Educational Program & Building
- New Classrooms
- New Gymnasium
- New Cafeteria
- Reconfigured existing building
- 3-story building
- 1941 building facade is retained

Site
- Relocates baseball field
- Retains a U12 soccer field
- Increases parking and provides separate parent drop-off/pick-up queuing
- Increases bus queuing
- New playground

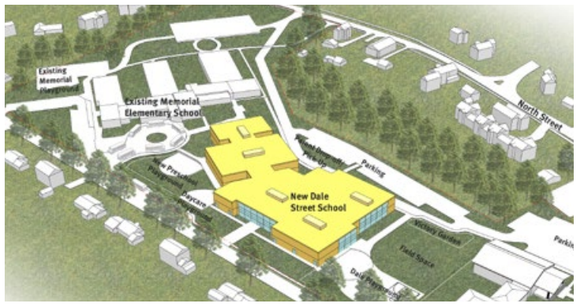
Phasing Issues
- Gymnasium would be unavailable during construction
- Playground would be unavailable
- Baseball field would be unavailable
- Temporary modular building needed

Gross Area: ~133,000 SF

EVALUATION OF ALTERNATIVES: NEW CONSTRUCTION ON DALE SITE

Alternative E1

New Construction
(Grades 4-5, 575 students)



Educational Program & Building
- New Building fully meets educational program
- 2-story building
- Could retain 1941 building for other uses

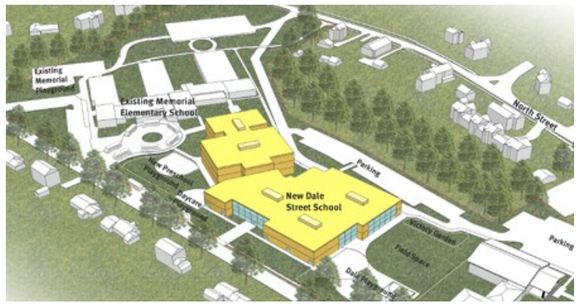
Site
- Displaces baseball field
- Displaces a U12 soccer field
- Increases parking and separate parent drop-off/pick-up queuing
- Increases bus queuing and shared with Memorial School
- New playground and field

Phasing Issues
- Demolition of existing modular classrooms to begin construction of the new school
- Existing schools will be in use during construction.
- Baseball field and soccer field will become unavailable.

Gross Area: ~98,200 SF

Alternative E2

New Construction
(Grades 3-5, 860 students)



Educational Program & Building
- New Building fully meets educational program
- 3-story building
- Could retain 1941 building for other uses

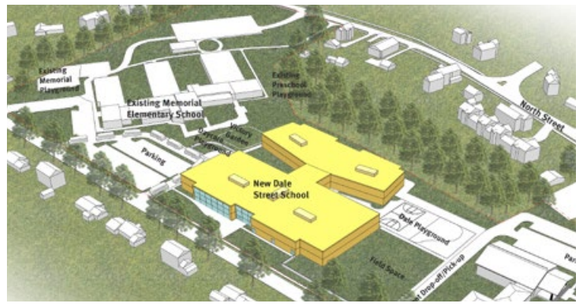
Site
- Displaces baseball field
- Displaces a U12 soccer field
- Increases parking and separate parent drop-off/pick-up queuing
- Increases bus queuing and shared with Memorial School
- New playground and field

Phasing Issues
- Demolition of existing modular classrooms to begin construction of the new school
- Existing schools will be in use during construction period.
- Baseball field and soccer field will become unavailable.

Gross Area: ~131,300 SF

Alternative E1.3

New Construction
(Grades 4-5, 575 students)



Educational Program & Building
- New Building fully meets educational program
- 2-story building
- Could retain 1941 building for other uses

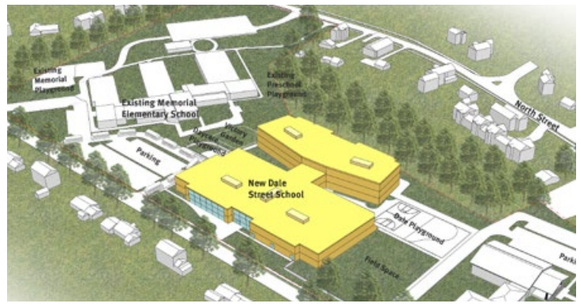
Site
- Displaces baseball field
- Displaces a U12 soccer field
- Increases parking and separate parent drop-off/pick-up queuing
- Increases bus queuing
- New playground and field
- More space between New Dale and Memorial School

Phasing Issues
- Demolition of existing modular classrooms to begin construction of the new school
- Existing schools will be in use during construction period.
- Baseball field and soccer field will become unavailable.

Gross Area: ~98,200 SF

Alternative E2.3

New Construction
(Grades 3-5, 860 students)



Educational Program & Building
- New Building fully meets educational program
- 3-story building
- Could retain 1941 building for other uses

Site
- Displaces baseball field
- Displaces a U12 soccer field
- Increases parking and separate parent drop-off/pick-up queuing
- Increases bus queuing
- New playground and field
- More space between New Dale and Memorial School

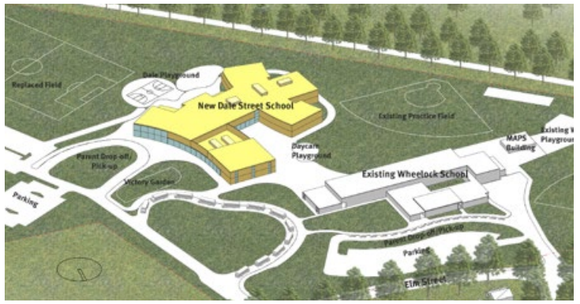
Phasing Issues
- Demolition of existing modular classrooms to begin construction of the new school
- Existing schools will be in use during construction.
- Baseball field and soccer field will become unavailable.

Gross Area: ~131,300 SF

EVALUATION OF ALTERNATIVES: NEW CONSTRUCTION ON WHEELOCK SITE

Alternative G1

New Construction
(Grades 4-5, 575 students)



Educational Program & Building

- New Building fully meets educational program
- 2-story building

Site

- Relocates 2 playing fields on site
- Existing softball field and practice field remain in place
- Increases parking and separate parent drop-off/pick-up queuing for each school
- Increases bus queuing and shared with Wheelock School
- New playground and field

Phasing Issues

- Relocates of the MAPS Building
- Existing parking for Wheelock School and soccer field will be temporarily relocated.
- Wheelock School will be in use during construction.

Gross Area: ~98,200 SF

Alternative G2

New Construction
(Grades 3-5, 860 students)

Educational Program & Building

- New Building fully meets educational program
- 3-story building

Site

- Relocates 2 playing fields on site
- Existing softball field and practice field remain in place
- Increases parking and separate parent drop-off/pick-up queuing for each school
- Increases bus queuing and shared with Wheelock School
- New playground and field

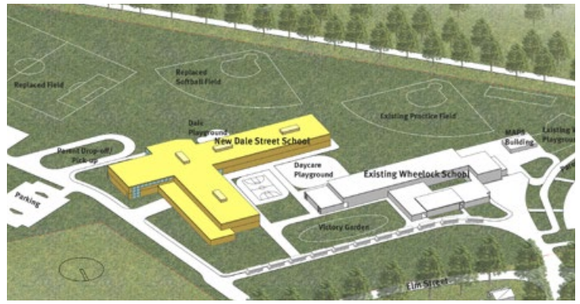
Phasing Issues

- Relocates of the MAPS Building
- Existing parking for Wheelock School and soccer field will be temporarily relocated.
- Wheelock School will be in use during construction.

Gross Area: ~131,300 SF

Alternative J1

New Construction
(Grades 4-5, 575 students)



Educational Program & Building

- New Building fully meets educational program
- 2-story building

Site

- Relocates 2 playing fields on site
- Relocates the softball field on site
- Existing practice field remains
- Increases parking and separate parent drop-off/pick-up queuing for each school
- Increases bus queuing and shared with Wheelock School
- New playground and field

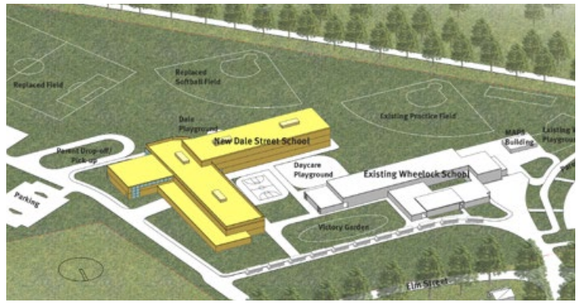
Phasing Issues

- Relocates of the MAPS Building
- Existing parking for Wheelock School and soccer field will be temporarily relocated.
- Existing softball field maybe unavailable for a period
- Wheelock School will be in use during construction.

Gross Area: ~98,200 SF

Alternative J2

New Construction
(Grades 3-5, 860 students)



Educational Program & Building

- New Building fully meets educational program
- 3-story building

Site

- Relocates 2 playing fields on site
- Relocates the softball field and on site
- Existing practice field remains
- Increases parking and separate parent drop-off/pick-up queuing for each school
- Increases bus queuing and shared with Wheelock School
- New playground and field

Phasing Issues

- Relocates of the MAPS Building
- Existing parking for Wheelock School and soccer field will be temporarily relocated.
- Existing softball field maybe unavailable for a period
- Wheelock School will be in use during construction.

Gross Area: ~131,300 SF

EVALUATION OF ALTERNATIVES: CRITERIA MATRIX

Dale Street School - Medfield, MA — **Options and Criteria Evaluation Matrix**

1) **Favorable** 2) **Neutral** 3) **Unfavorable**

* Note: All design options will meet current building codes.

		Potential Alternatives				
		B1 / B2	E1 / E2	E1.3 / E2.3	G1 / G2	J1 / J2
		Addition/ Renovation	New Construction at Dale Site	New Construction at Dale Site	New Construction at Wheelock Site	New Construction at Wheelock Site
Building and Site Facts						
1	Student enrollment population in 4-5 Grade	575	575	575	575	575
2	Student enrollment population in 3-5 Grade	860	860	860	860	860
3	Estimated Gross Square Feet					
4	Programmed Parking					
Cost and Schedule						
1	Relative capital cost					
2	Requires phased construction or modulars					
3	Shortest construction duration, earliest occupancy					
4	Impact to Town borrowing capacity or cost					
5	Impact to other Town capital projects					
Educational						
1	Sufficient spaces in which students learn to support current and project student enrollment					
2	Meets basic educational program and space needs/requirments					
3	Meets grade configuration requirements					
4	Provides space adjacency requirements					
5	Provides flexibility for future growth					
Community						
1	Provides accessibility to community used space					
2	Accommodates community program needs					
3	Accommodates after school program					
4	Maintains Campus relationship with Memorial School / Wheelock School					
Building						
1	Provides operable windows and indoor air quality for teaching/learning					
2	Meets accessibility and ADA requirements					
3	Optimizes connection of interior & exterior spaces; integration w/ site					
4	Addresses longevity, maintenance, and life cycle costs					
5	Adaptable to potential future changes in program or demographics					
6	Building serves to recruit teachers and families					
Site						
1	Maximizes efficient use of the site					
2	Optimizes outdoor program space and green space/playgroun					
3	Optimizes safety and efficiency of onsite drop-off/pick-up					
4	Separate bus and vehicular circulation					
5	Provides sufficient parking for teachers, staff and visitors					
6	Improves pedestrian safety and access					
7	Improves off-site traffic impact					
8	Disruptions to school and neighbors during construction					
Sustainable / Building Performance Goals						
1	Optimizes energy performance					
2	Optimizes water usage					
3	Optimizes waste reduction					
4	Optimizes daylight and views					

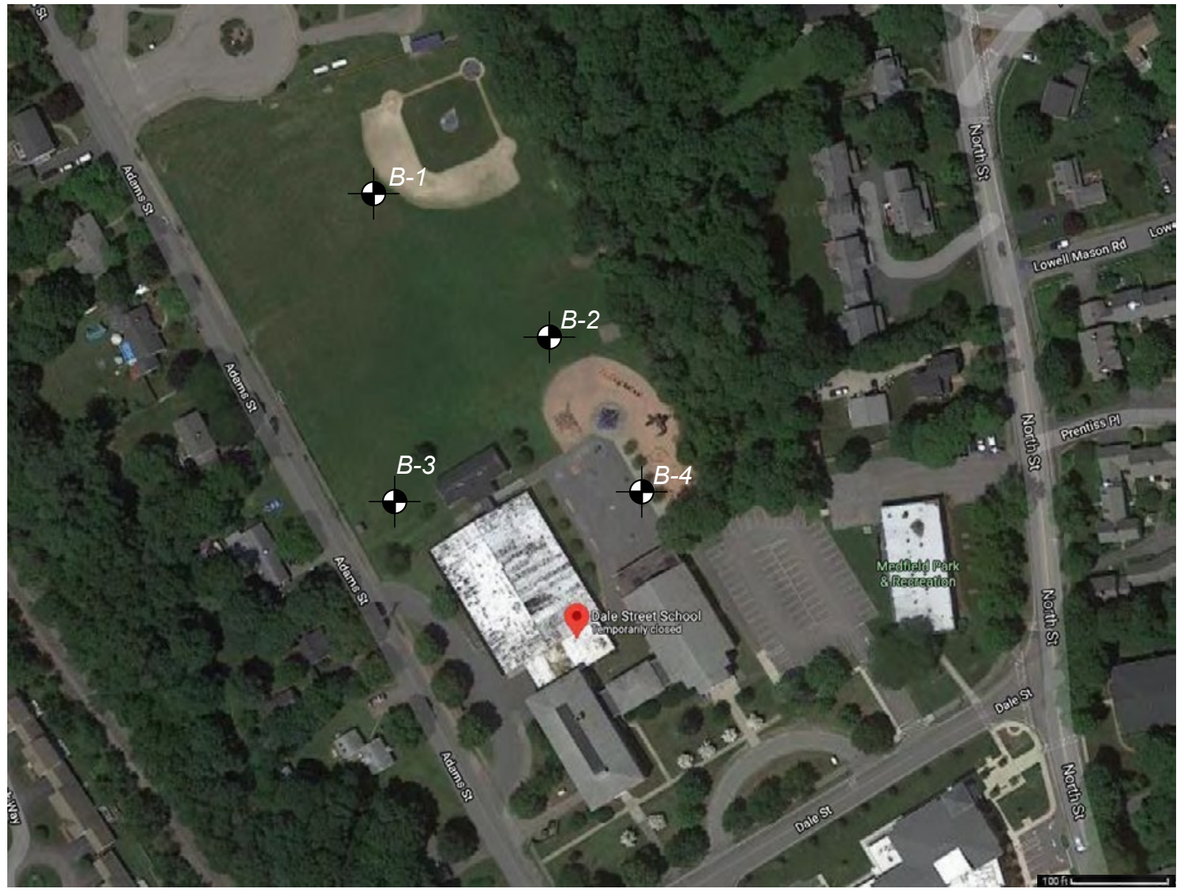
REQUIRES SCHOOL BUILDING COMMITTEE INPUT ON THESE CRITERIA

ENTER:
1 FOR FAVORABLE
2 FOR NEUTRAL
3 FOR UNFAVORABLE

EVALUATION OF EXISTING CONDITIONS

PRELIMINARY GEOTECHNICAL STUDY AT DALE STREET SCHOOL SITE

Note: Figure based on the aerial photograph of site obtained from google.com/maps. Boring location selected to cover preliminary layout options e-mailed to LGCI by Arrowstreet Inc. on May 1, 2020.



N

Legend

Approximate location of boring advanced by Northern Drill Service, Inc. (NDS) of Northborough, MA on May 22, 2020 and observed by Lahlaf Geotechnical Consulting, Inc. (LGCI).

Client:	Project:	Figure 3 – Boring Location Plan – Dale School Site	
Arrowstreet Inc.	Proposed Dale St. Elementary School - Dale School Site		
LGCI Lahlaf Geotechnical Consulting, Inc	Project Location: Medfield, MA	LGCI Project No.: 2006	Date: June 2020

EXISTING CONDITIONS

- Topsoil and Subsoil:
  0.5 to 1.5 feet beneath ground surface
- Sand Fill:
  5 and 9 feet beneath ground surface
- Sand and Gravel:
  22 feet beneath ground surface
- Groundwater:
  5-6 feet beneath ground surface

RECOMMENDATIONS:

- Remove entirely the surficial organic soil and the existing fill from within the proposed building footprint plus extend 5 feet.
- Support the building on spread footings bearing on Structural Fill placed on natural sand.
- Floor slabs should be constructed as a slabs-on-grade bearing on a minimum of 12 inches of Structural Fill placed directly on top of the natural sand.
- Sidewalks and other exterior slabs should be placed on a minimum of 12 inches of Structural Fill with less than 5 percent fines.

PRELIMINARY GEOTECHNICAL STUDY AT WHEELOCK SCHOOL SITE

Note: Figure based on the aerial photograph of site obtained from google.com/maps. Boring location selected to cover preliminary layout options e-mailed to LGCI by Arrowstreet Inc. on May 1, 2020.

N

Legend

Approximate location of boring advanced by Northern Drill Service, Inc. (NDS) of Northborough, MA on May 28, 2020 and observed by Lahlaf Geotechnical Consulting, Inc. (LGCI).

Client:	Project:	Figure 3 – Boring Location Plan – Wheelock School Site	
Arrowstreet Inc.	Proposed Dale St. Elementary School - Wheelock School Site		
LGCI Lahlaf Geotechnical Consulting, Inc	Project Location: Medfield, MA	LGCI Project No.: 2006	Date: June 2020

EXISTING CONDITIONS

- Topsoil and Subsoil:
  0.8 to 2 feet beneath ground surface
- Sand and Grave Fill:
  4 and 5 feet beneath ground surface
- Silty Sand:
  A layer found beneath the fill
- Groundwater:
  14.6 to 16 feet beneath ground surface

RECOMMENDATIONS:

- Remove entirely the surficial organic soil and the existing fill from within the proposed building footprint plus extend 5 feet.
- Support the building on spread footings bearing on Structural Fill placed on natural sand.
- Floor slabs should be constructed as a slabs-on-grade bearing on a minimum of 12 inches of Structural Fill placed directly on top of the natural sand.
- Sidewalks and other exterior slabs should be placed on a minimum of 12 inches of Structural Fill with less than 5 percent fines.

SUSTAINABILITY

LEED SCORECARD

LEED v4.1 for BD+C: Schools

Project Workplan

Medfield Dale Street Elementary School
6/23/2020

Prepared by: Arrowstreet

Y	?	N						
1	0	0	**Integrative Process**			1	Responsibility	Action
1			Credi 1		Integrative Process	1	All	

2	4	24	**Location and Transportation**			15	Responsibility	Action
		15	Credit 1		LEED for Neighborhood Development Location	15		
1			Credit 2		Sensitive Land Protection	1	AST	
	2		Credit 3		High Priority Site	2	AST	Need environmental site assessment results
	2	**3**	Credit 4		Surrounding Density and Diverse Uses	5	AST	Dale site can get 2pts
		4	Credit 5	EP	Access to Quality Transit	4		
		1	Credit 6		Bicycle Facilities	1		
		1	Credit 7		Reduced Parking Footprint	1		
1			Credit 8		Electric Vehicles	1	NEI/GGD	Install 5 charging stations

7	5	0	**Sustainable Sites**			12	Responsibility	Action
Y			Prereq 1		Construction Activity Pollution Prevention	Required	CM	
Y			Prereq 2		Environmental Site Assessment	Required	PEER	
1			Credit 1		Site Assessment	1	AST/TI	
	2		Credit 2		Protect or Restore Habitat	2	TI	Possible depending on site selection
1			Credit 3		Open Space	1	TI	
1	**2**		Credit 4		Rainwater Management	3	NEI	Determine stormwater requirements
2			Credit 5		Heat Island Reduction	2	AST/TI	Install white roof and concrete walkways/shade trees
1			Credit 6		Light Pollution Reduction	1	GGD	
	1		Credit 7		Site Master Plan	1	MPS/AST	
1			Credit 8		Joint Use of Facilities	1	MPS	

LEED SCORECARD

4	7	1	**Water Efficiency**		12	Responsibility	Action
Y			Prereq 1	Outdoor Water Use Reduction	Required	TI	
Y			Prereq 2	Indoor Water Use Reduction	Required	CAC	
Y			Prereq 3	Building-Level Water Metering	Required	CAC	
	2		Credit 1	Outdoor Water Use Reduction	2	TI	Determine if there will be irrigation
3	**3**	**1**	Credit 2	Indoor Water Use Reduction	7	CAC	Would need rainwater reuse to achieve more pts
	2		Credit 3	Cooling Tower Water Use	2	CAC	If no cooling tower may still meet alt compliance
1			Credit 4	Water Metering	1	CAC	Submeter water by use

13	18	0	**Energy and Atmosphere**		31	Responsibility	Action
Y			Prereq 1	Fundamental Commissioning and Verification	Required	CxA	
Y			Prereq 2	Minimum Energy Performance	Required	GGD	
Y			Prereq 3	Building-Level Energy Metering	Required	GGD	
Y			Prereq 4	Fundamental Refrigerant Management	Required	GGD	
4	**2**		Credit 1	Enhanced Commissioning	6	CxA	MPS determine if will do M&V
8	**8**		Credit 2 EP	Optimize Energy Performance	16	GGD	
1			Credit 3	Advanced Energy Metering	1	GGD	Meter main energy uses
	2		Credit 4	Demand Response	2	GGD	MPS determine if will participate in utility program
	5		Credit 5	Renewable Energy	5	MPS	Own PV or purchase RECs
	1		Credit 6	Enhanced Refrigerant Management	1	GGD	

5	5	2	**Materials and Resources**		12	Responsibility	Action
Y			Prereq 1	Storage and Collection of Recyclables	Required	AST	
Y			Prereq 2	Construction and Demolition Waste Management Planning	Required	CM	
1	**2**	**1**	Credit 1 EP	Building Life-Cycle Impact Reduction	4	AST/EDG	
1	**1**		Credit 2 EP	Building Product Disclosure and Optimization - Environmental Product	2	CM	
	1	**1**	Credit 3 EP	Building Product Disclosure and Optimization - Sourcing of Raw Materi	2	CM	
1	**1**		Credit 4 EP	Building Product Disclosure and Optimization - Material Ingredients	2	CM	
2			Credit 5 EP	Construction and Demolition Waste Management	2	CM	

LEED SCORECARD

8	6	2	**Indoor Environmental Quality**			16	Responsibility	Action	
Y			Prereq 1		Minimum Indoor Air Quality Performance	Required	GGD		
Y			Prereq 2		Environmental Tobacco Smoke Control	Required	MPS		
Y			Prereq 3		Minimum Acoustic Performance	Required	acoustical		
2			Credit 1	EP	Enhanced Indoor Air Quality Strategies	2	GGD		
1	**1**	**1**	Credit 2		Low-Emitting Materials	3	CM		
1			Credit 3		Construction Indoor Air Quality Management Plan	1	CM		
	2		Credit 4		Indoor Air Quality Assessment	2	CM	determine if will do testing	
	1		Credit 5		Thermal Comfort	1	GGD		
2			Credit 6		Interior Lighting	2	GGD		
1	**1**	**1**	Credit 7		Daylight	3	AST		
1			Credit 8	EP	Quality Views	1	AST		
	1		Credit 9		Acoustic Performance	1	acoustical		

6	0	0	**Innovation**		6	Responsibility	Action
1			Credit 1.1	Pilot: Designing w/ Nature Biophilic Design for Indoor Environment	1	AST	
1			Credit 1.2	Innovation: Purchasing Lamps	1	GGD	
1			Credit 1.3	Innovation: Green Building Education	1	MPS/AST	
1			Credit 1.4	Innovation: Design for Active Occupants	1	AST	
1			Credit 1.5	Innovation: O&M Kit/Occupant Survey/FoodAlt/Composting/Teaching T	1	MPS	
1			Credit 2	LEED Accredited Professional	1	AST	

1	3	0	**Regional Priority**		4	Responsibility	Action
	1		Credit 1	Renewable Energy Production: 2 of 5 pts	1	see credit above	
1			Credit 2	Optimize Energy Performance: 8 of 16 pts	1	see credit above	
	1		Credit 3	Building Life - Cycle Impact Reduction: 2 of 5 pts	1	see credit above	
	1		Credit 4	Protect or Restore Habitat 2 of 2pts	1	see credit above	

47	**48**	**29**	**Total**	Possible Points:	109

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110

HVAC SYSTEMS

		Net Zero Potential	EUI kBtu/sf/yr	CO_2 Emissions	Indoor Air Quality	Acoustics	Ease of Maintenance	Annual Energy Cost $/sf	Annual Maintenance Cost $/sf	Capital Investment Cost $/sf	Life-Cycle Cost Savings	Payback yrs
1	**Air Cooled Heat Pump Chiller & Gas Boiler**		26-33	◌	●	●	●	$0.98	$0.54	$52-56	●	●
2	**Air Cooled Heat Pump Chiller & Electric Boiler**	✓	25-28	○	●	●	●	$1.24	$0.51	$51-55	●	●
3	**Ground Source Heat Pump**	✓	21-26	●	●	●	○	$0.97	$0.59	$71-76	○	◌
4	**VRF**	✓	25-32	◌	○	○	◌	$1.33	$0.75	$55-60	◌	○

Scale

● ○ ◌

Better ⟷ Worse

**Estimated values based on recent HVAC system analysis of similar school projects and associated HVAC systems. Costs are averages.*

QUESTIONS?