Farmington High School

Creating New Possibilities | Option 2

QA+M architecture

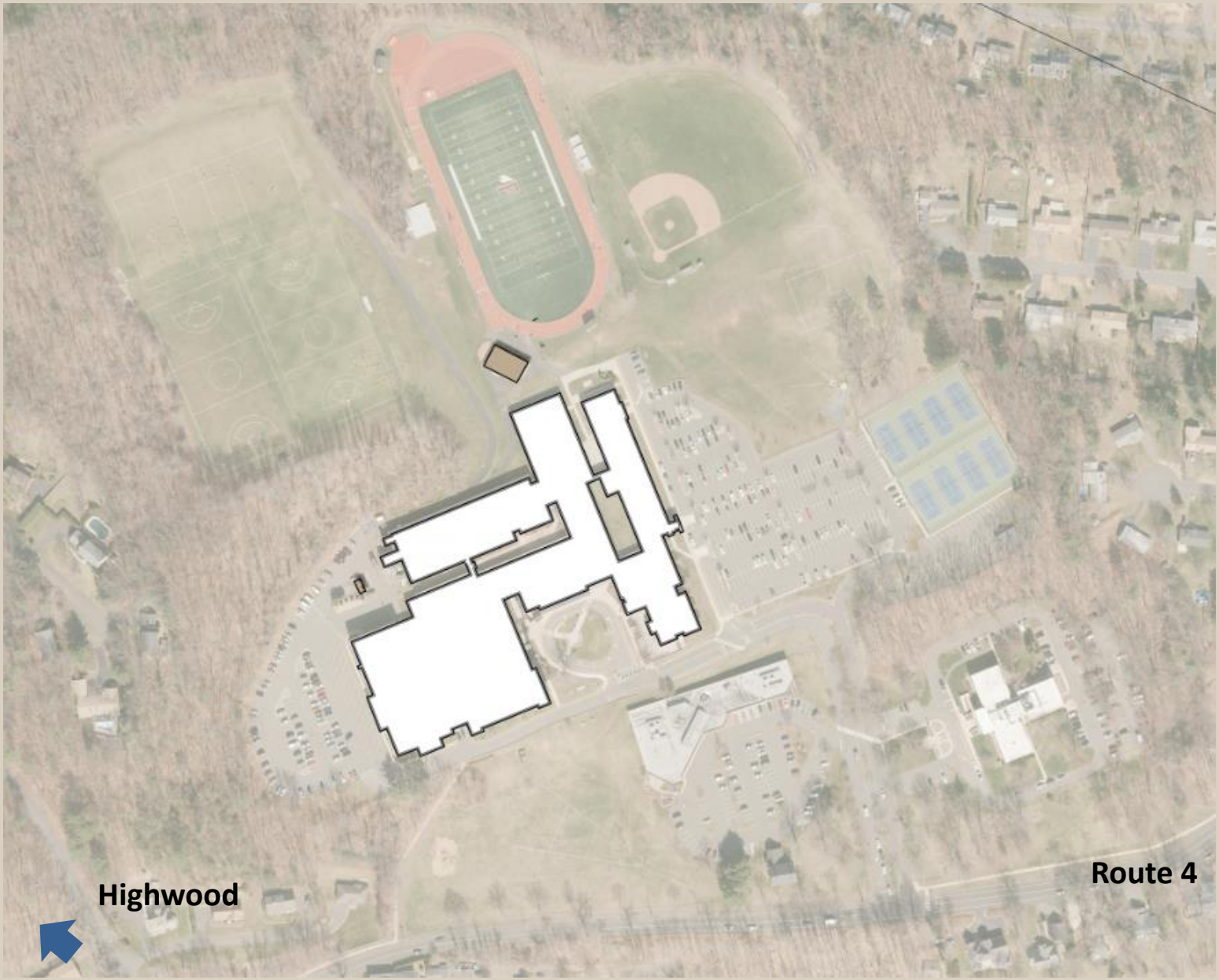
BSC GROUP VANZELM ENGINEERS

RFP Guidelines

“A comprehensive design solution as defined in the Statement of Needs…and falls within a category of Renovate as New…”

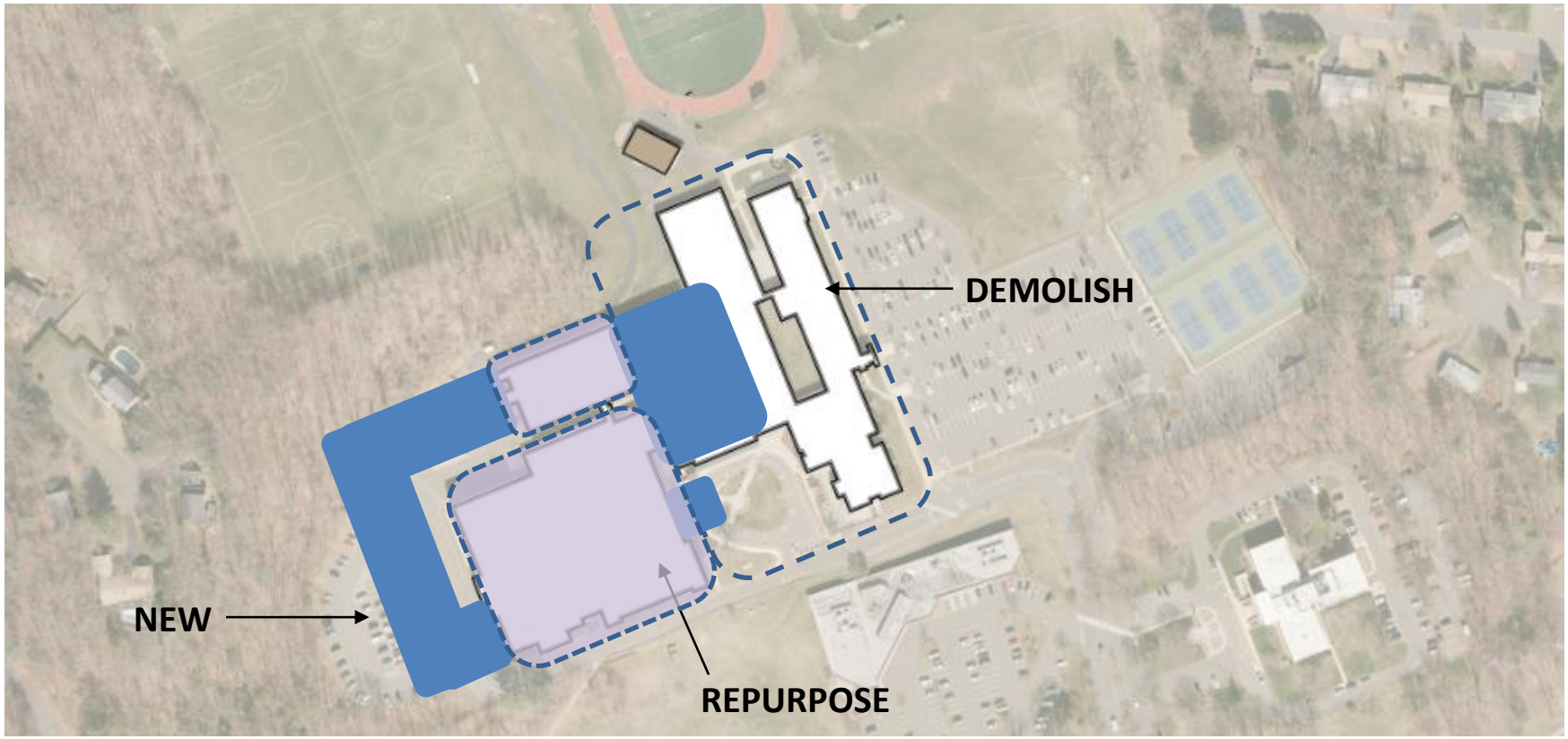
+ **Educational Specifications – Full compliance**
+ **Disruption to Education - Minimized**
+ **HVAC / mechanical systems – New energy efficient systems**
+ **Auditorium – New in place**
+ **Safety & Security – Meet all standards**
+ **NEASC Report – Full compliance**
+ **Codes, Accessibility & OCR Reports – Full compliance**
+ **BOE Central Office – Program space provided**
+ **Alternative Education – Program space provided**
+ **Sprawl & Circulation Efficiency – Resolved and optimized**
+ **Public & Private Separation – Fully addressed**
+ **Green / Sustainable Design – Strategies implemented**

Existing Site Plan



Design Goal

…to meet all criteria identified in the educational program and statement of needs by repurposing, demolishing and rebuilding, the existing occupied 218,000-SF facility into a reimagined future ready high school of approximately 275,000-SF, while minimizing disruption to education.



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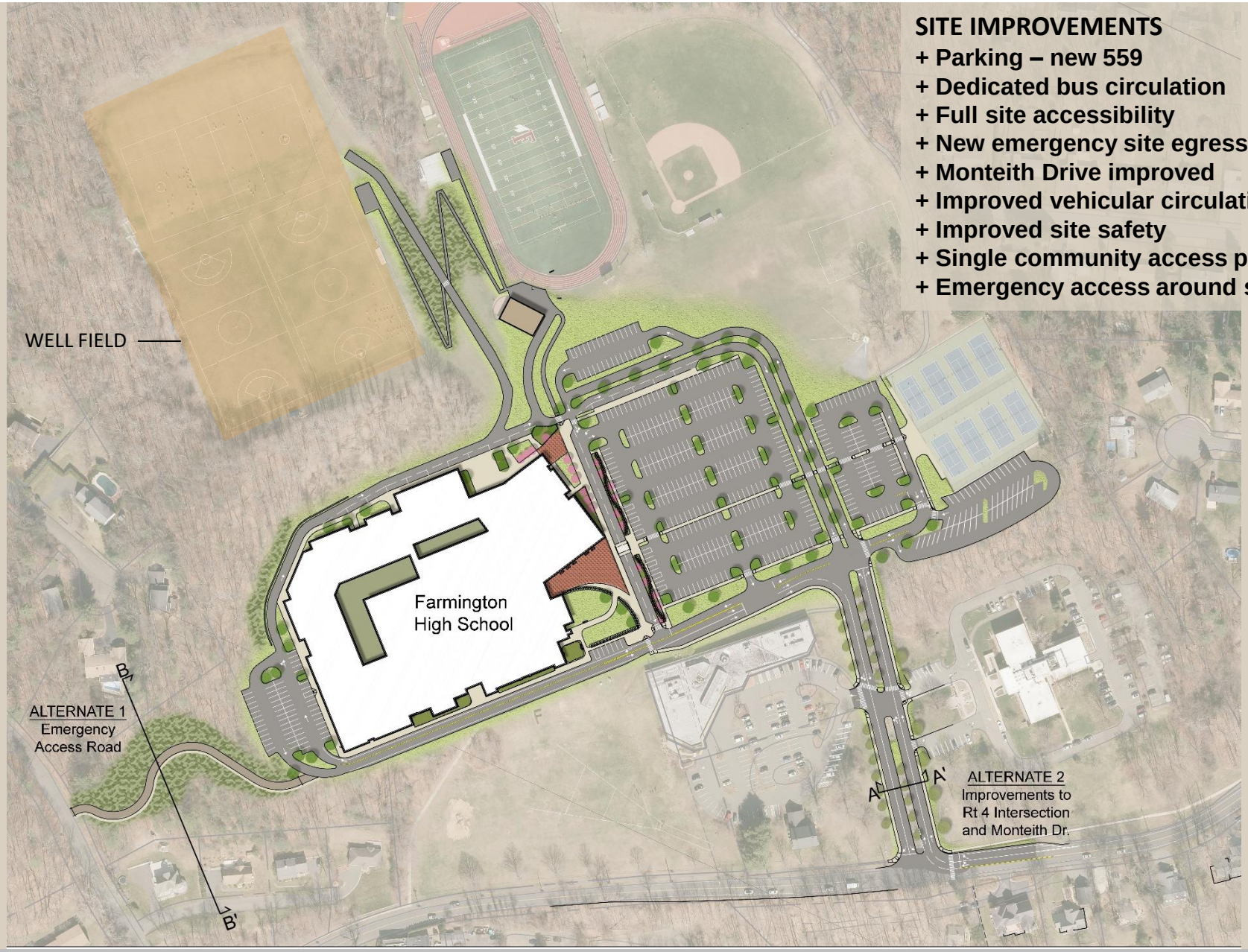
Proposed Site Plan



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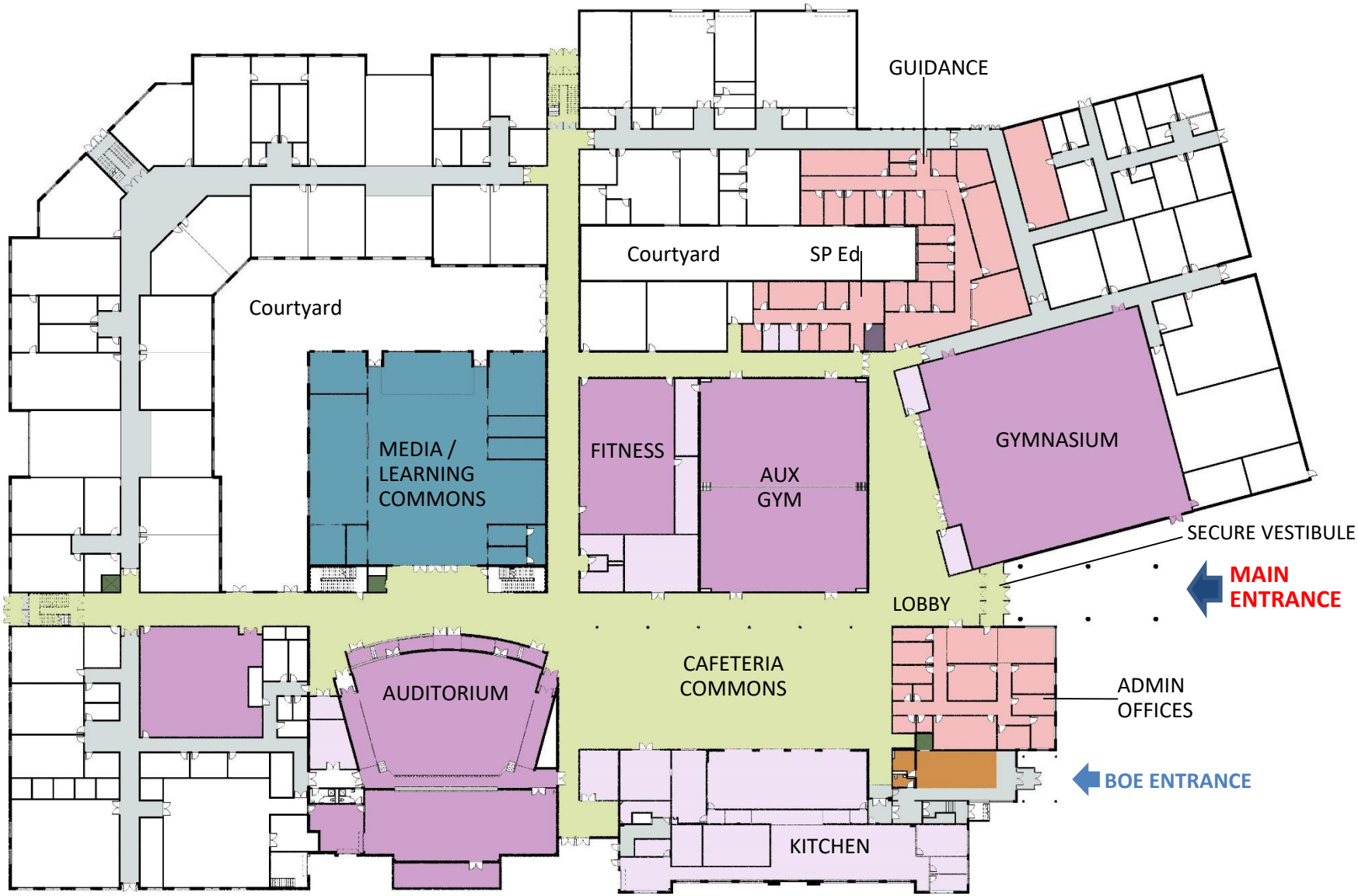
Main Entrance



First Floor Plan

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Main Entrance | View to Gym Lobby

New Gymnasium

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Main Entrance | View from Lobby

Cafeteria | Commons

Cafeteria | Commons

Media / Learning Commons + Auditorium

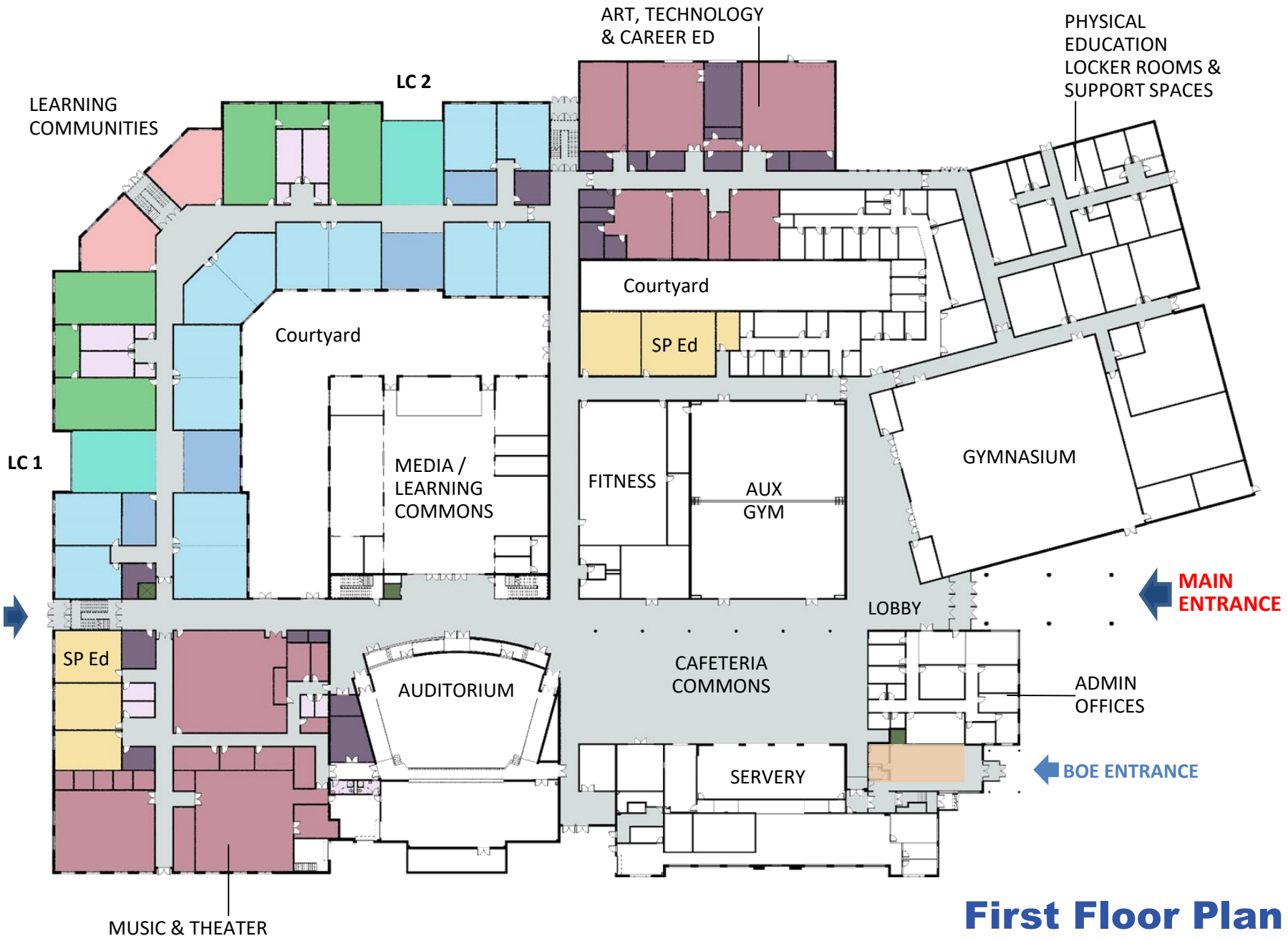
Media / Learning Commons

Media / Learning Commons

Auditorium

QA+M architecture

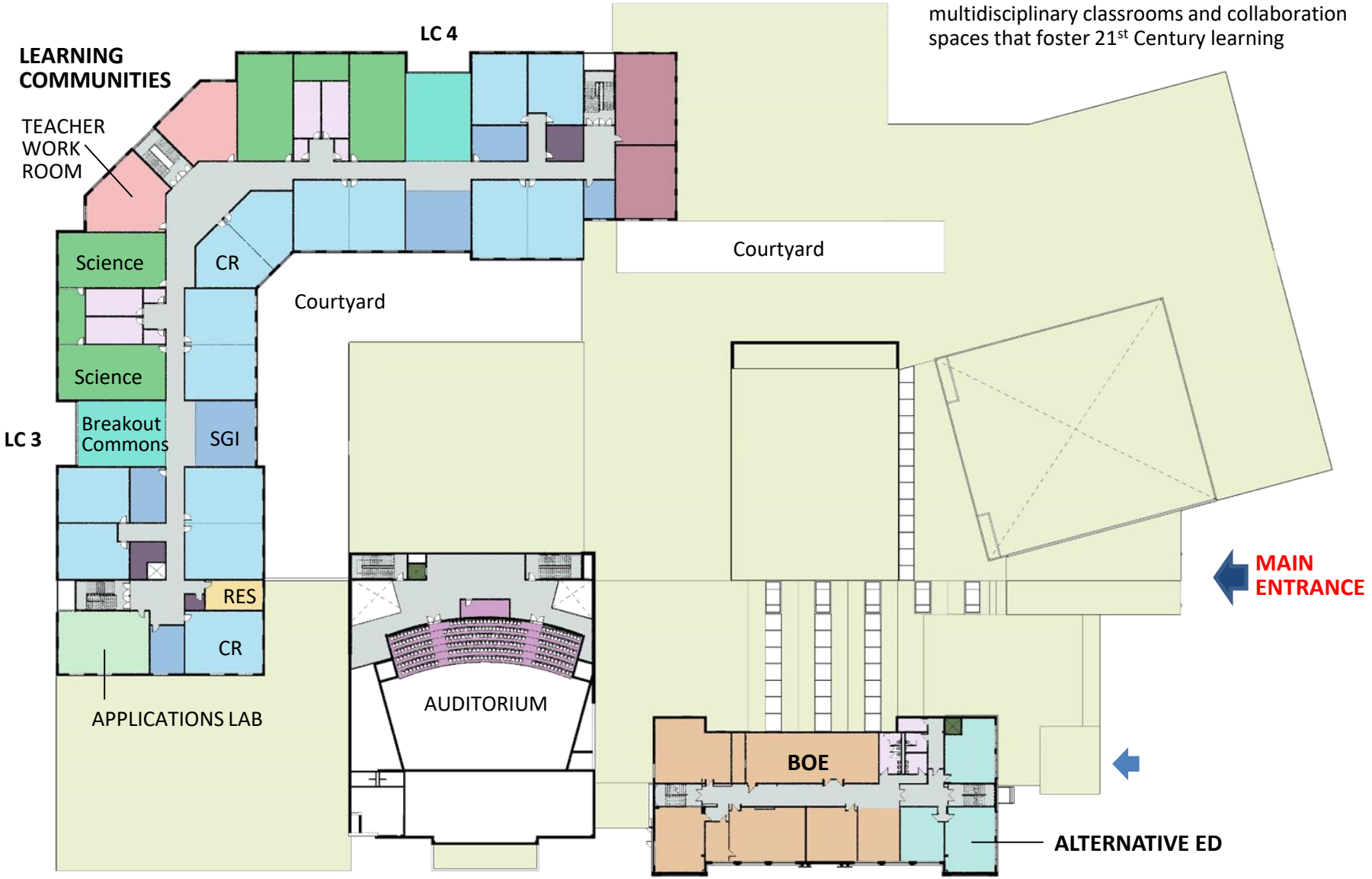
Studio Theater



First Floor Plan

QA+M architecture

LEARNING COMMUNITIES – A cluster of multidisciplinary classrooms and collaboration spaces that foster 21st Century learning



Second Floor Plan

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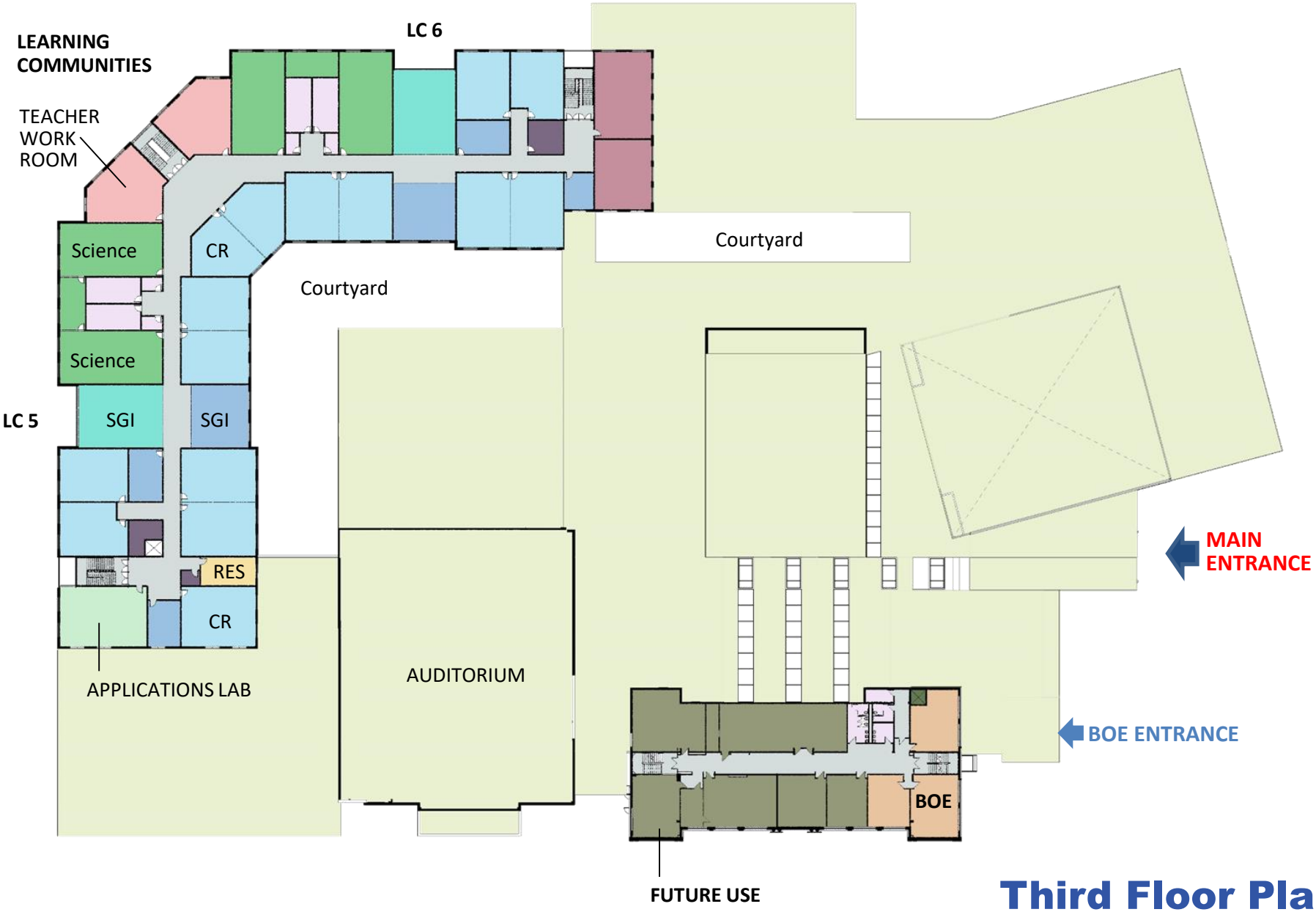
Breakout

Science Clabroom



Third Floor Plan

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Project Summary

PROJECT DATA

Projected Enrollment: 1,405 students

State OSCGR Allowable: 253,602 Net SF

1928 Building Bonus Area: 6,000 Net SF

Total Allowable Area: 259,602 Net SF

District Offices Area: 9,626 Net SF*

Total Area: 269,228 Net SF

Total Area Gross: 278,651 GSF

RENOVATION OPTION DATA

FHS Renovated Area: 255,000 Net SF

District Office Area: 11,500 Net SF

Total Area: 266,500 Net SF

Unused 1928 Area: 8,000 Net SF

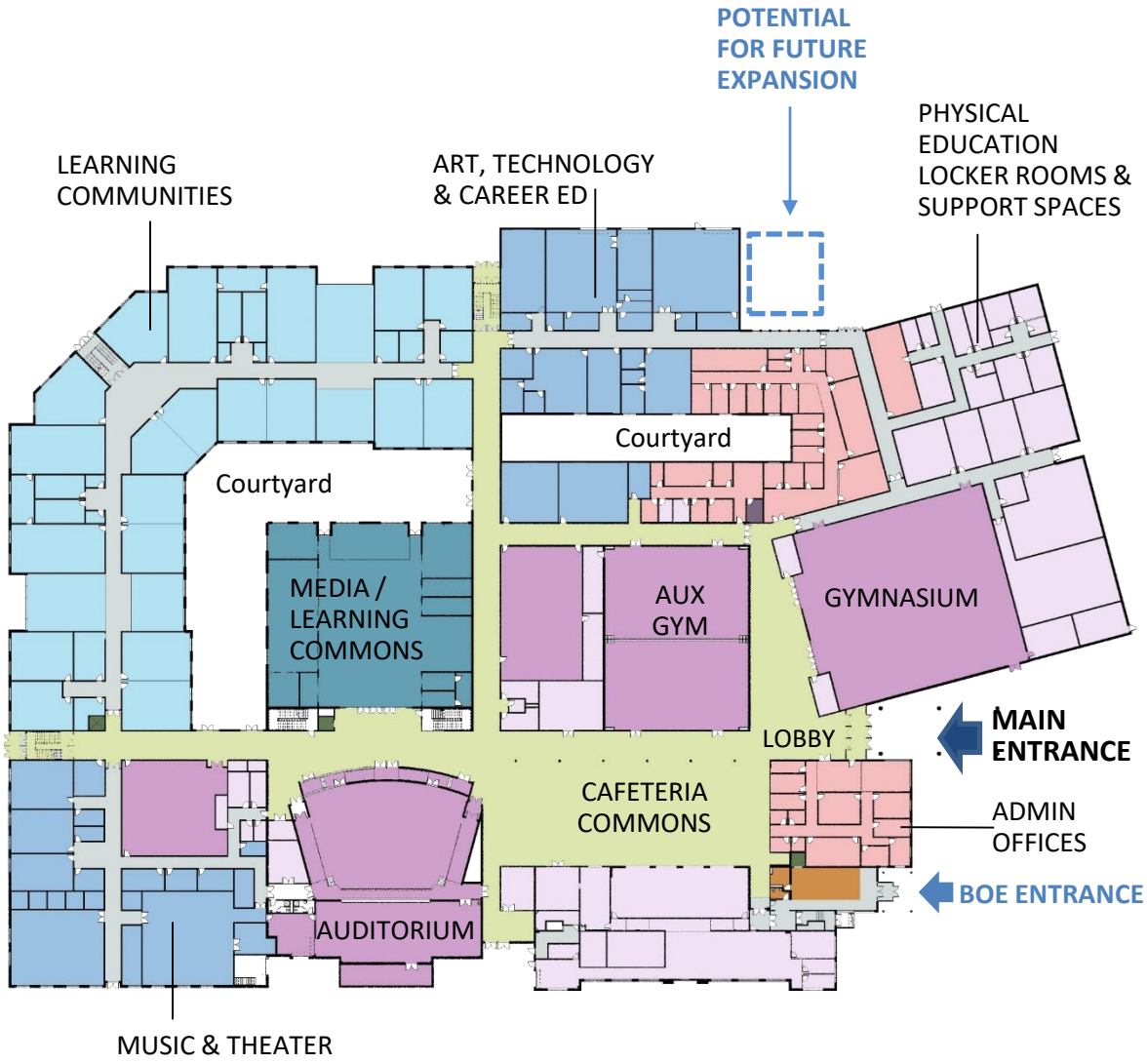
Total Area: 274,500 Net SF

Total Area Gross: 284,100 GSF

Original Building Footprint: 187,947 SF
Option One Footprint: 174,871 SF

58% OF THE ORIGINAL BUILDING STRUCTURE IS REMAINING

* No Space Standards for District Offices



First Floor Plan

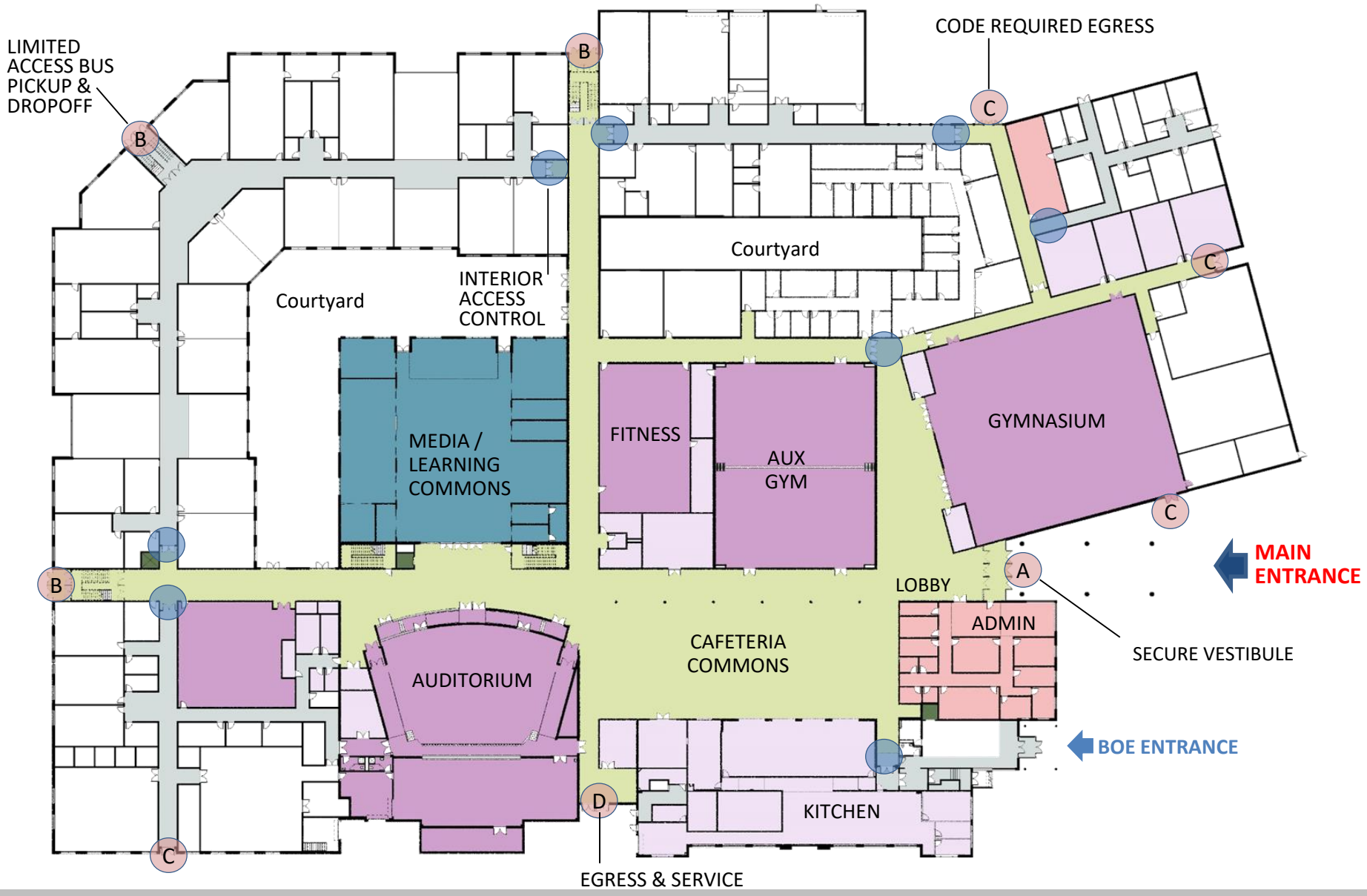
QA+M architecture

QA+M architecture

Criteria

1 Local, State and Federal Requirements

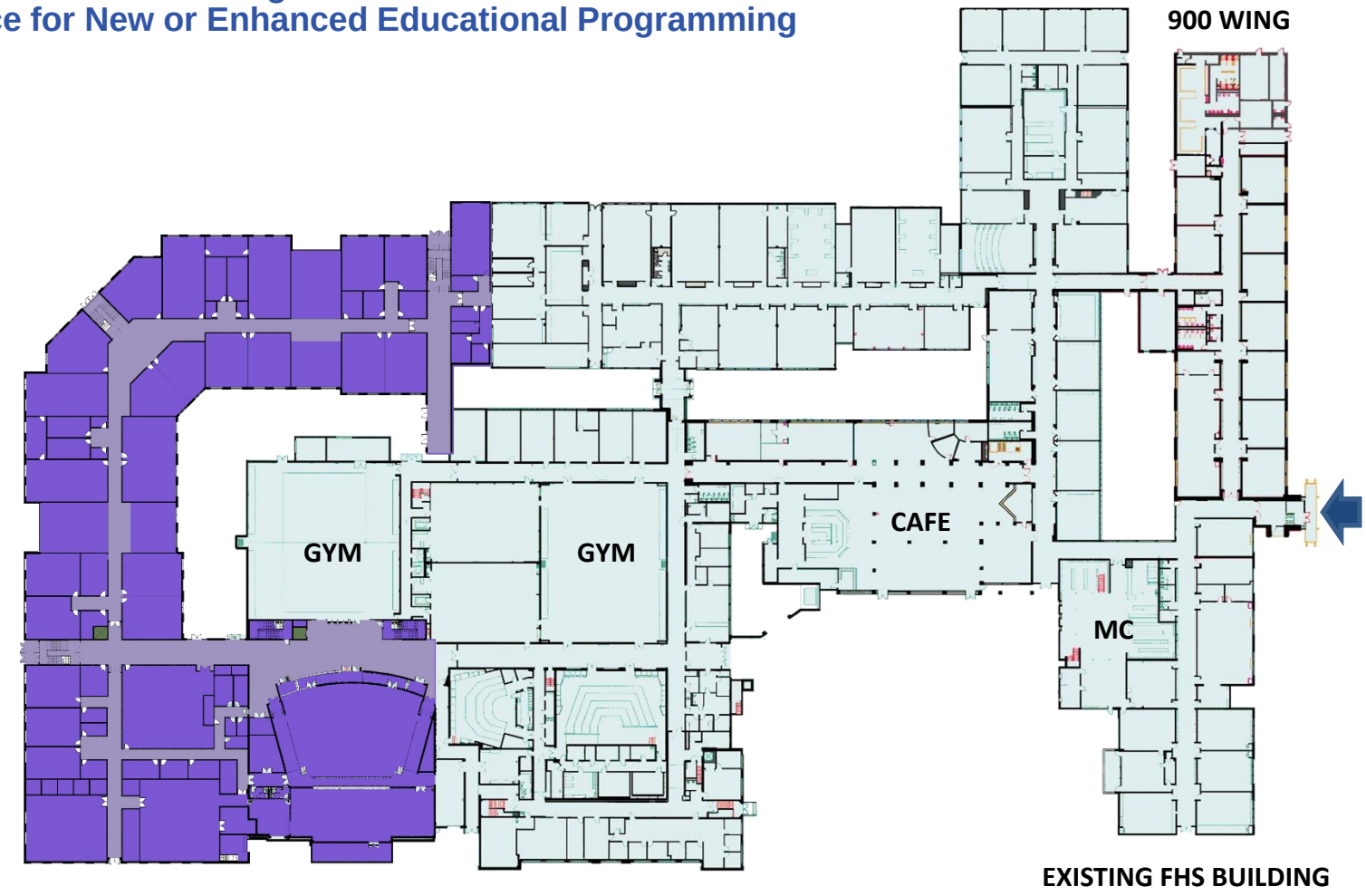
+ ADA Compliance + Security Needs + Public / Private Separation + NEASC Requirements



QA+M architecture

2 Programmatic Needs

+ Education Disruption
+ Satisfies Ed Specs
+ Undersized Learning Spaces
+ Collaborative Learning
+ Space for New or Enhanced Educational Programming



PHASE ONE 14 MONTHS

2 Programmatic Needs

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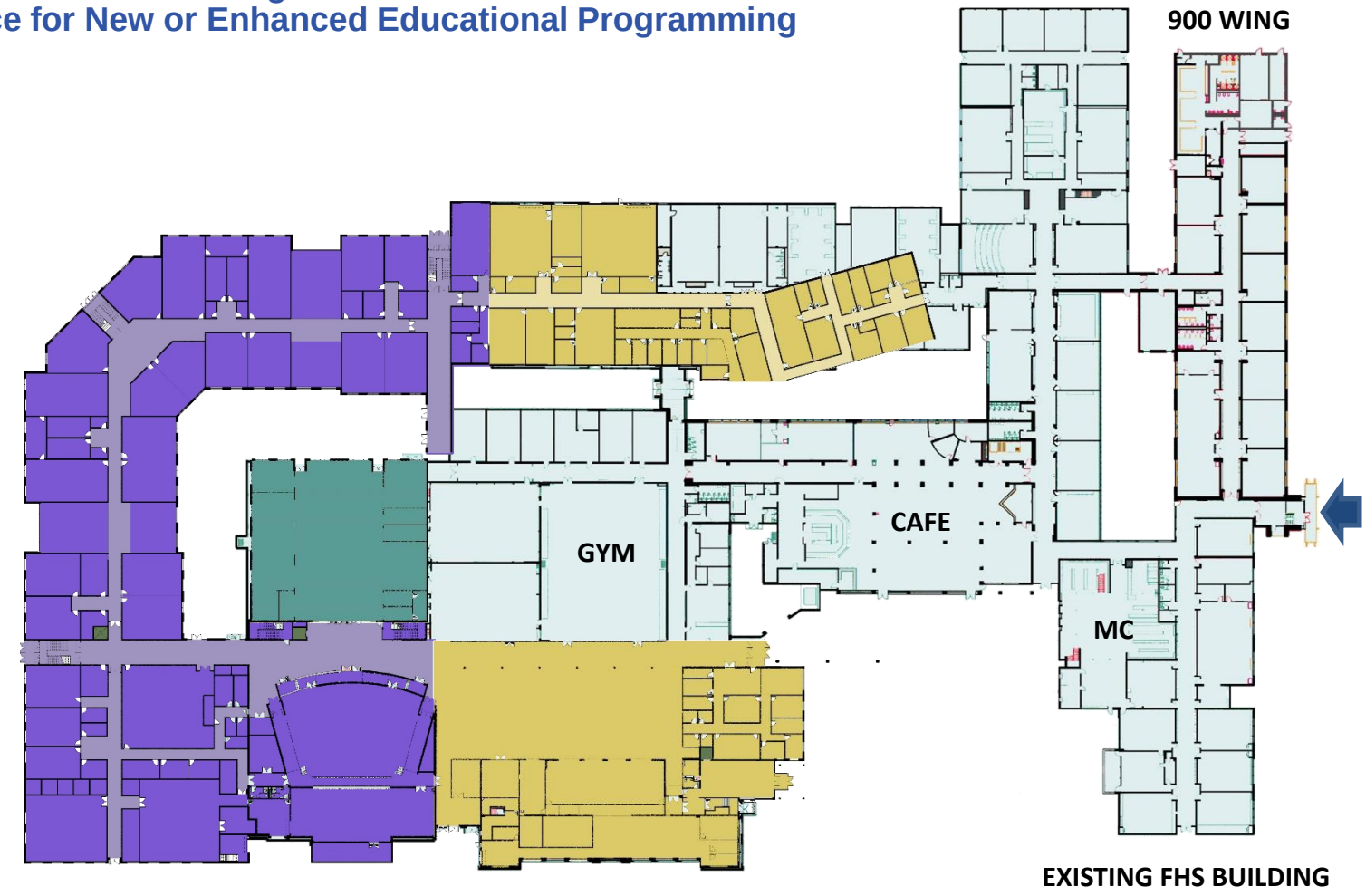

PHASE ONE 14 MONTHS **PHASE TWO 8 MONTHS**

2 Programmatic Needs

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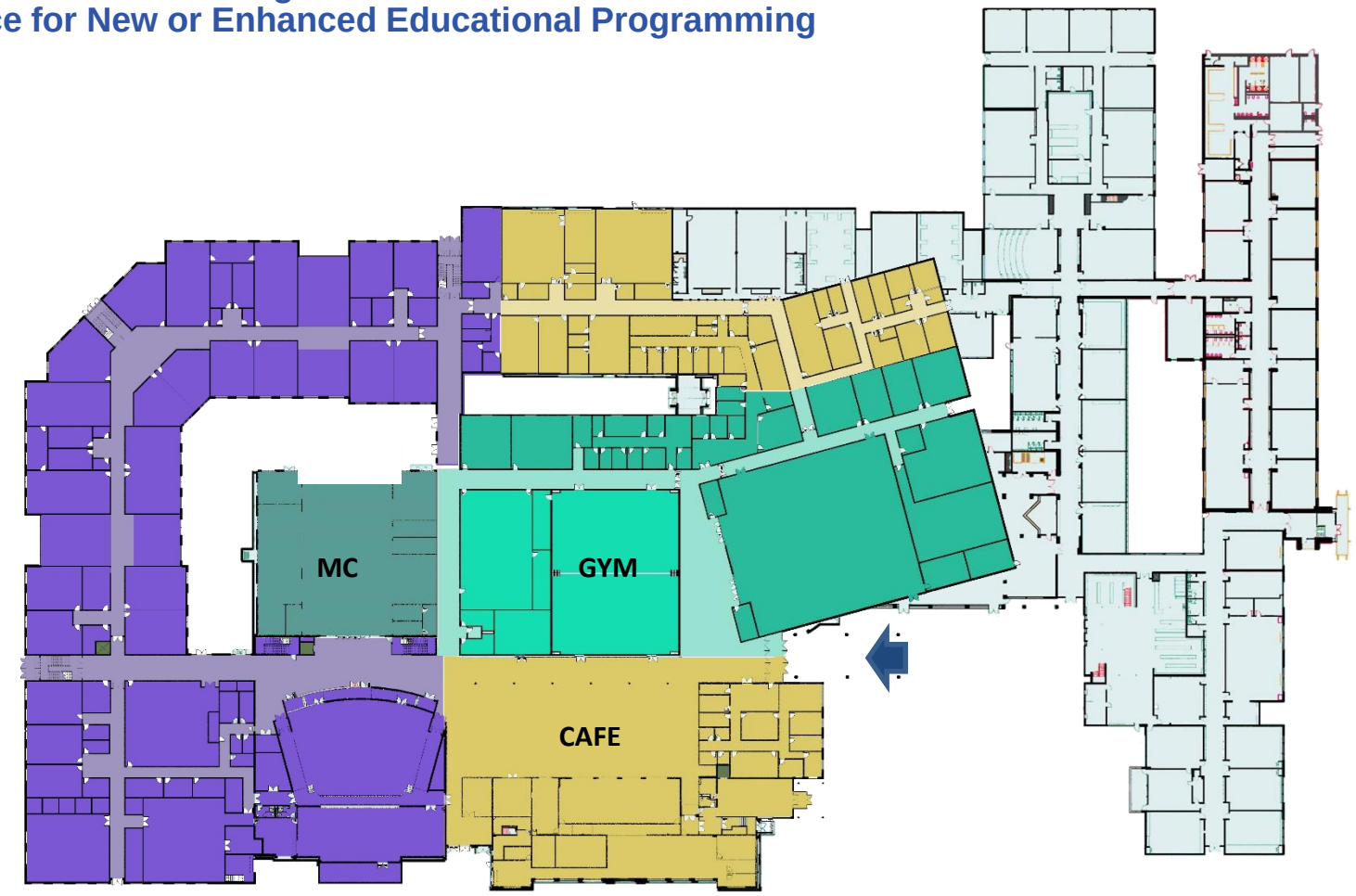
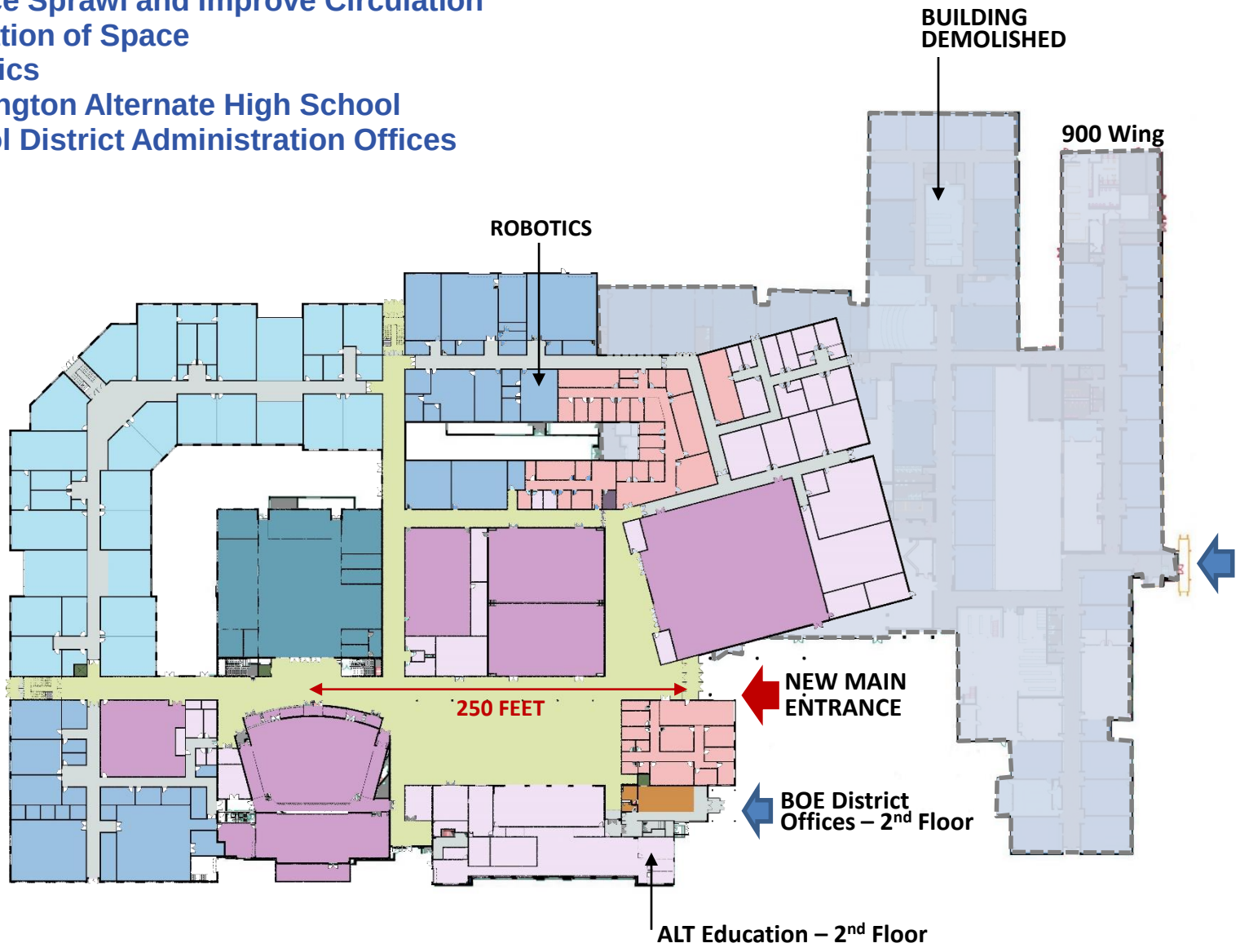


PHASE ONE 14 MONTHS **PHASE TWO 8 MONTHS** **PHASE THREE 14 MONTHS**

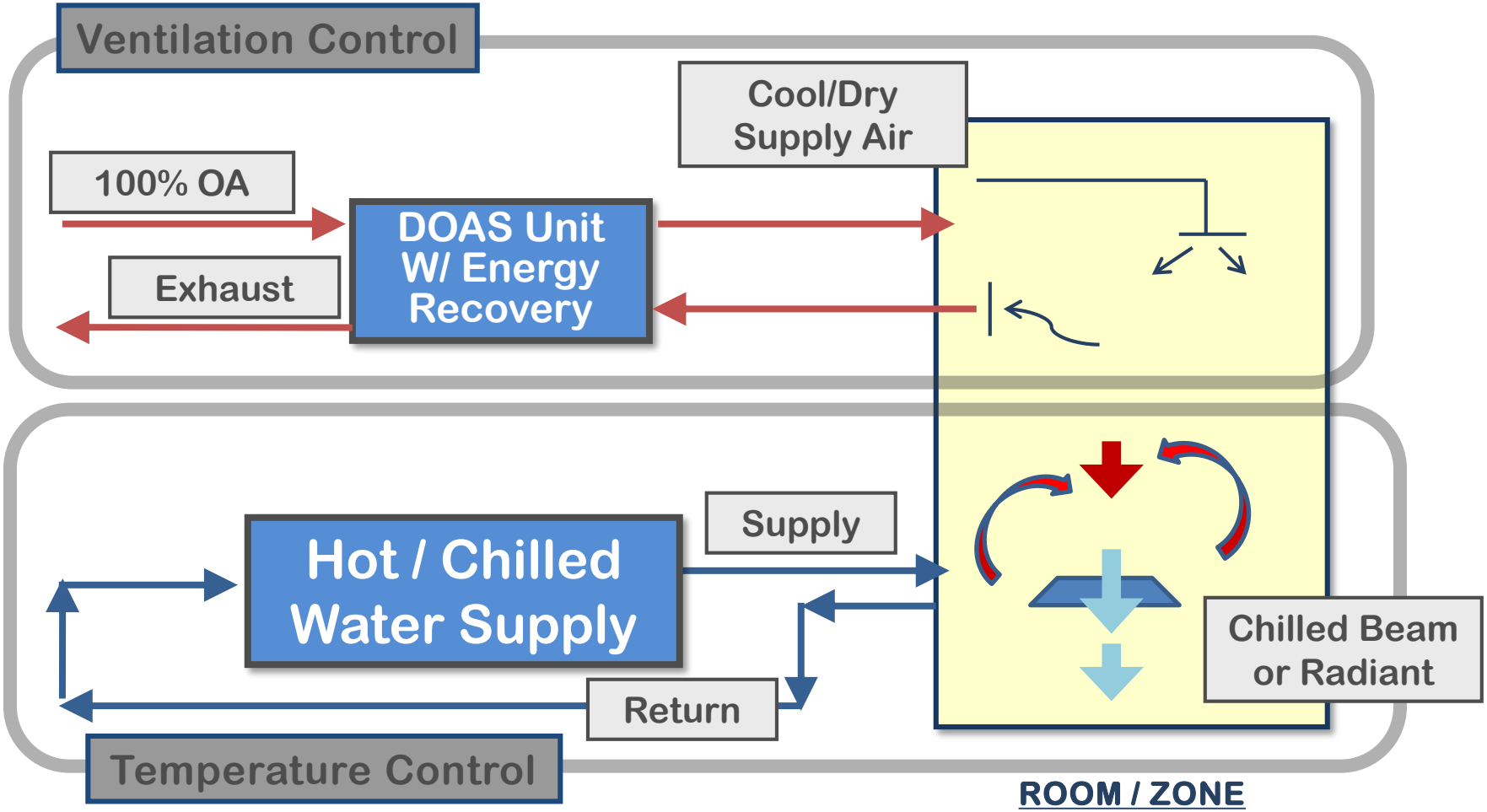
3 Consolidation of Space

+ Reduce Sprawl and Improve Circulation
+ Utilization of Space
+ Robotics
+ Farmington Alternate High School
+ School District Administration Offices



4 Building Systems – Low Energy HVAC Systems Approach

+ Energy Efficiency + Mechanical, Electrical, Plumbing + Building Envelope + Green Design



MULTIPLE SYSTEMS EVALUATED – Microgrid – Photovoltaics – Geothermal – Ice storage
ALL NEW MEP SYSTEMS
MEP SYSTEM INSTALLATION INCORPORATED IN PHASING PLAN

4 Building Systems – Sustainable Design & Energy Efficiency Criteria Met

MEP SYSTEMS

		ENERGY EFFICIENCY (EUI)	GREEN DESIGN	SUSTAINABILITY	CARBON REDUCTION	RESILIENCY	EASE OF MAINTENANCE	THERMAL COMFORT	RESPONSIVENESS TO THERMAL AND HUMIDITY CONDITIONS	INDOOR ENVIRONMENT QUALITY	CONSTRUCTION COST EFFECTIVENESS
MECHANICAL											
GENERATION											
CONDENSING BOILERS		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
AIR CONDITIONING		✓	✓	✓ *	✓ *	✓ *	✓	✓	✓	✓	✓
DISTRIBUTION METHODS											
DUCTS							✓	✓	✓	✓	✓
PIPING		✓	✓	✓	✓*	✓ *	✓	✓	✓	✓	✓
TERMINAL DEVICES											
CHILLED BEAMS		✓	✓	✓	✓*	✓*	✓	✓	✓	✓	✓
RADIANT CEILING PANELS		✓	✓	✓	✓ *	✓ *	✓	✓	✓	✓	✓
ELECTRICAL											
GENERATION											
GENERATOR						✓	✓				✓
NEW 480V SERVICE		✓		✓		✓	✓				✓
DISTRIBUTION											
NEW PANELS			✓			✓	✓				✓
TERMINAL DEVICES											
LED LIGHTING		✓	✓				✓			✓	✓
CONTROLS		✓	✓	✓							✓
PLUMBING											
GENERATION											
WATER HEATER		✓	✓				✓				✓
DISTRIBUTION											
NEW PIPING IN '28 BLDG.			✓			✓	✓				
TERMINALS											
REPLACE FIXTURES		✓	✓								✓

INDOOR AIR QUALITY →

← EASE OF MAINTENANCE

← GREEN / SUSTAINABLE DESIGN

← ENERGY EFFICIENT DESIGN

RETURN ON INVESTMENT →

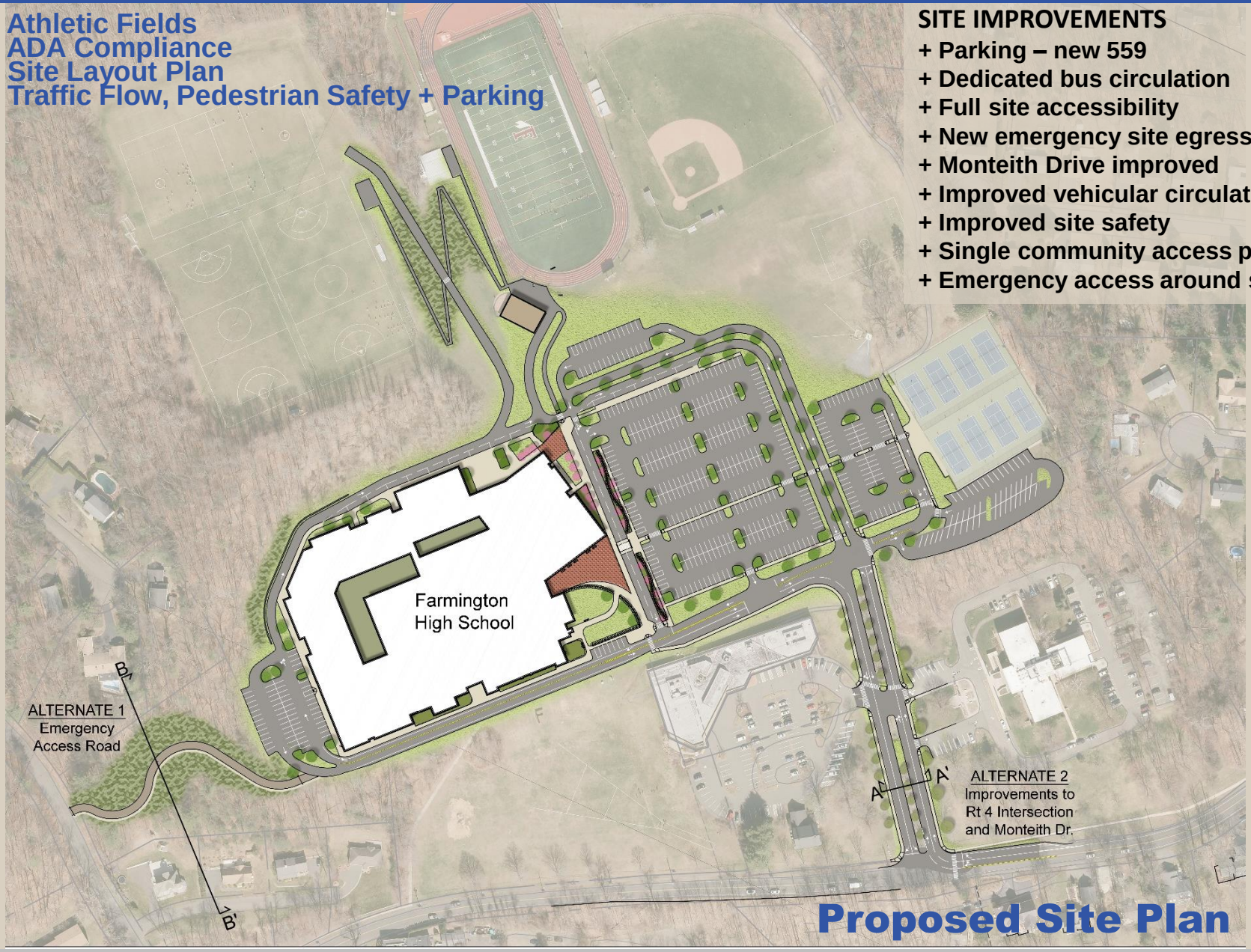
* IF HVAC OPTION # 2 (GEOTHERMAL) SELECTED

5 Site Improvements

+ Athletic Fields
+ ADA Compliance
+ Site Layout Plan
+ Traffic Flow, Pedestrian Safety + Parking

SITE IMPROVEMENTS

+ Parking – new 559
+ Dedicated bus circulation
+ Full site accessibility
+ New emergency site egress
+ Monteith Drive improved
+ Improved vehicular circulation
+ Improved site safety
+ Single community access point
+ Emergency access around school



Proposed Site Plan

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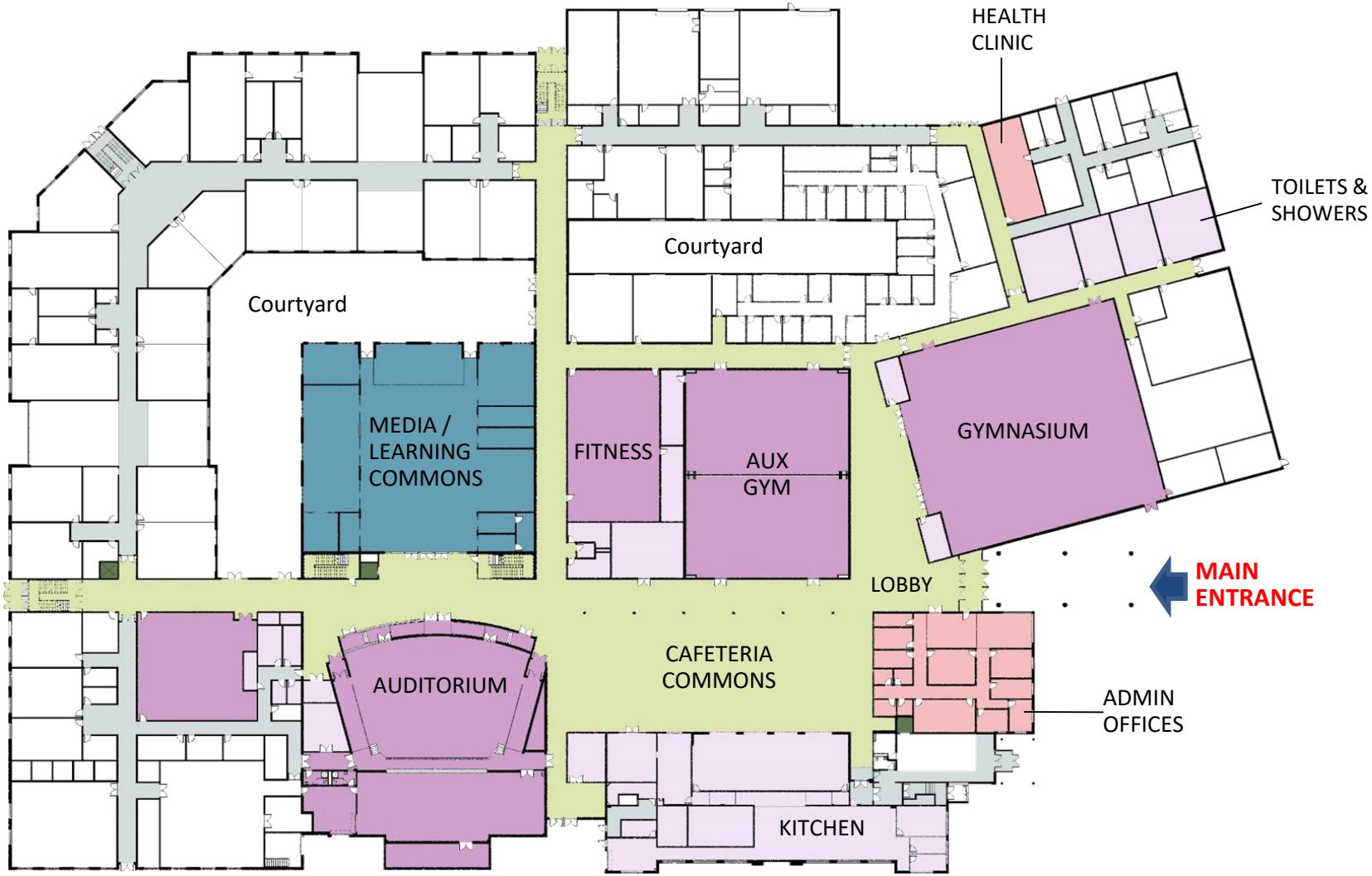
6 Benefits to the Community

+ Community Use of the Building
+ Shelter in Place



7 Fit and Feel For Farmington

+ Internal Design

+ External Design

+ Overall Fit + Feel

7 Fit and Feel For Farmington

+ Internal Design + External Design + Overall Fit + Feel

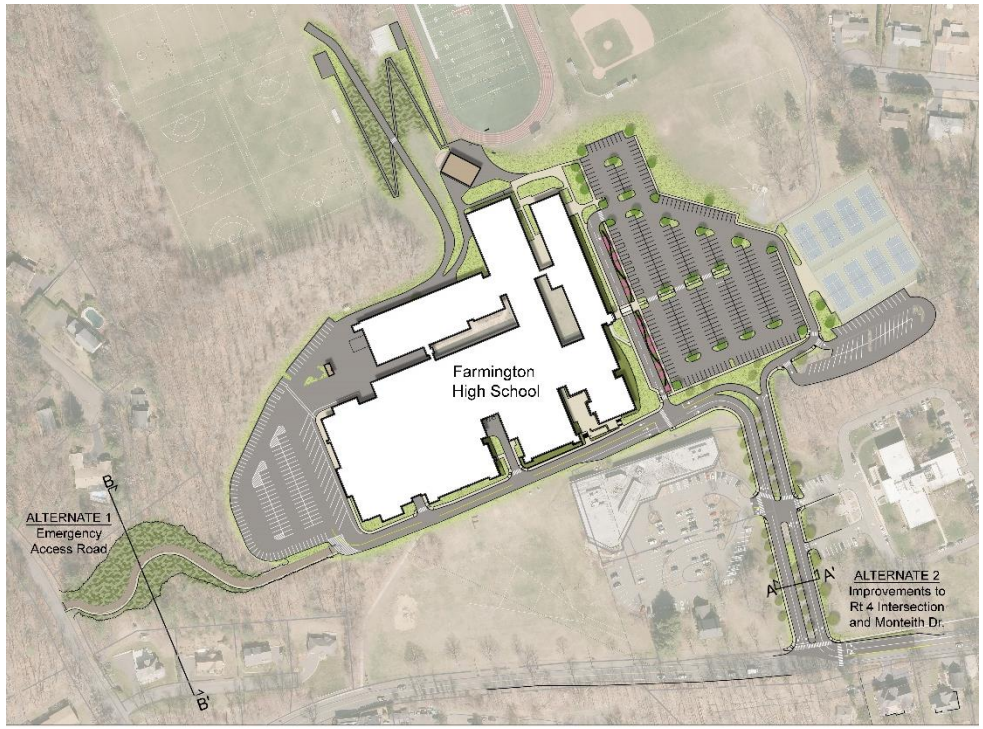
7 Fit and Feel For Farmington

+ Internal Design + External Design + Overall Fit + Feel

7 Fit and Feel For Farmington

+ Internal Design + External Design + Overall Fit + Feel

Alternates



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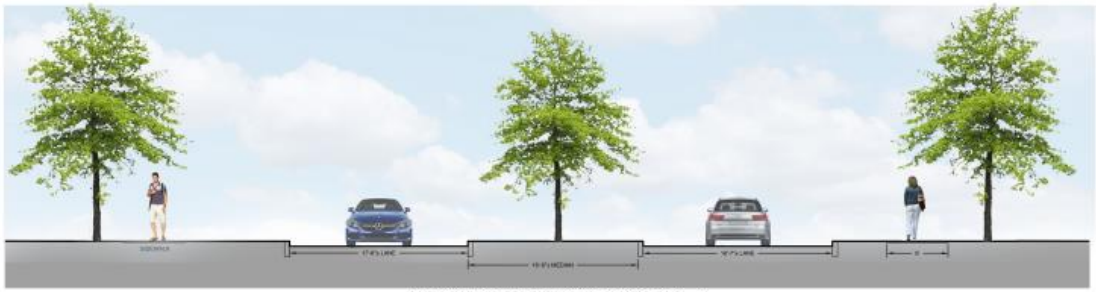
Alternates

+ Emergency Access
+ Improvements to Monteith Drive



EXISTING MONTEITH DRIVE SECTION A - A'
SCALE : 1" = 5'

PROPOSED MONTEITH DRIVE SECTION A - A'
SCALE : 1" = 5'

EMERGENCY ACCESS ROAD
SECTION B - B'
SCALE: 1" = 20'

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Summary | Option 2

+ **Minimizes disruption to education**

+ **Dramatically reduces sprawl and improves circulation**

+ **Meets all educational specifications and recommendations of NEASC**

“Dedicated to the needs and best interests of the community.”

QA+M architecture

Farmington High School- RAN Option

Mechanical and Electrical Systems

January 15, 2020

FHS- RAN MEP SYSTEMS

- **MAJOR COMPONENTS OF MEP SYSTEMS**
  - **GENERATION**
    - Boilers
    - Chillers
    - Cooling System
    - Electric Service
    - Water Heaters
  - **DISTRIBUTION**
    - Air Handling Units
    - Piping
    - Ductwork
    - Electric Wiring and Panels
    - Plumbing Piping: Sanitary, Storm, Hot and Cold Water
  - **Terminal Devices**
    - Chilled Beams
    - Radiant Panels
    - Plumbing Fixtures
    - Light Fixtures

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FHS – RAN - HVAC Systems

Central Heating Systems Upgrades

GENERATION

- New High Efficiency Condensing Boilers and variable speed pumping

DISTRIBUTION

- Plant Hot Water Piping and Distribution
- Lower Temperature Hot Water (120°F) operation

TERMINAL DEVICES

- Chilled Beams
- Radiant Ceiling Panels

VANZELM ENGINEERS

FHS – RAN - HVAC Systems

Central Cooling Systems Upgrades

GENERATION

- Air Condition Entire Building
- High Efficiency Water Cooled Chillers/Heat Pump Chiller Option
- Adiabatic Condensers in lieu of Cooling Towers for water savings/Geothermal Option

DISTRIBUTION

- Air Handling Units with DOAS and Air to Air Heat Recovery
- Minimize Ductwork to Just Serve Ventilation Requirements
- Maximize Use of Piping for Energy Transport Efficiency

TERMINAL DEVICES

- Chilled Beams
- Radiant Ceiling Panels

VANZELM ENGINEERS

FHS – RAN - MEP Systems

MEP SYSTEMS		ENERGY EFFICIENCY (EUI)	GREEN DESIGN	SUSTAINABILITY	CARBON REDUCTION	RESILIENCY	EASE OF MAINTENANCE	THERMAL COMFORT	RESPONSIVENESS TO THERMAL AND HUMIDITY CONDITIONS	INDOOR ENVIRONMENT QUALITY	CONSTRUCTION COST EFFECTIVENESS
MECHANICAL											
GENERATION											
CONDENSING BOILERS		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
AIR CONDITIONING		✓	✓	✓ *	✓ *	✓ *	✓	✓	✓	✓	✓
DISTRIBUTION METHODS											
DUCTS							✓	✓	✓	✓	✓
PIPING		✓	✓	✓	✓*	✓ *	✓	✓	✓	✓	✓
TERMINAL DEVICES											
CHILLED BEAMS		✓	✓	✓	✓*	✓*	✓	✓	✓	✓	✓
RADIANT CEILING PANELS		✓	✓	✓	✓ *	✓ *	✓	✓	✓	✓	✓
ELECTRICAL											
GENERATION											
GENERATOR						✓	✓				✓
NEW 480V SERVICE		✓		✓		✓	✓				✓
DISTRIBUTION											
NEW PANELS			✓			✓	✓				✓
TERMINAL DEVICES											
LED LIGHTING		✓	✓				✓			✓	✓
CONTROLS		✓	✓	✓							✓
PLUMBING											
GENERATION											
WATER HEATER		✓	✓				✓				✓
DISTRIBUTION											
NEW PIPING IN '28 BLDG.			✓			✓	✓				
TERMINALS											
REPLACE FIXTURES		✓	✓								✓

* IF HVAC OPTION # 2 (GEOTHERMAL) SELECTED

VAN ZELM ENGINEERS

FHS – RAN - Electrical Systems

Proposed System Upgrades – Power Distribution

GENERATION

- Main Electrical Service, Switchboards & Distribution
  - Provide New Service From New Utility Substation To Building – 3000A, 480V 3-Phase
  - Provide New Main Switchboard
  - Update Power Distribution
  - New Feeders / Panelboards
- Emergency Power
  - To Serve Emergency Power Loads And Increase Generator / Distribution Capacity
  - Include Cooling Systems
  - Provisions For Solar PV Input

DISTRIBUTION

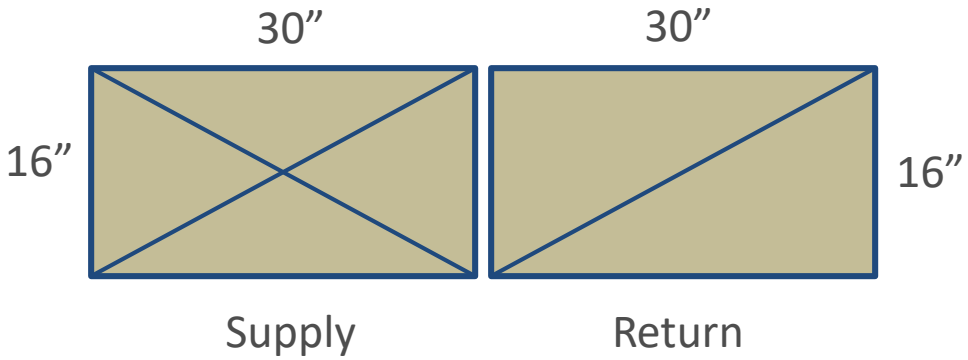
- Update Power Distribution
- New Feeders / Panelboards

VANZELM ENGINEERS

BASICS OF ENERGY DISTRIBUTION

To transport 100,000 Btu / hr:

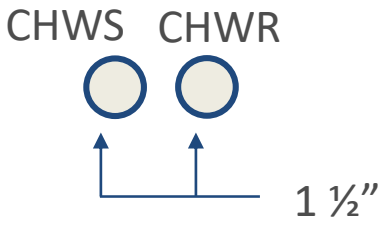
Air Based



Fan Horsepower: 4.2 hp

Annual Electric Cost $2711

Hydronic Based



Pump Horsepower: 0.3 hp

Annual Electric Cost $193

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LOW ENERGY HVAC SYSTEM APPROACH