

# Horace Mann Elementary School

Schematic Design Phase

# DRC Meeting

December 13, 2023





# Agenda

- Proposed DRC/SBC Meeting Schedule Agenda
- Site Design
  - Linwood Ave Access Drive
  - Accessible Entrances
- Building Design
  - Preliminary Building Envelope
  - MEP System Selections



# Horace Mann Elementary School

## Proposed Agenda

SD

**Project Introduction, Site Plan, Floor Plans, Elevations & Renderings**

**Site Plan, Floor Plans, Elevations, Building Systems & Materials, Energy Model**

**Building Systems & Materials, Energy Model, Sustainability, Building Envelope (Roof, Wall, Windows, etc.)**

**Building Envelope and Final SD Approval**

Site Plan Approval

DD

Proposed DRC/SBC Meeting Schedule

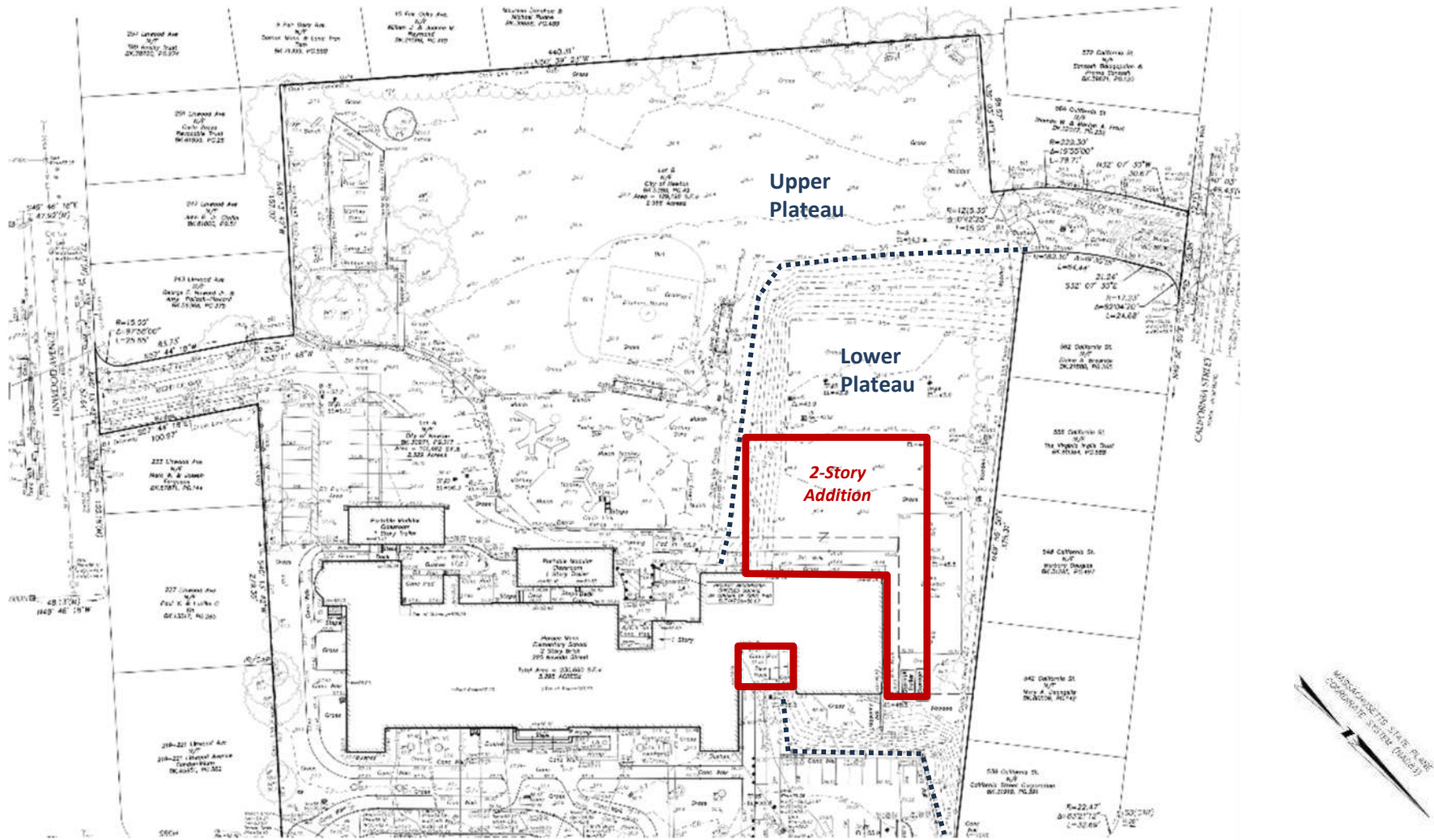
2023										2024										
Nov				Dec				Jan					Feb				Mar			
8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	6	13	20	27



# Site Design

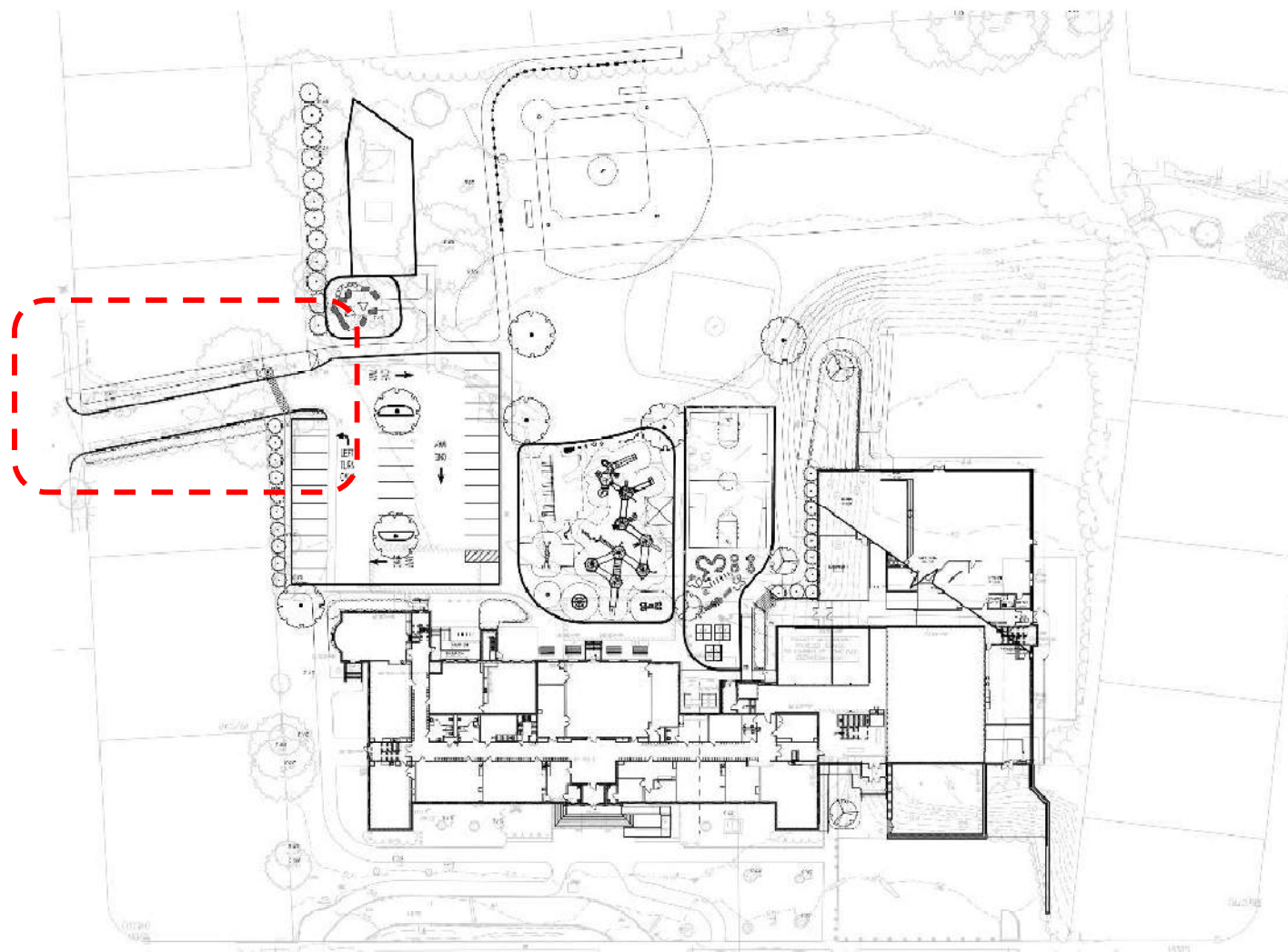
Linwood Ave Access  
New Accessible Entrances

# Existing Site Conditions

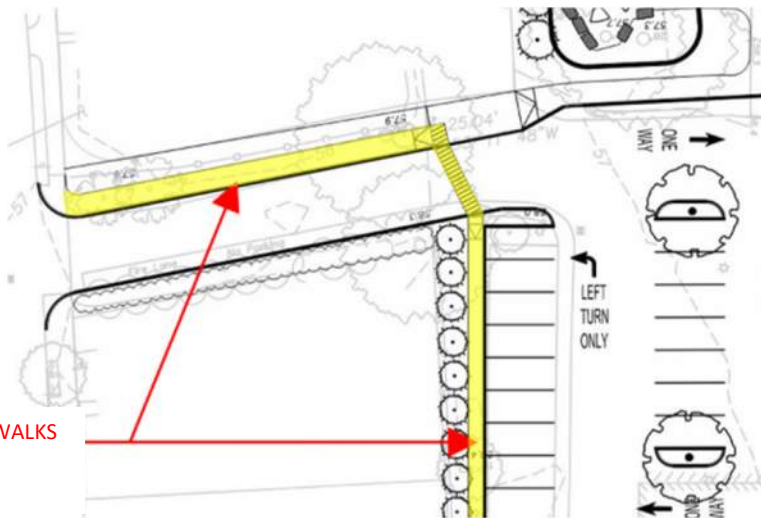
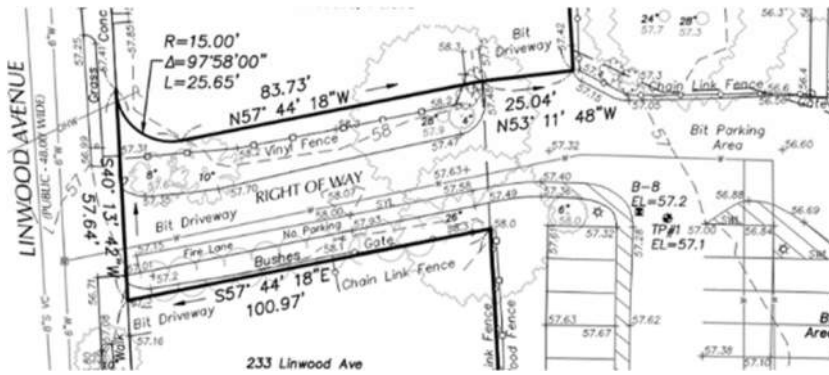




# Proposed Site Plan



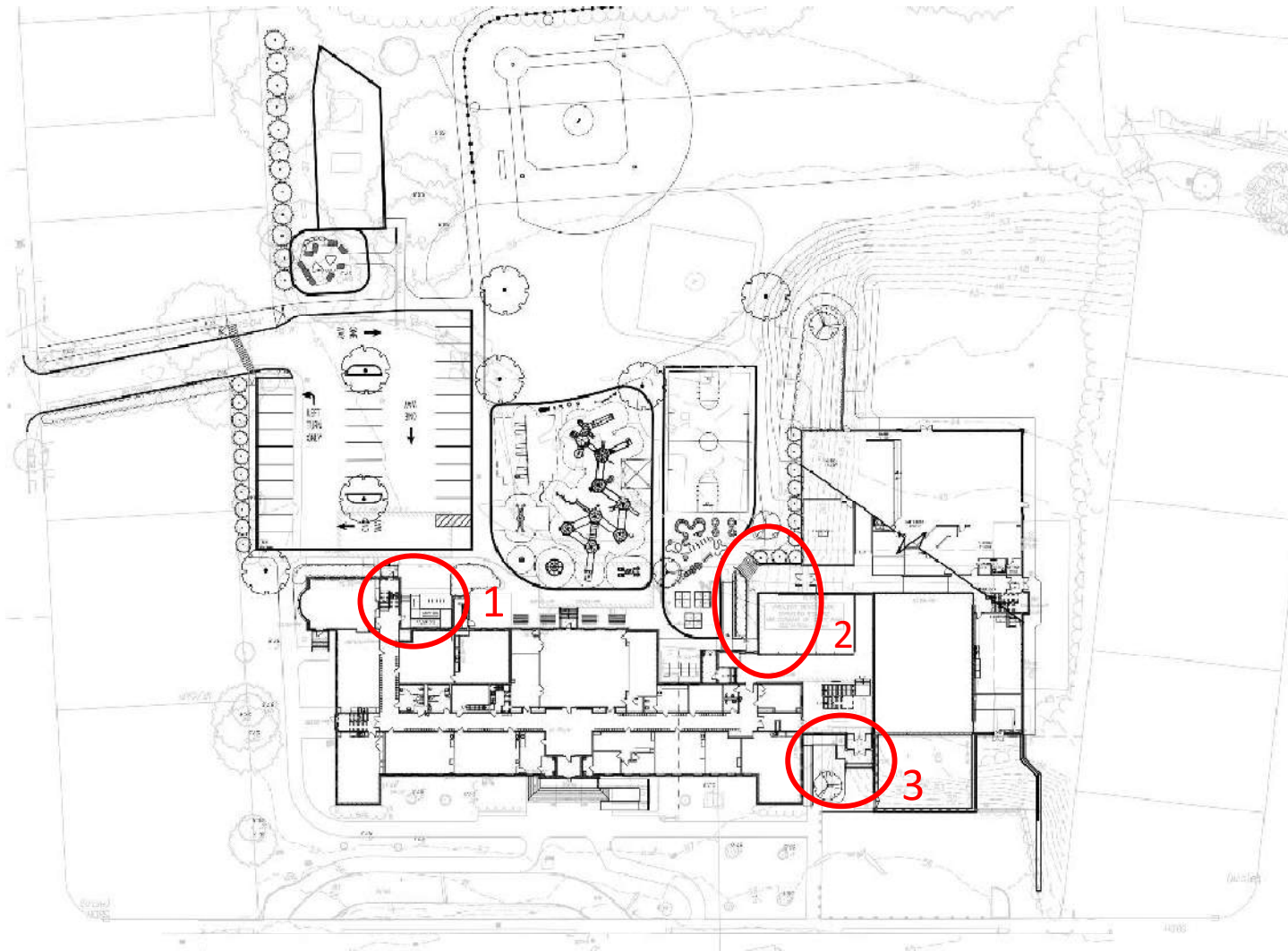
# Linwood Ave Access Drive



NEW SIDEWALKS



## Proposed Accessible Entrances





# Accessible Entrance to Existing Stair



*New Accessible  
Entrance – Replaces  
Existing Window*

*Existing  
Stair Exit Door*

*Ramp*

*Bike Racks*



## Rear Accessible Entrance to Addition





Rear Accessible Entrance to Addition  
(without exterior stair)





# Rear Exit Doors from Cafeteria + Music



*Break-Out /  
Project Areas*

*Retaining Wall*



# Front Accessible Entrance to Stair Addition (November 2023)



*Stair Addition*

*New Entrance  
Vestibule*

*Existing  
Gymnasium*

# Front Accessible Entrance to Stair Addition



*Stair Addition*

*New Entrance  
Vestibule*

*Existing  
Gymnasium*



# Front Accessible Entrance to Stair Addition



*Stair Addition*

*New Entrance  
Vestibule*

*Existing  
Gymnasium*



Perspective from above Nevada Street





# Building Design

Preliminary Building Envelope  
MEP Systems Selection

TO Raymond Design Associates, Inc.  
 FROM Thornton Tomasetti  
 DATE August 7, 2023  
 RE Horace Mann Elementary School MA Energy Stretch and Specialized Code Preliminary Assessment

New Construction Addition

To meet the energy efficiency requirements, the addition portion of the project will be required to comply with either the C401.2.1 Targeted Performance Compliance pathway or C401.2.2 Passive House Compliance pathway.

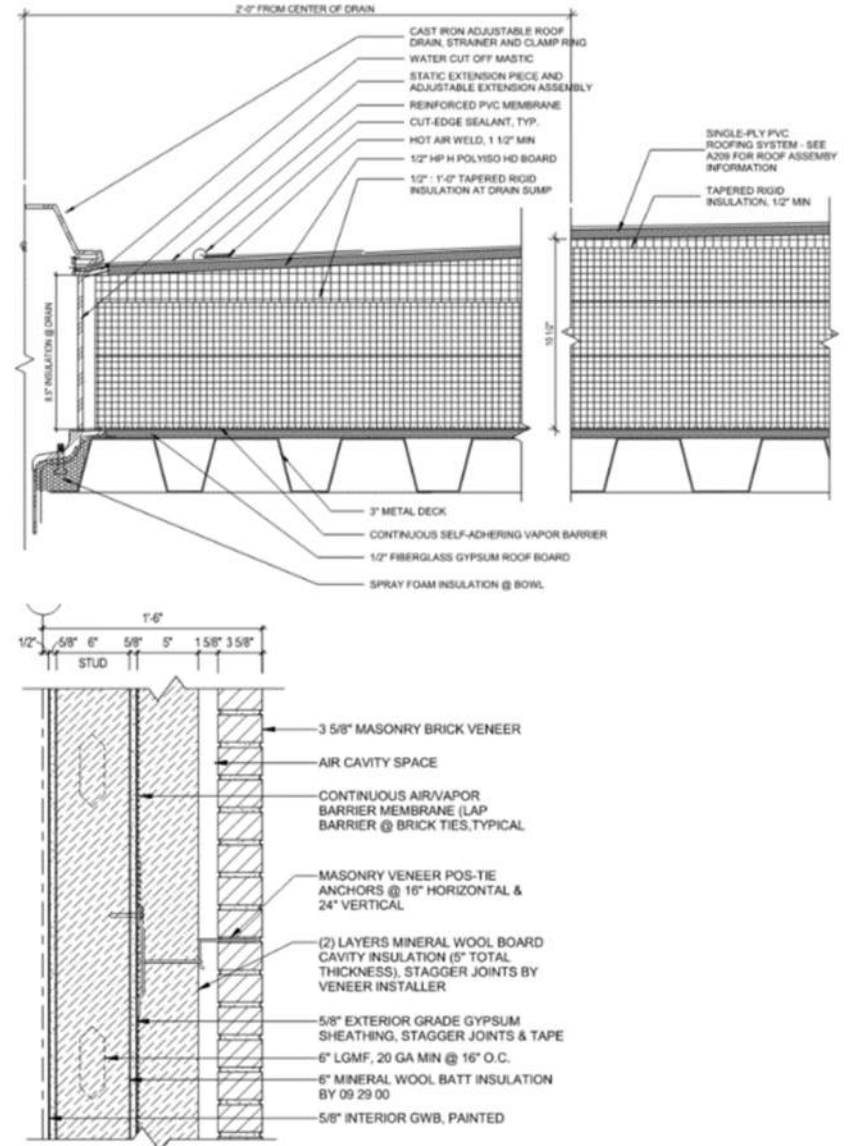
C401.2.1 Targeted Performance Compliance pathway: This pathway is required for schools larger than 20,000 ft<sup>2</sup> and have an average ventilation at full occupancy of 0.5 cfm/ft<sup>2</sup> or less. The heating thermal energy demand intensity (TEDI) target is 2.4 kBtu/ft<sup>2</sup>/yr and the cooling TEDI target is 20 kBtu/ft<sup>2</sup>/yr. To meet these stringent performance targets, we recommend the design team to target the following design parameters:

- =R-50 roof – this will mean a roof thickness of not less than 10 inches. Additional roof thickness may be required to provide slope to drain.
- =R-25 wall – This will result in approximately 6 inches of continuous mineral wool insulation in the wall cavity.
- Triple glazing windows – The project should also consider a double low-e coating on the triple glazing.
- Energy recovery ventilator (=80% effectiveness) providing ventilation for all spaces
- Heat recovery for kitchen exhaust (=50% effectiveness)
- Building envelope infiltration (air leakage) of 0.10 cfm/ft<sup>2</sup> at 75 Pa – This will require close attention to details between adjacent systems both in the design and construction process.

Please note the above parameters are not prescriptive for compliance; they are suggested preliminary recommendations to guide early design decisions in the feasibility phase. An energy model is required to confirm the actual performance required for compliance.

Existing Building Renovation

For the renovation portion of the project, the Stretch Code requires altered portions of an existing building to comply with requirements of Section 503 (of 2021 IECC) and the prescriptive sections C402 (envelope), C403 (mechanical), C404 (water heating) and C405 (electrical) without requiring unaltered portions of an existing building to comply. The renovation does not require an energy model.



## HVAC SYSTEMS

### Scope of Work Summary:

#### Renovation Area:

- Reuse & renovate existing system
- Heating: HW Boiler plant (2013) serves radiation heating
- Ventilation: Heated ventilation air (w/o cooling) via ERV unit (2013) & overhead ducted systems
- Air Conditioning: Air source VRF (2019)
- ATC Controls: Delta Controls DDC System (2013, 2019)
- Provide HVAC modifications for Renovation areas
  - For Renovation Walls - Ductwork and piping relocations
  - Perimeter fin tube reconfigured for new room layouts.



*Hot Water Boiler Plant*



*Perimeter FTR Heating*



*Rooftop Ventilation Unit*



*Attic - Ventilation Ductwork*



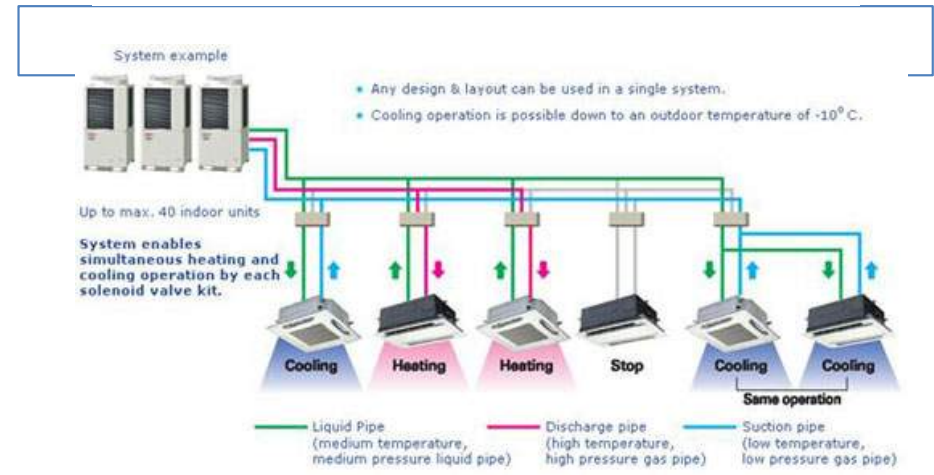
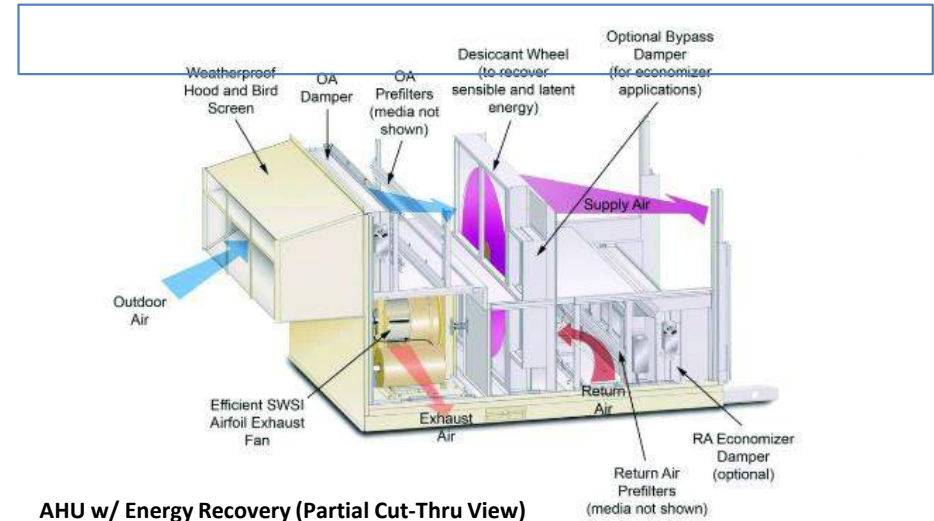
*VRF Heat Pump Units (Typical Indoor Units @ Left & Outdoor Units @ Center & Right)*

# HVAC SYSTEMS

Scope of Work Summary:

**Addition:**

- Heating & Air Conditioning: Air Source Heat Pump VRF System
  - Indoor VRF units (combination ducted & ductless)
  - Minimize use of supplemental electric heat
- Ventilation: AHUs w/ Air Source Heat Pump heating cooling & supplemental (back up) electric heat and Energy Recovery:
  - VAVs for Demand Ventilation Control
  - New Units
    - Admin/Classrooms
    - Cafeteria
    - Gym
- Controls
  - Connect to existing BMS



Air Source VRF Diagram



## ELECTRICAL SYSTEMS OVERVIEW

- New electrical service and distribution equipment with back-feed to the existing building service equipment.
- New diesel generator with sound-attenuated enclosure.
- High-efficiency lighting system and networked Automated Lighting Control System
- Expansion of existing fire alarm system
- New Public Safety Radio Distributed Antenna System (DAS) to support addition and existing building.
- Electric Vehicle Charging Equipment (EVSE) stations.



*New Utility Transformer*



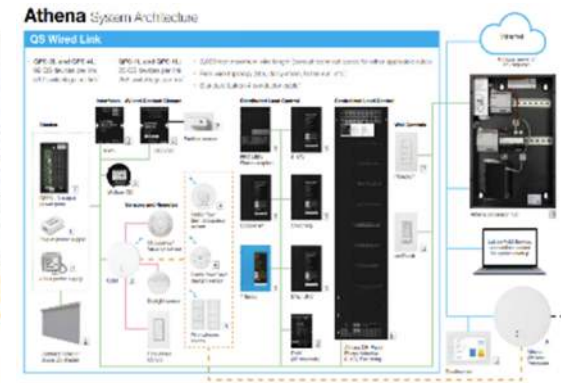
*New Service Equipment*



*New Diesel Generator*



*New Lighting*



*New Automated Lighting Control System*

## FIRE PROTECTION SYSTEMS

### Existing Building

- modify existing fire protection

### Addition

- extend existing fire protection system



*Existing Sprinkler Zone Control Valves*



*Existing Sprinkler Service Valves*

## PLUMBING SYSTEMS

### Existing Building

- modify existing sanitary, vent, water, and storm piping

### Addition

- new storm, sanitary, & kitchen shall be provided. Cold water shall connect to existing.



*Manual Flush Valve  
1.28 gpf Water Closet*



*Manual Flush Valve  
0.125 gpf Urinal*

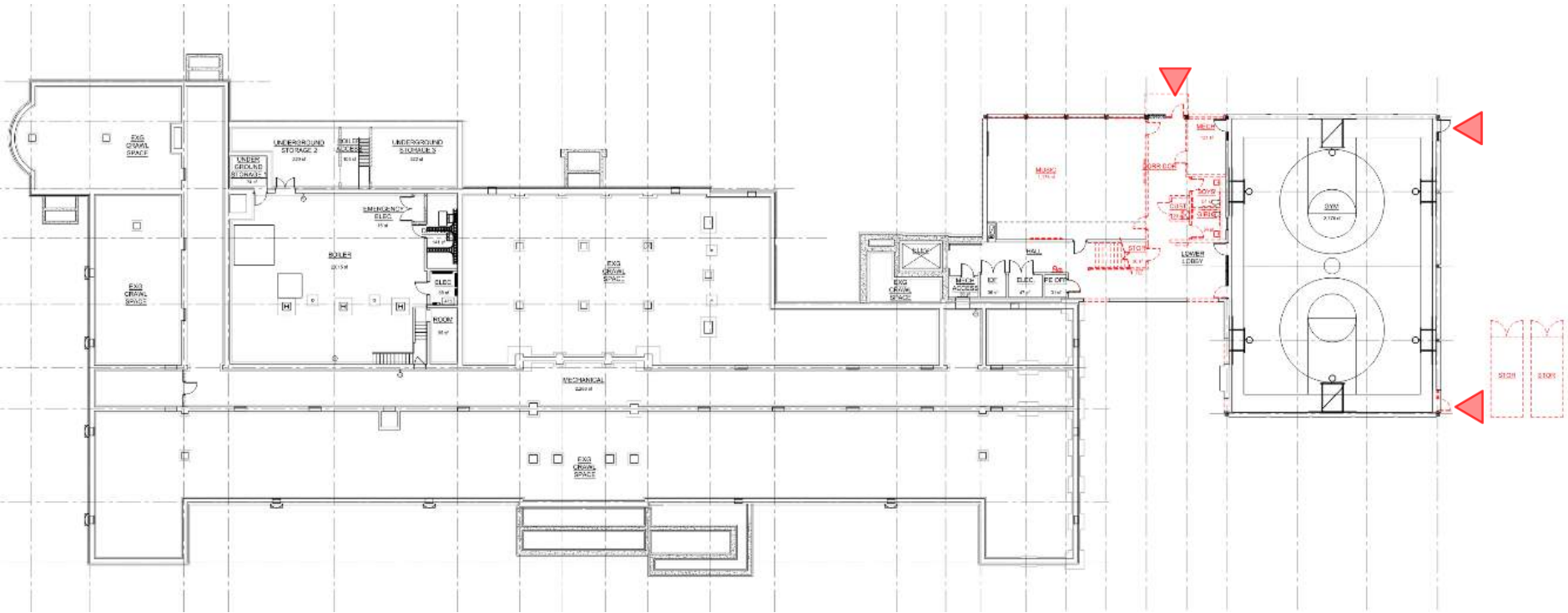


*Battery Sensor Faucet  
0.07 Gallons per cycle*



*Drinking fountain  
w/ bottle filler*

# Existing Conditions / Demolition

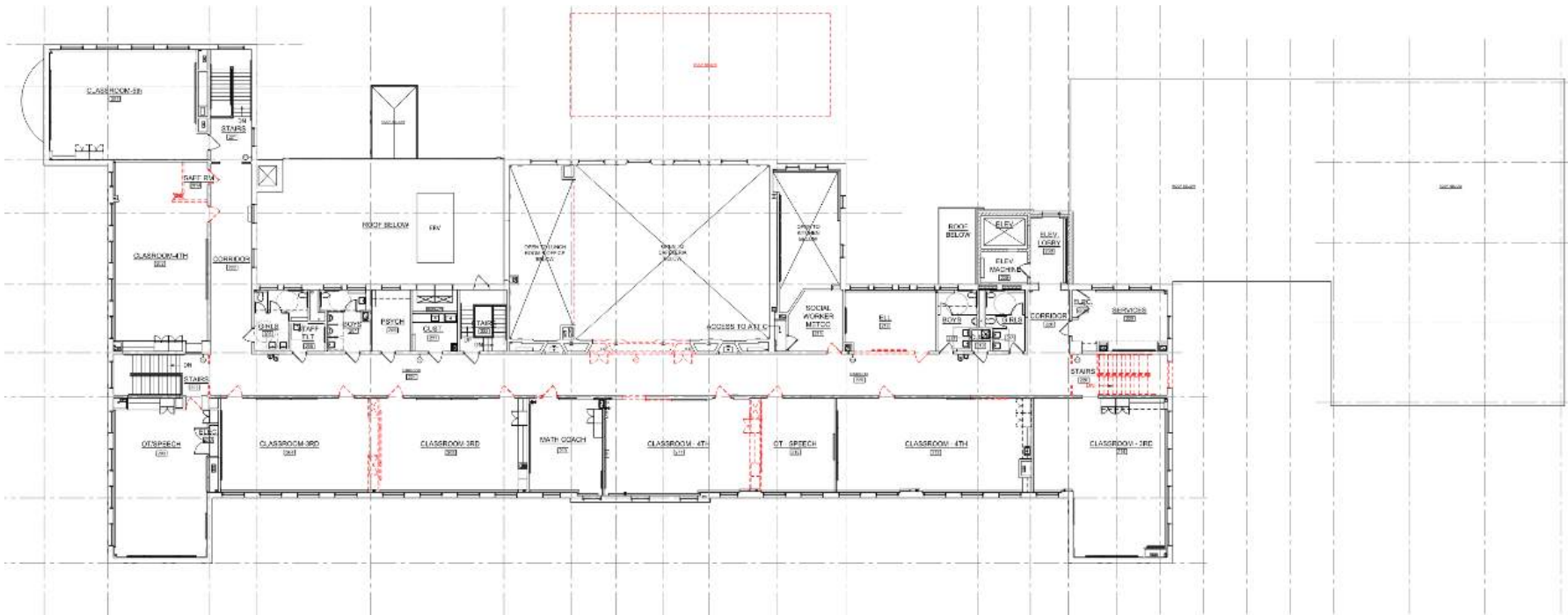


Lower Level Floor Plan





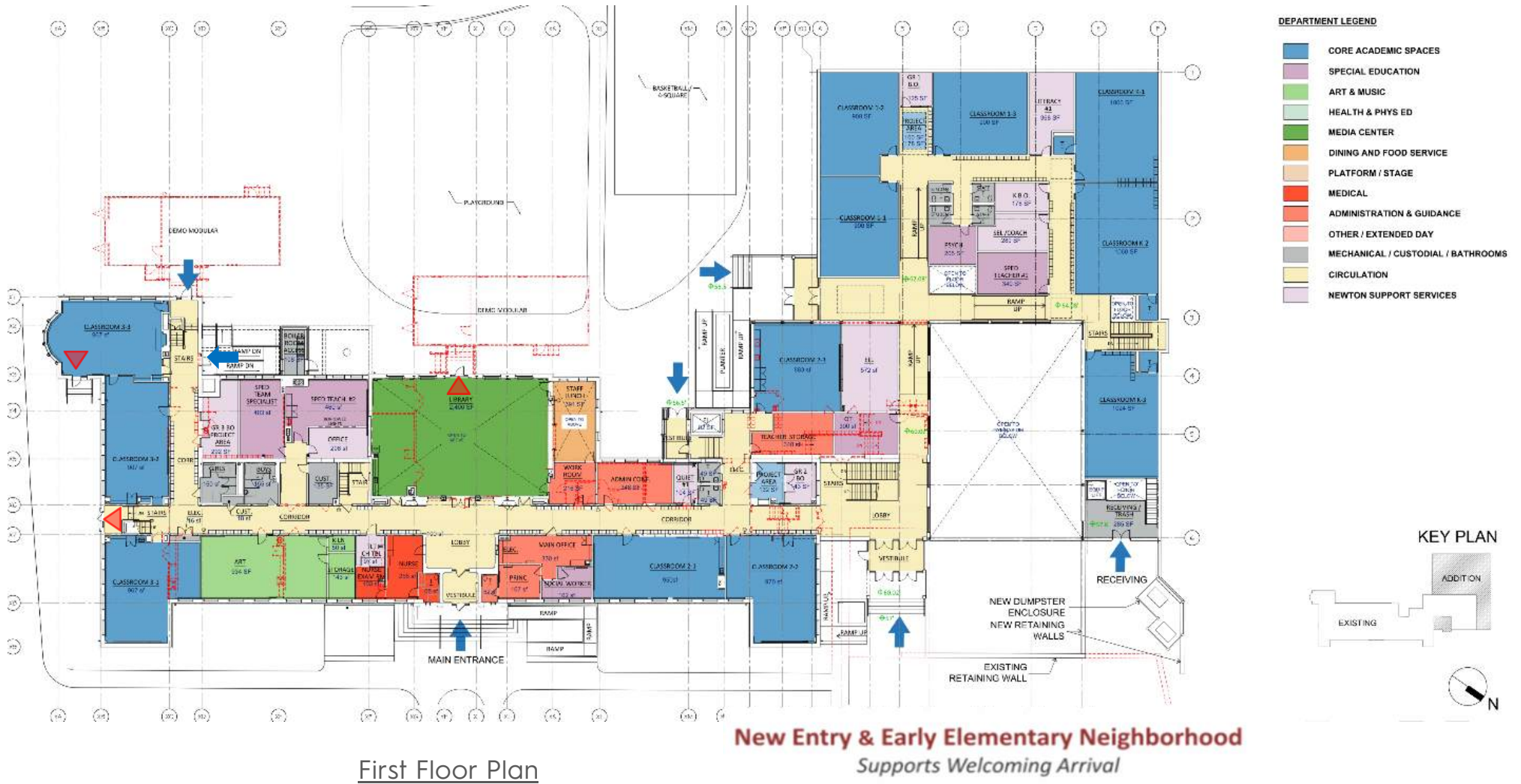
# Existing Conditions / Demolition



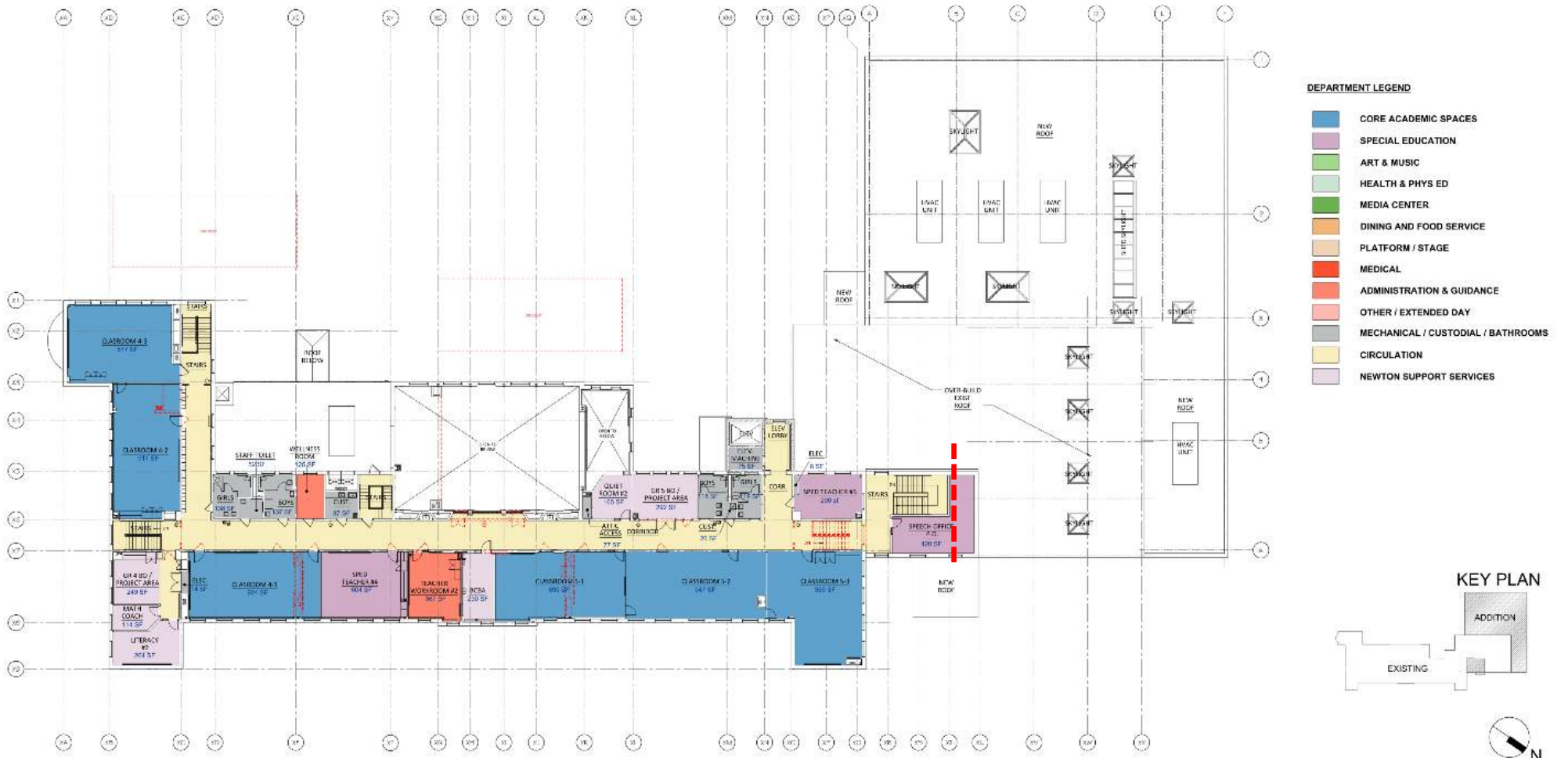
Second Floor Plan



# Conceptual Programming Plan



# Conceptual Programming Plan



- DEPARTMENT LEGEND**
- CORE ACADEMIC SPACES
  - SPECIAL EDUCATION
  - ART & MUSIC
  - HEALTH & PHYS ED
  - MEDIA CENTER
  - DINING AND FOOD SERVICE
  - PLATFORM / STAGE
  - MEDICAL
  - ADMINISTRATION & GUIDANCE
  - OTHER / EXTENDED DAY
  - MECHANICAL / CUSTODIAL / BATHROOMS
  - CIRCULATION
  - NEWTON SUPPORT SERVICES

Second Floor Plan



# Questions & Comments

