

Overview: Danville Capital Project

Danville Schools
April 5, 2022



REVIEW - WHAT HAVE WE DONE?

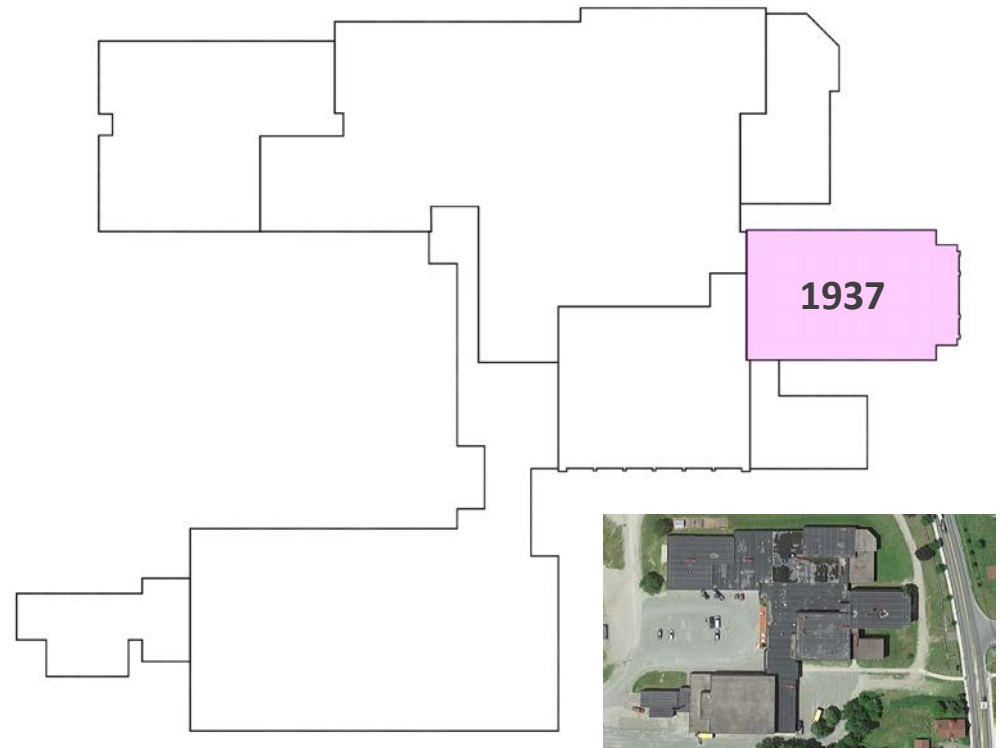
- Facility Evaluation Report - Issued 2019
- Based on facility needs without considering educational alignment or additions
- Three levels of priority
 - Health, Safety, Welfare, Code
 - End of usable life, energy efficiency
 - Other



Construction History: 1937 – Danville High School

1937 - SUMMARY:

- *5,170 SF/Floor x 2 Stories*
- *1,585 SF Basement*
- *Masonry bearing walls – exterior & interior*
- *Exterior: Brick & clay tile (uninsulated)*
- *Concrete floor structure*
- *Wood rafter and deck roof (combustible)*
- *8-in Cellulose insulation at attic space*



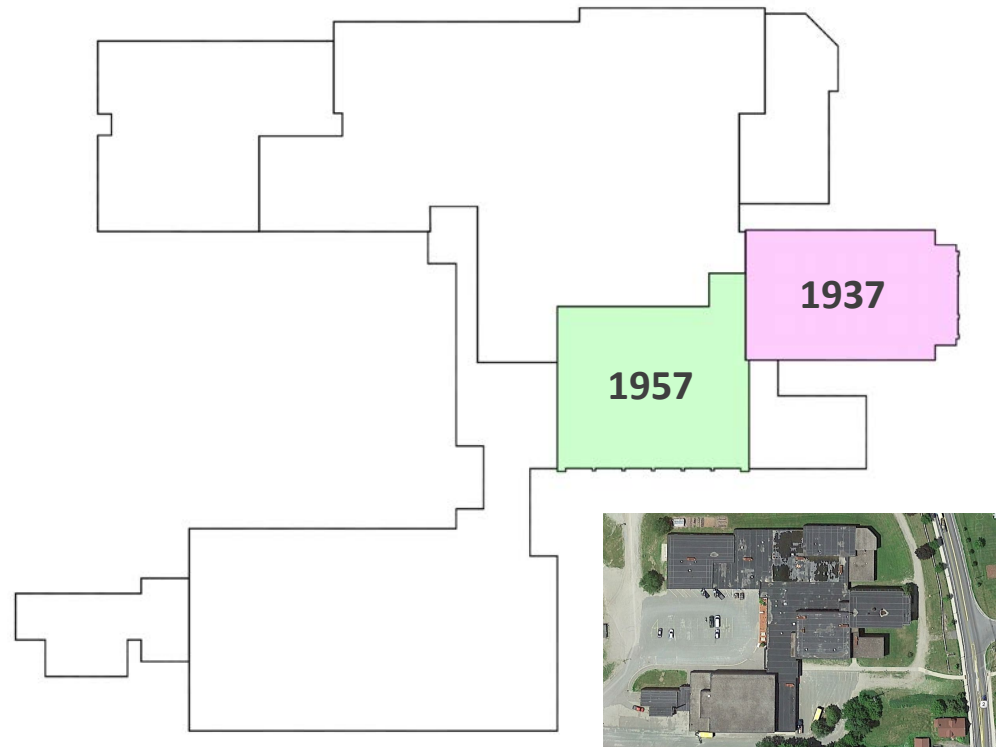
Area Total: 11,295

PLAN DIAGRAM

Construction History: 1957 – Danville High School Addition

1957 SUMMARY:

- *6,175 SF/Floor x 2 Stories*
- *Masonry bearing walls – exterior (12-in CMU) & veneer brick*
- *2nd Floor: Steel beams & concrete on metal deck*
- *Roof: Steel trusses & Tectum roof panels (no insulation)*
- *No insulation included at exterior walls*



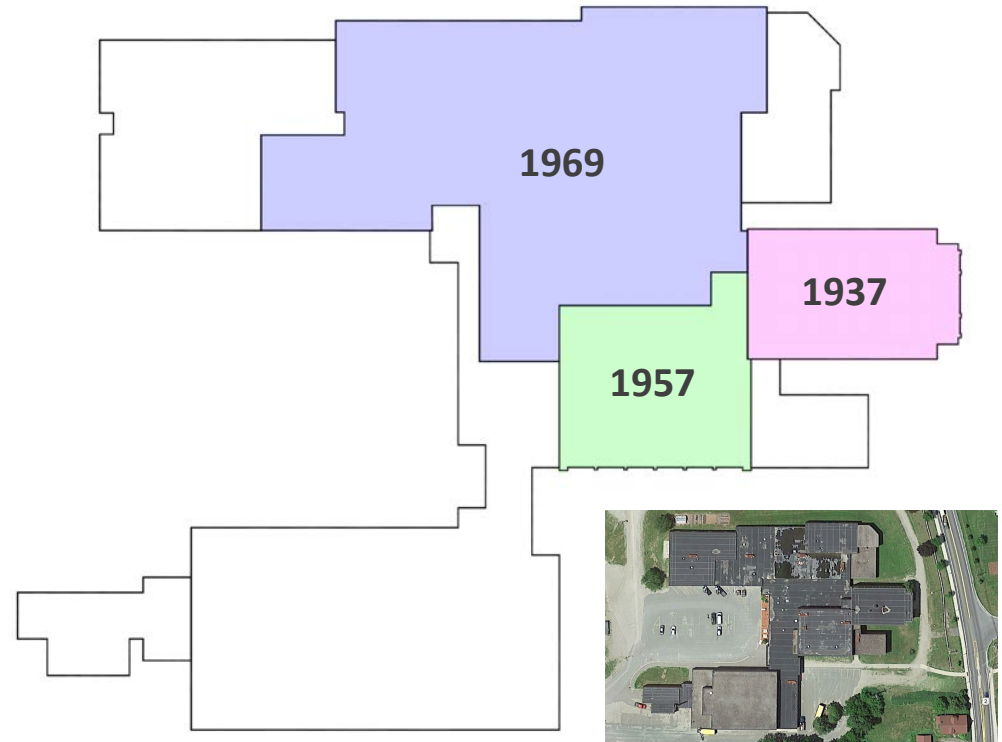
Area Total: 12,350 SF / Complex Total: 24,275 SF

PLAN DIAGRAM

Construction History: 1969 – Danville High School Addition

1969 SUMMARY:

- 22,875 SF/Floor x 1 Story
- Masonry bearing walls – exterior (8-in CMU) with veneer brick & 2-in rigid board insulation
- Roof: Steel joists and Tectum roof panels with 2-in rigid board insulation
- Electrical resistance heat
- Through-wall unit ventilators



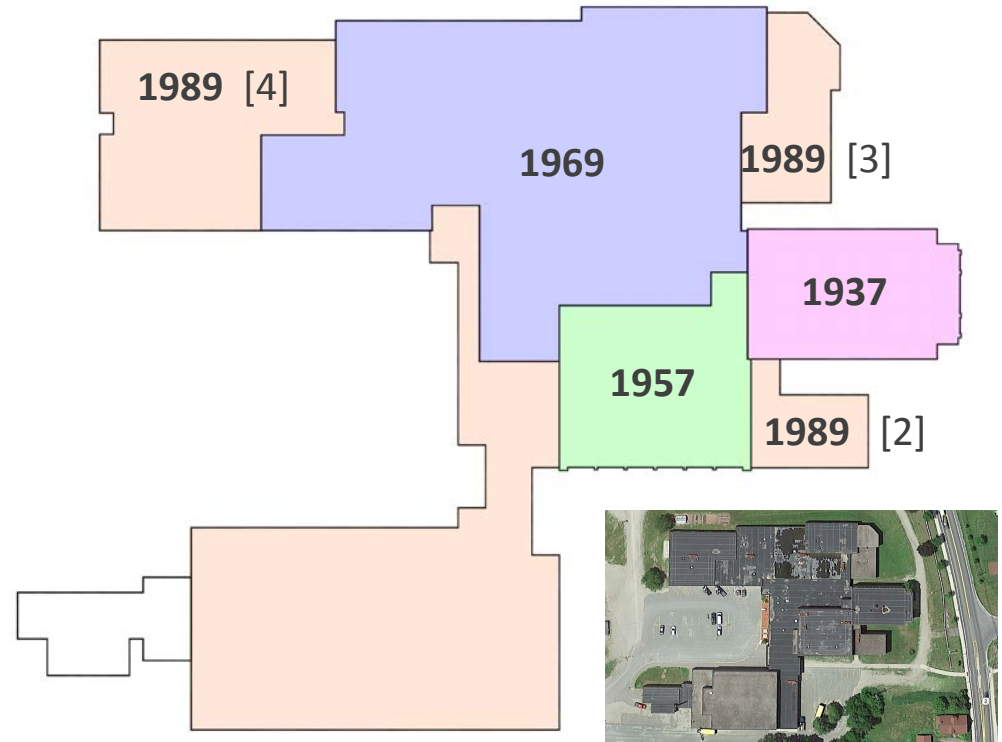
Area Total: 22,875 SF / Complex Total: 47,150 SF

PLAN DIAGRAM

Construction History: 1989 – Danville School Addition & Renovations

1989 – SUMMARY:

- 29,580 SF @ 1st Floor
- 2,715 SF @ 2nd Floor
- **Areas 2, 3 & 4:**
 - Brick veneer faced 6-in metal studs with fiberglass batt insulation at stud cavities
 - Open-web steel joists with metal roof deck and 4-in rigid board insulation
- Electrical heating replaced with oil-fired boilers serve full complex



Area Total: 32,295 SF / Complex Total: 79,445 SF

PLAN DIAGRAM

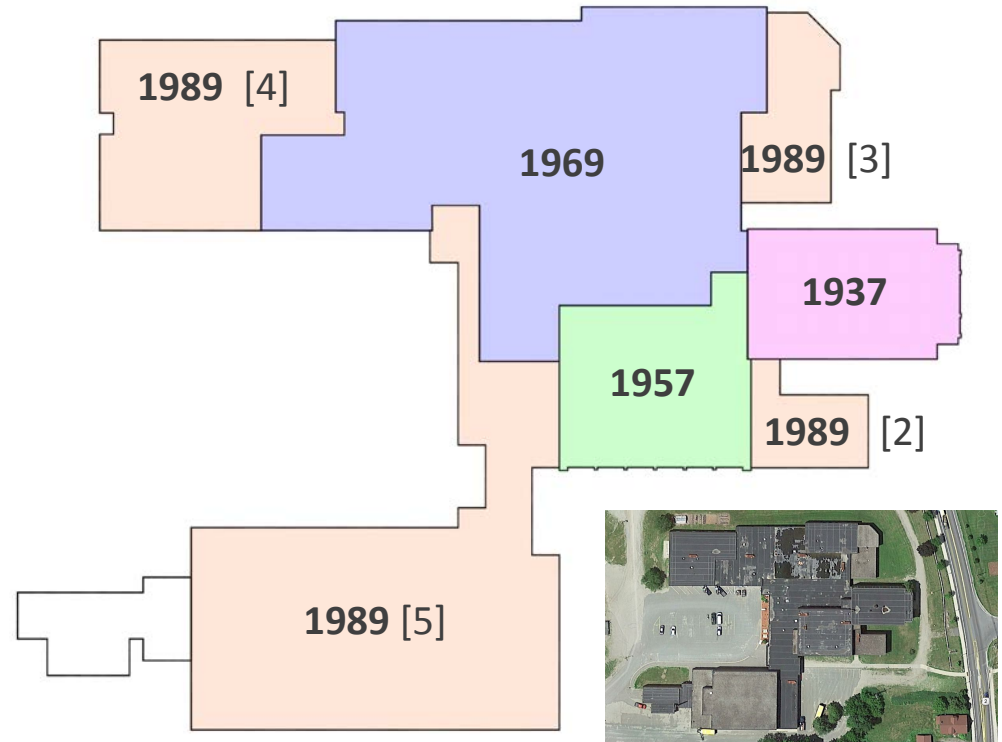
Construction History: 1989 – Danville School Addition & Renovations

1989 - SUMMARY:

- **Area 5:**

- Exterior walls: Brick veneer and metal panel faced 12-in CMU with 2-in of exterior rigid insulation
- Long-span steel roof trusses with metal roof deck and 4-in rigid board insulation

- New active ventilation system (Roof-top and 1937 & 1989 Gym HRU's)
- Limited area sprinklers
- Fire alarm & detection



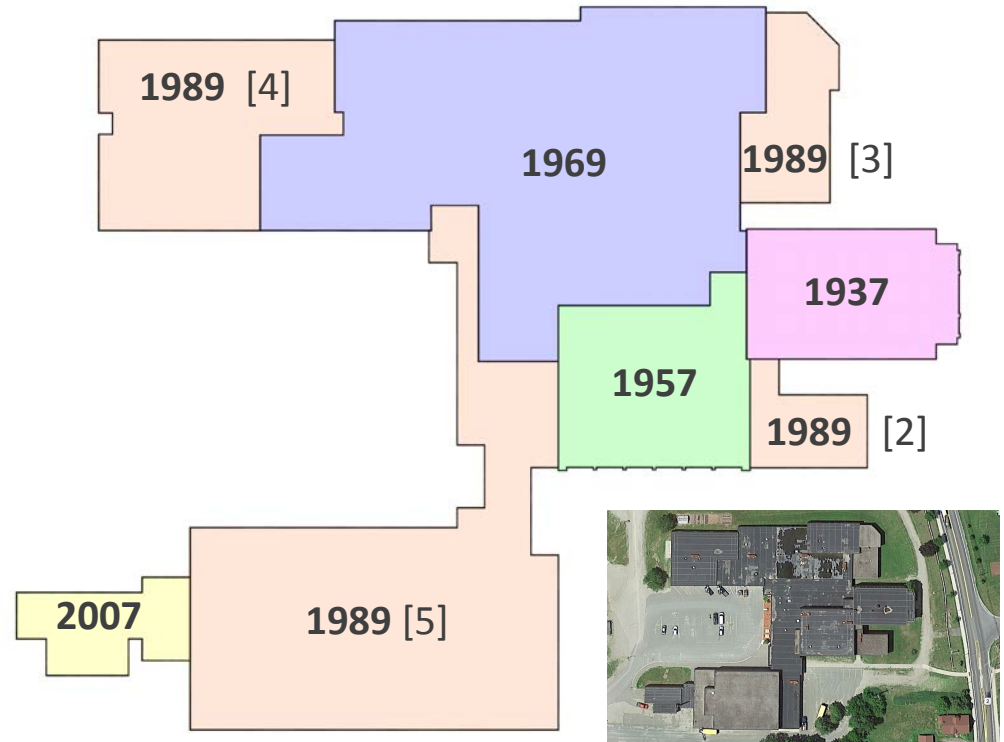
Area Total: 32,295 SF / Complex Total: 79,445 SF

PLAN DIAGRAM

Construction History: 2007 – Woodchip Heating Plant Addition

2007 SUMMARY:

- *Exterior walls: Brick veneer faced 12-in CMU with 1 1/2-in of spray-applied closed-cell foam insulation*
- *Open-web steel roof joists with metal deck and 6-in of rigid board insulation*



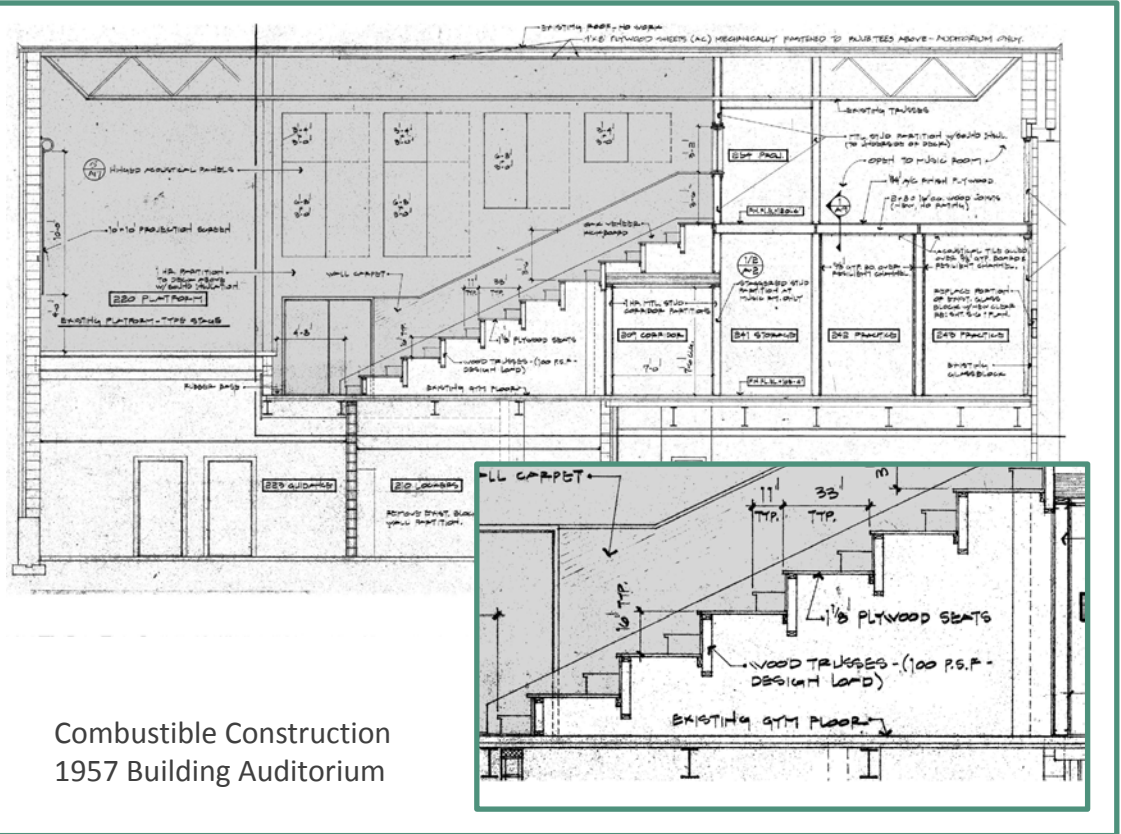
Area Total: 2,460 SF / Complex Total: 81,905 SF

PLAN DIAGRAM

Issues | Code: Life-Safety Code & Building Code

COMBUSTIBLE CONSTRUCTION:

- *Type II-B Non-Combustible*
 - ▣ *Wood Trusses*
 - ▣ *Plywood Tiers*
 - ▣ *Wood floor framing*
- *Concealed Inaccessible Space Below Seating*
- *Roof structure @1937 Building is combustible Type III-B Construction (Fire-barrier required)*

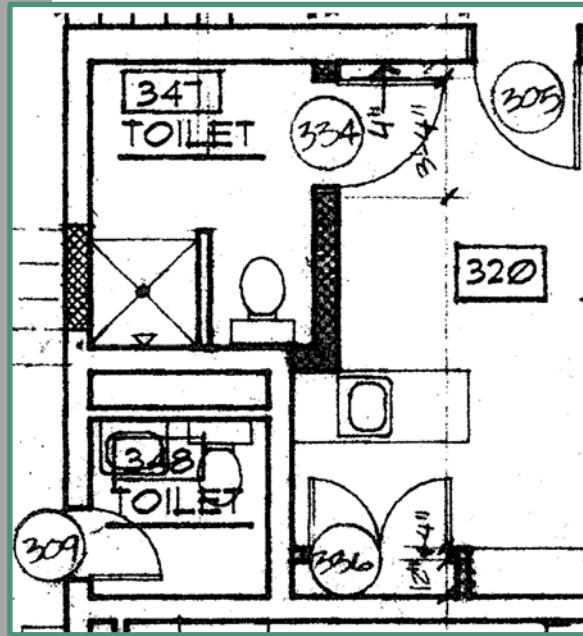


Combustible Construction
1957 Building Auditorium

Issues | Code: Accessibility

ACCESSIBILITY:

- Existing Multi-Fixture Bathrooms not fully compliant
- Single-hole bathrooms non-compliant
- Auditorium Seating
- Counter Heights
- Drinking Fountains



ACCESSIBILITY CONCERNS

Building Structure: Priority-2 Issues / Recommendations

1937 Building:

- *Monitor Floor Slab Crack*
- *Stabilize Wall Crack at Basement Concrete Wall*
- *Repair Rusting Steel Lintel*
- *Repair Cracked/Spalling Concrete Foundations*
- *Repair North Entry Ramp*



BUILDING STRUCTURE

Building Envelope Issues: | Thermal/Energy Performance

WALL INSULATION:

- 1937: Uninsulated
- 1957: Uninsulated
- 1969: 1-1/2" Rigid Board (R-6)
- 1989: 6" Batt & Metal Studs (R-7)
- 2007: 1-1/2" Spray-Foam (R-6)

VT COMMERCIAL BUILDING ENERGY STANDARD (CBES)

COMPONENT	MINIMUM R-VALUES ^{a,b}
	Conditioned Space
Roofs	
Insulation entirely above deck	R-40ci
Metal buildings ^a	R-25 + R-11 + R-11 LS
Attic and Other	R-49
Walls, Above grade	
Mass	R-19ci
Metal Building ^a	R-13 + R-17ci or R-22.1ci
Metal-framed	R-13 + R-15ci or R-20ci
Wood-framed and other	R-13 + R-12ci or R-19 + R-8ci or R-20ci
Walls, Below Grade^c	
Below-grade wall	R-15ci

BUILDING ENVELOPE

Building Envelope Issues: | Thermal/Energy Performance

ROOF INSULATION:

- 1937: Blown-in Attic Cellulose (R-19.2 / R-23.8)
- 1957: Tectum Roof Panels (R-3.7)
- 1969: 2" Rigid Board + Tectum Roof Panels (R-14.5)
- 1989: 4" Rigid Board (R-22)
- 2007: 6" Rigid Board (R-33)

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	Conditioned Space
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Walls, Below Grade^c	
Below-grade wall	R-15ci

BUILDING ENVELOPE

Building Envelope Issues: | Thermal/Energy Performance

WINDOWS:

- *1937: Exterior storms over single-pane wood windows*
- *1957: No original 1957 windows remain*
- *1969: A few 1969 era windows remain ...now 50 years old and failing*
- *1989: Original windows were of relatively poor quality, now at the end of useful life ...30 years old*

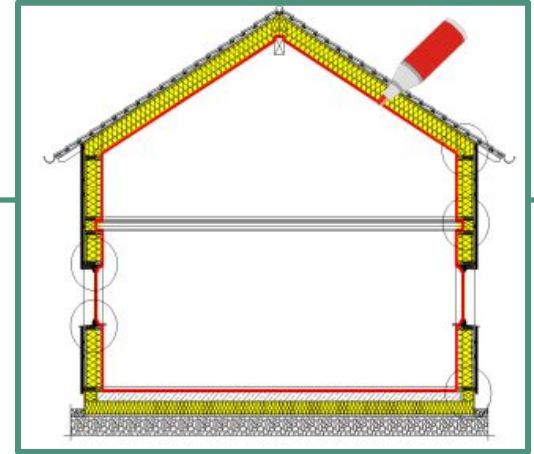


BUILDING ENVELOPE

Building Envelope Issues: | Air Barrier

NO AIR BARRIER:

- *Primarily constructed prior to the understanding of the Air Barrier Concept (except 2007 Addition)*
- *Multiple defects, holes and unsealed joints in the envelope*
- *Air moves freely between exterior and interior making it difficult to control the indoor environment*



Air barriers are systems of materials designed and constructed to control airflow between a conditioned space and an unconditioned space. The air barrier system is the primary air enclosure boundary that separates indoor (conditioned) air and outdoor (unconditioned) air. In multi-unit/townhouse/apartment construction the air barrier system also separates the conditioned air from any given unit and adjacent units. Air barrier systems also typically define the location of the pressure boundary of the building enclosure.

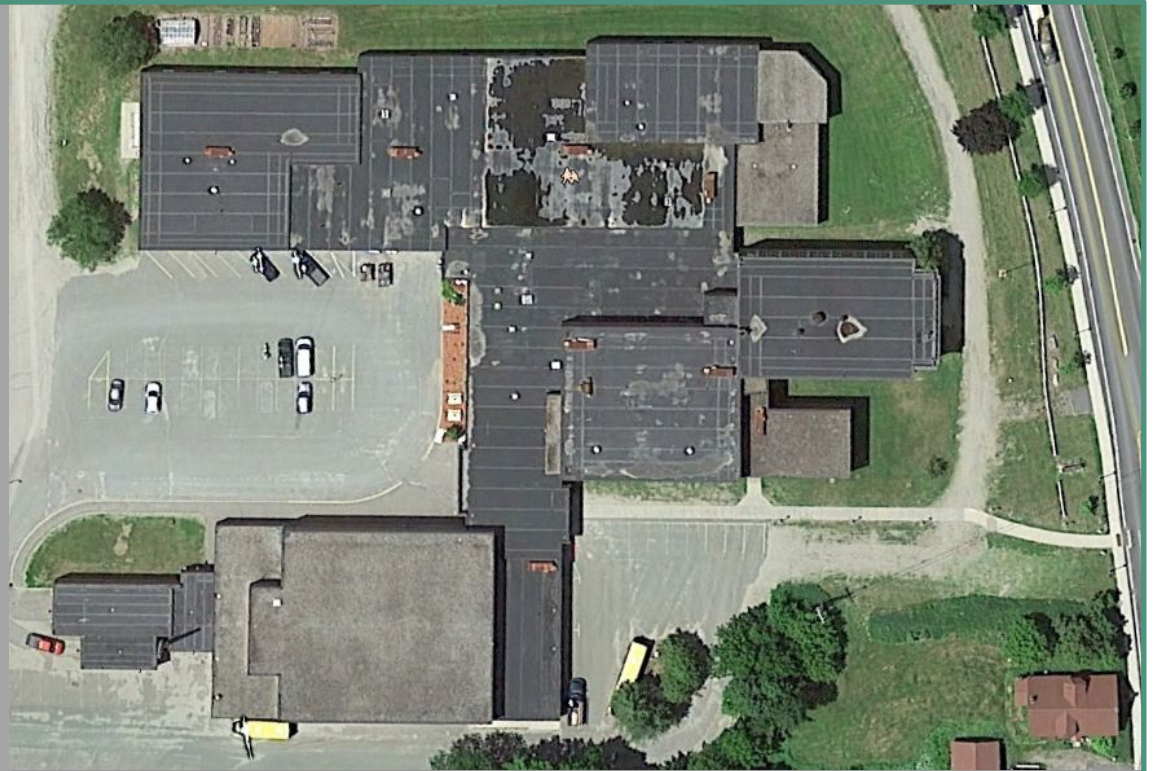
Wherever they are, air barriers should be:

- impermeable to air flow
- continuous over the entire building enclosure
- able to withstand the forces that may act on them during and after construction
- durable over the expected lifetime of the building

BUILDING ENVELOPE

Building Envelope Issues: | Roofing Membranes

- Ballasted Single-Ply Membrane:
 - 1989 Library/ Classroom
 - 1989 2-Story Addition
 - 1989 Gymnasium
- Single-Ply Membrane:
 - 1989 Other Areas
 - 2007 Woodchip
 - 1937 High School
 - 1957 Addition



BUILDING ENVELOPE

Building Envelope Issues: | Exterior Wall Conditions

- DETERIORATING MORTAR:
- *Previously noted as source of interior wall damage at 1937 Building*
- *Recommendation:
Full-building repointing at
1937 Building*



BUILDING ENVELOPE

Building Envelope Issues: | Exterior Wall Conditions

- **STRUCTURAL CRACKING:**

- *Foundation Wall Cracks*

- 1937

- 1969

- *Cracking at Concrete Block (CMU) of Exterior Bearing Walls*

- 1957

- 1969

- 1989



BUILDING ENVELOPE

Building Envelope Issues: | Exterior Wall Conditions

- CONTROL JOINTS:
- *Failed Exterior Control Joints with water penetration to brick veneer cavity*
 - 1957
 - 1969
 - 1989



BUILDING ENVELOPE

Building Interior: | Interior Conditions

- **FLOORS:**

- *Replace aged, stained and worn **carpeting** throughout building*
- *Replace **wood sports floor** at Gymnasium*

- **COUNTERS & CASEWORK:**

- *Replace deteriorated casework/counters in areas slated for renewal/renovation*



INTERIOR CONDITIONS

Building Interior: | Fittings & Equipment

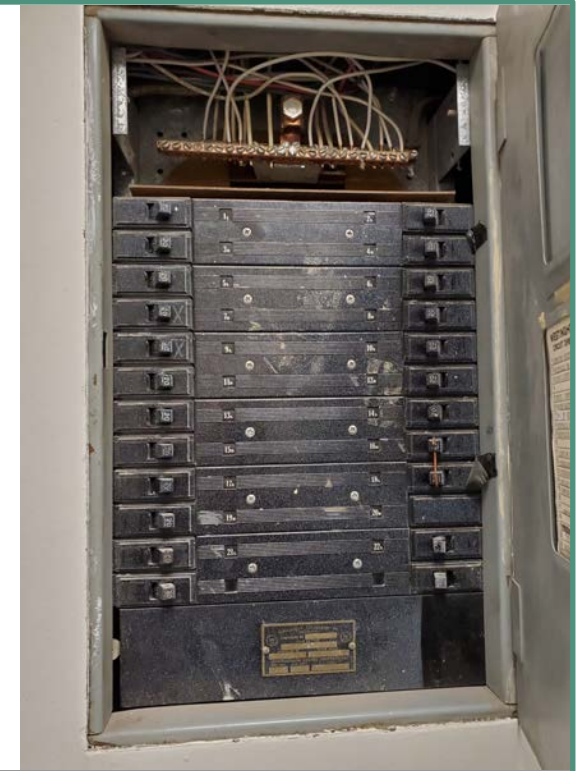
- **GYMNASIUM:**
- *Replace Retractable Bleacher seating system*
- *Renew or replace operable Basketball Backstops*
- **KITCHEN**
- *Infrastructure at end of useful life*
- *Replace all piping and waste lines under-slab*



INTERIOR CONDITIONS

Electrical Systems Issues: | Electrical Distribution

- **DISTRIBUTION:**
- *Electrical switchgear more than 50 years old. At the end of service life and oversized for current loads*
- *Electrical distribution panels in service date from 1937, 1957 & 1969. Beyond service life – some well beyond...*
 - *Replace outdated distribution gear and panels*



ELECTRICAL SYSTEMS

Electrical Systems Issues: | Lighting Systems

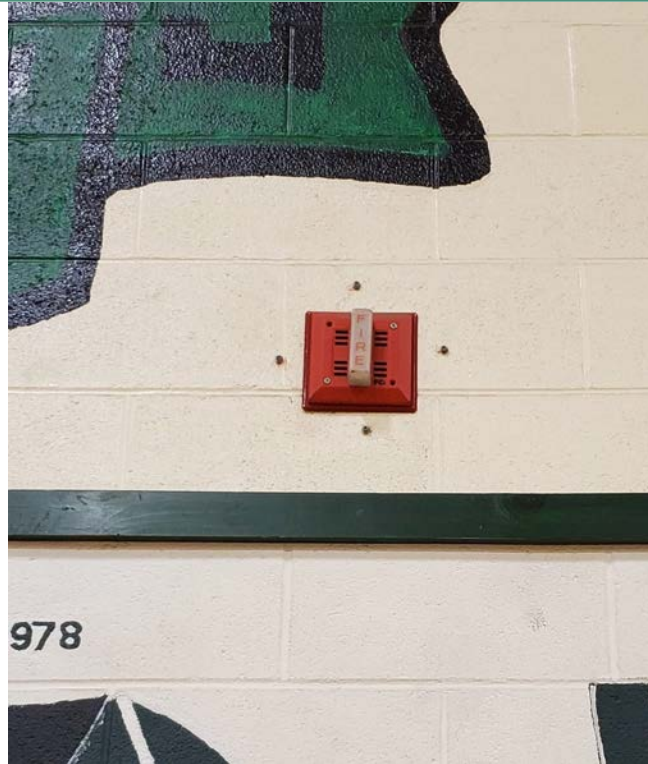
- **Lighting:**
- *Currently fluorescent technology with efficiency upgrades*
- *LED lighting technology offers controllability, better quality of light and energy savings – a next generation solution*
 - *Replace all lighting with LED lighting systems*



ELECTRICAL SYSTEMS

Electrical Systems Issues: | Fire Alarm Systems

- **CODE ISSUES:**
- *Current system does not meet current code- not a Voice Evacuation System*
- *Outdated and ADA-non-compliant devices*
- *Heat/Smoke Detection incomplete ...required in non-fully sprinklered building*
 - *Provide code compliant alarm system*



ELECTRICAL SYSTEMS

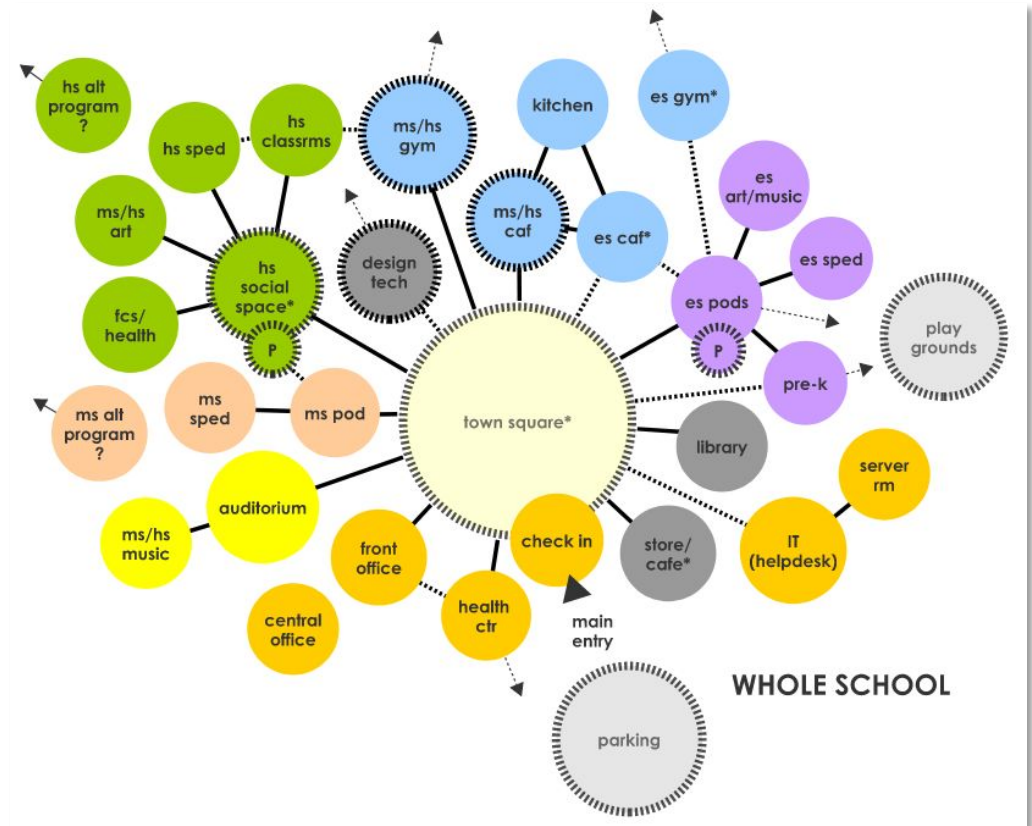
COST OPINIONS – CONCEPT DESIGN

- Includes all items in Facility Evaluation Report
- Includes all additions and renovations needed for educational alignment
- Represents complete cost to design and build everything designed to date

- **Facility Evaluation Work \$32.3 Million**

REVIEW – WHAT HAVE WE DONE?

- Visioning and Programming done in Winter/Spring of 2021
- Includes program analysis, organizational diagram, and space needs program
- Findings include need for significant addition and reorganization of space to address existing program



REVIEW – WHAT HAVE WE DONE?

- Initial Design Concepts in Spring/Summer 2021
- Site Concepts and Pricing drawings in Late Summer 2021
- Cost Estimating in Fall 2021



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- **Additions \$23.8 Million**
- **Cost Escalation (to 2024) \$4.8 Million**

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- **Facility Evaluation Work \$32.3 Million**
- **Additions \$23.8 Million**
- **Cost Escalation (to 2024) \$4.8 Million**
- **Soft Costs \$5.9 Million**

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 - **Soft Costs \$5.9 Million**
 - **Owner Contingency \$4.3 Million**

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 - **Owner Contingency \$4.3 Million**
 - **HazMat Allowance \$516,000**

COST OPINIONS – CONCEPT DESIGN

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- **Facility Evaluation Work \$32.3 Million**
- **Additions \$23.8 Million**
- **Cost Escalation (to 2024) \$4.8 Million**
- **Soft Costs \$5.9 Million**
- **Owner Contingency \$4.3 Million**
- **HazMat Allowance \$516,000**
- **Total Estimated Project Cost \$71.6 Million**

ALTERNATIVE OPTIONS – REDUCED PLAN

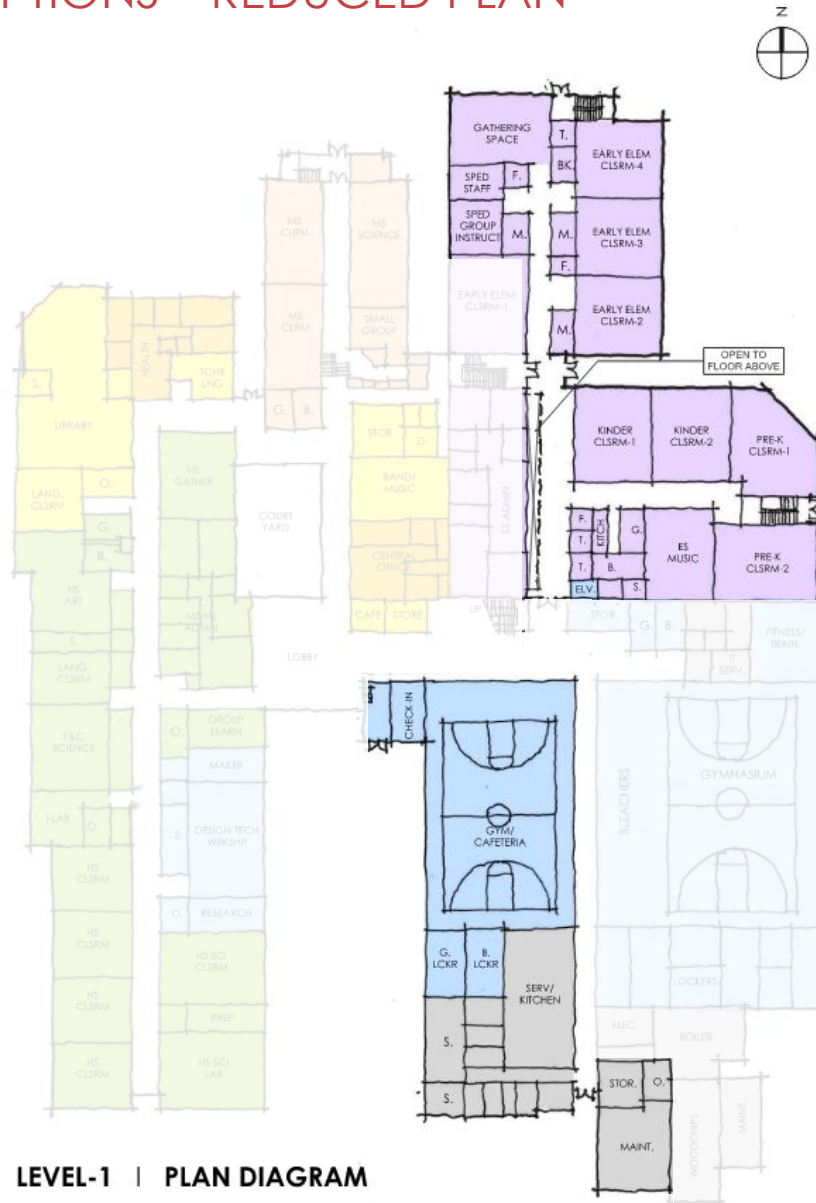


ALTERNATIVE OPTIONS – REDUCED PLAN



PROPOS ED LEVEL-1 | PLAN DIAGRAM

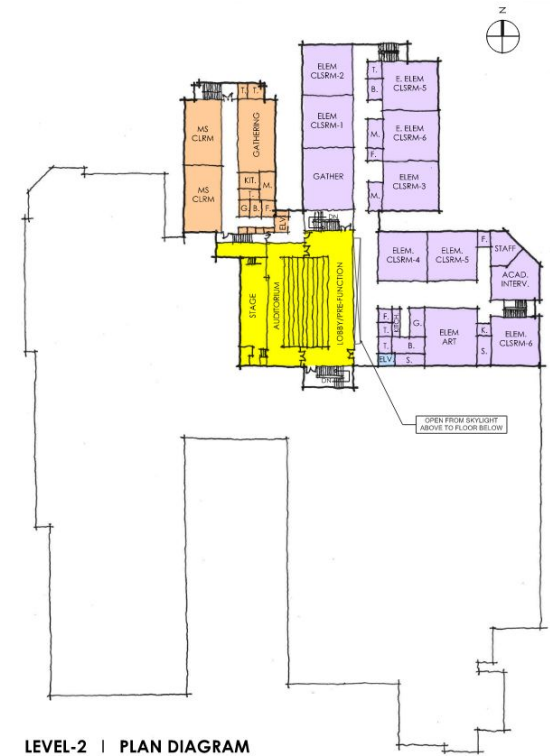
ALTERNATIVE OPTIONS – REDUCED PLAN



PROPOS ED LEVEL-1 | PLAN DIAGRAM

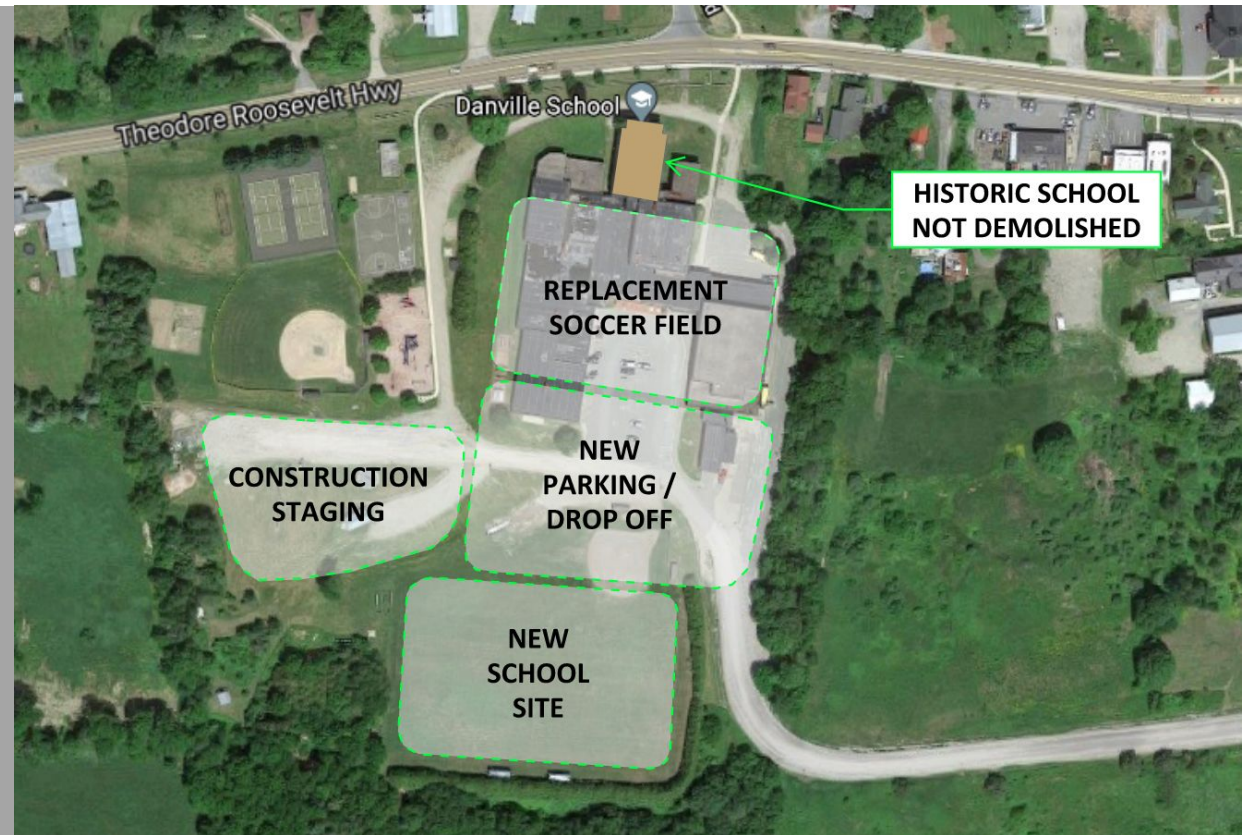
ALTERNATIVE OPTIONS – REDUCED PLAN

- Combined Cafeteria/Gym
- Reduced Auditorium
- Reduced demolition of existing
- Reduced new construction
- Increased areas of renovation
- Up to \$10 million in potential savings



ALTERNATIVE OPTIONS – NEW SCHOOL

- Purpose built for 21st century education
- Less risk (Haz Mat, unforeseen conditions)
- Minimal disruption to students, teachers, and families
- 100% of investment is in new facility
- Estimated \$70 - \$80 M



PROJECT OPTIONS – SUMMARY

OPTION 1 (original design)

Pros:

- Design is farthest ahead of options
- Separate cafeteria and gym
- Separate elementary school

Cons:

- Cost
- Site disruption
- Occupied construction
- \$\$ spent on enabling work



OPTION 2 (reduced design)

Pros:

- Reduced costs
- Less site disruption

Cons:

- Combined cafeteria and gym
- Occupied construction
- \$\$ spent on enabling work



OPTION 3 (new school)

Pros:

- Purpose built
- Minimum student disruption
- Best investment

Cons:

- Highest cost



NEXT STEPS

- Review Options
- Confirm Approach and Project Budget
- Project Proposal
- Board Recommendation
- Bond Vote
- Design & Construction



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E D U C A T I O N