

PRESENTATION OUTLINE

INTRODUCTION (2-3 SLIDES)

- Building Overview (2 Screens)
- Mechanical System Overview (2-4 Screens)

DEPTH EVALUATION (7 SLIDES)

- Air System Modifications (4 Screens)
- Natural Ventilation System (4 Screens)
- Geothermal Hybrid System (4 Screens)
- Decentralized Pump System (2 Screens)

ELECTRICAL BREADTH (2 SLIDES)

- Photovoltaic Array Design (2 Screens)
- Photovoltaic System (2 Screens)

ARCHITECTURAL BREADTH (2 SLIDES)

- Façade Redesign (2 Screens)
- Roof Redesign (2 Screens)

CONCLUSIONS (1-2 SLIDES)

- Life Cycle Cost Analysis (1-2 Screens)
- Recommendations (1-2 Screens)

CREDITS AND ACKNOWLEDGEMENTS (1 SLIDE)

QUESTIONS (1 SLIDE)

PROPOSED TOTAL OF SLIDES/SCREENS: 16-18/31-35

Note – The far left screen will be an outline slide that will present on the screen throughout the entirety of the presentation

INTRODUCTION

BUILDING OVERVIEW

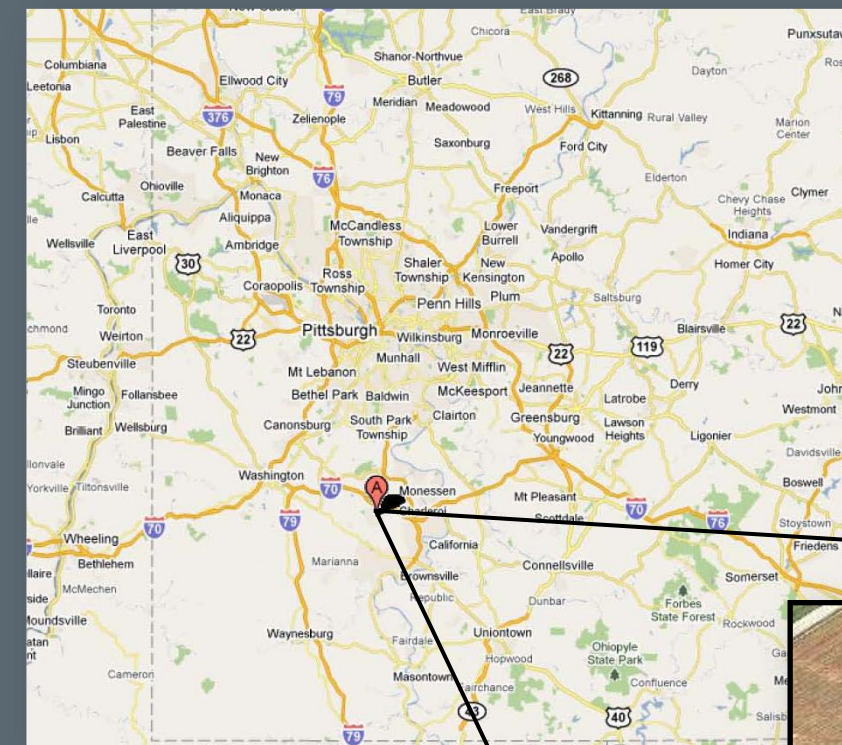
MECHANICAL SYSTEM OVERVIEW

MECHANICAL DEPTHS

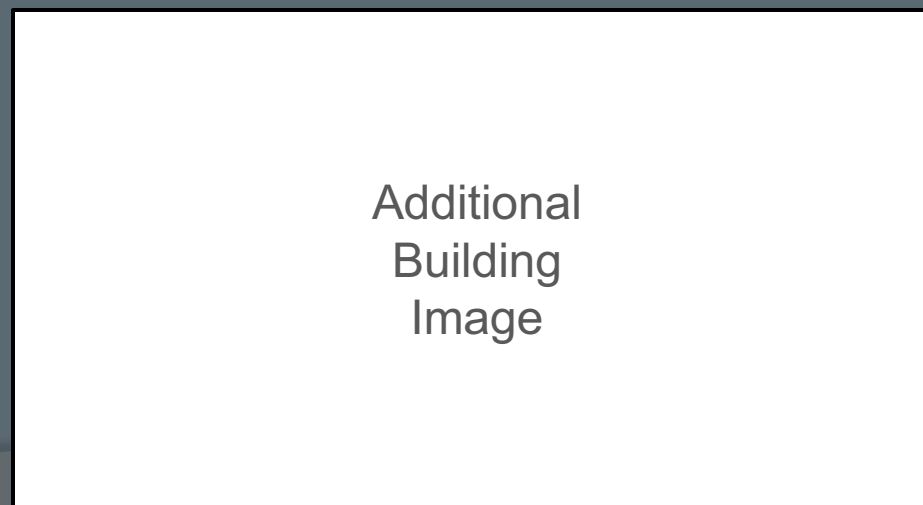
ELECTRICAL BREADTH

ARCHITECTURAL BREADTH

CONCLUSION



Building Name: Bentworth Middle School
 Location: Bentleyville, PA
 Building Owner: Bentworth School District
 Architect and MEP Engineer: Hayes Large Architects
 Occupancy Type: Educational
 Size: 83,800 Square Feet
 Stories Above Grade: 3 Stories
 Start Construction Date: May 2007
 End Construction Date: January 2009
 Cost: \$18 Million
 Project Delivery Method: Design-Bid-Build



INTRODUCTION

MECHANICAL DEPTHS

AIR SYSTEM MODIFICATIONS

NATURAL VENTILATION SYSTEM

GEOTHERMAL HYBRID SYSTEM

DECENTRALIZED PUMP SYSTEM

ELECTRICAL BREADTH

ARCHITECTURAL BREADTH

CONCLUSION

Drawing of
Mechanical
Tower

Goals of Redesigned Air System

- Reduce ductwork
- Eliminate mechanical mezzanine
- Ensure proper ventilation
- Reduce fan energy
- Provide additional usable space
- Energy savings through the use of a higher efficiency flat plate heat exchanger
- Improved air quality
- Maintain ease of maintenance access
- Maintain remote location of heat pumps for acoustical purposes

Table Showing
Fan Energy
Savings

Schematic
Showing Air
Flow Path

Drawing Showing
New Design in a
Typical Classroom

INTRODUCTION

MECHANICAL DEPTHS

ELECTRICAL BREADTH

ARCHITECTURAL BREADTH

FAÇADE REDESIGN

ROOF REDESIGN

CONCLUSION

Goals of Redesigned Façade

- Provide area for redesigned mechanical system
- Allow for natural ventilation
- Incorporate elements previously used in the building
- Maintain views

Existing Building Elevation

New Building Elevation

Existing Building Elevation

New Building Elevation

Existing Building Elevation

New Building Elevation