

OLDHAM COUNTY SCHOOLS

Five New Schools in Five Years *The Pursuit of Perfection*

March 14, 2012

James P. Ewalt, AIA

Director of Facilities Management, Oldham County Schools

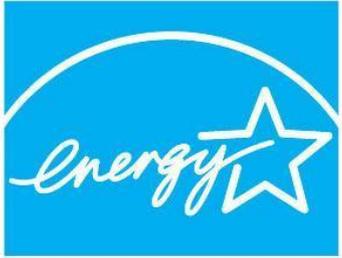
Douglas Hundley, P.E.

Principal, CMTA, Inc.

Nancy Wenz

Energy Manager, Oldham County Schools





Oldham County Schools

Five ENERGY STAR Schools

- ❖ **East Oldham Middle School**
- ❖ **Kenwood Station Elementary School**
- ❖ **Harmony Elementary School**
- ❖ **Locust Grove Elementary School**
- ❖ **Crestwood Elementary School**



East Oldham Middle School

Energy Star Ranking: **92** Label Year: **2010** **37** kBtu/sf yr

Scott-Klausing and Company, Inc. Architects

CMTA Inc. Engineers

Oldham
COUNTY SCHOOLS



Kenwood Station Elementary

Energy Star Ranking: **75** Label Year: **2006** **39** kBtu/sf yr

Scott-Klausing and Company, Inc. Architects

CMTA Inc. Engineers

Oldham
COUNTY SCHOOLS



Harmony Elementary

Energy Star Ranking: **96** Label Year: **2007** **34** kBtu/sf yr

K. Norman Berry Associates. Architects

CMTA Inc. Engineers



Locust Grove Elementary

Energy Star Ranking: **99** Label Year: **2010** **26** kBtu/sf yr

Scott-Klausing and Company, Inc. Architects

CMTA Inc. Engineers

Oldham
COUNTY SCHOOLS



Crestwood Elementary

Energy Star Ranking: **100** Label Year: **2010** **29** kBtu/sf yr

McCulloch Associates. Architects

CMTA Inc. Engineers

Oldham
COUNTY SCHOOLS

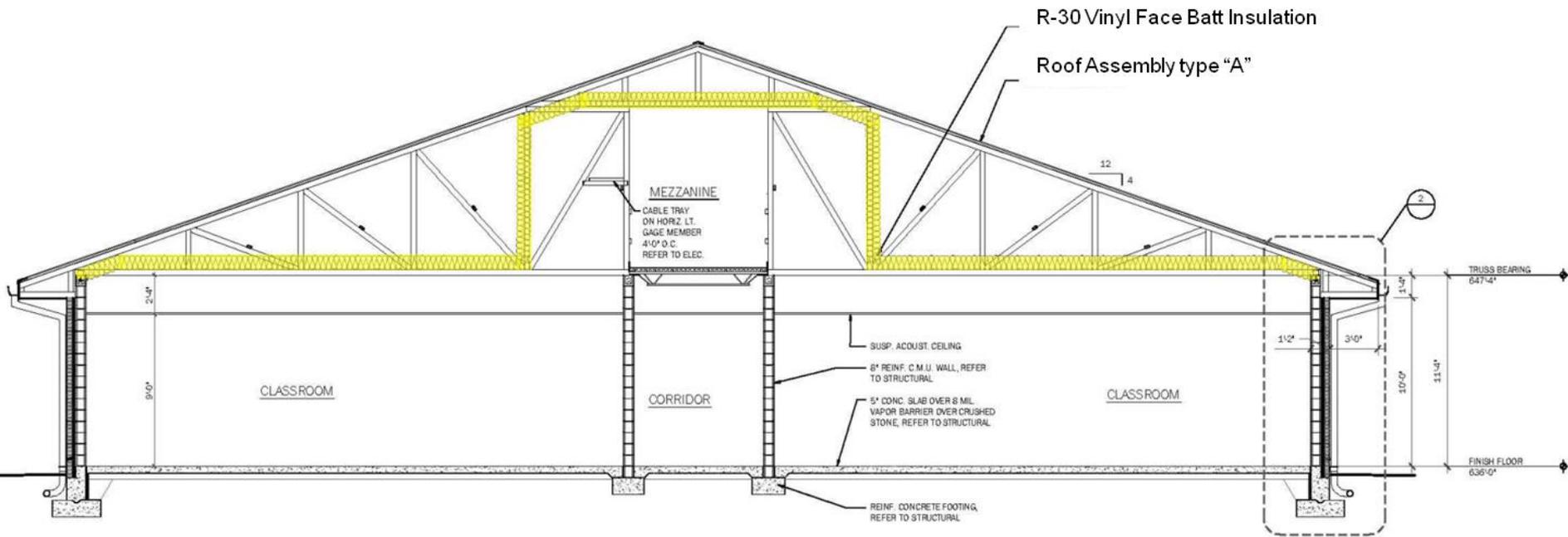
Areas of Focus

- ❖ Building Envelope: Three Generations
- ❖ Mechanical & Electrical Systems
- ❖ Energy Management/Building Operations

Building Envelope

Generation #1

EOMS/Goshen Elementary Building Envelope - Generation #1



1 BUILDING SECTION

Building Envelope

Generation #1

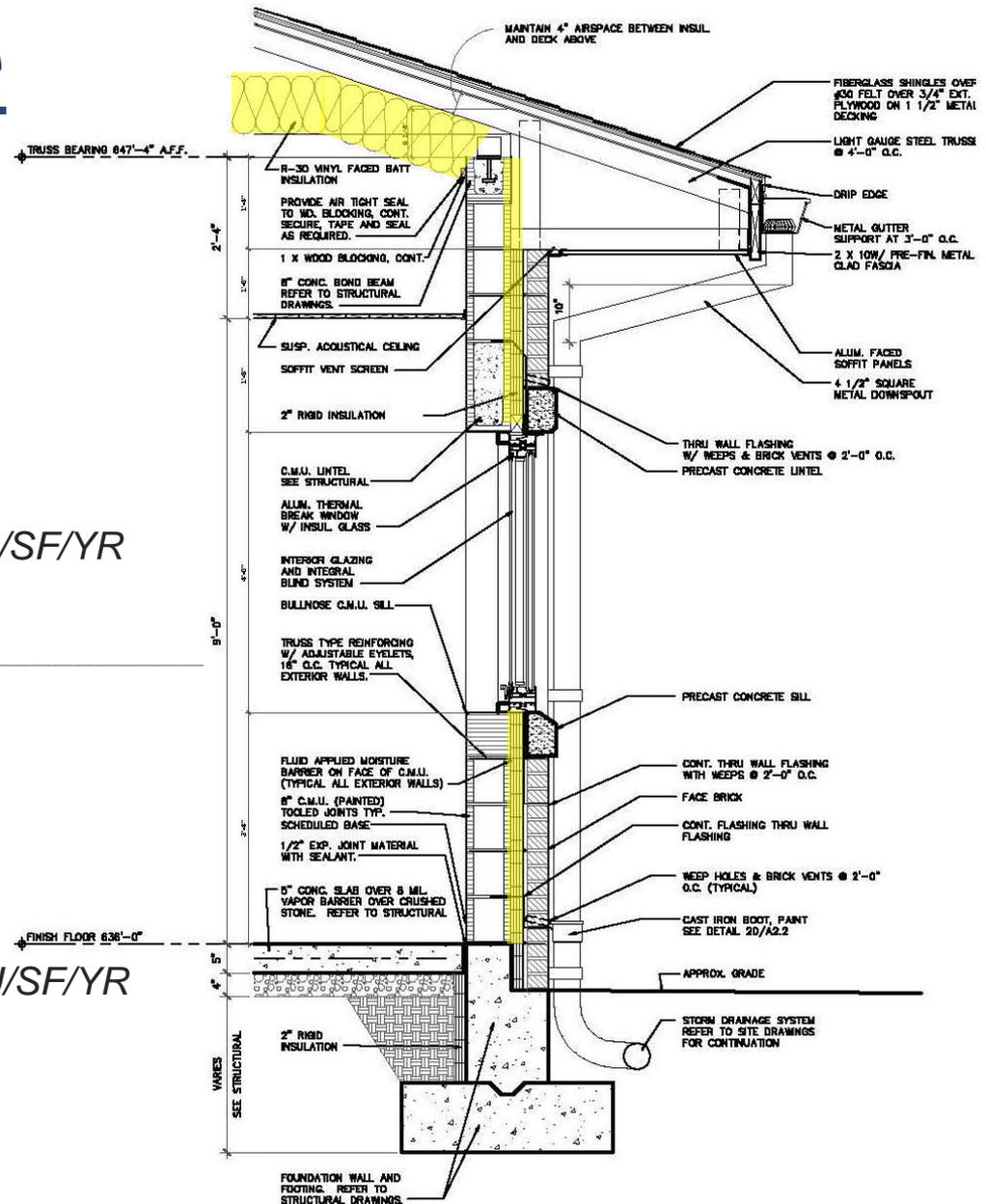
Goshen at Hillcrest Elementary School

2010 Energy Rating: **50** KBTU/SF/YR



East Oldham Middle School

2010 Energy Rating: **37** KBTU/SF/YR

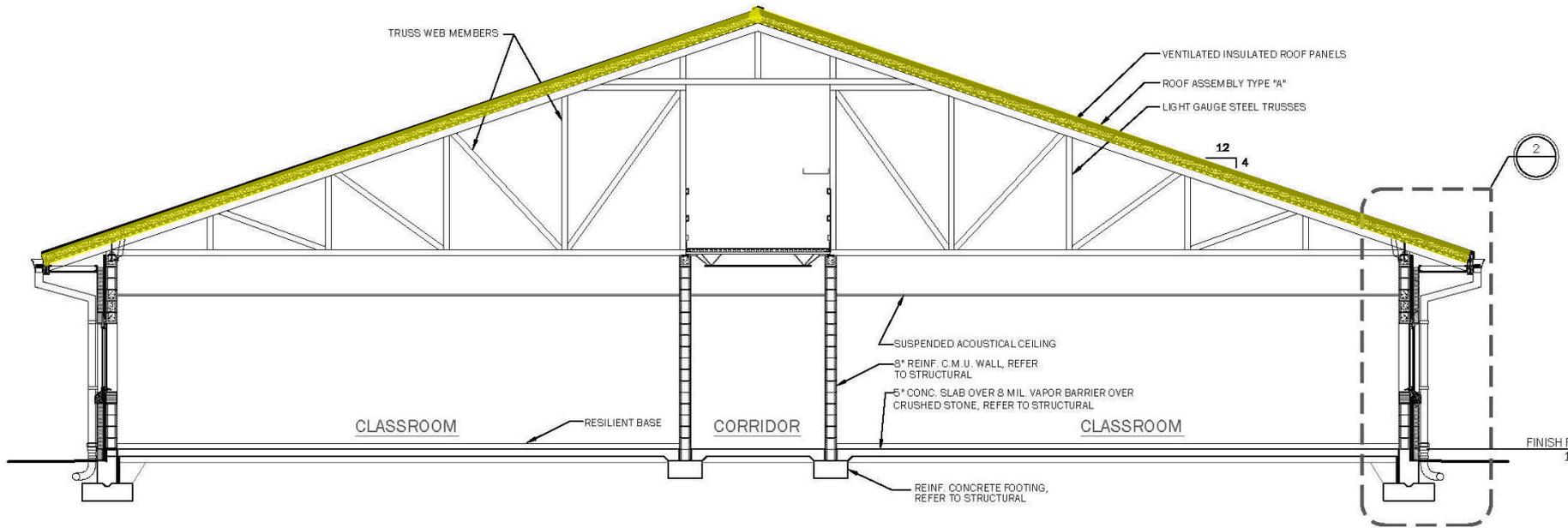


2 WALL SECTION

Building Envelope

Generation #2

Kenwood Station Elementary Building Envelope – Generation #2



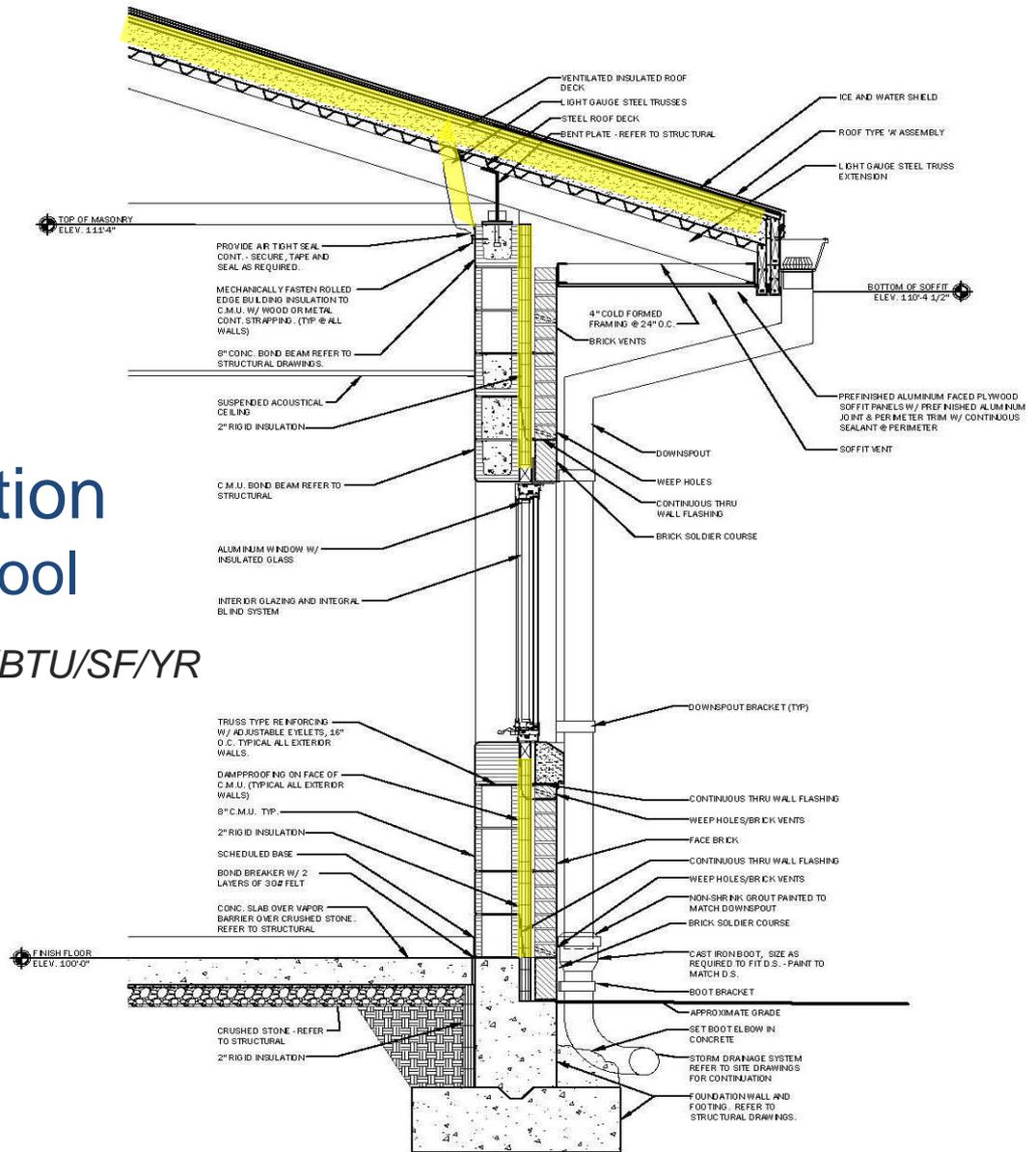
Building Envelope

Generation #2



Kenwood Station Elementary School

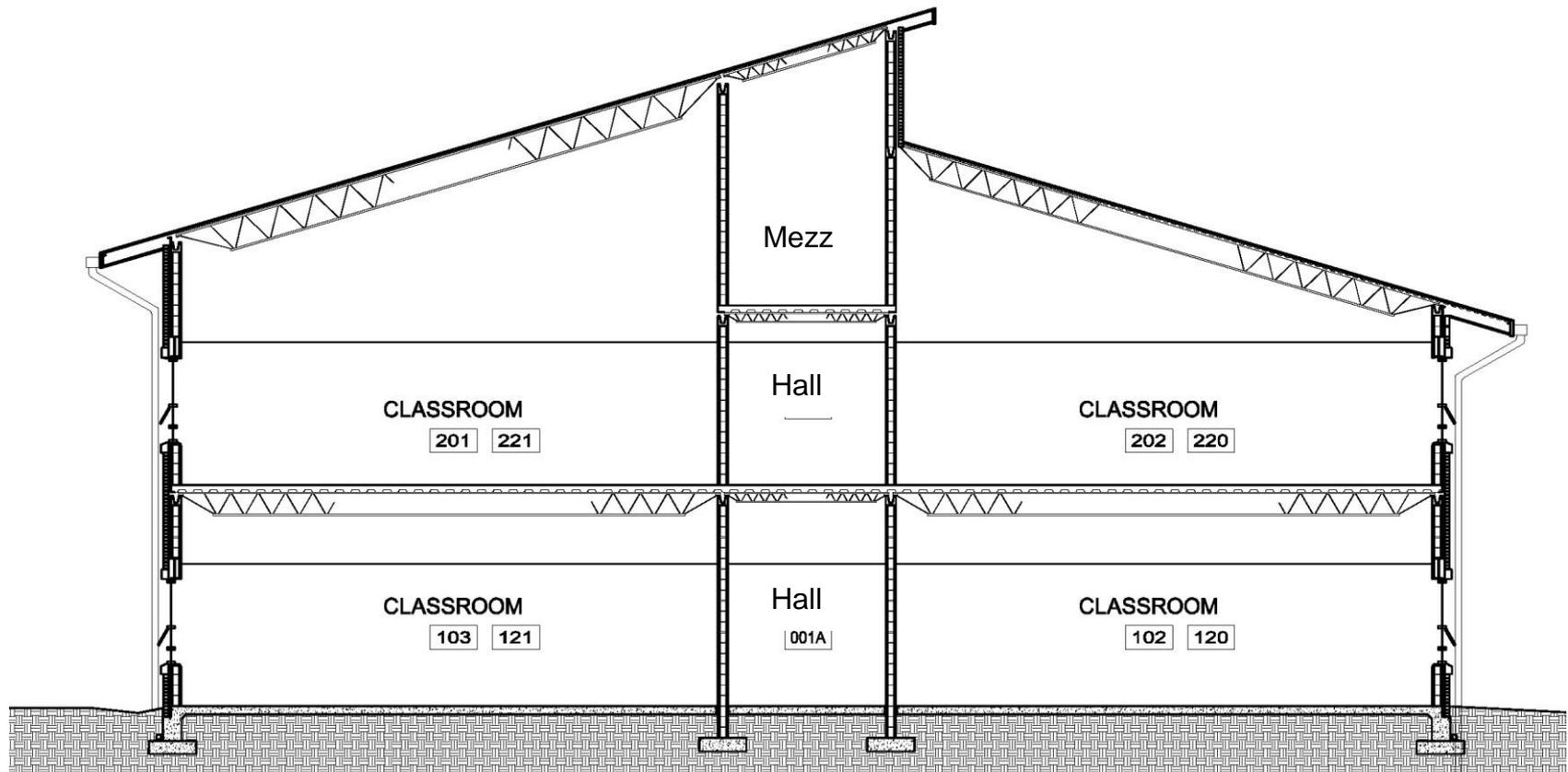
2006 Energy Rating: **39** KBTU/SF/YR



2 WALL SECTION

Harmony Elementary

Building Envelope – Generation #2



Energy Rating Comparison



East Oldham
Middle School

2010 Energy Rating:
37 KBTU/SF/YR



Kenwood Station
Elementary School

2006 Energy Rating:
39 KBTU/SF/YR



Harmony
Elementary School

2007 Energy Rating:
34 KBTU/SF/YR

Building Envelope

Generation #3

Building Envelope Generation #3



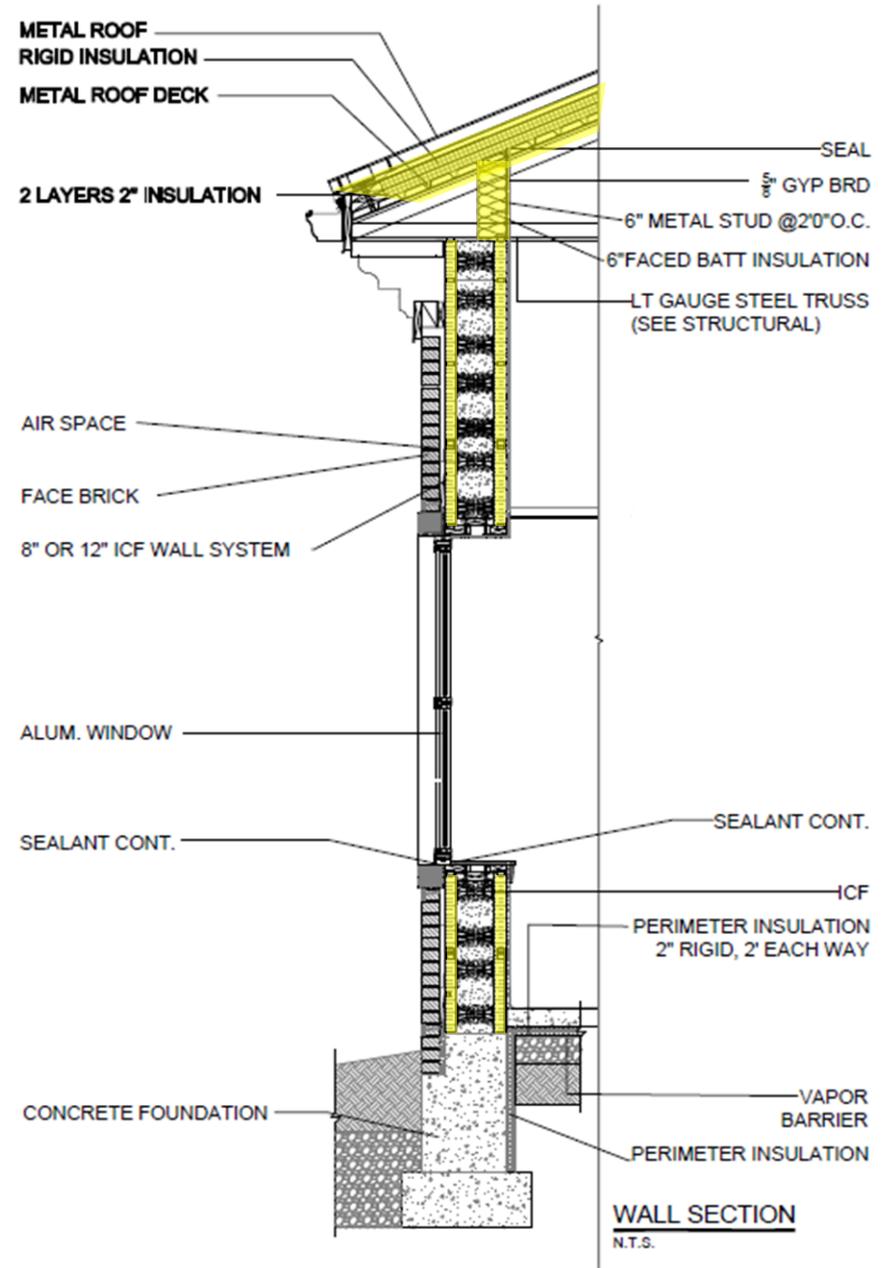
Locust Grove
Elementary School

2010 Energy Rating: **26** KBTU/SF/YR



Crestwood
Elementary School

2010 Energy Rating: **29** KBTU/SF/YR

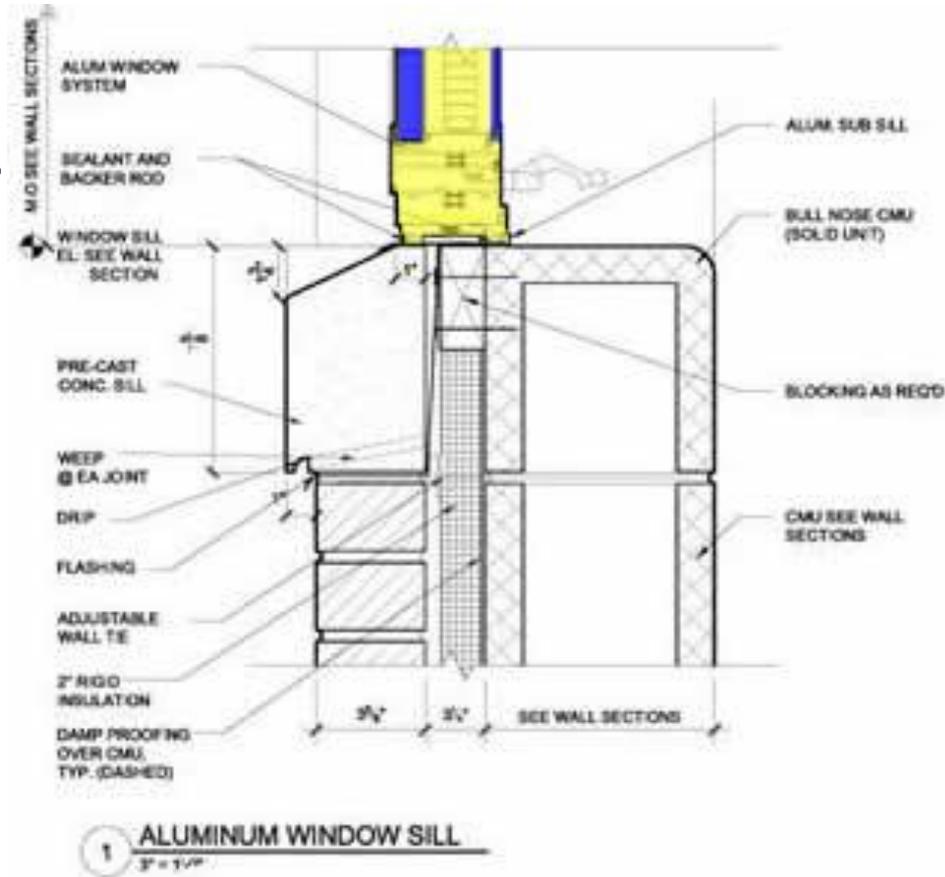


Wall Penetration Details

- ❖ Windows
- ❖ Doors
- ❖ Hardware

Window Details

- ❖ Insulating Perimeter
- ❖ Improved Glazing
- ❖ Triple Glazing



Window Details



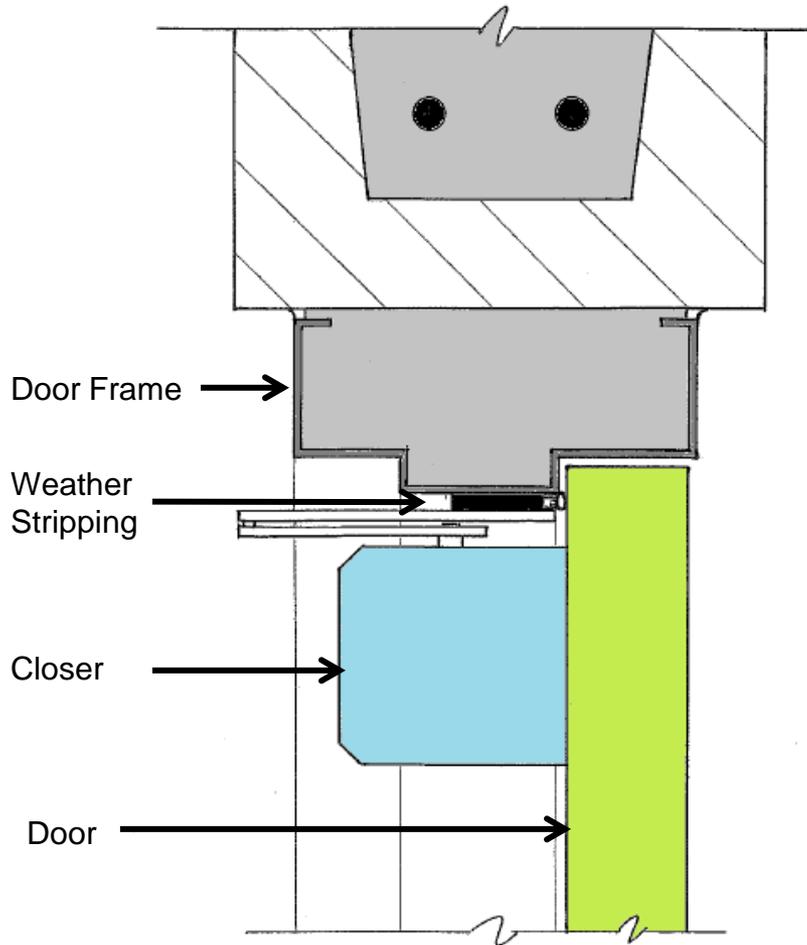
Door Details

- ❖ Weather Stripping
- ❖ Mullion Seals
- ❖ Thresholds

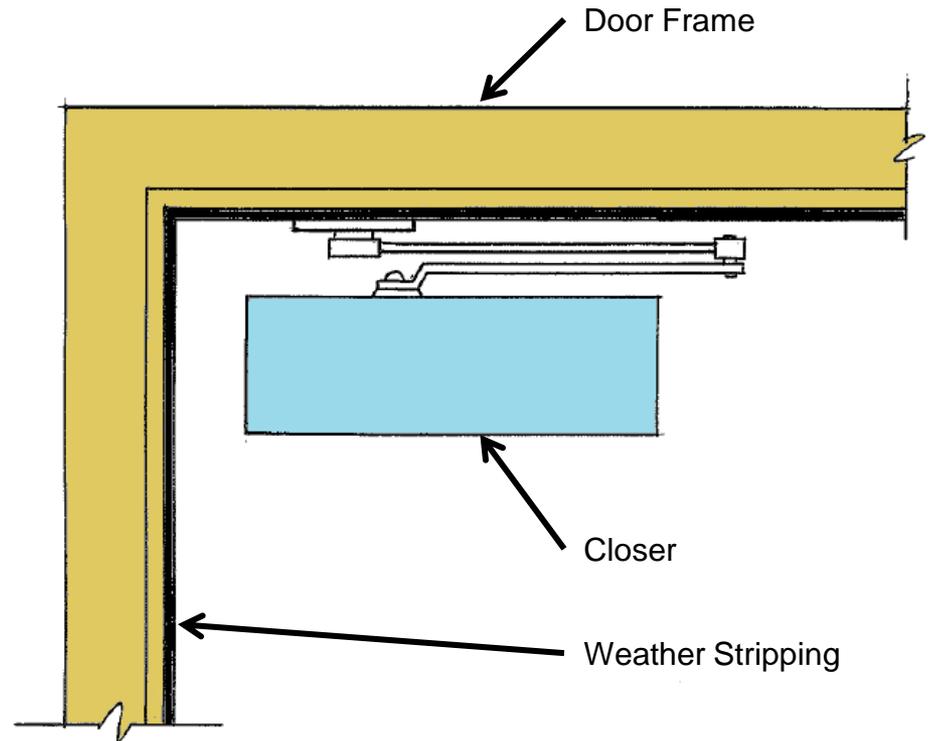
Weather Stripping – Old Style



Weather Stripping



Door Section

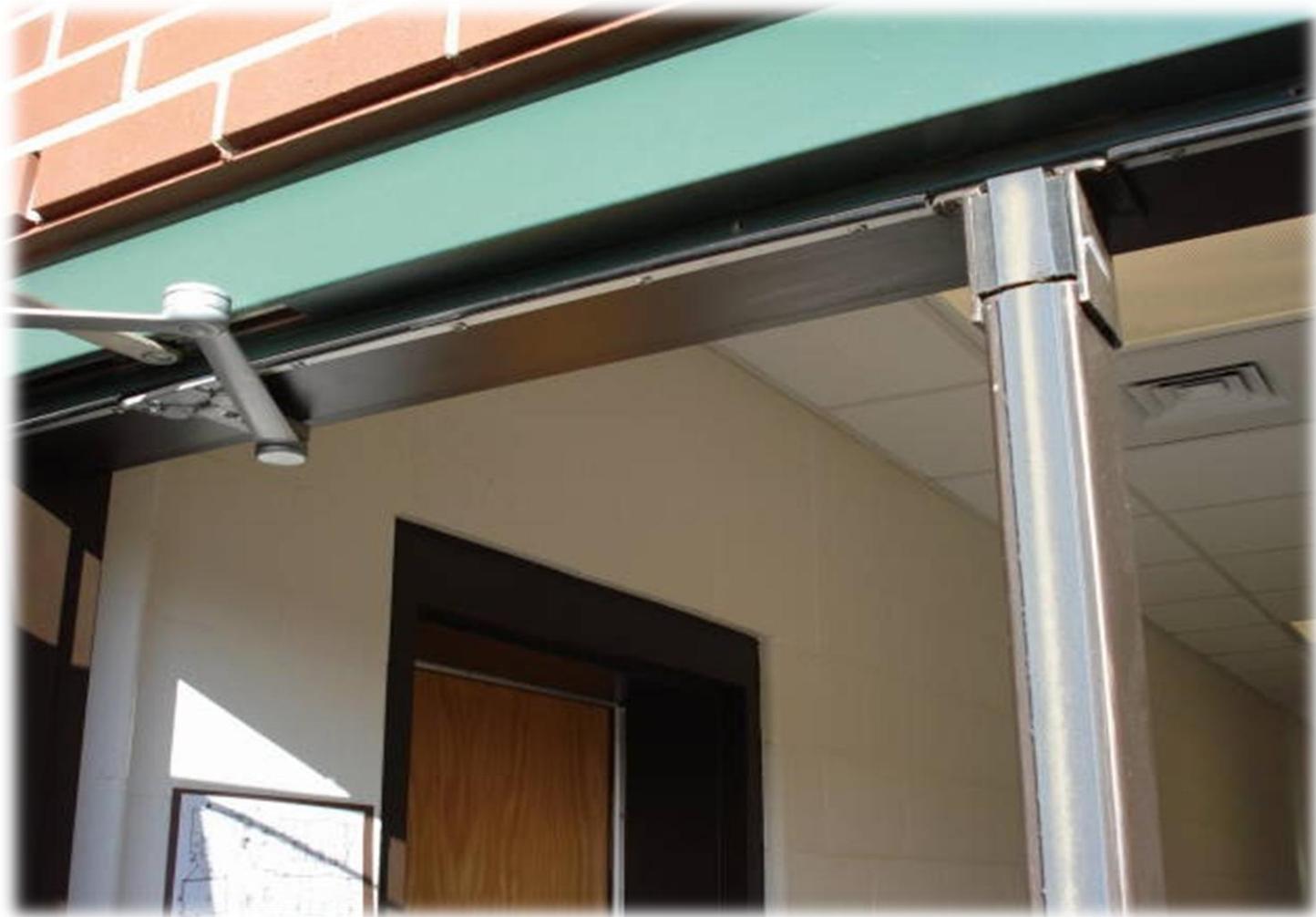


Door Elevation

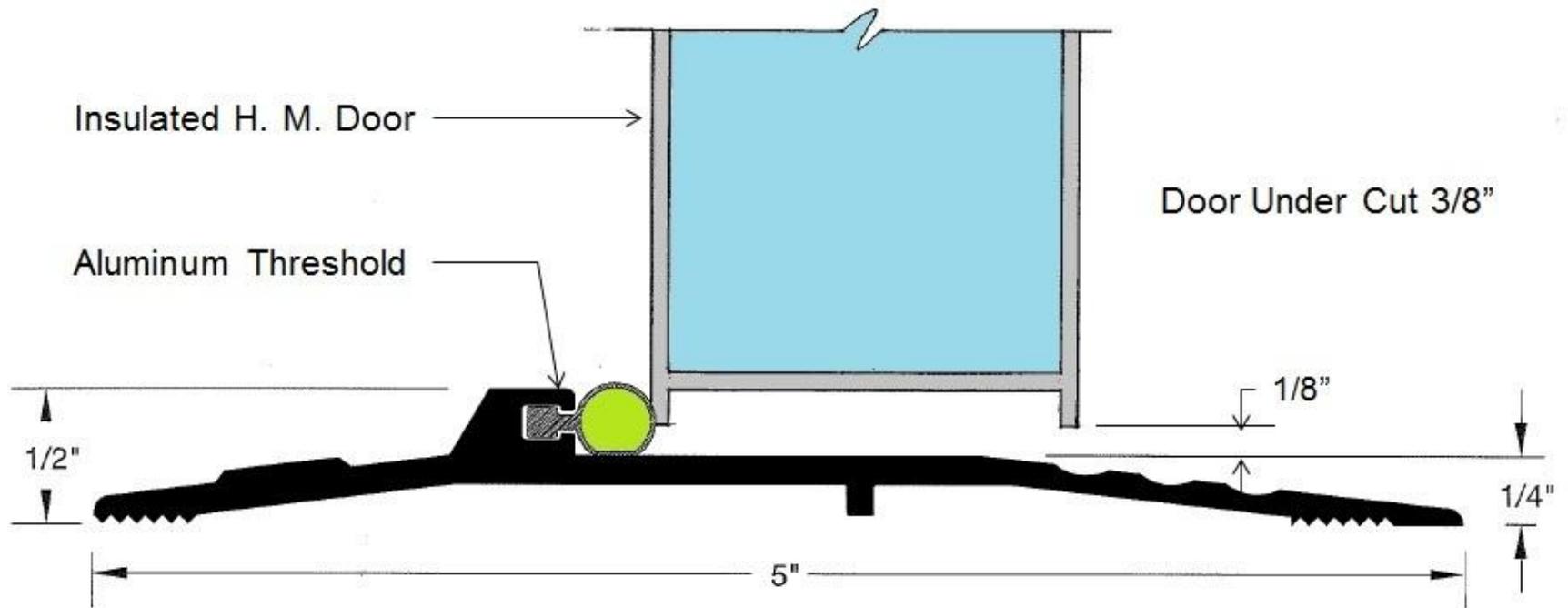
Weather Stripping - Bad Installation



Mullion Seals



Thresholds



THRESHOLD DETAIL

The Next Generation #4

Brownsboro Elementary School

- ❖ **ICF Construction**
- ❖ **Improved Window Glazing – Solarban 70 XL**
- ❖ **Metal Roof with Energy Star Color**
- ❖ **Solar Tubes in Library**

Centerfield Elementary (Renovation)

- ❖ **Rigid Wall Insulation with Thermally Broken Brick Ties**
- ❖ **Occupancy Sensors**
- ❖ **Reduced Light Intensity (watt/sf)**
- ❖ **Two Stage High Efficiency Heat Pumps**

Mechanical Systems

- ❖ **Goshen/EOMS** – Boiler, Water Tower with W.S. H.P.
- ❖ **Kenwood** – Geothermal, Central Pumping
- ❖ **Harmony** – Geothermal, Central Pumping
- ❖ **Locust Grove** – Geothermal, Distributed Pumping
- ❖ **Crestwood** – Geothermal, Distributed Pumping

Mechanical Features

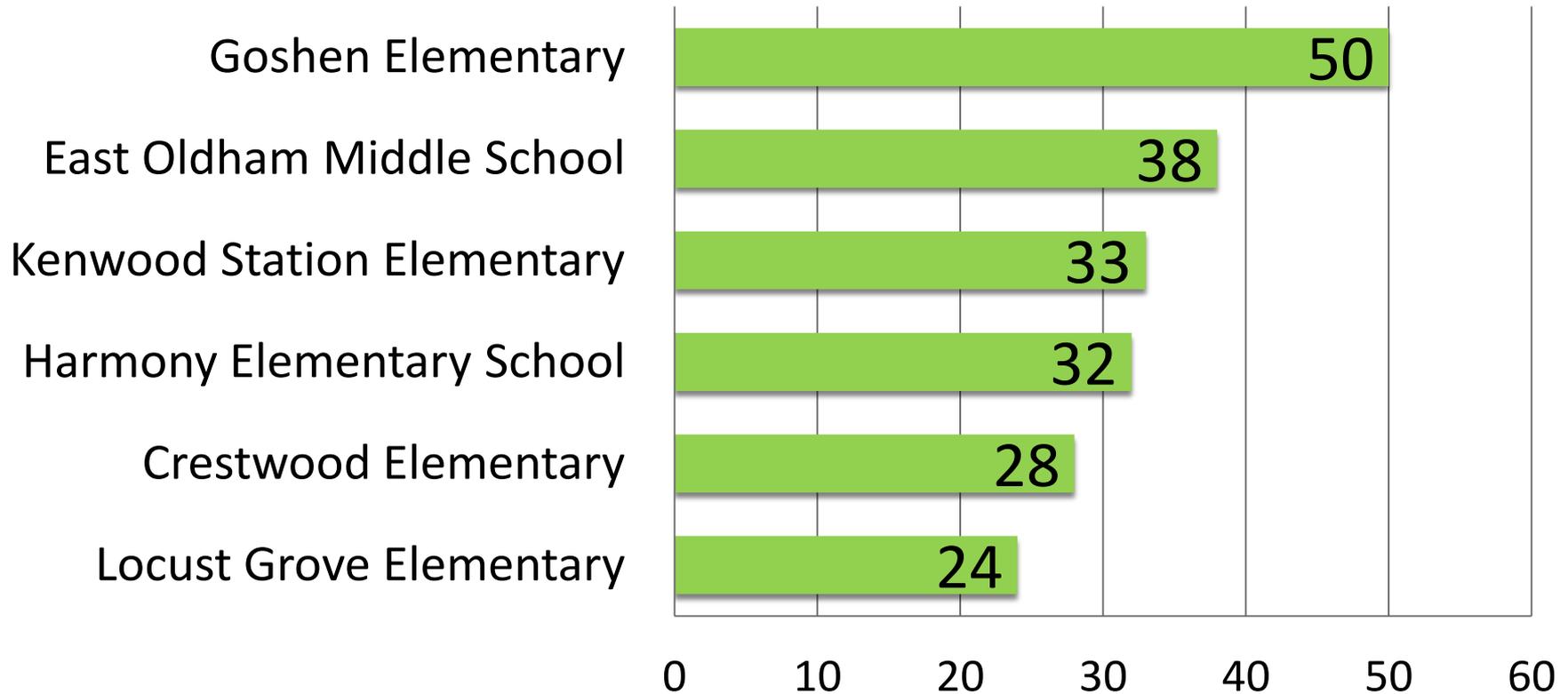
- ❖ HVAC Temperature Controls
- ❖ Dedicated Fresh Air Utilizing Energy Recovery Wheel
- ❖ Filter Changes/Filter Boxes
- ❖ Kitchen Hood Design Changes
- ❖ Water Usage (electronic flushers, faucets)

Electrical Features

- ❖ Automated Lighting Controls
- ❖ Occupancy Sensors
- ❖ Reduction in lighting densities (watts/sqft)
- ❖ LED Site Lighting
- ❖ Electric Demand Control

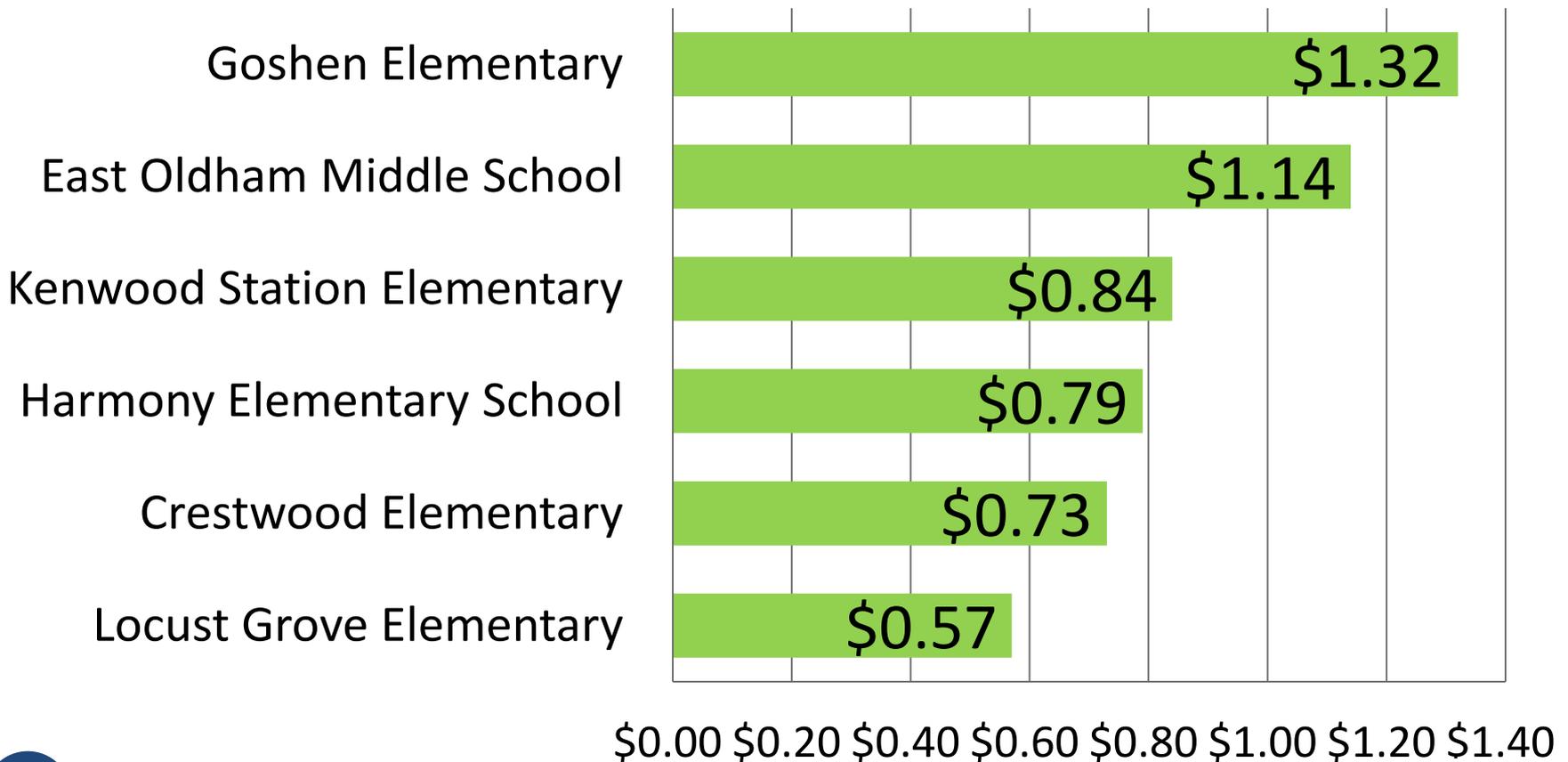
FY2011 Energy Use Data

FY2011 kBtu/SqFt



FY2011 Energy Cost Data

FY2011 Total Energy Cost /SqFt

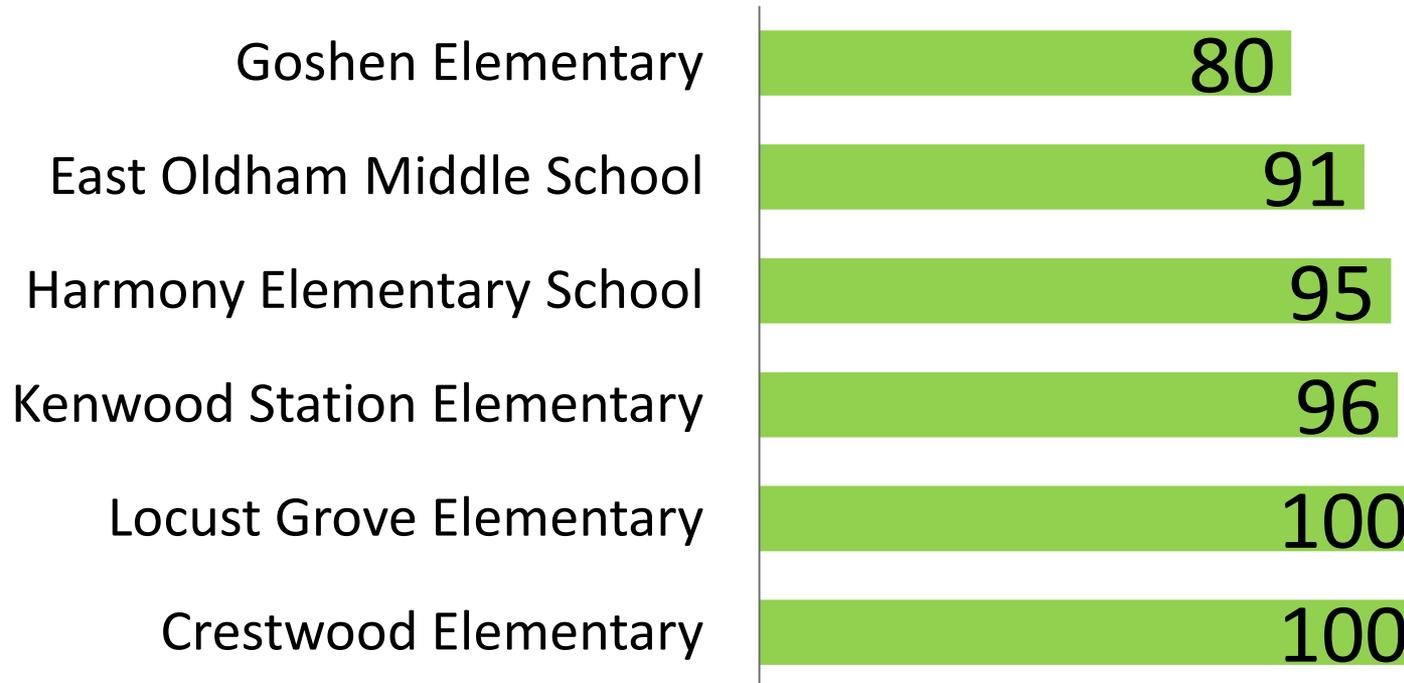


Energy Management/Building Operations

- ❖ Energy Policy: Clear Expectations
- ❖ Monitoring usage and costs
- ❖ Rate analysis
- ❖ Building Scheduling
 - ❖ Web-based, dedicated personnel to DDC
- ❖ Energy education/Behavior changing programs
- ❖ Shut down procedures for school breaks
- ❖ Compact Fluorescent Light (CFL)

Current Energy Star Rating

Energy Star Rating FY2011 energystar.gov portfolio manager



Cost Savings

- ❖ If the district continued building all schools like the Generation #1 Goshen @ Hillcrest model, the district would have spent \$638,000 per year on energy
 - ❖ *Based on Goshen Elementary energy costs of \$1.32/sf * total square feet of six newest buildings in district - 485,116 sf*
- ❖ Since the district has improved the building envelope, MEP systems and facility operations, energy costs was only \$434,000 per year
 - ❖ *Average \$.90/sf combined*

Energy Savings of \$204,000 per year!

Leadership



Oldham County Board of Education

Guidance



Paul Upchurch, Superintendent

Team Work



Design Team Partners

- ❖ CMTA, Inc.
- ❖ K. Norman Berry Associates Architects, PLLC
- ❖ McCulloch Associates Architects
- ❖ Scott/Klausing & Company



“IT’S ALL ABOUT THE KIDS”