Exhibit M

BALTIMORE COUNTY PUBLIC SCHOOLS

DATE: October 11, 2011

TO: **BOARD OF EDUCATION**

FROM: Dr. Joe A. Hairston, Superintendent

SUBJECT: **REPORT ON BALTIMORE COUNTY PUBLIC SCHOOLS' ROOFING PROGRAM**

ORIGINATOR: Dr. Renee A. Foose, Deputy Superintendent

RESOURCE PERSON (S): Michael Sines, Executive Director, Department of Physical Facilities

INFORMATION

That the Board of Education receives the report on roofing programs in Baltimore County Public Schools (BCPS).

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Attachment I – Executive Summary
Attachment II – PowerPoint Presentation

BCPS Roofing Program

Executive Summary

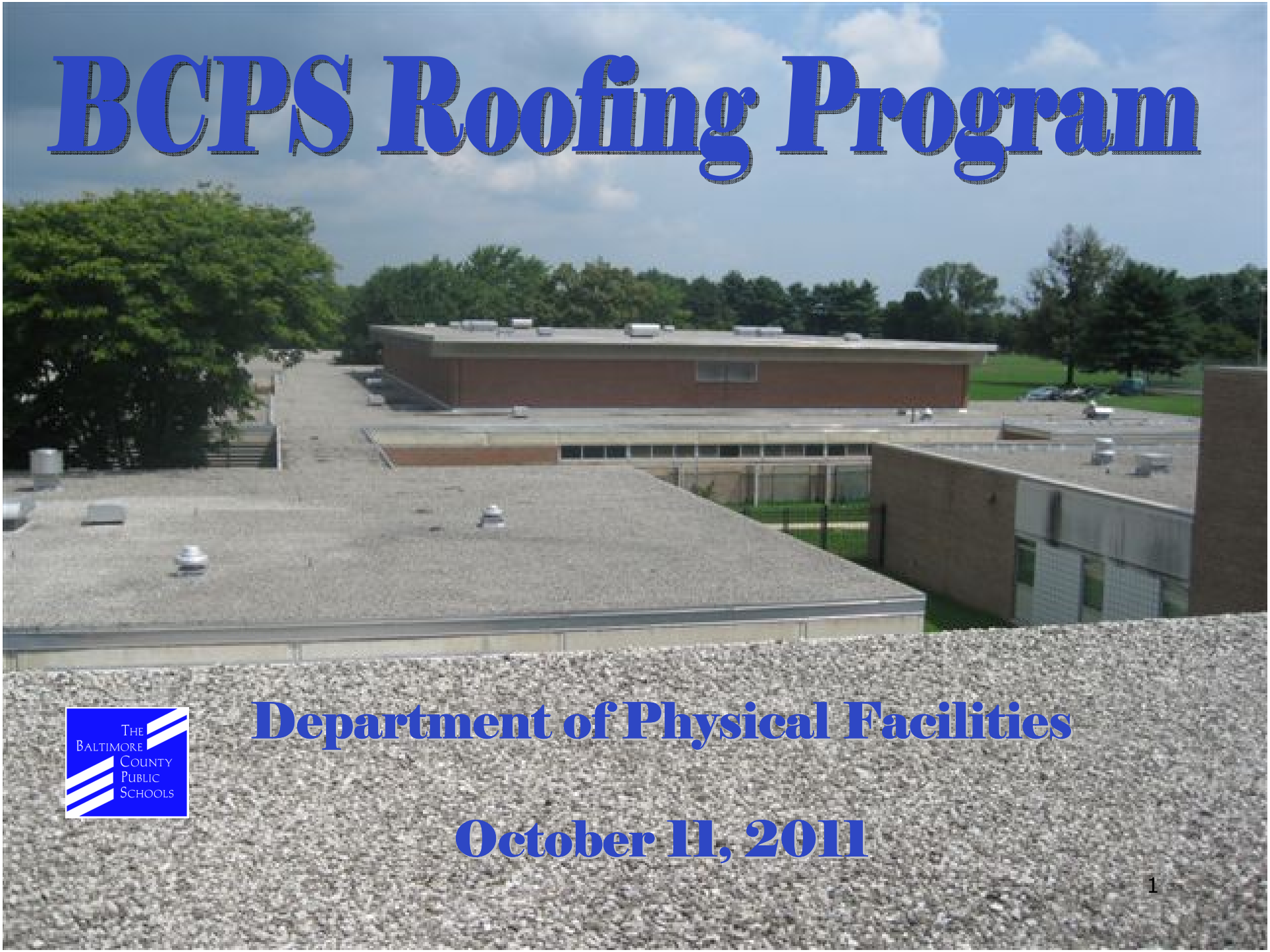
School building roofs are maintained and replaced through a comprehensive program that includes semi-annual roof inspections, maintenance repair, and Capital program systemic renovations for roof replacement. Each year the office of engineering and construction selects eight school roofs on average for Capital budget requests to achieve a 20 year replacement cycle for all school buildings.

The report includes the details on the types of roofing systems that are being used on existing and new roofs. The evaluation of roofing type for a 20-year life is explained to include a comparison of built-up, ethylene propylene diene monomer (EPDM) membrane, metal, and shingle roofs. An overview of the roof maintenance program describes the capability of the department of physical facilities to sustain a watertight roofing system for all schools.

Data is presented to review the overall budget for both roof replacement and other renovations to the roofing system such as new roof drains, masonry repair, access ladders, mechanical system repair, and other factors. A breakdown of the BCPS roofing system cost includes details of all the budget costs for the comprehensive roofing program that BCPS has had in place for decades.

Procurement of roof replacements is described including design/build, design/bid, and intergovernmental cooperative purchasing agreements. The utilization of cooperative purchasing over the past five years has accrued benefits to the BCPS roofing program.

BCPS Roofing Program

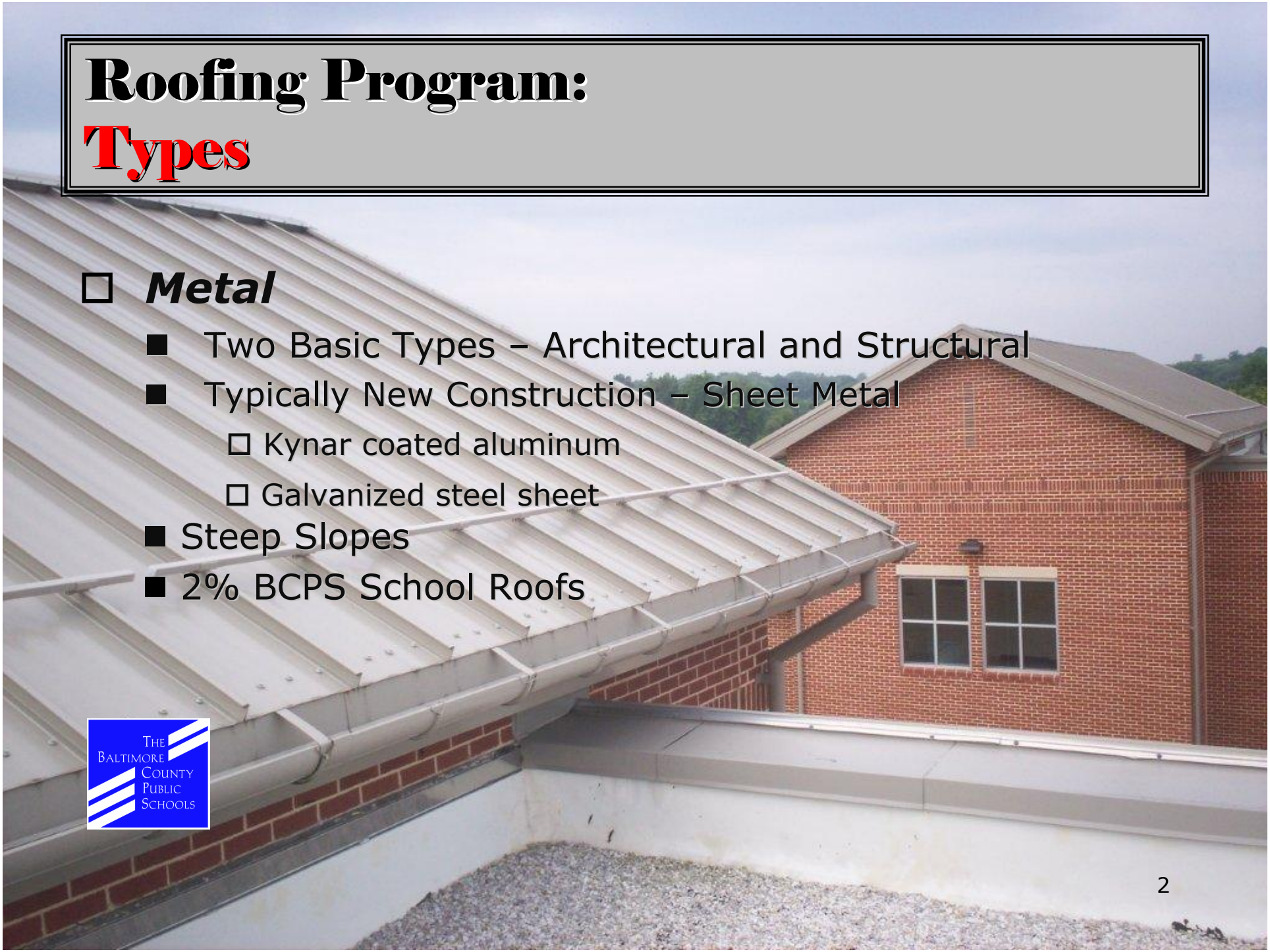


Department of Physical Facilities

October 11, 2011

Roofing Program:
Types

- ***Metal***
  - Two Basic Types – Architectural and Structural
  - Typically New Construction – Sheet Metal
    - Kynar coated aluminum
    - Galvanized steel sheet
  - Steep Slopes
  - 2% BCPS School Roofs



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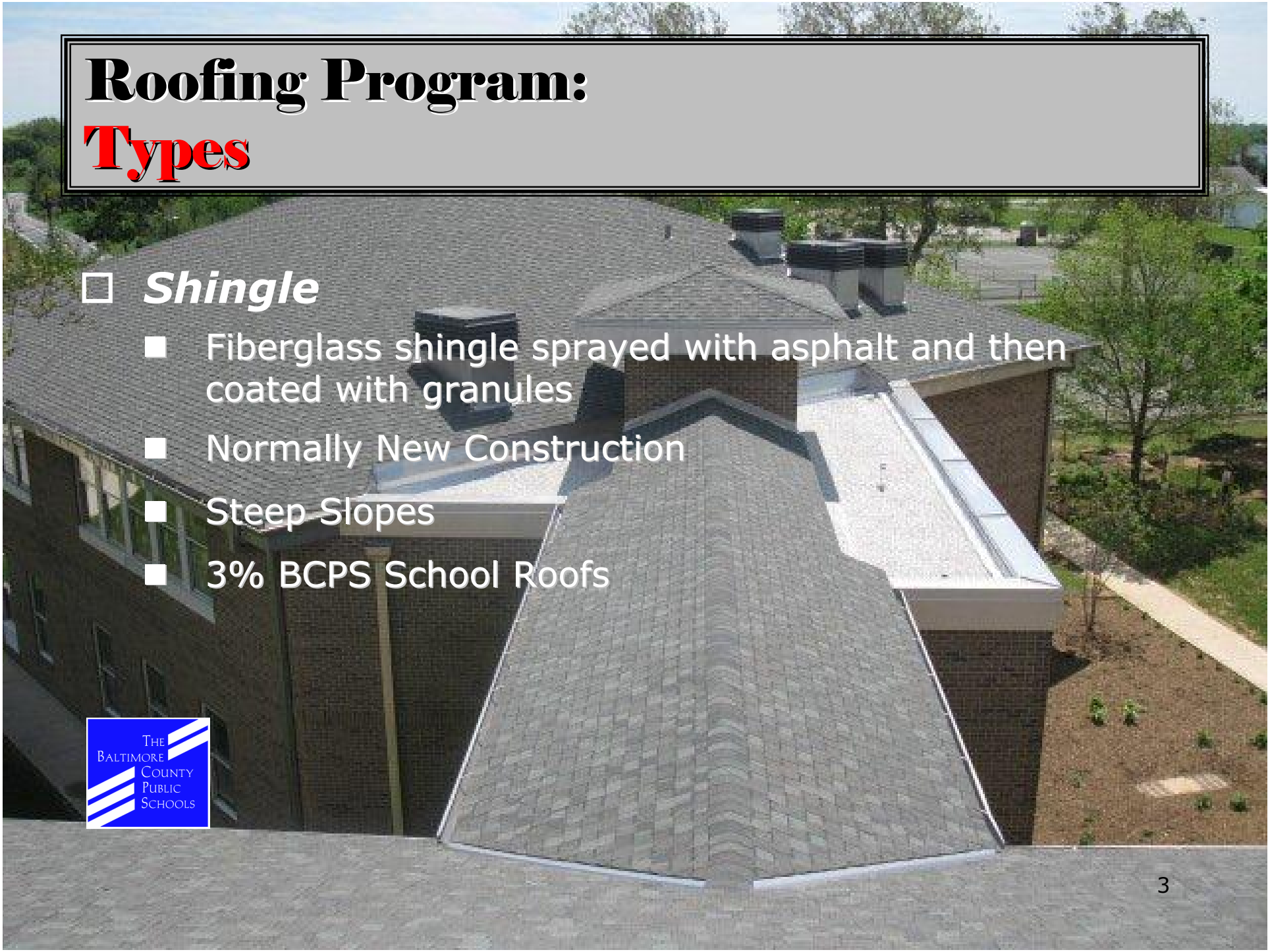
Roofing Program:
Types

- ***Shingle***
  - Fiberglass shingle sprayed with asphalt and then coated with granules
  - Normally New Construction
  - Steep Slopes
  - 3% BCPS School Roofs



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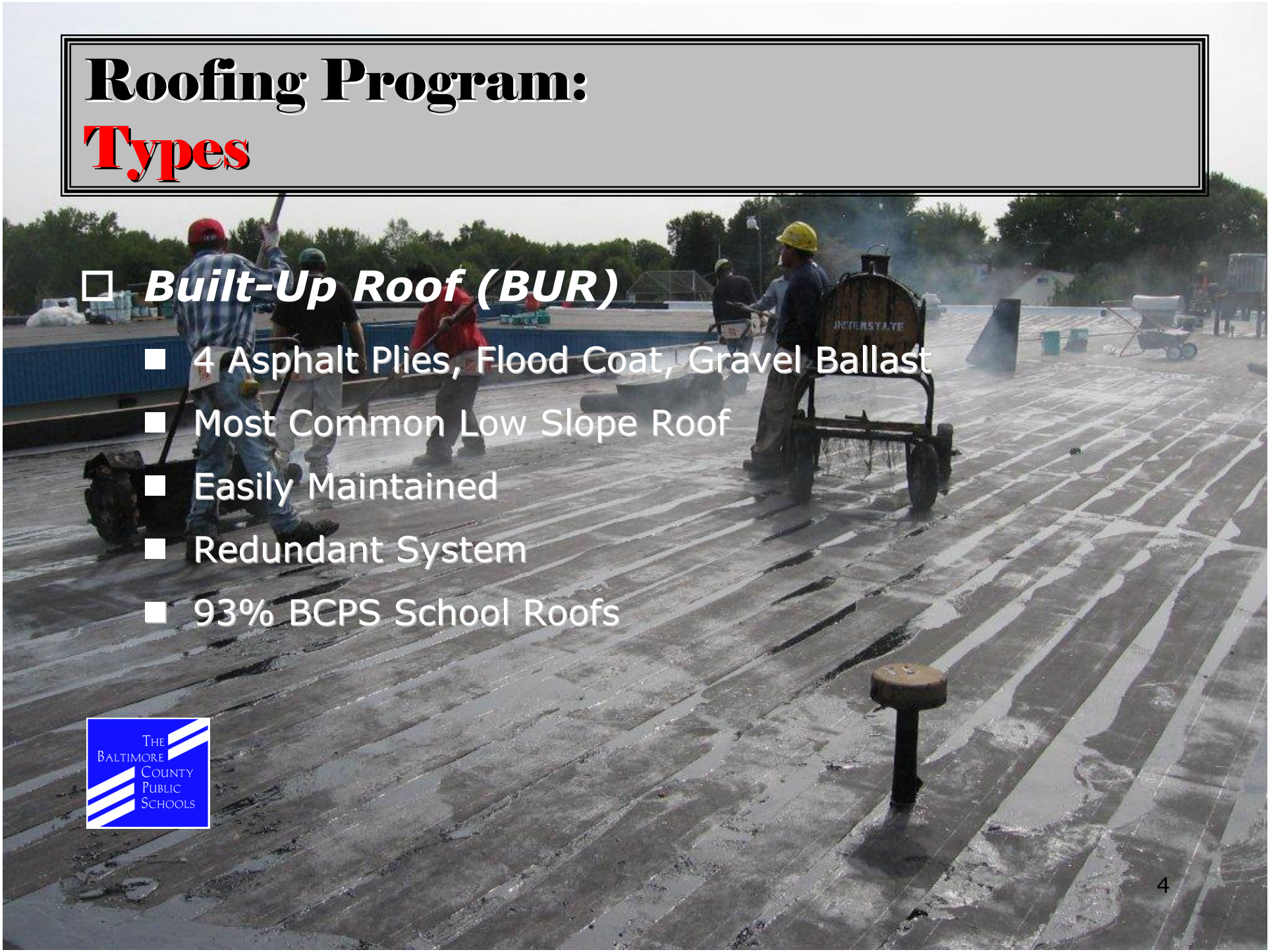
Roofing Program:
Types

- ***Built-Up Roof (BUR)***
  - 4 Asphalt Plies, Flood Coat, Gravel Ballast
  - Most Common Low Slope Roof
  - Easily Maintained
  - Redundant System
  - 93% BCPS School Roofs



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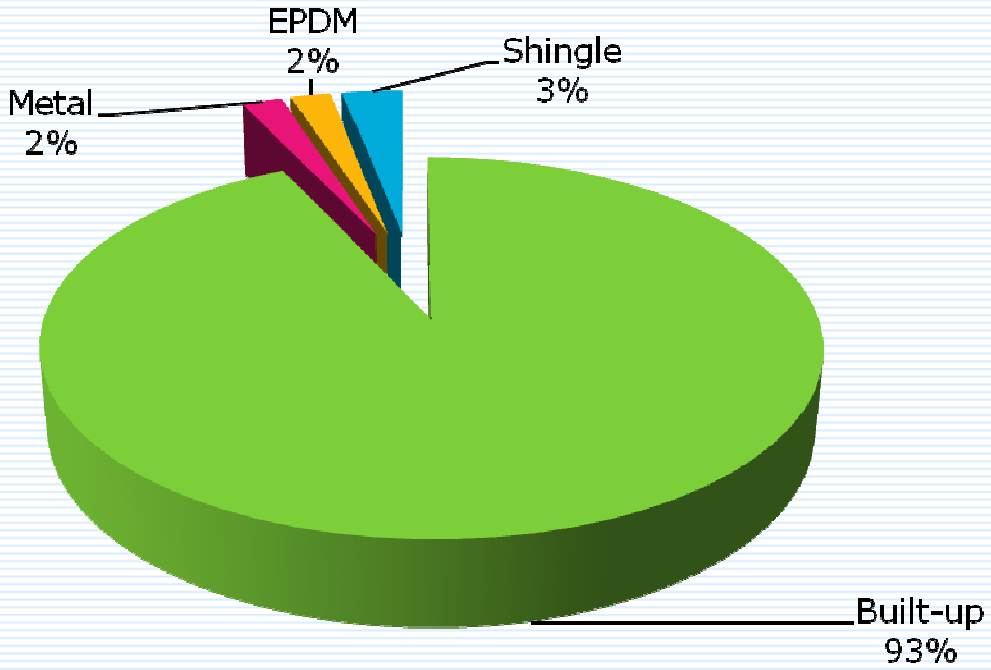
Roofing Program:
Types

- ***EPDM (Ethylene Propylene Diene Monomer or Rubber)***
  - Single large sheets of synthetic rubber with seams held in place with glue, tape or welding
  - Lowest Life Expectancy
  - Water shedding system, not recommended for heavy foot traffic
  - 2% BCPS School Roofs

Roofing Program:
Types

Roof Types: Percentage Used



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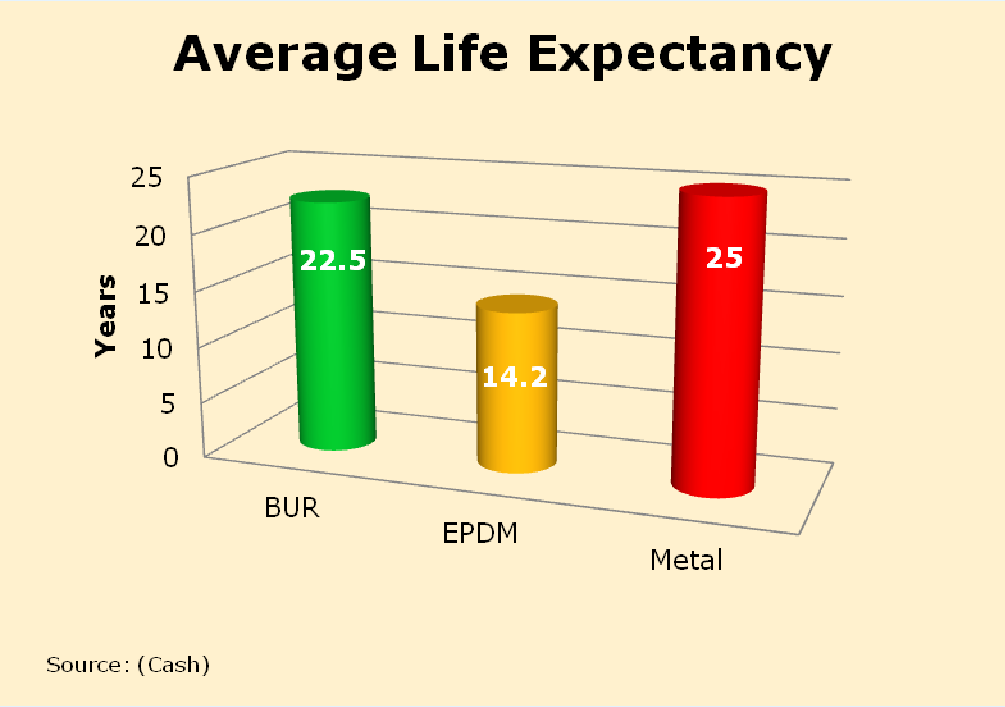
Roofing Program: Selection

- ***Life Cycle Costing***



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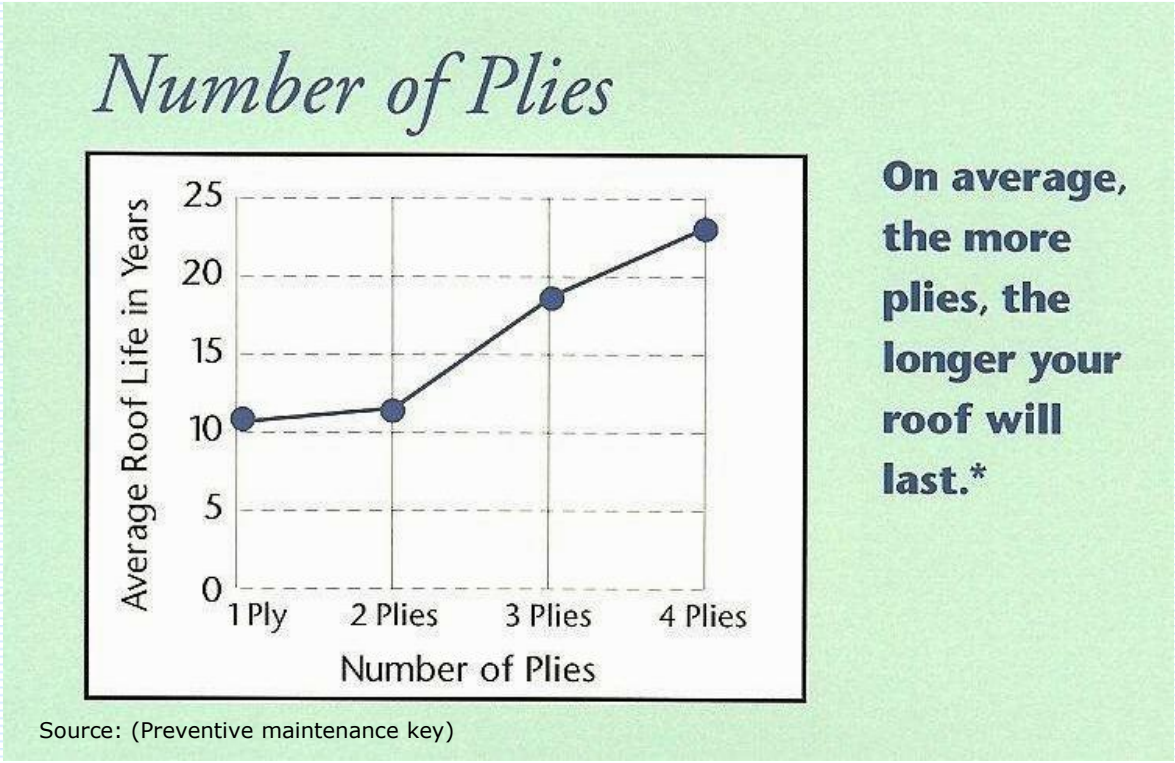
Roofing Program: Selection

- ***Life Cycle Costing***



Source: (Preventive maintenance key)

Roofing Program:
Maintenance

- ***BCPS staff and contract capabilities***
  - ***Roof inspection*** **- each school system must inspect their school roofs twice annually per the Guidelines for Maintenance of Public School Facilities in Maryland, Interagency Committee on School Construction**
  - **Maintenance and repair**
    - **Six BCPS mechanics address work orders and emergency repairs.**
    - **On-Call Contractors**

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Roofing Program:
Maintenance

- ***Other Considerations***
  - **Accessibility to the roof**

Roofing Program:
Maintenance

- ***Other Considerations***
  - **Accessibility to the roof**

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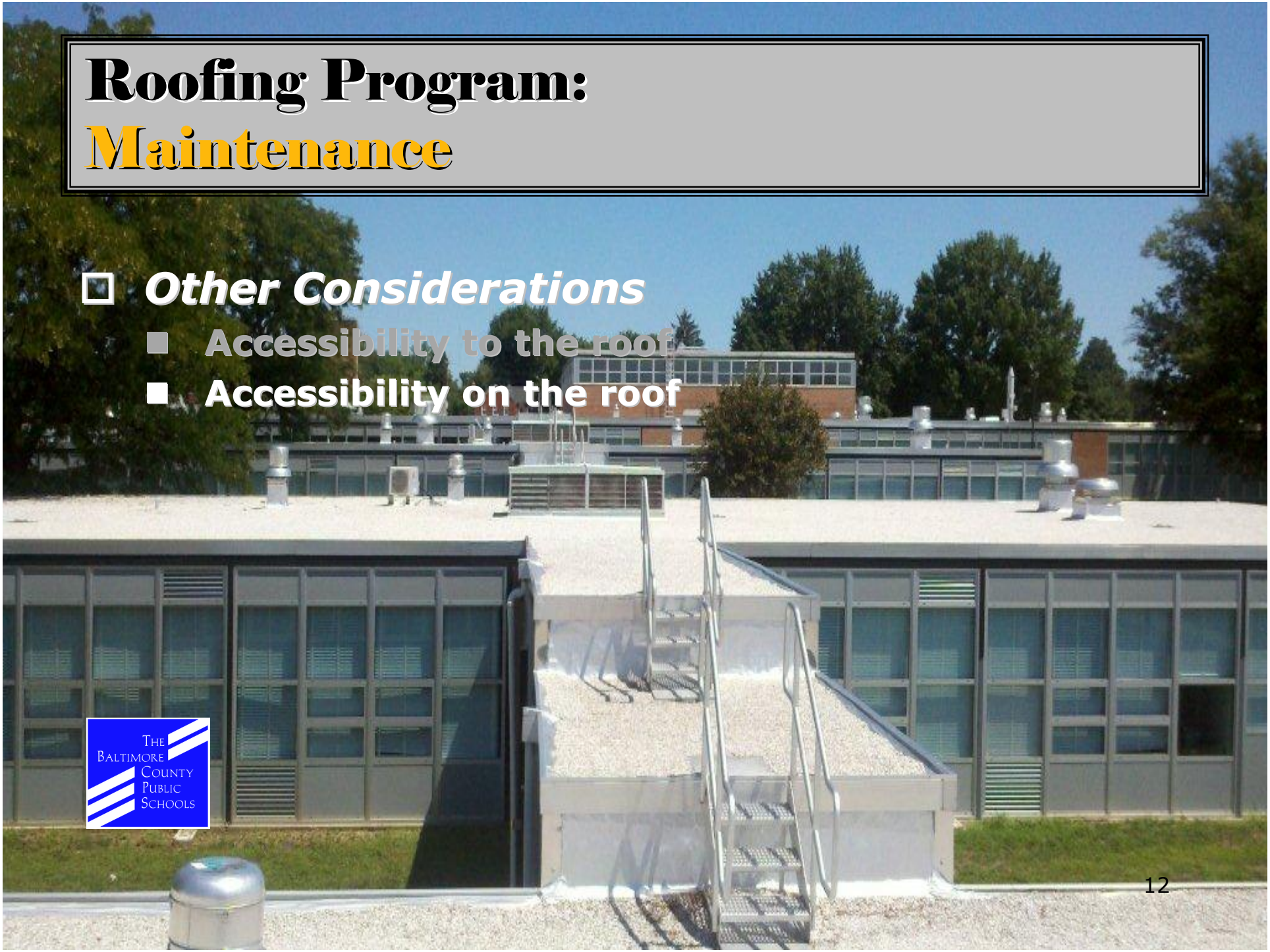
Roofing Program:
Maintenance

- *Other Considerations*
  - Accessibility to the roof
  - Accessibility on the roof



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Roofing Program:
Maintenance

- ***Other Considerations***
  - Accessibility to the roof
  - Accessibility on the roof
  - **Roof-top equipment**

Before Improvement

Roofing Program:
Maintenance

- ***Other Considerations***
  - Accessibility to the roof
  - Accessibility on the roof
  - **Roof-top equipment**

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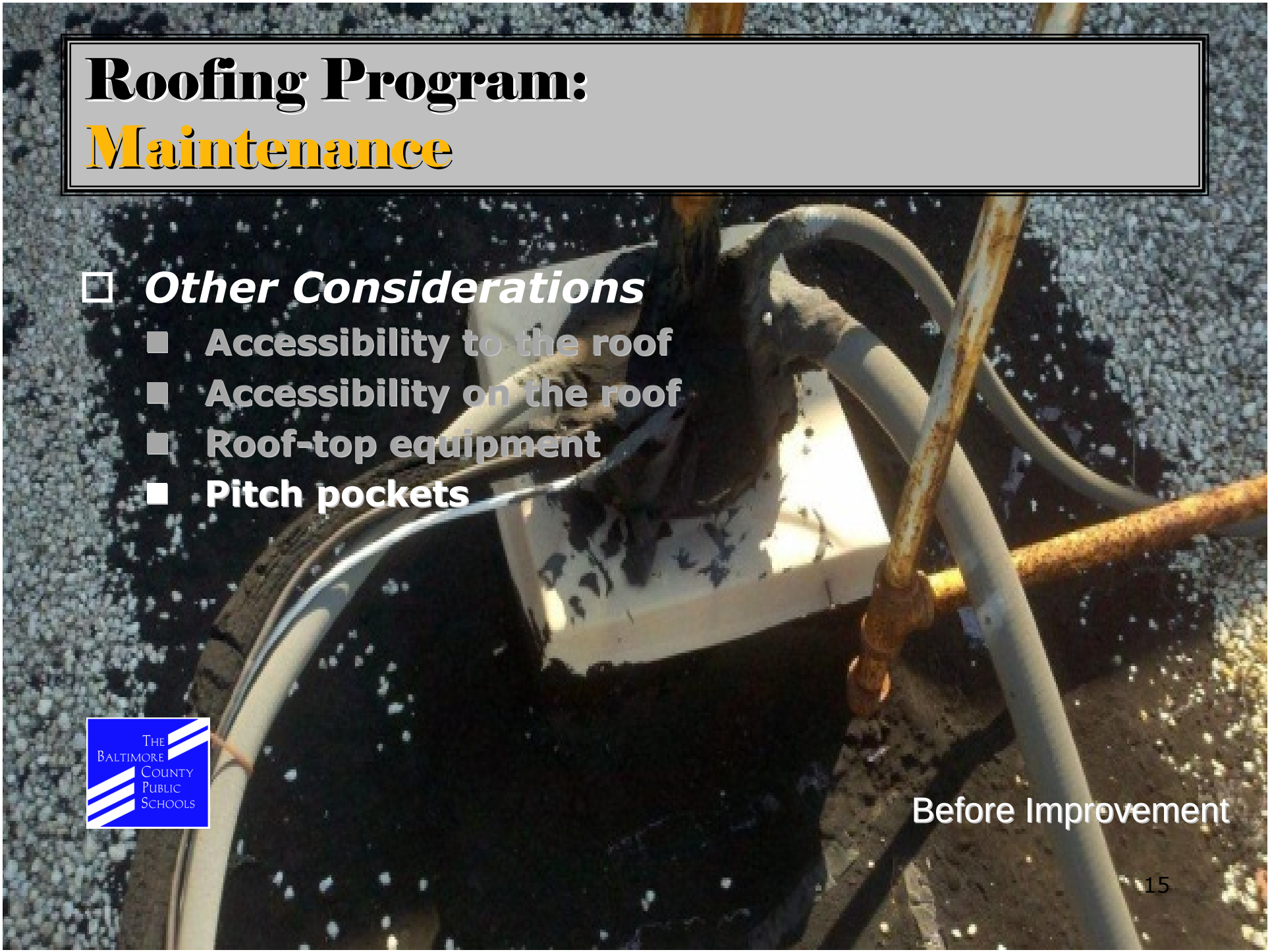
After Improvement

Roofing Program:
Maintenance

- *Other Considerations*
  - Accessibility to the roof
  - Accessibility on the roof
  - Roof-top equipment
  - Pitch pockets



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Before Improvement

Roofing Program:
Maintenance

- ***Other Considerations***
  - Accessibility to the roof
  - Accessibility on the roof
  - Roof-top equipment
  - **Pitch pockets**

After Improvement

Roofing Program:
Maintenance

- ***Other Considerations***
  - Accessibility to the roof
  - Accessibility on the roof
  - Roof-top equipment
  - Pitch pockets
  - Lifts/conveyors

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Roofing Program:
Maintenance

- *Other Considerations*
  - Accessibility to the roof
  - Accessibility on the roof
  - Roof-top equipment
  - Pitch pockets
  - Lifts/conveyors
  - Weather conditions
    - Snow load - 30 PSF Design Live Load

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Roofing Program:
Maintenance

- *Other Considerations*
  - Accessibility to the roof
  - Accessibility on the roof
  - Roof-top equipment
  - Pitch pockets
  - Lifts/conveyors
  - Weather conditions
    - Snow load - 30 PSF Design Live Load

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Roofing Program:
Maintenance

- *Other Considerations*
  - Accessibility to the roof
  - Accessibility on the roof
  - Roof-top equipment
  - Pitch pockets
  - Lifts/conveyors
  - Weather conditions
    - Snow load - 30 PSF Design Live Load
    - Blister(s)

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Roofing Program:
Maintenance

- *Other Considerations*
  - Accessibility to the roof
  - Access facility on the roof
  - Roof-top equipment
  - Pitch pockets
  - Lifts/conveyors
  - Weather conditions
    - Snow load - 30 PSF Design Live Load
    - Blister(s)
    - Drain(s)

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Roofing Program:
Maintenance

- *Other Considerations*
  - Accessibility to the roof
  - Accessibility on the roof
  - Roof-top equipment
  - Pitch pockets
  - Lifts/conveyors
  - **Weather conditions**
    - Snow load - 30 PSF Design Live Load
    - Blister(s)
    - Drain(s)
    - Wind Shear

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Roofing Program:
Life Safety & Health

- ***Safety Precautions***
  - Trip/Slip
  - Roof failures
    - Membrane deterioration
    - Total collapse

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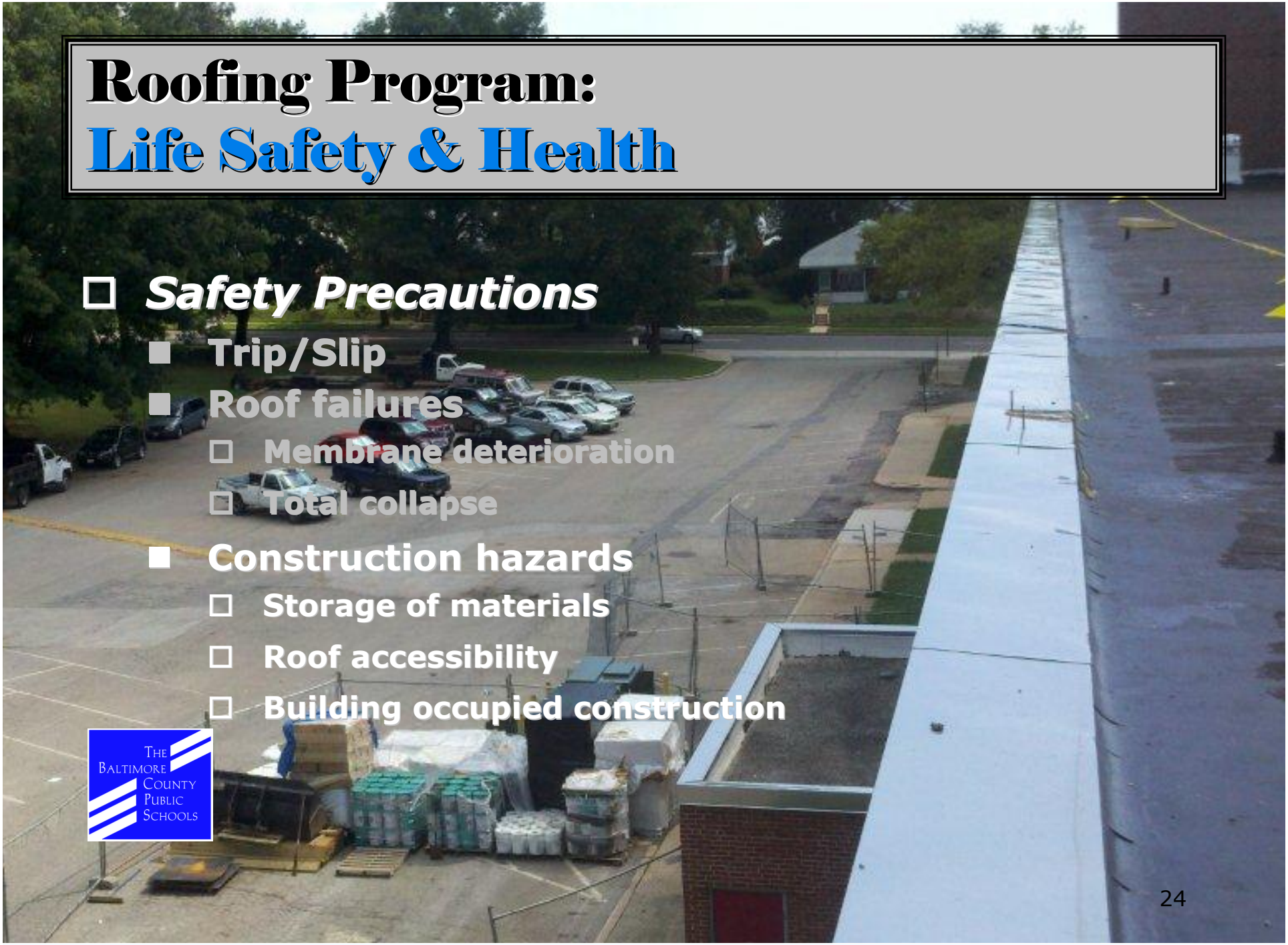
Roofing Program:
Life Safety & Health



- ***Safety Precautions***
  - **Trip/Slip**
  - **Roof failures**
    - **Membrane deterioration**
    - **Total collapse**
  - **Construction hazards**
    - **Storage of materials**
    - **Roof accessibility**
    - **Building occupied construction**

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Roofing Program:
Life Safety & Health

- ***Safety Precautions***
  - ***Impact on indoor environment quality***
    - **Mechanical systems**

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Roofing Program:
Life Safety & Health

- *Safety Precautions*
  - *Impact on indoor environment quality*
    - Mechanical systems
    - Hot versus cold applications

Roofing Program:
Life Safety & Health

- ***Safety Precautions***
  - ***Impact on indoor environment quality***
    - **Mechanical systems**
    - **Hot versus cold applications**
    - **Microbial contamination**

Roofing Program:
Special Conditions

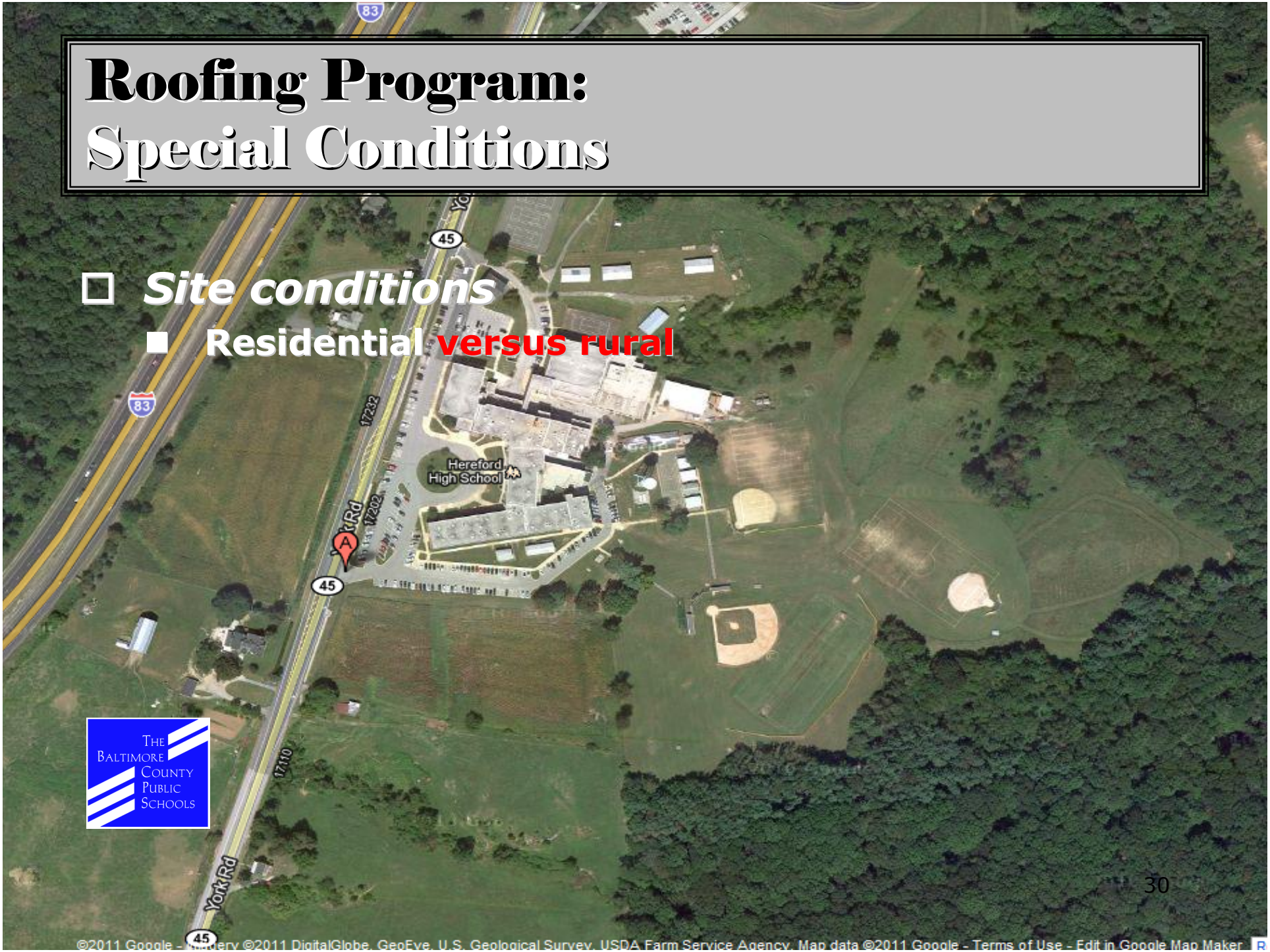
- ***Wage rates***
  - **Maryland Prevailing Wage Rates**
  - **Federal – Davis Bacon Wage Determination**

Roofing Program:
Special Conditions

- ***Site conditions***
  - **Residential**

Roofing Program:
Special Conditions

- ***Site conditions***
  - **Residential versus rural**



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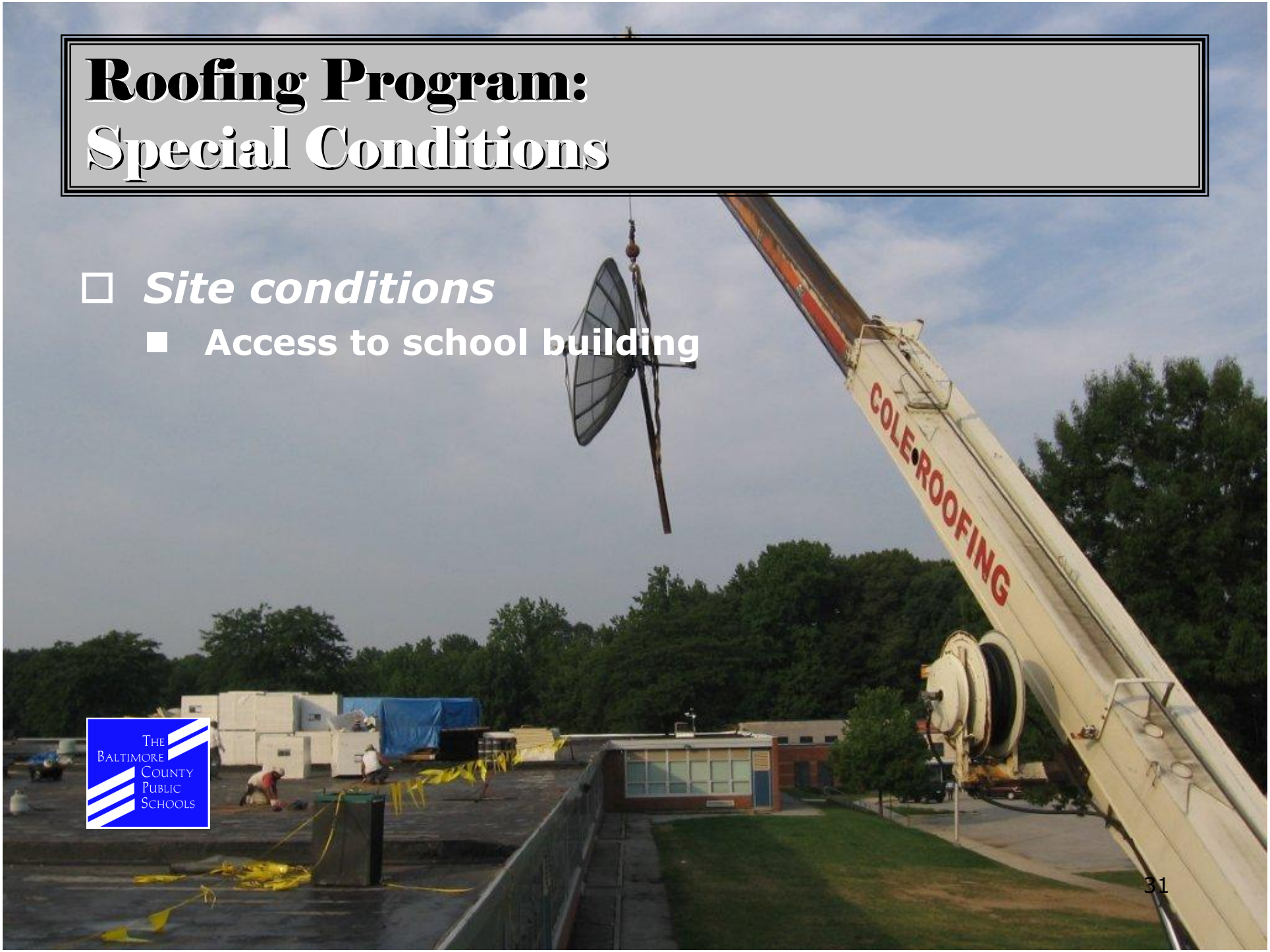
Roofing Program:
Special Conditions

- ***Site conditions***
  - **Access to school building**



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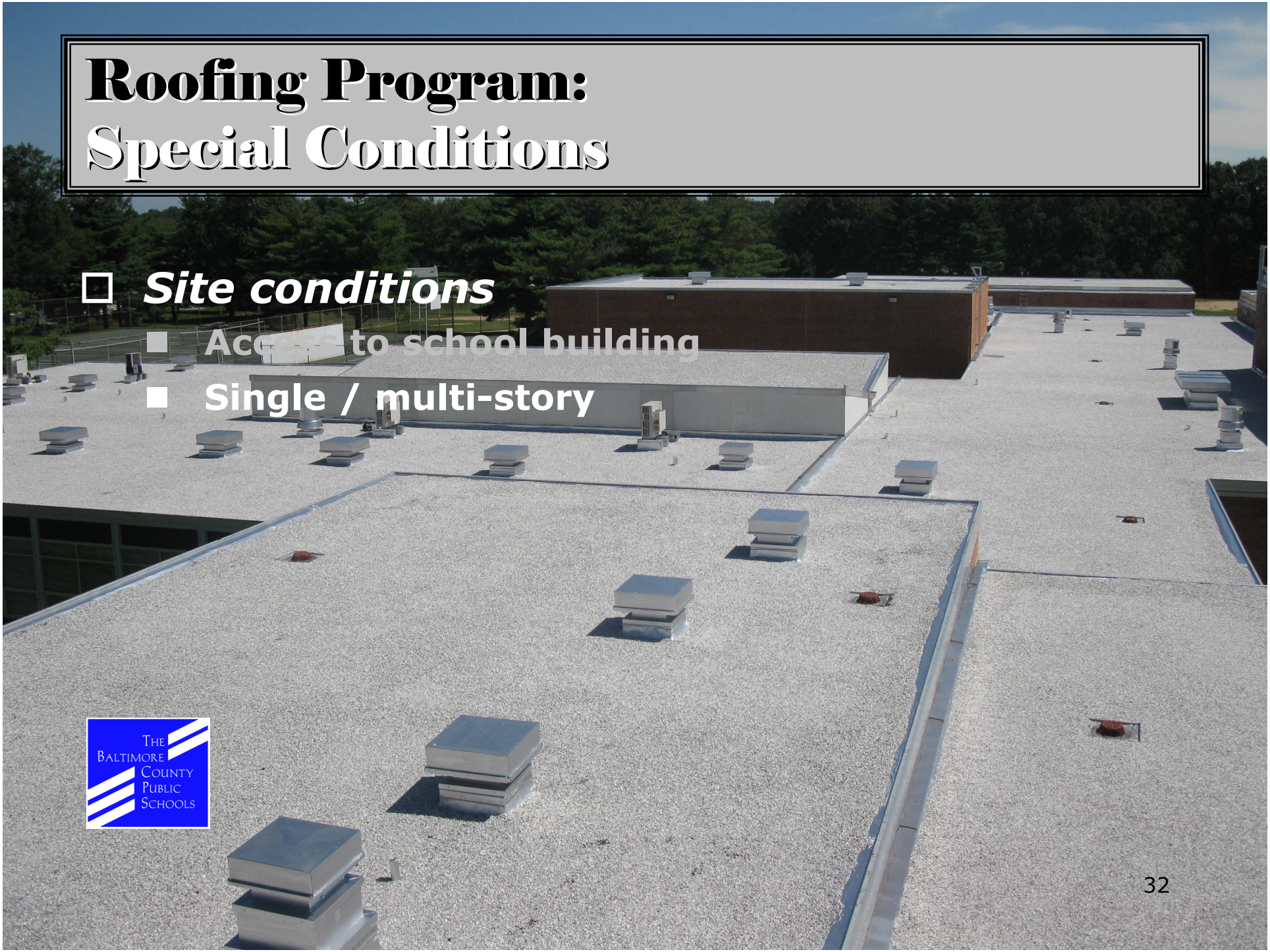
Roofing Program:
Special Conditions



- ***Site conditions***
  - Access to school building
  - Single / multi-story

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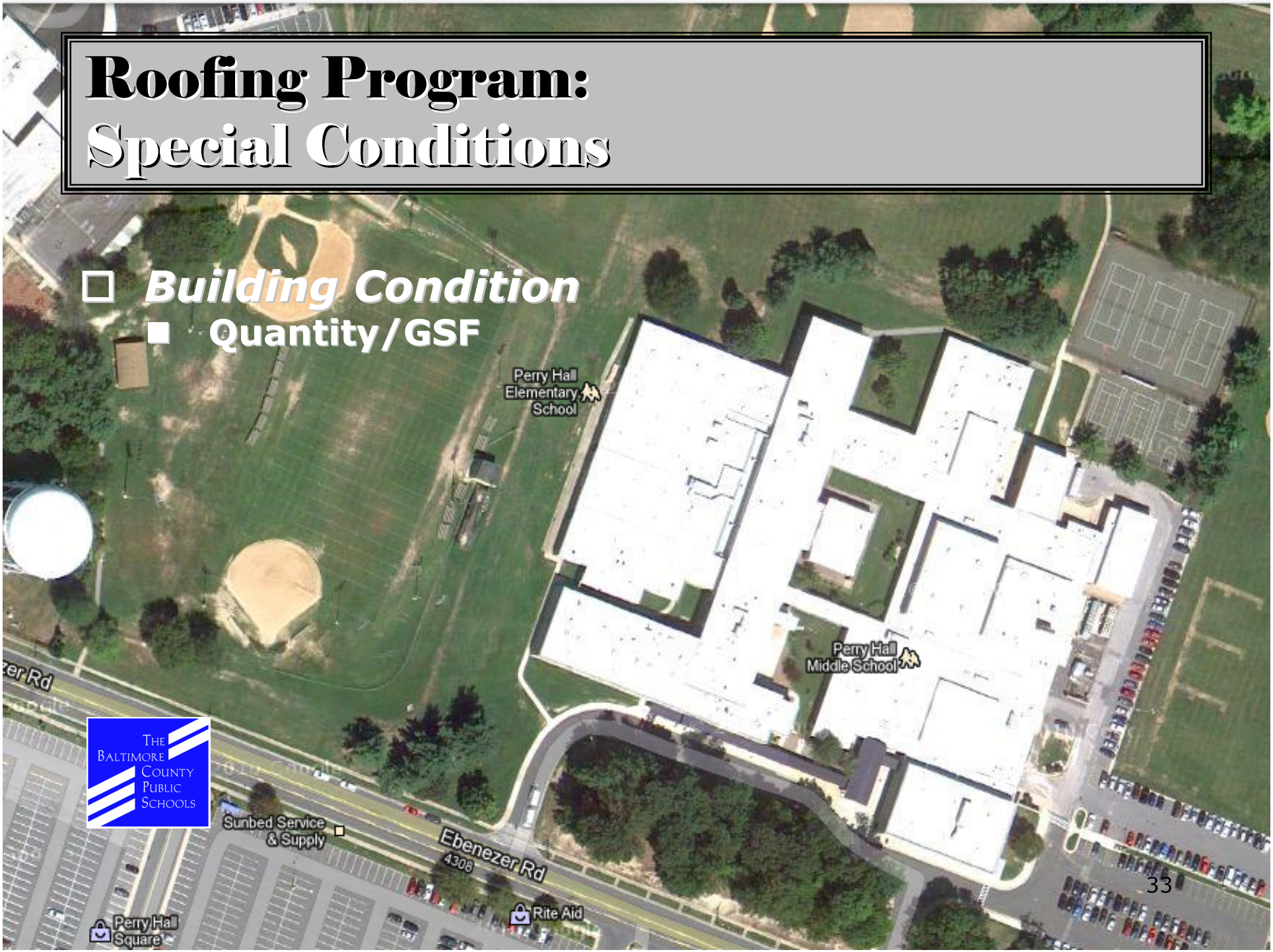
Roofing Program:
Special Conditions

- ***Building Condition***
  - **Quantity/GSF**



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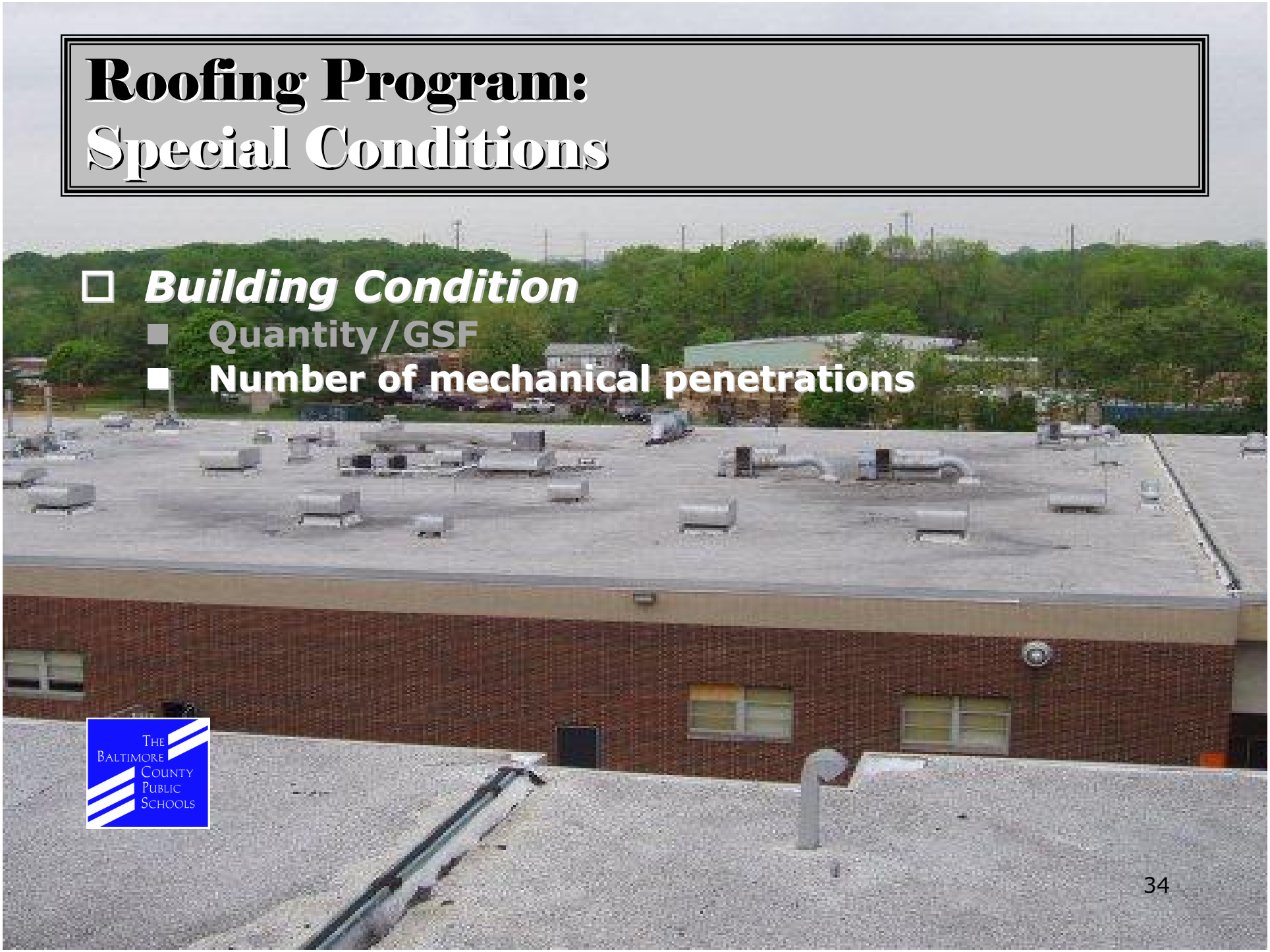

- ***Building Condition***
  - **Quantity/GSF**
  - **Number of mechanical penetrations**

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Roofing Program:
Special Conditions

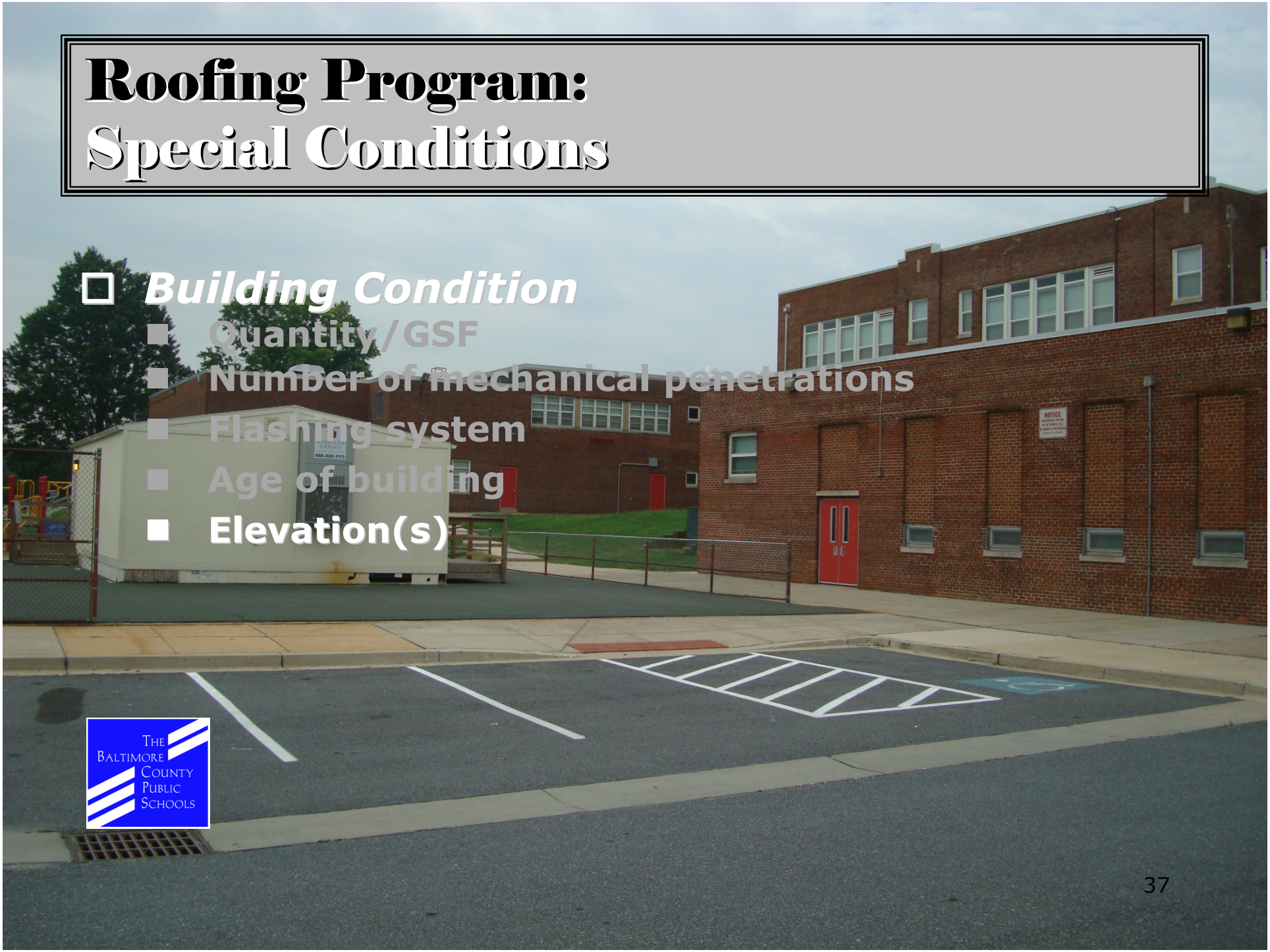
- ***Building Condition***
  - **Quantity/GSF**
  - **Number of mechanical penetrations**
  - **Flashing system**

Roofing Program:
Special Conditions

- ***Building Condition***
  - Quantity/GSF
  - Number of mechanical penetrations
  - Flashing system
  - **Age of building**

Roofing Program:
Special Conditions

- ***Building Condition***
  - Quantity / GSF
  - Number of mechanical penetrations
  - Flashing system
  - Age of building
  - Elevation(s)



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Roofing Program:
Special Conditions

- ***Building Condition***
  - Quantity/GSF
  - Number of mechanical penetrations
  - Flashing system
  - Age of building
  - Elevation(s)
  - Fascia systems

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Roofing Program:
Special Conditions

- ***Building Condition***
  - Quantity/GSF
  - Number of mechanical penetrations
  - Flashing system
  - Age of building
  - Elevation(s)
  - Fascia systems
  - **Masonry**

Roofing Program:
Special Conditions

- ***Building Condition***
  - Quantity/GSF
  - Number of mechanical penetrations
  - Flashing system
  - Age of building
  - Elevation(s)
  - Fascia systems
  - Masonry
  - **BUR – Number of Plies**
  - **Metal – Gauges**
  - **Shingle - Architectural**

Roofing Program:
Data

- ***BCPS Total Roof Area 13,027,957 GSF***
- ***BCPS Cyclic replacement – 20 year life***

Roofing Program:
Data

- ***Average Cost Comparison to other LEAs****
  - **Baltimore City - $31.06**
  - **Baltimore County - $23.28**
  - **Prince George's County - $20.53**
  - **Frederick County - $14.95**
  - **Montgomery County - $14.27**

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* **costs are per square foot based on data from IAC/PSCP budget requests for FY 2012**

Roofing Program:
Data

- ***Breakdown of BCPS Costs for Roofing and Extra Work Bid in 2011 from FY 2012 CIP***

School	*Lutherville Lab*	*Westowne Elementary*
Building Age (yrs)	60	60
Contract Amount	$1,314,863.00	$1,307.312.00
Total Area (sf)	55,034	59,700
Estimated Budget ($/sf)	$25.00	$25.03
BUR Cost ($/sf)	$17.78	$15.74
Other Costs ($/sf)	$6.11	$6.15
TOTAL (Actual $/sf)	**$23.89**	**$21.89**

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Other Costs are in a range that includes ladders, masonry repair, plumbing, mechanical, and electrical work, full time inspection, metal panels, restrictive work hours, etc.

Roofing Program:
Procurement

- ***Design/Build is a project delivery method in which a single entity is contractually responsible for both design and construction of a project.***

Roofing Program:
Procurement

- ***Design/Bid is a project delivery system which uses an individual design consultant or team to prepare the design and bidding documents that are then advertised to the construction industry. The construction contract is then awarded to the lowest qualified bidder.***

Roofing Program:
Procurement

- ***Cooperative Procurement is a project delivery method that allows State agencies in Maryland to obtain products and services that were competitively bid by other federal, state, county, municipal entities and alliances of governmental agencies. EG) GSA Schedule, State contracts, service contracts. (COMAR 21.05.09)***

Roofing Program:
Procurement

- ***Advantages of Cooperative Procurement***
  - **Risk to BCPS is reduced.**
  - **Project schedule is shortened by pre-established bid process.**
  - **Pricing is stabilized for 3 year period from multi-state competitive bid process.**
- **20 year NDL Warranty for the total roof system**
  - **Cooperative procurement results in an efficient and effective watertight building envelope.**
  - **Comports with Goals 4 & 8 – *Blueprint for Progress***

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Roofing Program:
Presentation

Questions