Civil & Structural Engineers, Inc.

Birmingham – Atlanta – Huntsville

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Hewitt-Trussville High School Project Team

Owner:	Trussville City Schools
Architect:	Davis Architects, Inc.
General Contractor:	Doster Construction Company
Site work Contractor:	CA Murren
Landscape Architect:	Robert Marvin/Howell Beach & Associates
Civil Engineer:	LBYD, Inc.
Structural Engineer:	LBYD, Inc.
Electrical Engineer:	Jackson Renfro
Plumbing/Mechanical Engineer:	Edmonds Engineering
Geotechnical Engineer:	BHATE Geosciences, Inc.

LOW IMPACT DEVELOPMENT
SITE PLANNING SECTION OBJECTIVES

- Research Existing Land Use Regulations
- Identify Development Parameters
- Minimize Building Footprint
- Consider Site Topography & Hydrology
- Develop Preliminary Site Plan

"LEED® sustainable sites credits promote responsible, innovative, and practical site design strategies that are sensitive to plants, wildlife, and water and air quality which will mitigate some of the negative effects buildings have on the local and regional environment."

Taken from LEED 2009

Research Existing Land Use Regulations

Things to look for when reviewing a code related to LID principles:

- Parking Ratio, Parking Stall Sizes, Roadway Widths, Etc.
- Paving, Hardscape Material Types
- Buffers, Setbacks, Open Space and Tree Conservation
- Storm Water and Floodways
- Grading
- BMP's for Erosion Control
- Utilities

Identify Development Parameters

- Owners Vision
- Project Purpose – Who Are The Project Users?
- Municipality Requirements
- Additional Certifications

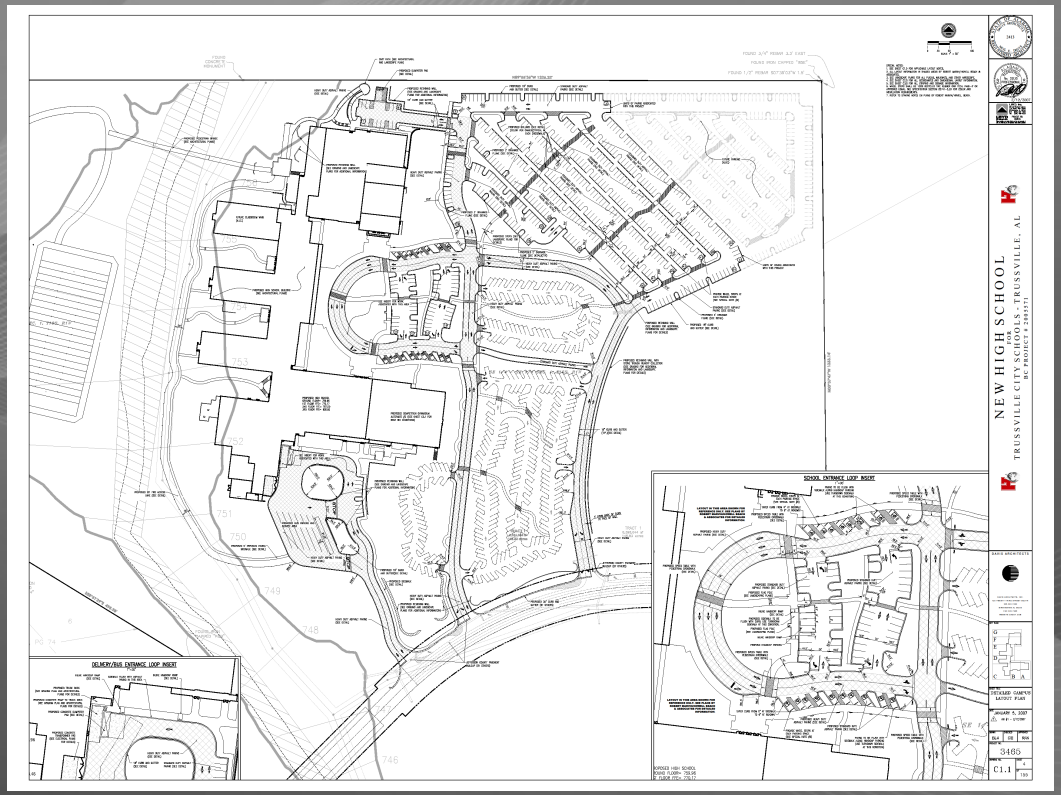
  (LEED®, Green Globes, SPiRit, etc.)
- Environmental Sensitivity

  Protect Waterways, Floodways, Forests, Drinking Water Sources, Limit Clearing and Land Disturbance

  Try to return the drainage back to the pre-development patterns and flow characteristics
- LID Heat Island Principals

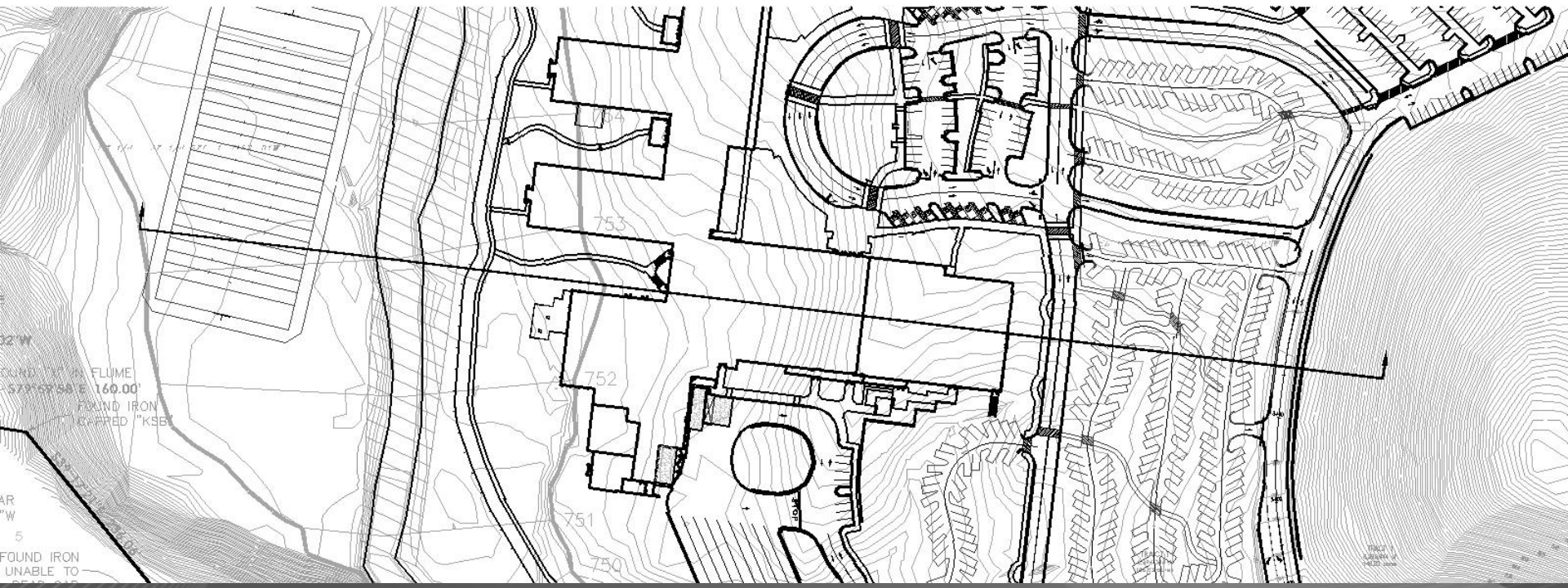
Develop Preliminary Site Plan

- Utilize development parameters to serve as a guide
- Determine critical site aspects that will drive the design
- Iterative process



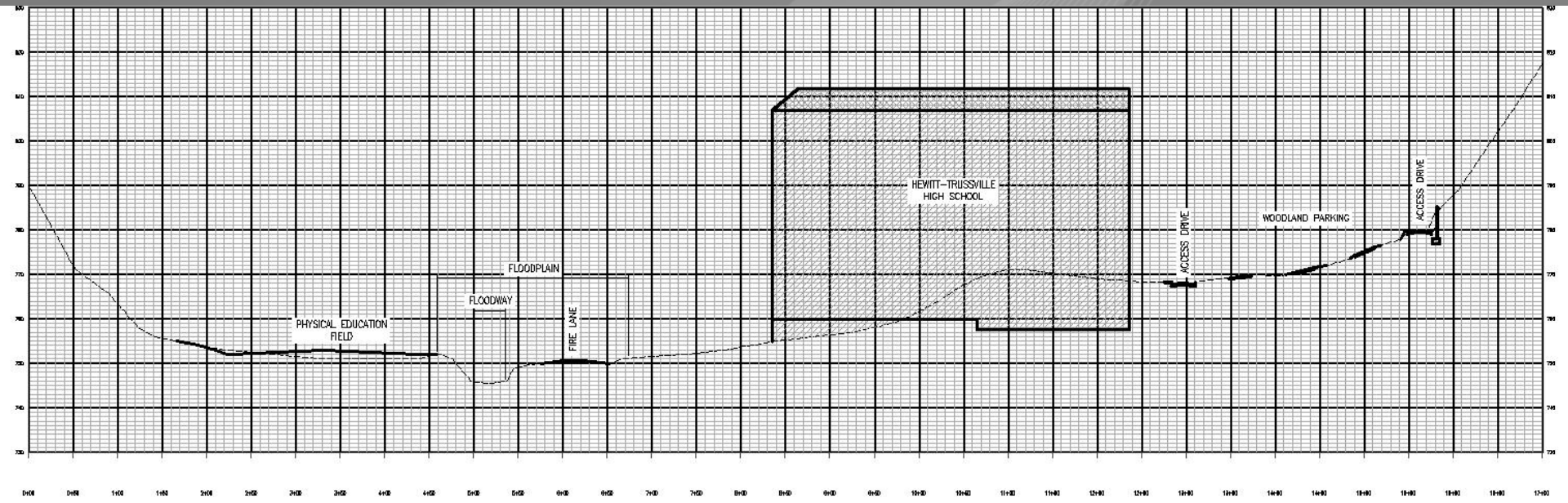
Develop Preliminary Site Plan

Plan View



Develop Preliminary Site Plan

Cross Section



Detailed Campus Layout Plan

Sustainable Design Considerations

Building placement and parking layouts were dictated by the proximity to the Cahaba River, by the existing tree canopy, and by the existing topography. Retaining walls and site layout were used to minimize land disturbance activities for tree preservation and erosion control purposes.

Sustainable Design Considerations

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Sustainable Design Considerations

Building placement was dictated by the existing tree canopy and the desire to preserve the natural environment to the greatest extent possible.

Sustainable Design Considerations

A portion of the Necessary parking was provided in Woodland parking areas.

These areas preserve the existing tree canopy to offset the heat island effect while allowing natural drainage of runoff from the teacher parking lot before entering the aboveground detention pond.

Sustainable Design Considerations

Site utilities and fire department access were routed in areas where disturbance was already occurring to minimize clearing and promote tree save areas.

Sustainable Design Considerations

Main Entrance to Campus During Site Grading Requiring Minimal Tree Disturbance

Sustainable Design Considerations

Main Entrance to Campus Showing Tree Preservation After Construction

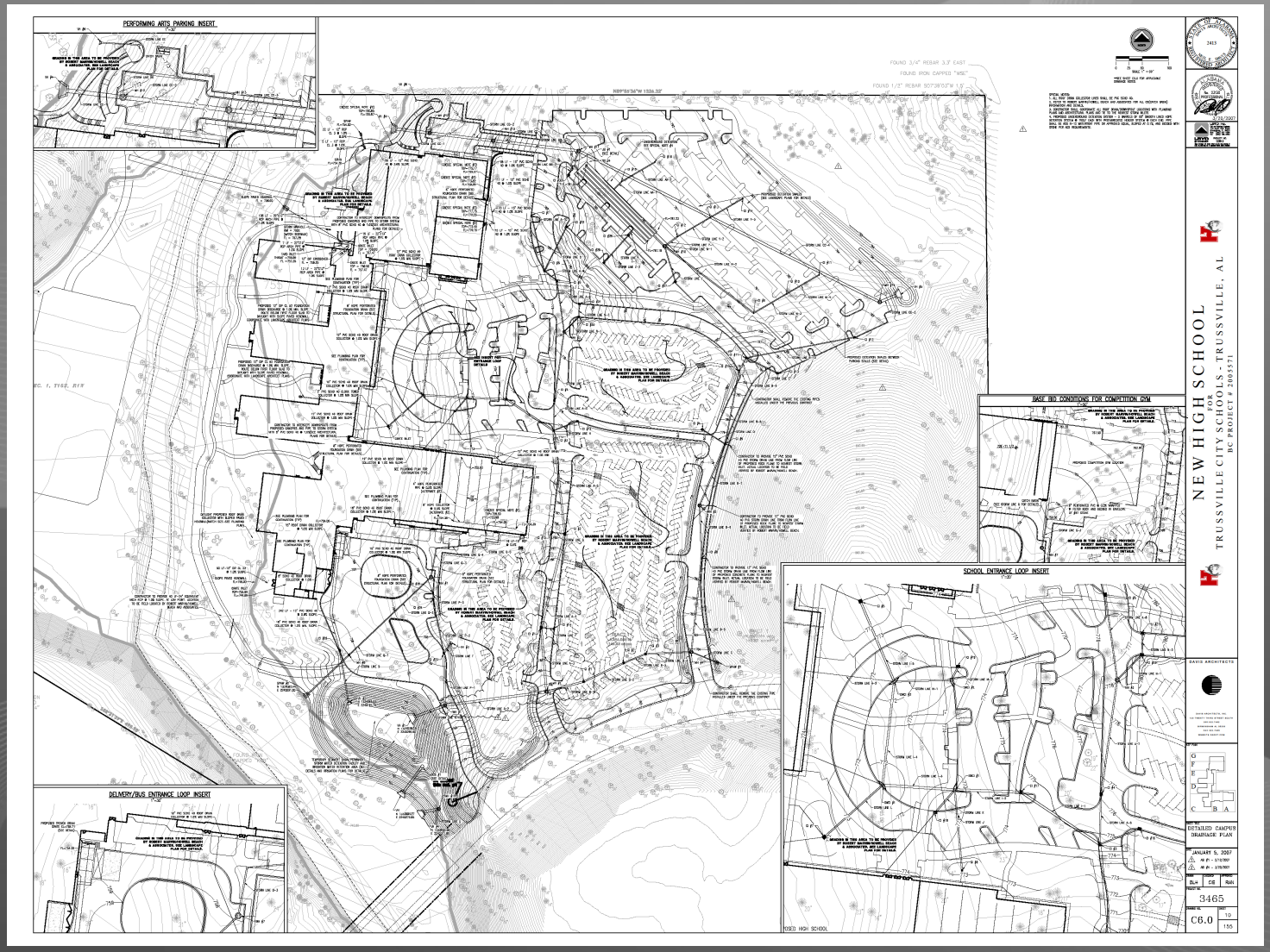
Sustainable Design Considerations

Rainwater collected from rooftops and parking lots drain into an above ground detention/ retention pond and is used to irrigate the campus landscaping in addition to regulation storm water discharge rates and aiding in water quality.

Sustainable Design Considerations

In areas where required parking densities did not allow for woodland parking, bioswales were used to treat surface water and aid in groundwater recharge before entering the underground storm water detention facility.

Detailed Campus Drainage Plan



Site Quick Facts

- School main floor level area - 183,891 SF/Total building area – 360,000 SF
- Student capacity – 1,600/9th through 12th grade
- Woodland parking area – 292 spaces
- Traditional parking area – 467 spaces with 1,450 LF of bioswales
- Visitor parking area - 67spaces
- School site area, north side of the river - 33 Acres
- Above ground detention/retention pond (25 year storm event)
  - Surface area – 26,863 SF/0.62 Acres
  - 16’ deep total - 8’ detention depth/163,200 CF storm storage
  - Pre-developed flow – 55 CFS
  - Post-developed flow – 120 CFS
  - Routed flow - 52 CFS
  - Irrigation volume in pond - 71,000 CF (8’ depth)
- Underground detention system (25 year storm event)
  - 950 LF 60” diameter HDPE/18,650 CF storage
  - Bioswales provided 17,100 CF of storm storage and 14,500 SF/0.33 Acres of infiltration area. This reduced the underground detention system by 1/4.
  - Pre-developed flow – 11 CFS
  - Post-developed flow – 21 CFS
  - Routed flow – 8 CFS
- Percentage of green space – over 21.2%
- Closest distance from the back of the building to the top of bank of the river - 105 feet
- Lowest building finish floor elevation was placed a minimum of 3 feet above the 100 year storm elevation
- 2 through 100 year storm events routed and detained for per Trussville codes

Unique Site
“Green Building” Aspects

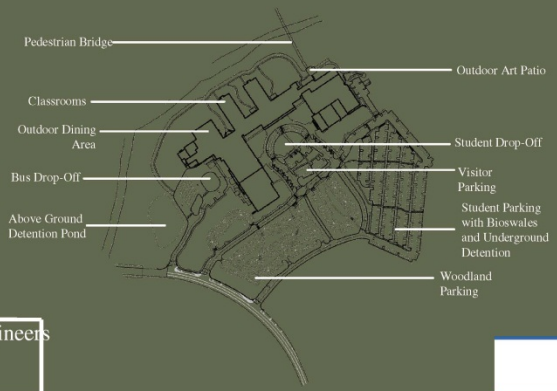
- Building placements and parking layouts were dictated by the proximity to the Cahaba River, by the existing tree canopy and by the existing topography. Retaining walls and site layout were used to minimize land disturbance activities for tree save and erosion control purposes.
- Bioswales in the upper parking lot were used to treat surface water and aid in ground water recharge before entering the underground storm water detention facility.
- Rain water collected from rooftops and parking lots drain into an above ground retention pond and is used to irrigate the campus landscaping.
- Athletic fields were built on naturally occurring meadows.
- Woodland parking areas preserve the existing tree canopy to offset the heat island effect while allowing natural drainage of runoff from the teacher parking lot before entering the above ground detention pond.
- Site utilities and fire department access were routed in areas where disturbance was already occurring to minimize clearing and promote tree save areas.

Hewitt-Trussville High School

Trussville, Alabama

Owner: Trussville City Schools
Trussville, Alabama
Client: Davis Architects, Inc.
Birmingham, Alabama

The Hewitt-Trussville High School project involved an extremely challenging site with a design focused on preserving a protected river and the surrounding natural environment. The site was heavily wooded, topographically challenging and bisected by the Cahaba River. A very complex storm drainage system was designed to minimize disturbance in the area near the river and preserve existing trees and natural features. The completed school provides a state-of-the-art learning facility offering an "Engineering Academy" that serves as a platform for students pursuing an engineering or technical degree after high school.



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Birmingham, Alabama
Category G - Water Resources

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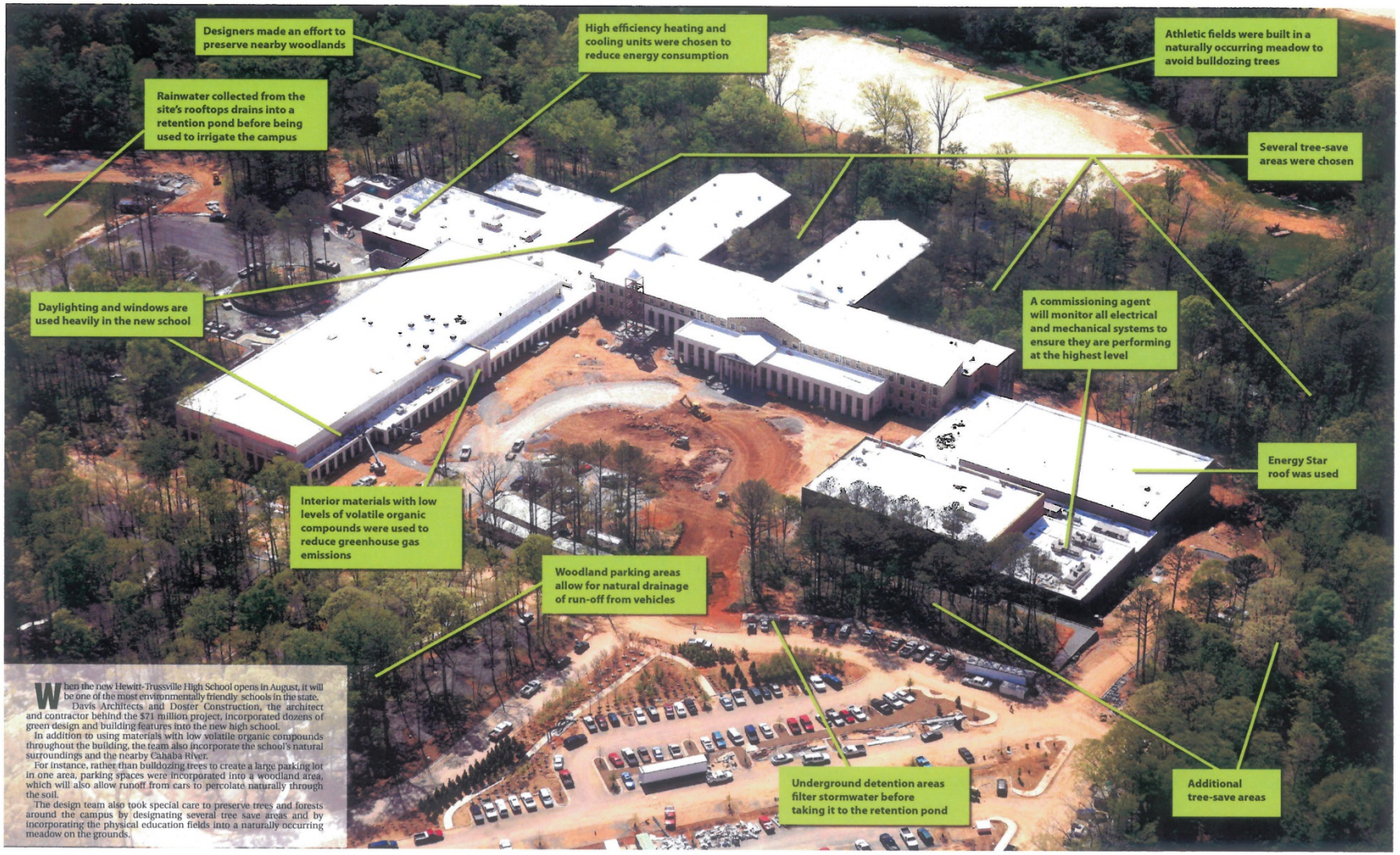
Inside a green project: The new Hewitt-Trussville High School



When the new Hewitt-Trussville High School opens in August, it will be one of the most environmentally friendly schools in the state.

Davis Architects and Doster Construction, the architect and contractor behind the $71 million project, incorporated dozens of green design and building features into the new high school.

In addition to using materials with low volatile organic compounds throughout the building, the team also incorporate the school's natural surroundings and the nearby Cahaba River.

For instance, rather than bulldozing trees to create a large parking lot in one area, parking spaces were incorporated into a woodland area, which will also allow runoff from cars to percolate naturally through the soil.

The design team also took special care to preserve trees and forests around the campus by designating several tree save areas and by incorporating the physical education fields into a naturally occurring meadow on the grounds.

Questions?