Mechanical Design Engineering Portfolio

BROWARD COUNTY PUBLIC SCHOOLS (BCPS) EDUCATIONAL FACILITIES

Project Type: Large Educational Campus Development

Location: Fort Lauderdale, Florida, USA

Scope: HVAC, Fire Protection, Booster Pumps, BIM Coordination

ASHRAE | ASME | NFPA | Florida Building Code

HVAC ENGINEERING DESIGN

Design Activities

Cooling Load Calculations

Ventilation Analysis

Air Distribution Design

Duct Sizing & Equipment Selection

Engineering Tools

Revit MEP | AutoCAD | HAP | BIM 360

Key Deliverable Fully optimized HVAC schematics and equipment schedules tailored for Florida's climate.

Systems Designed

AHUs, FCUs, Chilled Water Systems, Ventilation & Exhaust

MECHANICAL INFRASTRUCTURE

Booster Pump Systems

- Pressure calculations & Pipe sizing
- Equipment selection & Redundancy

Boiler Systems

- Capacity analysis
- Thermal efficiency optimization

Fire Protection

- Fire pumps & Sprinkler networks
- NFPA compliant hydraulic calculations

Outcomes: Reliable water supply, life safety compliance, and long-term maintainability.

BIM & MULTIDISCIPLINARY COORDINATION

Collaboration

Architecture & Structural

Electrical & Civil

Construction Teams

Key Activities

Clash Detection, Design Validation, Constructability Reviews, Technical Workshops.

HIGH-PERFORMANCE SUSTAINABILITY

Design Objectives

Energy Efficiency

Operational Reliability

Sustainability

Implemented Strategies

High-Efficiency HVAC

Energy Recovery Systems

Smart Controls Integration

> *"Delivering sustainable mechanical systems that maximize performance while minimizing energy consumption."*

FINAL PROJECT RESULTS

Achievements

- Fully coordinated design
- NFPA/ASHRAE compliant
- BIM coordination success
- Sustainable infrastructure

Engineering Impact

Improved student comfort, enhanced indoor air quality, and reduced operational costs.

"Successfully delivered a fully coordinated, code-compliant, energy-efficient mechanical design solution for a large-scale educational campus."