

SOLVING COMPLEX BUILDING SYSTEM CHALLENGES THROUGH PRACTICAL ENGINEERING

Building projects become more challenging when existing systems are unclear, energy performance is poor, equipment is aging, utility capacity is limited, or field conditions do not match the drawings. These issues require more than a standard design response. They require an engineering team that can evaluate the condition, understand the operational impact, coordinate across disciplines, and develop solutions that are practical, efficient, constructible, and code compliant. ECF's Building Services Group helps clients solve these challenges through innovative mechanical, electrical, and plumbing engineering solutions designed to support building performance, energy efficiency, reliability, and long-term maintainability.



COMPLEX BUILDING CHALLENGES WE HELP SOLVE

- Aging HVAC, electrical, or plumbing systems requiring replacement or modernization
- Buildings with unclear existing infrastructure or undocumented field conditions
- Renovations where existing systems must be reused, extended, or reconfigured
- Utility capacity limitations affecting building expansion or new equipment
- Poor indoor comfort, ventilation, humidity control, or air distribution
- High energy use caused by outdated equipment or inefficient system operation
- Electrical capacity concerns related to new loads, equipment, EV charging, or standby power
- Plumbing system modifications required by new layouts, equipment, or building use
- Code compliance issues affecting permitting, inspections, or construction progress
- Projects requiring coordinated engineering solutions across HVAC, electrical, plumbing, architecture, and construction teams
- Construction-phase problems that require quick engineering review, clear direction, and practical solutions

HOW ECF HELPS MOVE PROJECTS FORWARD

ECF's Building Services Group provides MEP engineering support for new construction, renovations, facility upgrades, system replacements, assessments, and construction-phase design challenges. Our team evaluates existing conditions, identifies practical design options, coordinates across disciplines, and develops engineering documents that support permitting, pricing, construction, and long-term operation. When a building presents a complex engineering problem, ECF works through the details to provide a clear path forward.



HVAC SYSTEM DESIGN

- HVAC system design for new construction and renovations
- Heating and cooling load calculations
- Equipment sizing and replacement design
- Energy-conscious HVAC system planning
- Ventilation and exhaust system design
- Indoor air quality and humidity control considerations
- Mechanical room and equipment layout coordination
- Controls coordination and sequence of operations
- Existing system assessments and modernization planning
- Construction documents and construction administration support

ELECTRICAL SYSTEM DESIGN

- Electrical service and power distribution design
- Panelboard, feeder, and branch circuit design
- Lighting and lighting controls
- Energy-efficient lighting design and controls coordination
- Emergency and standby power coordination
- Generator and transfer switch design support
- One-line diagrams and electrical system documentation
- Load calculations and electrical capacity evaluations
- EV charging infrastructure design
- Site lighting and photometric analysis
- Electrical assessments and code compliance reviews
- Construction documents and construction administration support

PLUMBING SYSTEM DESIGN

- Domestic water system design
- Sanitary waste and vent system design
- Storm drainage coordination
- Natural gas system design
- Water-efficient plumbing fixture coordination
- Water heater and plumbing equipment sizing
- Fixture calculations and code compliance
- Plumbing renovations and system alterations
- Existing plumbing system assessments
- Coordination with architectural layouts and equipment requirements
- Construction documents and construction administration support

Bring us the building challenge. ECF's Building Services Group will bring you engineering solutions.