

About BD Engineering, LLC

BD Engineering is a multidiscipline engineering firm focused on providing real world, economical, practical and buildable engineering solutions.

We understand that our clients have to live with and maintain the system designs we provide, and that many clients ultimately have an end-user with specific needs that must also be met. Balancing the needs of both the client and the end-user is one of the most important factors in the overall success of a project. For that reason, we adhere to a simple "client first" philosophy where an extensive evaluation of both client and end-user needs are considered first and foremost in every project we undertake. This ensures that every client will get the results they are looking for.

With our diverse staff, we are proud to offer a wide variety of professional services in the areas of **Facilities Engineering** and **Project Management**.

Please browse through this brochure to see the services we offer and we welcome the opportunity to discuss our qualifications with you. Feel free to call us any time to discuss how we can help ensure the success of all your future projects.

Sincerely,

BD Engineering, LLC
engineers@bd-engineering.com



BD Engineering, LLC
1825 Swarthmore Ave, Suite B
Lakewood, NJ 08701

732-886-5432 Phone
732-886-5565 Fax
www.bd-engineering.com



Facility Engineering

BD Engineering offers design services for a variety of project and building construction types in the architectural/engineering fields:

Project Types:

- Food Processing
- Academic
- Retail
- Healthcare
- Industrial
- Sports and Entertainment
- State and Federal Contracts
- Small Business Set-asides (Certified SBE)

Building Construction Types:

- New Construction
- Repairs
- Renovations
- Alterations
- Reconstruction
- Change of building use
- Additions

Electrical Engineering

HVAC

Plumbing

Fire Protection

Refrigeration

Energy Management

Project Management

**Equipment
Commissioning**

**Construction
Administration**

Infrastructure evaluations



Electrical

BD Engineering offers full service electrical design services. If it requires electricity, you can be confident our electrical engineers have the experience and know how to handle the job. For example, what if your expansion plans require a service upgrade? Will you be able to keep the doors open while the system is changed over? BD Engineering can ensure that your service upgrade will happen with minimal downtime and will maximize the reuse of existing systems. This is just one example of our philosophy of designing buildable and maintainable systems.

Let BD's electrical engineers provide for all of your electrical engineering needs.



Electrical Distribution

BD Engineering will provide all of your electrical distribution needs. These will include from the initial coordination with the utility company to coordinating the location of the receptacles.

Lighting Design

Utilizing the latest design techniques and computer software, BD Engineering will design energy code compliant lighting schemes that meet the clients specific needs and design criteria. We will work closely with the owner, architect and/or interior designer to provide a functional and decorative lighting system.

Life Safety Systems

All life safety system needs will be fully evaluated based upon the latest local and state code requirements. These systems will utilize the latest equipment and include: Fire Alarms, Emergency Power Systems and associated distribution equipment.

Optional Standby Systems

BD Engineering will provide a complete analysis of your standby power requirements and design a cost effective system.

Critical Operations Power Systems (COPS)

BD Engineering will perform a full coordination analysis and equipment recommendation for the electrical system to comply with the new National Electrical Code requirement for critical power systems.

Arc Flash Analysis

Are you OSHA compliant? Let BD Engineering perform an arc flash analysis of your electrical system to ensure you are providing the proper PPE (Personal Protection Equipment) for your employees.

Power Factor Correction

Let BD Engineering evaluate your power factor requirements and provide the most economically feasible controls.

Alternative Energy Evaluations

BD Engineering will work with you to help perform an evaluation of alternative energy solutions that could save you hundreds if not thousands of dollars in energy costs.

Utility Rebates

We will work closely with utility companies and state agencies to help maximize all available rebates in order to help control your construction costs.



HVAC

BD Engineering offers full service heating, ventilation and air-conditioning design services. Our engineers have extensive experience in the design of these systems for all project types. We are sensitive to the critical requirements of the end user and will address your needs for humidity control, indoor air quality, ease of maintenance, low installed and life cycle costs and overall impact on the interior sound levels and visual aesthetics.

BD Engineering will design your HVAC systems to provide proper humidity control and a comfortable environment. We can design for a variety of applications including:

- Conventional rooftop package units
- Steam boilers and systems
- Hot Water Boilers and systems
- Custom manufactured units
- Desiccant systems
- Gas fired infrared heating
- Gas fired forced air heating
- Heat pumps
- Electric heat
- Exhaust hood systems
- Make up air units
- Machine room exhaust systems
- Split air conditioning systems
- Heated air curtains
- Air handlers
- Duct furnaces
- Combustion air
- Economizer units
- Garage ventilation
- Utility Rebates
- Building Management Systems



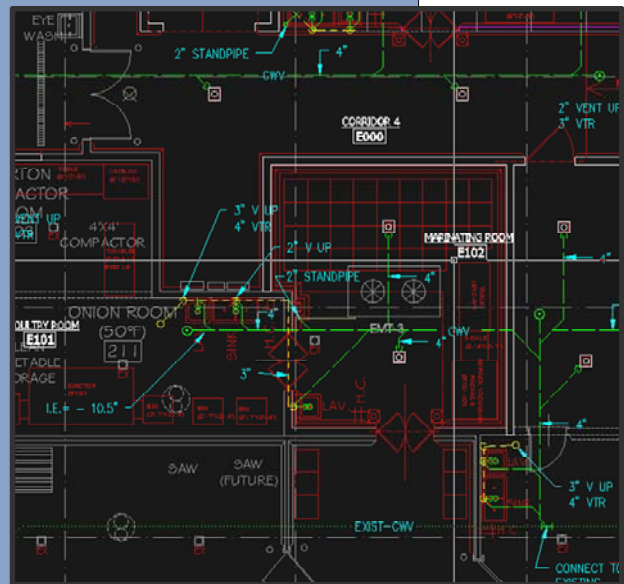
Our engineers will do a thorough analysis of the facility to determine the required loads and ventilation requirements to ensure a comfortable, clean environment. We will design the systems to be code compliant and energy efficient while balancing the need to keep costs low. For every project we provide:

- Full load calculations based on the building construction and location utilizing load calculation software such as Trane Trace™ 700 and Elite CHVAC.
- Determine the fresh air requirements based on occupancy and exhaust requirements
- Fully designed supply and return duct distribution system, targeting critical comfort areas and utilizing both high and low returns to de-stratify the air in the space

Plumbing

BD Engineering will provide full plumbing system design services for all your project needs. Our experienced engineers have an intimate knowledge of the complex specialty systems that are required by today's strict building codes and will provide an economical, easy to build system. BD Engineering has extensive experience in the design and specification of all plumbing systems and components including:

- Sanitary waste
- Storm water systems
- Indirect waste systems
- Vacuum sanitary systems
- Grey water waste systems
- Domestic hot and cold water systems
- Recirculating systems
- High and low pressure natural gas systems
- Sprinkler and domestic water services
- Natural gas service and meter requirements
- Back flow protection
- Grease interceptors
- Solids interceptors
- Ejector pumps
- Fire pumps
- Misting systems
- Fixture requirements
- Freeze protection
- House traps
- Trap primers



We will provide the necessary due diligence with all of the local building officials to ensure a quick approval of your project. We have the experience to identify the potential problem areas and conflicts in a typical construction project. Our engineers are experts at coordinating all of these systems with all building trades to minimize conflicts during construction. Let BD Engineering design the plumbing solution for your next project.

Fire Protection

One of the most important building systems and the least thought about or mentioned is sprinkler systems. They limit the damage caused by fire and even more importantly save lives.

BD Engineering offers full service fire protection design services. Our engineers have extensive experience in the design of these systems for all project types. We are sensitive to the critical requirements of the local building code, NFPA and local fire department requirements.

We can design for a variety of applications including:

Back flow prevention

- Fire service entrance
- Fire department requirements
- Wet sprinkler systems
- Dry sprinkler systems
- Pre-action sprinkler systems
- Deluge sprinkler systems
- Gaseous suppression systems
- Anti freeze systems
- High Rack Storage In-Rack Systems
- Fire pumps
- Fire pump controllers



Our engineers will do a thorough analysis of the facility to determine the type of fire protection system that best suits the needs of your building while keeping in mind the cost impact of constructing the system.

Each project receives a full evaluation of the available public water supply to determine if the pressure and flow are adequate or if a fire pump will be required

We have the capability to hydraulically calculate the system demand to expedite the permitting process while verifying that the system will perform as designed.

Levels of Design Services Offered

Performance Specification:

Drawings that will show basic information to indicate code requirements and design pressures while coordinating utilities service entrance.

Sprinkler head layout:

We will create drawings that will coordinate with all trades to avoid conflicts in the ceiling grid.

Full system layout:

A full system layout will coordinate the routing of ductwork, plumbing piping, luminaires and the building structure to ensure that the system can be installed without conflict.

Refrigeration & Control System Design

To Coldly Go Where No Man Has Gone Before . . .

One of the key distinctions that make supermarket engineering unique is the requirement for storing and displaying refrigerated and frozen food products. Supermarket refrigeration systems and their sophisticated control systems present a difficult challenge to the uninitiated. The potential for product loss and the high-energy use associated with these systems demand that the engineer has extensive experience not only in refrigeration system design but in energy management systems as well. With over **15** years experience in the design and application of refrigeration systems and controls, **BD** engineers are more than capable to meet these challenges.

The mechanical systems manager for today's supermarket has an almost unlimited variety of choices to make for refrigeration and control systems: What refrigerant should I use? What type of compressor should I use? What type of system will best meet my needs? Should I use air-cooled or water-cooled condensers? Will a rooftop machine house solve my space problems? Do case controllers make sense for this project? These are tough questions with long lasting implications. **BD Engineering** can help you choose the right answers. Our knowledge in these areas will allow you to examine all of the possibilities and make informed decisions early on in the design process.

BD Engineering can tailor a system to provide the right balance of energy efficiency, maintainability, and cost to meet your needs and ensure that it is installed to provide the maximum benefit. A complete, detailed design with written specifications will allow you to get competitive apples-to-apples bids, eliminating surprises after the bids are awarded.

Need to remodel or do a refrigerant changeout? No problem. **BD's** engineers are fully qualified to visit your site, perform a thorough survey of the existing systems, make recommendations, and design a solution to keep your store up and running throughout the renovation. We will even prepare a phasing plan to guide the other trades through the process; ensuring a smooth remodel and minimizing change orders. Will your OEM do that? **BD Engineering** can perform a final walk through and generate a punchlist to ensure a quality installation.

You Can Rely On BD Engineering . . .

Our areas of expertise include the following:

- All types of refrigeration systems: parallel, compound, singles, air-cooled, water-cooled, and natural gas driven
- All types of compressors: reciprocating, screw and scroll compressors, open drive, hermetic, and semi-hermetic
- Looped refrigerant piping systems
- All major control manufacturers: CPC, ECI, Trend, Danfoss, and Control including case controllers
- Rooftop machine houses
- Refrigeration trenching systems



Energy Management Systems

BD Engineering has over 16 years of experience with Energy Management System (EMS) design and commissioning. We can specify and prepare designs for all of the major control manufacturers for every application including lighting, HVAC and refrigeration systems. We specialize in designing a system that is tailored to your needs and will safely minimize your energy consumption while ensuring functional and comfortable lighting, temperature and humidity levels in your facility.

BD Engineering has extensive experience in designing and commissioning refrigeration system controls. In a typical supermarket the refrigeration systems utilize roughly 50% of the electricity consumed and refrigeration systems are required to run around the clock, 365 days a year. If these systems are not properly controlled to run at maximum efficiency, the real cost to you can be significant. Let BD Engineering help you get the most of your energy dollars. Let us design and commission an EMS system for you that will work to reduce your energy costs by providing the following:

Lighting Controls

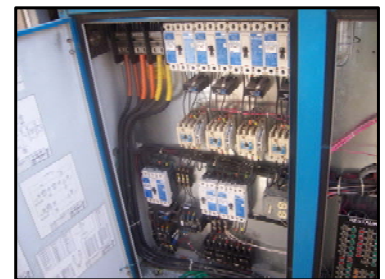
- Control lighting levels based on time of day, and interior & exterior lighting level sensors
- Occupancy sensors to control office lighting
- Provide multiple levels of lighting to match operational needs

HVAC Controls

- Provide programmable controls to accommodate operational hours, holidays, night & weekend schedules
- Control temperature and humidity levels to optimize comfort and reduce loads on the refrigeration systems
- Reduce demand during peak energy rate periods
- Use variable air volume systems (VAV) to allow individual local control based on local load conditions

Refrigeration Controls

- Float the suction pressure up and the head pressure down to reduce energy consumption
- Cycle compressors to best match the current and predicted loads
- Split the condensers and cycle the fans during periods of low loads and low ambient temperature
- Utilize anti-sweat heater controls to cycle or turn off the anti-sweat heaters during periods of low humidity
- Utilize variable speed drives
- Reduce demand during peak energy rate periods
- Monitor product temperature and generate alarms when temperatures reach a predetermined level or as a result of a component failure

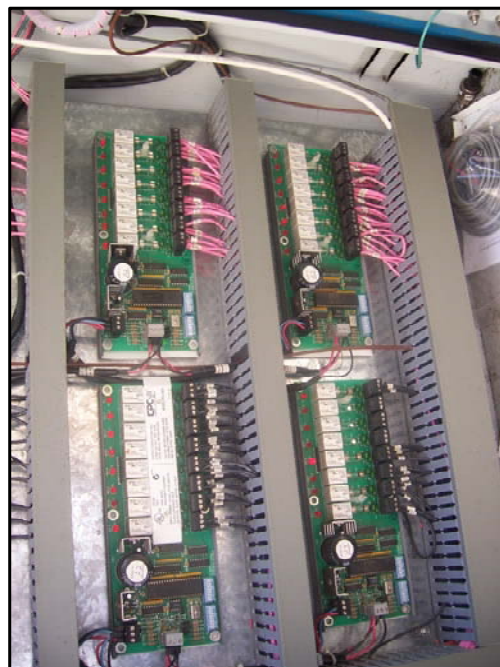


Energy Management Systems

Are your existing control systems up to par? Then let BD Engineering re-commission your EMS system to ensure that everything is functioning properly and is fine-tuned to optimize your energy usage. Frequently contractors will “jump out” portions of the control system in order to provide a quick fix for an unresolved problem. These fixes can operate undetected for years, wasting your valuable energy dollars. Let BD Engineering verify proper operation of your systems by inspecting and testing the EMS system including:

- Interrogate your EMS systems and document all of the existing systems, controls and setpoints.
- Provide a written report for your records
- Verify proper operation of all sensors and transducers
- Sensors and transducers typically “drift” over time and need to be re-calibrated
- Physically verify proper operation of all contactors, stages of heat, stages of cooling and all other functions
- Provide a back-up of the final control set up for use in case of a failure at some future date

BD Engineering is your best resource for getting the most out of your energy dollars.



Project Management

BD Engineering can provide for all your project management needs. Let us take your project from initial concept, through design and bidding, and provide supervision during the construction process. Our Project Managers have a combined experience of over 28 years, enabling them to better understand the big picture construction process to improve on project turnaround and minimize change orders. We have proven experience for both new and renovation projects nationwide.

Our Project Management services include:

- Preparation of bid packages with bid instructions for qualified contractors
- Help with negotiations to help you obtain the best price and ensure the full scope of work is included in the price
- Preparation of the project schedule in conjunction with your key personnel
- Oversee the building permit process
- Ensuring inspections are performed by the appropriate authorities
- Review and approval of all invoices, including tracking of all payments to contractors
- Log and review of all shop drawings
- Log and resolution of all RFI's and Change orders
- Job site meetings with all trades during construction
- Review of construction at key points during construction as required: At rough-in, prior to closing up walls and floors, substantial completion and final inspection prior to turn over
- Verifying proper operation of all major systems prior to turn over
- Preparation of job close out documentation including warranty and service contact information
- When requested, we can work with the manufacturers to help you buy equipment directly and eliminate price mark-up. Typical direct buy items include:

- Refrigeration systems and equipment
- Walk-in coolers & freezers
- HVAC equipment
- Lighting
- Energy Management Systems
- Electrical Switchgear and Panelboards
- Coordination of all deliveries



BD Engineering can provide the support you need to make your construction/renovation projects smooth, painless and economical. We offer a "one stop shopping" approach to your engineering and construction needs. Rely on us to make your projects a success and to allow you to focus on your core business.

Outside Plant Engineering

The staff of BD Engineering has extensive experience in the design and construction support of large scale underground cable systems, including complex fiber optic and copper based telecommunications systems, manholes and pullboxes, underground building-to-building systems, and underground utility-to-building interfaces for a variety of clients:

- TELCO
- Utility Companies
- Universities and Colleges
- Hospitals
- Wireless Service Providers
- Industrial Parks
- Commercial Buildings
- Corporate Complexes of all sizes



Our OSP services include:

- Design of large or small scale conduit, manhole and pullbox systems for power and communications cables
- Underground trench and direct burial designs
- Development of detailed Plan Sets and Engineering Specifications for Contractor Bid Packages
- Infrastructure needs analysis
- Design of System Expansions
- Harsh environment communications and power system designs
- Infrastructure Cost analysis
- Feasibility Studies
- Computer Aided Design and Drafting (CADD)
- Construction Support Assistance
- Quick turn-around field-change designs