Gage Consulting Engineers, Inc.
Introductory Meeting with
Northwestern Memorial Hospital

Firm Profile Presentation to NMH
Design and Construction Team
March 21, 2011
Gage Consulting Engineers, Inc. ||| Oak Brook, IL

BUILDING SYSTEMS DESIGN | FACILITY EQUIPMENT ENGINEERING

Accurate, Reliable & Professional ... These traits are the foundation of a successful engineering firm, and are the essential qualities of Gage Consulting Engineers -- leaders in the design and management of building systems projects. Gage provides complete MEP/FP systems design & construction administration, as well as commissioning.

Gage’s many long-term partners and clients have come to expect a high level of accuracy and reliability in the engineering expertise provided, and can trust their projects to be managed in a very professional manner ... with accountability as a high priority.

Gage Consulting Engineers welcome the opportunity to demonstrate & discuss the firm’s professional expertise, and provide strong examples from a large portfolio of well-executed & successful design projects across a range of various markets & facilities ...
Overview ||| Firm Profile

Gage Consulting Engineers is a professional engineering firm incorporated in 1995 by the two founding Principals – John Bouse and David McVey. Since then, Gage has grown to a strong and diverse team that offers depth across the MEP engineering disciplines along with a support staff. **Gage engineers offer 125+ years of combined experience** at facilities in these key markets: Healthcare, Assisted Living, Municipal, Recreational, Educational and Commercial.

Gage partners with architects, facility managers, general contractors and other engineering firms – on building design projects for renovations, expansions and new construction. Gage engineers are licensed in 15 states, as certain design partners have requested Gage’s services in other regions. Staying current with industry demands and developments, with LEED Green Building (BD+C) expertise on staff, Gage is ready to take on projects requiring sustainability and energy efficiency.

Gage Engineers specialize in MEP/FP building systems design & construction administration for **projects involving demanding client specifications** - such as healthcare facilities, public safety & municipal buildings, educational institutions, laboratories, park district and recreational centers. Gage provides long-term service and accountability to clients - ensuring a successful project.

**Better building systems performance ... through expert design & engineering**
Gage Executive Team

John C. Bouse, P.E.
President
Licensed Mechanical Engineer

John Bouse is one of the founding principals of Gage Consulting Engineers, with 35+ years of experience in engineering design and project management.

David P. McVey, P.E.
Vice President
Licensed Electrical Engineer

Dave McVey is one of the founding principals of Gage Consulting Engineers, with 20+ years of experience in engineering design and project management.

Steven J. Nargang, P.E.
Vice President
Licensed Mechanical Engineer

Steve Nargang has a combined 20+ years of design, engineering, project management, technical applications consulting and business development experience.

Gage Engineering expertise

125+ years overall team experience

DEPARTMENT DIRECTORS

John C. Bouse, P.E.
Director of Mechanical Engineering

David P. McVey, P.E.
Director of Electrical Engineering

Steven J. Nargang, P.E.
Director of Development

PROJECT ENGINEERING / MANAGEMENT

Bob Chen, P.E. LEED AP BD+C
Senior Mechanical Engineer
20+ years overall experience

Mark Loth, Certified Plumbing Designer
Project Engineer - Plumbing, Fire Protection
20+ years overall experience

Steve Vaccaro, E.I.T.
Electrical Engineering / Project Engineer

George Intal
Mechanical Engineering / Designer

... assisted by Gage support staff
Expertise ||| Our Services

Our team includes experienced registered professional engineers, design professionals and support staff — offering the following Engineering, Design and Project management services:

**Mechanical / HVAC Systems**
- Electrical / Lighting
- Plumbing / Fixtures
- Medical Gas Systems
- Fire Protection
- Fire Alarm Systems
- Fire / Smoke Damper Surveys

**IDPH Submittals**
- Communications
- Voice / Data Distribution
- LEED™ Green Design BD+C
- Commissioning – CxA certified
- BIM – AutoCAD/Revit MEP
- Lean Design / IPD

*We offer these services at the highest level of expertise and accuracy — with commitment to integrity, safety, quality and performance.*
Sustainable Buildings ... Energy-Focused Design ...
Registered Energy Professionals ... LEED Accredited Engineering

With a progressive approach and LEED™ Green Design expertise on staff, Gage is prepared to take on sustainable building and energy-focused design projects with demanding requirements. Gage engineers have the experience with proper specification of the equipment and technology to provide the expected energy efficiency performance, with proper consideration of budget and schedule.

Gage has a strong team of highly-qualified licensed engineers, with the diverse background and range of experience to execute projects of various types and sizes. An important factor is that the principals of Gage Consulting Engineers are deeply involved with every client and project - providing direct oversight to ensure proper coordination and management of the team, working with project engineers in each discipline to execute the details with accuracy and efficiency ...

Gage Engineers - Additional staff credentials / certifications
- Commissioning Authority - Process Management Professional (CxA)
- Healthcare Facilities Design Professional (HFDP)
- USGBC Building Design+Construction accreditation (LEED AP BD+C)
Gage Engineers are members of key organizations across the major disciplines and within the firm’s primary markets.

Gage principals are active in HESNI, ASHE and other associations related to the healthcare industry.

As corporate members of USGBC, Gage has committed to staying current with industry trends towards increased energy efficiency and sustainability.
Portfolio  |||  Healthcare

Gage’s experience over the firm’s history includes more than 650 projects at 25+ different healthcare facilities. Projects range from existing campus additions and renovations, to new buildings and off-site medical offices and clinics. Gage Engineers are highly respected in this market for knowledge and attention to detail ...

**Specializing in the following project & facility types:**

- Cancer Centers
- Central Data Rooms
- Central Sterilization
- Emergency Departments
- Hybrid Operating Room
- Hyperbaric Chambers
- Intensive Care
- Imaging / Technology: 
  - Cath Lab, Gamma Knife,
  - Linear Accelerator, MRI,
  - Ultrasound, X-Ray, CT
- Laboratories
- M/E Infrastructure
- Medical Office Buildings
- OB/Gyn Facilities
- Outpatient Surgery
- Labor Delivery Rooms
- Patient Rooms
- Pharmacies
- Psychiatric
- Surgical Suites

<table>
<thead>
<tr>
<th>Year</th>
<th>Medical</th>
<th>Non-Medical</th>
<th>Assisted Living</th>
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<td>72%</td>
<td>23%</td>
<td>5%</td>
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<tr>
<td>2010</td>
<td>91%</td>
<td>4%</td>
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*Healthcare Specialization ...Increased Focus over past 5 Years*
Background | Description
Gage Engineers have worked with Edward Hospital for over 10 years, completing more than 90 projects at the various facilities – while assisting with the annual budget process. Some example projects include:

- Operating Rooms Renovations
- OB, NICU and PICU Renovations
- Pharmacy Renovations
- Replacement of (2) 750 hp steam boilers
- Conversion of chilled water distribution to primary/secondary piping with variable speed pumping
- Replacement of (12) air handling units
- Replacement of (6) dehumidification units
- Relocation and replacement of the 1960, 1970 and 1980 switchgear

Challenges | Solutions
With ongoing projects at different facility locations, a major challenge has been keeping the facility in operation while implementing the installation of new systems and equipment. Gage Engineers have successfully handled this challenge with minimal interruption of normal facility operation.
Provena St. Joseph | Regional Cancer Care Center - Elgin, Illinois

Disciplines: Mechanical / HVAC, Electrical / Lighting, Plumbing / Piping, Medical Gas, Fire Protection, Construction Administration

Budget: $6,900,000
Square Feet: 26,000
Completion: 2009
Reference: Mr. Allen Jensen
Provena St. Joseph
847-695-3200

Background | Description
This challenging project was for a 2-story cancer care center attached to an existing hospital. The new Infusion Suite (upper level) was designed to maximize patient comfort. The fourteen individual treatment stations include both private rooms and semi-private bays. The bays have sliding doors allowing patients to have privacy or interaction with each other when they desire.

The Radiation Suite (ground level) features two new linear accelerators, space for a future CT simulator, new exam and consultation rooms, nursing stations, administrative offices, staff laboratories and support work spaces. Gage’s expertise with these types of facilities was critical.

The mechanical and electrical systems for the addition are stand-alone, with minor connections to the main building systems. Gage engineers provided complete MEP design and CA of these systems.

Challenges | Solutions
Technical integration and budget constraints were a top priority for this project. By working closely with the hospital's equipment providers as well as the general contractor, this project was completed ahead of schedule and under budget. Gage’s effective project management was a key factor.
Alexian Brothers Medical Center – Mt. Prospect, Illinois

Disciplines: Mechanical / HVAC, Electrical / Lighting, Plumbing / Piping, Medical Gas, Fire Protection, Construction Administration

Budget: $4,435,000
Square Feet: 11,450
Completion: 2007
Reference: Mr. Sam Salahi
AP&S Architects
630-665-0355

Background | Description
This 40,000 square foot medical office building was designed as a shell and core. All mechanical and electrical systems were installed within the shell with future tenants in mind. The building and its systems were designed to support diagnostic imaging, laboratories, therapy and clinical spaces – with Gage’s expertise a key factor.

The interior of this project was never completed by Alexian Brothers, and the building was recently sold to Northwest Community Hospital. Gage Consulting Engineers will now be completing the build-out project at this facility - which will include a Radiology Department, CT, MRI, X-Ray, Labs, Doctor’s offices and clinical spaces.

Challenges | Solutions
The challenge of this project was to design a shell and core building with enough flexibility and versatility to accommodate unknown future medical equipment needs. Gage has expertise handling this type of challenge ...
Background | Description
This project consisted of an extensive, multi-phased remodeling and expansion of the existing orthopedic surgicenter. The design of this project featured the following key features:

- Expansion from two to four operating rooms
- Completely new and enlarged decontamination and sterilization
- Expansion of Pre-Op and Post-Op support facilities
- New expanded waiting, reception and consultation areas
- Enlarged staff locker rooms
- New supply receiving area and elevator to second floor surgical storage and distribution area

Challenges | Solutions
The challenge was keeping the two existing operating rooms open while adding two more operating rooms adjacent to them, installing new HVAC systems, medical gases and emergency power without closing the facility. Gage Engineers accomplished this by helping to coordinate 7 phases of construction to keep the facility completely operational throughout the renovation.
Provena Madison Medical Plaza – Joliet, Illinois

Disciplines: Mechanical / HVAC, Electrical / Lighting, Plumbing / Piping, Medical Gas, Fire Protection, Construction Administration

Budget: $10,000,000
Square Feet: 67,320
Completion: 2006
Reference: Mr. Todd Eiken
HDR Architects
773-380-7900

Background | Description
The Madison Medical Plaza is a 3-story facility on what was the campus of Provena St. Joseph’s Medical Center. The project was completed in phases.

The first phase was the construction of the base building with all of the major services included for future tenant occupancy. Included in the core work were an emergency generator, building automation system, an air handling system with humidification and final filters.

The second phase was the construction of the Surgical Center. The Surgical Center contains three operating rooms, two endoscopy rooms, central sterile, recovery bays and exam spaces. As a part of the Surgical Center work medical gas manifolds, a vacuum pump, a reverse osmosis water system and a pressure booster system for the sterilizing system were installed.

The third phase of the project was the completion of the tenant spaces. To date the following tenants have been added to the building: a wound care clinic with a hyperbaric chamber, pharmacy, pain center, plastic surgeon and cardiovascular clinic. … Gage provided coordination of all 3 of these phase.

Challenges | Solutions
Madison Medical was designed as a new building. There were no challenges as normally presented in an existing building. It was necessary though to design the mechanical and electrical systems to be flexible enough to accommodate a variety of potential tenants. Potential tenants ranged from a surgi-center to a full-service restaurant.
Background | Description
The project was a 9,000 square foot addition to an existing surgical center in Orland Park. The new work included two new operating rooms, new recovery beds, a new central sterile area and patient interview rooms.

The addition required two new rooftop air handling units, new medical gas manifolds and a new vacuum pump. The remaining utilities were extended from existing systems within the original building.

Challenges | Solutions
The addition required extending utilities through the building without disturbing ongoing operations, keeping the existing surgical suite functional. - Gage expertise made this happen.
**Background | Description**
The Diagnostic Imaging Center involved the remodeling of a 6,000 square foot existing retail building. Featured technologies such as a CT Scan, MRI, Dexscan and several Ultrasound rooms were included in the new facilities design.

Process cooling, new rooftop air conditioning units, and new electrical service were all included in the new design features. **Gage’s experience across the disciplines was key.**

**Challenges | Solutions**
The biggest challenge of the project was providing the mechanical and electrical services needed to convert the existing retail space into a high-tech diagnostic facility.
Loretto Hospital Emergency Department Addition – Chicago, Illinois

Disciplines: Mechanical / HVAC, Electrical / Lighting, Plumbing / Piping, Medical Gas, Fire Protection, Construction Administration

Budget: $5,000,000

Square Feet: 7,000 (remodeled)
8,000 (addition)

Completion: 2009

Reference: Mr. Rich Potokar
Potokar, Inc.
708-442-5575

Background | Description
This project involved the remodeling of the existing 7,000 square foot Emergency Department and an 8,000 square foot addition. The mechanical work included three new air handling units, new variable air volume terminal units, digital controls and negative air systems designed for a large scale toxic event.

The electrical portion of the project included relocating and replacing the electrical service to the hospital. Interior work included energy efficient lighting fixtures and controls, nurse call systems and communications systems. Gage’s expertise with all these technologies was a key factor for success.

Challenges | Solutions
The project challenges centered around keeping the electrical service and ventilation systems operational during the addition and remodeling portions of the project.
Fox Valley Outpatient Clinical Facility – Geneva, Illinois

Disciplines:  Mechanical / HVAC, Electrical / Lighting, Plumbing / Piping, Medical Gas, Fire Protection, Construction Administration

Budget:  $5,070,000
Square Feet:  27,610
Completion:  2006
Reference:  Ms. Bohdonna Strawniak
    Fox Valley Orthopedic Institute
    630-542-4598

Background | Description
The Fox Valley project involved the remodeling of an existing industrial building and the remodeling of an existing ambulatory surgery building. The industrial site was designed to house an MRI, exam rooms, office spaces and physical therapy.

The existing ambulatory surgery was reconfigured to include two new operating rooms, a new central sterile area, recovery bays and nursing stations.

The ambulatory surgery work required a new emergency generator, new air handling equipment, new medical gas manifolds and distribution piping. The outpatient clinic required all new services for the change in building usage. … Gage’s experience with these facility types was a key factor.

Challenges | Solutions
The existing building was a large warehouse facility. The conversion to a medical clinic was a smooth transition. Consideration was given to supplying future medical uses in unfinished areas.
**Hybrid OR-10 | Loyola University Medical Center – Chicago, Illinois**

**Disciplines:** Mechanical / HVAC, Electrical / Lighting, Plumbing / Piping, Medical Gas, Fire Protection, Construction Administration

**Budget:** $800,000

**Square Feet:** 1,500

**Completion:** 2011

**Reference:** Mr. Steve Reis
GFGR, Inc.
312-831-2000

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**Background | Description**

Gage has completed design drawings for the renovation of an operating room at Loyola University Medical Center to a hybrid surgical suite. When completed, the suite will have the combined capability of a neuro-angiography room and a modern surgical room. Included in the project was the installation of new medical gases, process cooling, uninterrupted electrical power supply and equipotential grounding.

**Challenges | Solutions**

The hybrid suite straddles Building 103 and 107. The structure separating the two bisects the new space. Coordinating ceiling space between structure, medical equipment ductwork and piping posed the biggest challenge, well handled by Gage.
Assisted Living & Skilled Care

For Gage Consulting Engineers, the assisted living market is seen as a natural extension of the healthcare market – and is therefore an area of increasing focus and design work.

Gage has completed nearly 40 projects at various assisted-living facilities, including memory care & senior living centers – with the following as featured examples:

- The Birches Memory Care Facility – Clarendon Hills, IL
- Asbury Court Skilled Care – Des Plaines, IL
- Presbyterian Homes Balmoral Care Center – Lake Forest, IL
- Plainfield Assisted Living – Plainfield, IL
- The Moorings – Arlington Heights, IL
- Victorian Inn – Homer Glen, IL
- Coventry Assisted Living and Memory Care – Coventry, RI
- Urbandale Alzheimer’s Special Care Center – Urbandale, IA
- Bethesda Lutheran Homes – Watertown, WI
OB & NICU Renovation – Edward Hospital, Naperville
The design of the first of four phases was recently completed at Edward Hospital. The entire project through all phases will include the addition of an elevator lobby to the Bed Tower, and renovation of the first and second floors – which will convert the existing inpatient usage to OB and NICU. The total project will include 5,000 square feet of cosmetic remodeling and 40,000 square feet of new heavy remodeling. The final estimated completion of these 4 phases is August 2012.

On-Call and Nursery Renovation – Norwegian American Hospital, Chicago
As the 13th project for Gage Consulting Engineers with NAH over the last 5 years, the on-call rooms and three nurseries will be renovated, with the project to include medical gas outlets and all new lighting.

Bethany Pharmacy Renovation – RML Specialty Hospital, Chicago
As the 12th project with RML over the last 8 years and with extensive similar experience, Gage is providing design services for this renovation project and work has recently begun on the interior remodeling.

The Pavilion Behavioral Health System, Champaign
Gage will begin drawings for an addition to the Pavilion a 77 bed inpatient hospital in Champaign, Illinois. This facility provides a safe and nurturing environment where children, adolescents, adults and senior adults can receive treatment for emotional, psychiatric and addictive diseases.

New Medical Clinic – Greater Elgin’s Family Community Center, McHenry
A new free-standing health center (single story sized at 8,300 square feet) will offer a full range of primary healthcare services for the residents of McHenry County. The initial schematic drawings include a waiting rooms, chart room, reception/check-out area, working/copier room, 12 examination rooms, 5 ADA restrooms, 2 additional restrooms, a lab and physician charting area, 5 offices, a server room, and a large meeting/lunch room which can be divided by a movable partition. Additionally, plans call for an elevator, elevator mechanical room, 2 staircases which will initially be used for storage, but may later be developed to create access to a second story for future development.
At Gage Consulting Engineers, we approach every project with a primary goal of completing the client’s project on time, within budget and exceeding their expectations. We have a very strong reputation for representing the client’s interests while being able to develop sound and cost effective solutions with the project team.

Gage engineers actively promote cooperation between our team members, the owner, architect and contractor to encourage open and timely communication. One of the main goals of the team is to respond to issues that might arise during the project which potentially can increase cost, extend the project timeline, or might result in a completed task that does not meet client expectations.

At Gage, our Principal engineers actively manage the mechanical and electrical team on each project. Principal involvement ensures that many years of proven experience in healthcare design are carried through the design process, construction and to final completion. The direct involvement of these Principals with every project is a level of personal attention that sets Gage Consulting Engineers aside from many engineering firms, ensuring client satisfaction.

... a full team approach to MEP/FP systems design for the built environment
Healthcare Clients Facilities & Partners ||| Who We Work With

Gage Consulting Engineers work as trusted partners of clients – either directly with facility managers, or through partnerships and cooperation with Architects, Engineering Firms and General Contractors ...

Advocate Healthcare
  – Preferred Engineering Partner
Alexian Brothers Medical Center
Bethesda Lutheran Homes
Central DuPage Hospital
Delnor Community Hospital
Edward Hospital & Health Services
Loretto Hospital
Loyola University Medical Center
Neurologic & Orthopedic Institute
Norwegian American Hospital
Provena Mercy Medical Center
Ravenswood Hospital
Riverside Medical Center
RML Specialty Hospital
St. Alexius Medical Center
St. Anthony Hospital
St. Elizabeth Hospital
Sherman Health Resource Center
University of Chicago Hospital
Valley West Hospital
Weiss Memorial Hospital

AP&S Architects
Eriksson Engineers
FGM Architects
Garapolo Maynard Architects
GFGR Architects
Harley Ellis Devereaux Architects
HDR Architects
International Contractors
Jensen & Halstead Architects
Johnson Wilbur Adams Engineers
LaPage and Associates Architects
Matthei & Colin Architecture
Michuda Construction
Performance Mechanical Contractors
Perkins+Will Architects
PFB Architects
Potokar Architecture
Power Construction
Ragnar Benson Construction
Sigalos & Associates Construction
Skender Construction
TK&B Architects
Wold Architects & Engineers
Gage Consulting Engineers, Inc.  
– providing specialized engineering & design expertise to the healthcare industry

We look forward to the opportunity of serving the engineering needs at Northwestern Memorial Hospital