

# Printing Facilities



**BROWN PRINTING CO.  
BUILDS 111,000  
SQUARE FOOT  
ADDITION**

Implementation of new technologies increases production capacity, speed, and flexibility to better serve customers. Sievert provided professional design, engineering and construction management services for a 111,000 square foot addition to Brown Printing's Woodstock Division. The building addition accommodates new high-speed web presses with Sunday technologies, perfect binder equipment, and a warehouse and shipping dock. Sievert also provided mechanical engineering services to optimize process chilled water systems, air conditioning and ink pumping systems in the existing facility.

## OTHER REPRESENTATIVE SIEVERT CAPITAL IMPROVEMENT PROJECTS

Sievert was retained by **Advance Direct** to provide facility programming and design services for a 350,000 square foot direct mail facility located in **Boulder, Colorado**.

Sievert provided facilities design and engineering services for relocation and consolidation of web printing and bindery operations for a **Consolidated Graphics, Inc.** facility located in **Houston, Texas**.

**Chicago Decal Company** commissioned The Sievert Group to design and manage the construction of their new state-of-the-art manufacturing facility and corporate offices located in a 60,000 square foot building in **Burr Ridge, Illinois**.

The Sievert Group was commissioned by **Motheral Printing Company** to provide programming and design for a new 200,000 square foot production facility in **Fort Worth, Texas**.

**Visual Systems, Inc.** commissioned The Sievert Group to provide facilities layout, design and engineering services for remodeling a 65,000 square foot plant in **Milwaukee, Wisconsin**.

**World Color Press - Chicago Division** retained Sievert to provide plant layout and engineering services for relocating presses acquired through the acquisition of a nearby business into a single location.

## SIEVERT PROVIDED PROJECT PROGRAMMING, DESIGN AND CONSTRUCTION CONSULTING SERVICES FOR A NEW 25,000 SQUARE FOOT PRINTING FACILITY FOR BAT GRAPHIC PARTNERS



## VALUE ENGINEERING SAVES CONSTRUCTION DOLLARS

When the president of a large printing company received a cost estimate of \$8,000,000.00 to construct a regional printing facility, he asked his project team to provide suggestions for reducing the cost of the facility without compromising the original purpose of the project. Fortunately, the cost estimate was established before 35 percent completion of the design when the cost to make changes was minimal compared to the potential savings.

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The Sievert Group led a value engineering workshop using a Certified Value Specialist from its project management division. Value engineering is a multi-disciplined approach to developing changes to projects, products, services and processes by following a creative methodology based on the analysis of functions. In this case, the value engineering study was employed to identify new approaches and alternatives to design and construction of a facility to reduce cost and provide a project of equal or better quality.

Representatives from the printing company's staff and each design engineering consultant participated in the workshop. They evaluated the owner's program requirements and the design schemes prepared by each of the various disciplines of work (i.e., plant layout, civil, architectural, structural, mechanical, electrical and fire protection). Their suggestions included changes in the owner's program requirements and modifying or eliminating expensive parts of the originally proposed design concepts. The life cycle costs of suggested changes were considered rather than just initial costs. The study resulted in cost saving changes to space, structure, equipment, materials and methods that were accepted by the printing company and incorporated into the final design and construction of the project. The following is a summary of savings that resulted from the value engineering study:

### Before value engineering

Estimated Cost: \$8.5 Million  
Size: 160,000 square feet

### After value engineering

Actual Cost: \$5.8 Million  
Size: 120,000 square feet

Manufacturers and service establishments are mapping processes to identify opportunities for reducing cycle times, waste and production costs. They are striving to eliminate waste in operations caused by bottlenecks, overproduction, inefficient utilization of labor and equipment, inefficient workflow, material handling and utilization of space. The critical path method is a powerful tool for determining the shortest possible time to produce and deliver products and projects based on technology and resource constraints.

The critical path method (CPM) was developed in the 1950's by Dupont Corporation to reduce the amount of time and money required to construct their chemical plants.

Today, CPM is used for:

- Identifying bottlenecks, eliminating waste, and improving work flow in manufacturing and service operations.
- Introducing new products into the marketplace.
- Planning and scheduling construction, production, and maintenance projects.

CPM is a planning, scheduling and control tool. A CPM network diagram is a time-based flow chart of the activities required to produce a product or project based on the current or planned sequence and duration of activities.

There is at least one path of activities through the network from start to finish that controls the overall time to produce or deliver a product. The sum of the activity durations along this critical path shows the shortest amount of time possible to manufacture a product or build a project. If any activity on the critical path takes longer than its estimated duration it becomes a bottleneck and the overall production schedule or project completion date will be delayed accordingly.

Activities not on the critical path have more time for completion than the amount allotted by the planner. This extra time is called float. Non-critical activities may become critical or bottleneck operations if the time required to complete them exceeds their allotted time plus float. As a result of implementing process flow reviews of market segments and process family groupings printers have optimized utilization of fixed assets and resources, cut work-in-process inventory, reduced waste and non-value added activities, and decreased lead times. CPM also helps printers to deliver the right facilities in a timely manner to save money and gain market share.

## CLIMATE CONTROL CAN ENHANCE PRODUCTIVITY, WORKER HEALTH AND SAFETY

According to laws identified in building codes, OSHA and EPA regulations, owners and operators of facilities are responsible for the safe and sanitary maintenance of their facilities at all times. In printing operations, contaminants in the form of solvent vapors, ink misting, offset powders and ozone from UV curing systems can cause illnesses. A proper ventilation system must be designed and installed to remove contaminated air from occupied zones and to supply fresh outside air. Stagnant air conditions, noxious odors, excessive dust, and negative air pressure inside a building may signal inadequate ventilation and make-up air.

In addition to providing occupant health and comfort, the plant air conditioning system provides process control. Control of temperature, humidity, ventilation and air filtration facilitates the ability to estimate and schedule work accurately and minimizes equipment downtime, production waste and rework.

The Sievert Group surveys, diagnoses and corrects indoor climate control problems. Through examination of countless printing and related operations in North America, they have observed that ineffective indoor climate control continues to be a root cause of quality, waste and productivity problems. Changes in space function, chemical usage, type of operations, equipment utilization, occupant population and activities, requires re-evaluation of the heating, ventilating and air conditioning systems.



### UARCO'S IMPRESSIONS DIVISION CORPORATE HEADQUARTERS

Sievert designed and managed construction of the corporate headquarters for Uarco's Impressions Division located in Carol Stream, Illinois. Sievert also designed and remodeled various facilities to accommodate new digital print technologies in various regions throughout the United States.

## FACILITIES PLANNING AND RELOCATION: A CASE STUDY

Developing a new printing plant or remodeling an existing one involves a myriad of decisions and balancing competing demands among scope, time, cost and quality. Project management is the key to the success of any building construction or process installation project. The following example illustrates steps in a typical construction project that must be managed carefully to achieve successful project completion.

One commercial printer determined that it was necessary to relocate because its existing facility was not capable of meeting increasing customer demands and new technology requirements. The company had to consider remodeling a 110,000 square foot plant or building a new facility. The Sievert Group was selected by the printer to manage the entire building program from concept to completion.

The construction project was executed in four phases to enable better management control. At the completion of each phase a tangible, verifiable work product (e.g., a plant layout, feasibility study, design concept, construction drawing, cost estimate, contractor bid proposal, permit, test and balance report) was delivered to the project owner.

### Phase 1: Programming and Preliminary Design Studies

The decisions made during the planning and early design phase are vital to the success or failure of your project. During the pre-construction phase the scope, quality, budget and project schedule are defined. Your opportunity to control cost and technical performance decreases from 100 percent during the initial planning and programming to 50 percent at the end of the schematic design phase. Further, control drops to approximately 10 percent once construction begins. The importance of involving the project management firm during the initial planning phase cannot be overemphasized.

The first step in the project life cycle is to clarify and document the owner's specific needs. The Sievert Group conducted an owner needs identification study to develop a comprehensive building program. Sievert worked with the project owner to develop the space requirements, an ideal plant layout, and a master site plan for determining the feasibility of project sites. Sievert's engineers calculated the HVAC loads, selected air conditioning equipment and determined the power and lighting requirements.

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The scope of work must be clarified before reliable feasibility studies, construction cost estimates, and time allotments for final design and construction can be developed. Field surveys were made of prospective sites including existing facilities and undeveloped properties. Sievert identified the general condition, functional adequacy, and life expectancy of existing building systems, identified necessary remedial repairs and upgrades, and prepared budget cost estimates and schedules for making the improvements.

The Sievert Group developed the design documents in more detail when an existing building was selected to be the printing company's new home.

### Value Engineering and Cost Trade-Off Studies

Sievert's Certified Value Specialists took into account plant layout options as well as the life cycle cost of building materials and design alternatives before the major systems were selected and locked into the project. They analyzed the systems and design components that required the greatest expenditure, challenged the concepts and compared them with alternatives on a cost/benefit basis. The guaranteed maximum price for the project was established early in the design phase and approved by the project owner. The printer knew exactly how much to budget for the project prior to purchasing the property and building.

### Phase 2: Final Design

After the preliminary design and budget were approved by the project owner, Sievert completed the final design and construction documents. The documents were used to procure a building permit and obtain competitive bids from specialty trade contractors to perform construction.



**SIEVERT ENGINEERS  
FACILITY FOR  
BOWNE & CO.**



Sievert engineered a new manufacturing facility for Bowne & Co., Inc. in South Bend, Indiana. The 125,000 square foot state-of-the-art plant functions as a midwest printing and distribution center. Bowne & Co. serves the financial printing sector. It is the oldest printing company in the United States.

### Phase 3: Bidding and Award of Construction Contracts

Sievert continued to provide services throughout the bidding and construction phases of the project. Bids were obtained directly from qualified specialty contractors (e.g., concrete, mechanical, electrical, structural, etc.) and manufacturers of equipment (e.g., HVAC and electrical switch gear). The project owner achieved substantial cost savings because equipment and services were purchased directly from equipment vendors and specialty contractors - rather than having to pay a general contractor who would mark up such items. Sievert coordinated work efforts, prepared bid packages, evaluated bids, and negotiated contracts with multiple specialty trade contractors and equipment manufacturers on behalf of the project owner. Long-lead items were identified and ordered early to avoid project delays. The critical path method of planning and scheduling identified the least possible time to complete construction activities for the project.

### Phase 4: Construction

Sievert provided an on-site superintendent to monitor and coordinate daily construction activities on behalf of the project owner.

This printer's successful construction program was the result of integrated planning, design and construction activities by a firm that specializes in the printing industry. Sievert's approach relieved the owner of many burdens associated with the on-going project and enabled the printing company's personnel to concentrate on their core business responsibilities. If you desire, Sievert can provide pre-construction phase services only.

## GET ACQUAINTED WITH SOME OF OUR PRINTING INDUSTRY CLIENTS

Action Graphics  
Advance Direct  
Advertising Metal Display  
Alaniz & Sons, Inc.  
Amoco Corporation  
BAT Graphic Partners, Inc.  
Berlin Industries, Inc.  
Bowne & Co., Inc.  
Brown Printing Company  
Castle Communications  
CB International  
Century Graphics  
Chicago Decal Company  
CMP Printing Company  
Consolidated Graphics  
Crane Carton Company  
Douglas Press  
Duplex Products, Inc.  
E&G Printing Service, Inc.  
Farm Journal  
Follett Publishing Company  
General Binding Corporation  
General Business Forms  
Graphix Products, Inc.

ISA Direct, Inc.  
Lions Clubs International  
Midwest Bank Note Company  
Mills-American Envelope Company  
Motheral Printing Company  
National Safety Council  
Perry Printing Company  
R.R. Donnelley & Sons Co.  
Regensteiner Press  
Response Graphics - Div. Of Moore  
Business Forms  
Ringier America  
Schawk Graphics  
Standard Register  
The Buhl Press, Inc.  
Thomas C. Lane Publishing Company  
Uarco, Inc.  
VIP Global Communications  
Visual Systems, Inc.  
Wayside Press, Ltd. - Vernon, British  
Columbia, Canada  
World Color Press, Inc.  
Xerox