Drane Engineering Home



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| Drane Engineering provides mechanical engineering services. We focus on providing the highest value solutions to our clients.   * We ask appropriate questions to get proper client input * We stay up-to-date in our areas of expertise through trade journals and vendor interaction * We apply appropriate engineering discipline to quantify scope/size/cost of design options * We manage complexity/variation to help clients reach  higher-value, lower-risk solutions   Please take a few moments to view the rest of this website for more details on our experience and the services we provide. | * **Cost Estimates** * **Specifications** * **Heat Balances** * **Part Modeling** * **Stress Analysis** * **BOMs** * **Thermal Analysis** * **VISIO Development**   **...and more** |

Services and Skills

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| |  | | --- | | With over 10 years of Mechanical Engineering and Design experience, Drane Engineering provides mechanical engineering and owner's engineering consulting services, with a strong attention to communication. Whether you are documenting a product for manufacture, or trying to express the cost benefits of a cogeneration plant to your board of trustees, how clearly you communicate your idea significantly contributes to its capacity for funding and often its cost performance and lead time.  RFQs, contracts and bid documents are complex communication devices. It is critical for a successful project to leverage the experiences of its owner and of the construction, building and product industries. With Drane Engineering as your Owner's Engineer, we help you make educated choices on how to constrain your new plant, as well as how to communicate these choices to bidders such that you can receive an excellent project constructed excellently.   [**Product Engineering**](http://www.draneengineering.com/mechanical.htm)[**Owner's Engineering**](http://www.draneengineering.com/ownerengineering.htm)[**Visio Development**](http://www.draneengineering.com/visio.htm) | |

services and skills, product eng

**Product Engineering**We help companies with brainstorming, design and documentation challenges associated with product design. For example, we have helped companies implement part numbering and MRP systems for improved documentation efficiency.

* **Part models**
* **Part documentation**
* **Assemblies**
* **BOMs**
* **ECO/ECN rev control**
* **Instruction sheets**
* **Cost estimates**
* **Outsourcing  
  - Manufacturing  
  - Rapid prototyping  
  - Assembly**
* **DFM**
* **FMEA**
* **Thermal analysis**
* **Stress analysis**

services and skills, owners eng

**Owner's Engineering**We help an owner manage project and design complexity to help determine:

* *Best marginal dollar/equipment choices*
* *Contractor deliverables/guarantees*
* *Plant interfaces to existing systems*
* *Redundancy and capacity choices*
* **Cost estimates  
  - Richardson's Rapid System  
  - Means  
  - Prior job quote database  
  - Proforma**
* **Project Manuals  
  - RFQ  
  - Submittal requirements  
  - Contract requirements  
  - Specifications**
* **System models**
* **Heat balances**
* **Flow networks**
* **Thermal analysis**
* **Stress analysis**
* **Pipe stress analysis**

services and skills, Visio Development

**Visio Development**Visio is a wonderfully flexible and powerful tool that provides a modular basis for modeling complex systems. The visual nature of the software aids in the communication and understanding amongst all parties involved. By linking custom "smart shapes" together, complex system behavior can be quantified and analyzed for sensitivity to input variation. The modular and straight forward interface enables managers and other personnel to manipulate the model directly without significant training. Development time is minimal and legacy software can often be readily incorporated into the model.

* **System models**
* **Heat balances**
* **Flow networks**
* **System status reports**

About Us

Drane Engineering has been owned and operated since 1997 by [Randell B. Drane](http://www.draneengineering.com/resume.htm), PE.    
Mr. Drane has over 10 years of engineering and design experience. With manufacturing experience and exposure ranging from small batch and custom volumes to massproduction, he understands how priorities can vary with volume. His machining experience serves as a reminder in all he designs of the cost ramifications of his choices. This experience was reinforced at Da'Lan Inc. where he was responsible for design and documentation of small car and truck trailer hitches. Design for manufacturability and efficiency of material and labor were paramount. At Asyst Automation, where he was part of a team delivering clean room transport systems, reliability, design modularity, design flexibility and installation efficiency became increasingly important.

Since Asyst Automation, Mr. Drane has mostly worked in the Power Plant and Process Piping industry. Here he has been exposed to the critical importance of project management and proper project definition. He recognizes the success of a project is dependant on the right design being constructed excellently. As an [owner's engineer](http://www.draneengineering.com/ownerengineering.htm), Drane Engineering facilitates an owner's definition of scope and design parameters in preparation for RFQ submittals, project permitting and construction documentation. For [product engineering](http://www.draneengineering.com/mechanical.htm), Drane Engineering helps optimize manufacturability, feature and cost parameters.

Additionally, over the last several years, Drane Engineering has been involved in VISIO development for system modeling. VISIO is used to perform heat balances and flow networks. By piecing together modular power plant components, such as pumps, boilers and turbines, plant performance and sensitivities can be analyzed. This solution provides reasonable speed, significant ease-of-use, infinite flexibility and very low per-seat cost.

Drane Engineering would be excited to discuss how we can help you with your project. Please [contact us](http://www.draneengineering.com/contact.htm) for more information.

[**Resume**](http://www.draneengineering.com/resume.htm)[**Clients Served**](http://www.draneengineering.com/clients.htm)[**Outside Interests**](http://www.draneengineering.com/outside_interests.htm)

About Us, Resume

Randell B. Drane, PE

**PROFESSIONAL EXPERIENCE**

**Mechanical Engineer**March 1997 - Present

*Drane Engineering, Winchester, MA*

Owner of sole proprietorship providing mechanical engineering services.

* Developed Visio heat balance application for systems modeling of mechanical systems (heat balances, network flow analysis).
* Used Pro-E. to develop and release to manufacturing several fatigue testing rigs for local product design company.  Fatigue testing was part of a failure analysis on some product critical drive parts.
* Designed process steam lines serving papermill near Syracuse, NY.  Work included main steam supply to desuperheating stations and back pressure turbine. Pressure drop calculations, network analysis and pipe stress analysis were performed.
* Designed automation nest for local semiconductor wafer testing machinery company.
* Designed tail gas process piping for local test lab processing carbon black.  Performed heat loss, pressure drop and pipe stress calculations.  Helped manage release of print package for construction and PE stamp.
* Developed heat balance model for cost analysis and design point selection of local co-generation project using gas turbine and heat recovery steam generator to supply heat of evaporation to LNG operation.
* Compiled cost estimate for boiler replacement at U. Mass. Amherst.  Used Richardson Rapid system to estimate plant and equipment purchase, installation and construction costs.
* Updated documentation of “Doser” product for local asthma product company.
* Developed heat balance model to predict the value of new Fisonic feed water heater system to Astoria Power Station.  For same project also performed pipe layout, pipe stress, costing and supplier quote management.
* Provided pipe stress and alternate routing design for temporary steam pipes in Atlantic Avenue for The Big Dig.

**Mechanical Design Engineer**January 1995 - February 1997

*Asyst Automation, Inc., Wilmington, MA*

Researched, designed and developed new transport system products for clean room automation.

* Developed specifications, prototypes, tooling and documentation of new clean room transportation system.
* Tested systems for cleanliness and acceleration values to SemaTech specifications utilizing statistical methods.
* Responsible for system design and documentation of suspension and interconnection of automated conveyor system used for semiconductor fabrication in Class 1 clean rooms.
* Assisted in overall layout and design of conveyor control system using centralized PLC and PC networked controllers in addition to localized hardware control.
* Invented safety washer for clean room ceilings to prevent inadvertent dropping of hangers.
* Designed and documented sensor mounts including special send/receive “smarttag”.

**Design Engineer**October 1993 - January 1995

*Da’lan, Inc., Shirley, MA*

* Designed, tested, provided user documentation and built small car and light truck trailer hitches.
* Designed and implemented federal standard test fixture for trailer hitches up to Class III.
* Developed new production techniques and processes for improved quality and efficiency while working toward reduced lead time and inventory requirements.

**Machinist** August 1989 - August 1990

*R.J. Moran Production Machining, Littleton, MA*

* Programmed, set up and operated CNC and hand machines for small batch production.

**COMPUTER SKILLS**

CAD and numerical methods modeling (AutoCAD, Unigraphics, ProEngineer).  DOS, Windows, UNIX, Macintosh, and Main Frame platforms.  Pascal, FORTRAN, 68000 assembly, “G Code”, Visual Basic, MAS90, MANMAN.

**EDUCATION**

Northeastern University, Boston, MA              1993

Bachelor of Science, Mechanical Engineering Magna Cum Laude

**ACTIVITIES**

Northeastern University Solar Powered Electric Car,

* Designed and built power side of three phase PWM motor controller, 4130 steel space-frame chassis, McPherson Strut type suspension, and aerodynamic front wheels.

**PROFESSIONAL ASSOCIATIONS/TRAINING**

Member of the Society of Automotive Engineers (SAE), American Society of Mechanical Engineers (ASME), National Society of Professional Engineers (NSPE).  Attended SemaTech course on “Failure Mode Effects Analysis” (FMEA).  Attended Motorola’s corporate quality course “Design for Manufacturability” (DFM).

[**About Us home**](http://www.draneengineering.com/about.htm)[**Clients Served**](http://www.draneengineering.com/clients.htm)[**Outside Interests**](http://www.draneengineering.com/outside_interests.htm)

About Us, Clients Served

Partial Client Listing   
  
Asyst Automation  
Newmed  
NH Product Dev Company  
QC Solutions  
[Stapla Ultrasonics](http://www.staplaultrasonics.com/contact.htm)  
[Tri-Mont Engineering](http://www.tri-mont.com/)

About Us, Outside Interests

**Outside Interests**

[Home Energy Systems](http://www.draneengineering.com/outside_interests.htm#Home Energy)  
[Automotive](http://www.draneengineering.com/outside_interests.htm#Automotive)  
[Home Building Systems](http://www.draneengineering.com/outside_interests.htm#Home Building)  
[Rapid Prototyping](http://www.draneengineering.com/outside_interests.htm#Rapid prototyping)

**Home Energy Systems**

* Solar Power   
  - Photovoltaics   
  - Balance of plant systems
* Combined Heat & Power/Cogeneration
* Ground coupled heat pumps
* Home energy system management

**Automotive**

* Ultralight vehicles
* Composite chassis
* Hybrid power
* Active collision protection

**Home Building Systems**

* Stressed skin panels
* Local fiber content

**Rapid Prototyping**

* Large composite parts, art to part

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Links of Interest

Contact Us