

WHEATON & SPRAGUE ENGINEERING



WHEATON & SPRAGUE  
ENGINEERING, INC.

Creating<sup>SM</sup>  
STRUCTURE



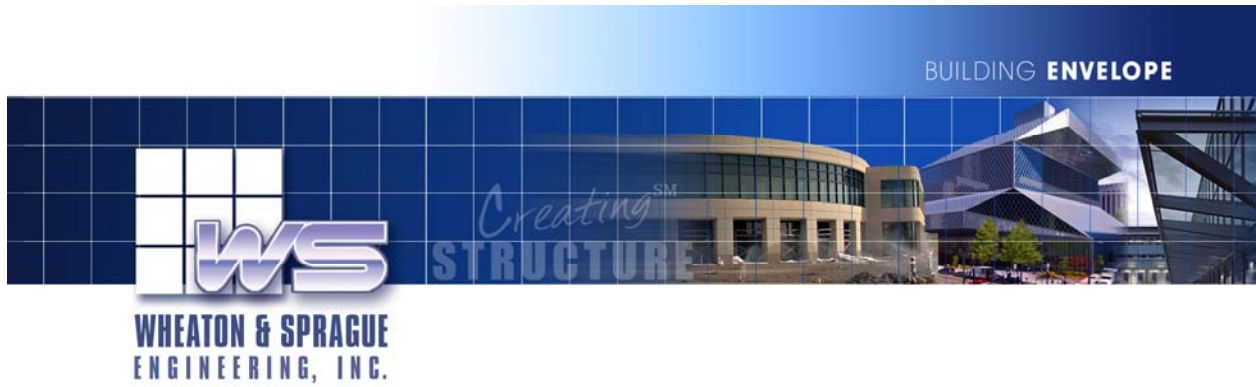
# WHEATON & SPRAGUE ENGINEERING, INC.

## CLIENT SERVICES BROCHURE

Building Envelope Engineering Division  
2011

[www.wheatonsprague.com](http://www.wheatonsprague.com)

1100 Campus Drive, Suite 200 • Stow, OH 44224-1756 • Tel: (330) 923-5560 • Fax: (330) 923-5569  
Building Envelope Engineering ■ Building Envelope Consulting



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# COMPANY HISTORY

BUILDING ENVELOPE



## COMPANY HISTORY:

Formed in 1994, by Mr. John Wheaton, P.E., LEED AP, President, and Mr. Richard Sprague, Vice President, Wheaton Sprague (WS) is a professional services company with a staff of designers, consultants, engineers, and LEED AP's, with technical focus on building facades, building envelopes, and custom curtain wall systems. WS is organized into Building Envelope Engineering (BEE) and Building Envelope Consulting (BEC) Divisions, providing a full array of expert services to the building envelope industry in one enterprise, with experienced professionals and multiple offices.

WS experienced growth primarily by providing services for clients on thousands of projects through our Building Envelope Engineering Division. Throughout our history, we provided building envelope consulting services as part of our practice. However, there was not a legitimate manager to devote attention to growing demand and interests, and to drive that business's unique client needs and technical specialties. In response to our desire to be a complete building envelope specialty company, in 2008 the Building Envelope Consulting (BEC) Division was added, and Mr. Mark Coulis, LEED AP, appointed as Vice President of the Division. Mr. Coulis is a highly qualified senior design consultant operating from the Stow Ohio office, with a distinguished career in the building envelope consulting field.

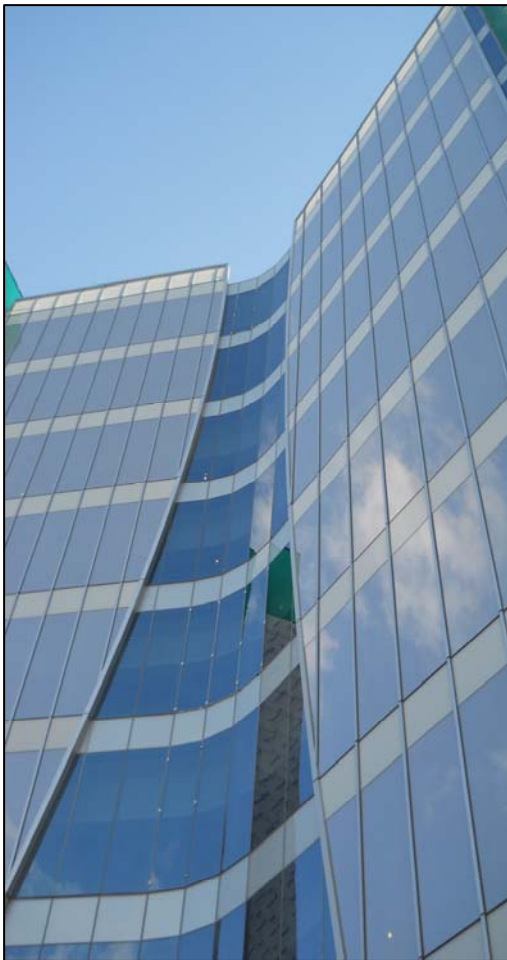
As part of the ongoing strategic plan to add branch offices to support our growing service offerings, WS added a Bloomington, Minnesota branch in 2010, and in 2011, WS has added a presence in Seattle and the Pacific Northwest, working with experienced building envelope consultant, Ray Kelly. WS has been involved in the Seattle market for over a decade through our Stow, Ohio Headquarters, designing and engineering many curtain wall projects in Seattle and throughout the state of Washington.

WS will continue to grow and provide national and regional clients with pragmatic, value-oriented solutions through branch offices and in both the consulting and engineering divisions, utilizing specialized technical expertise to aid in the design and construction of building envelope systems.



**WHEATON & SPRAGUE**  
ENGINEERING, INC.

**Wheaton & Sprague houses 2 Distinct and Strategic Divisions  
which service the total needs of the building envelope**



**THE BUILDING ENVELOPE  
ENGINEERING DIVISION:**

Full-service engineering for exterior cladding systems: including system design, structural engineering, thermal analysis, shop drawings, fabrication / production drawings, building informational modeling and related services

**THE BUILDING ENVELOPE  
CONSULTING DIVISION:**

Expert consulting for the building envelope including schematic design, design development and construction documents, specification development, construction administration, testing and witnessing of testing in laboratory or field, forensic investigation of building envelope failures or defects, expert witness testimony, thermal design and analysis, observation, peer review, blast / impact assessment



We seek to build long term relationships with the people and organizations that we serve, and partner with them to facilitate competitive and successful projects and add order and structure to the engineering and design realm of our clients' business.

Because we employ design professionals, technicians, and firm leaders who have worked directly for, and with some of the client types we serve, and because we work hard to understand our clients' businesses, we believe it gives us a unique perspective, and a deeper understanding of our client's side of the business.

W&S's Building Envelope Division Client Approach:

- One stop shopping for all your engineering, drawing, and design & consulting needs
- Meeting your schedule is primary
- Project Management plan and contact for each project provides you consistency, communication, and cohesion for thorough and clearly communicated deliverables
- Technical project management to serve your individual needs & provide consistency
- Strategic relationships that will help to bridge gaps, and meet your total needs
- National building envelope experience and practice base, providing you with a large experience base and network
- Consistency of process for deliverables, thus ensuring more accuracy, and facilitating additional time to focus on the more complicated aspects of projects
- *Creating Structure*<sup>®</sup> not only through the science and art of structural engineering, but in our client approach - through communication, quality control, project management, delivery, marketing, technical knowledge, creative and practical problem-solving skills, relationships and innovation - by working to understand your spoken and unspoken goals and desires for the project, for your business, and for your clients

*Creating*<sup>®</sup>  
**STRUCTURE**



## THE BUILDING ENVELOPE ENGINEERING DIVISION:

Full-service engineering and consulting for exterior cladding systems: including system design, structural engineering, shop drawings, fabrication / production drawings and related services.

### SYSTEMS

#### Curtain wall Systems – Custom & Standard

- Unitized
- Stick
- Strip Window
- Punched Openings
- Storefront



#### Stone Systems

- Granite
  - Limestone
  - Sandstone
  - Cladding
- on strongback, aluminum, curtain wall, stud, unistrut or handset*



#### Panel Systems

- Sheet
- Composite
- Insulated Foam



#### Skylight / Sloped Wall Systems

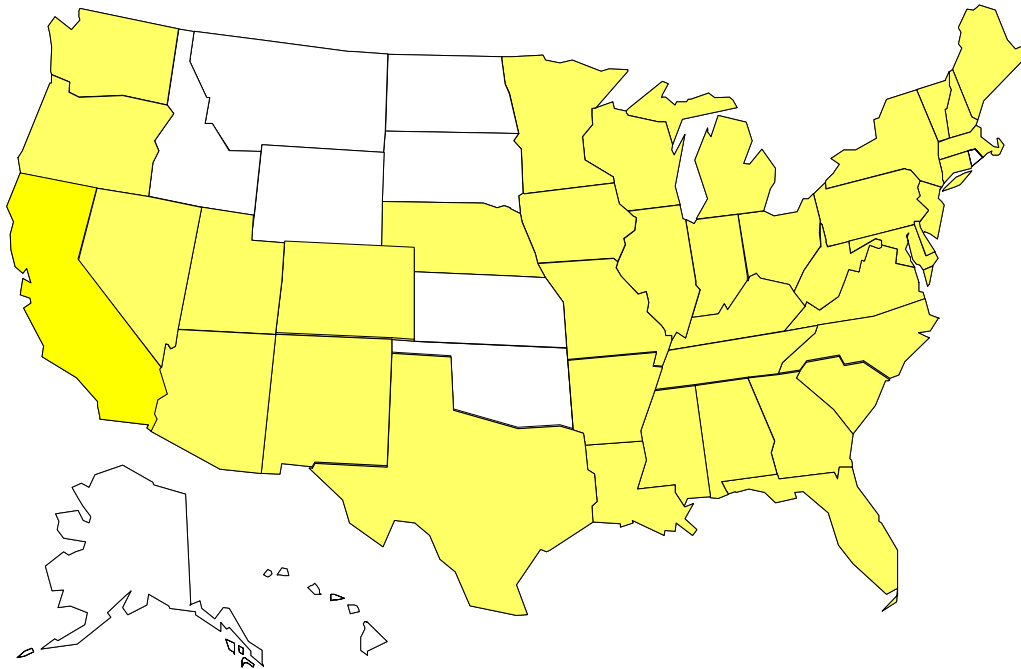
- Rafters
- Purlins
- Anchors

#### Architectural Specialties

- Railing
- Canopy
- Inserts
- Embeds
- Point Supported Glass
- Tension Cable Walls
- Sunshades
- Solar Panels
- Other architectural components



**WHEATON & SPRAGUE**  
ENGINEERING, INC.



- |                      |               |                |                |
|----------------------|---------------|----------------|----------------|
| ALABAMA              | IOWA          | NEVADA         | PUERTO RICO    |
| ARIZONA              | KENTUCKY      | NEW HAMPSHIRE  | SOUTH CAROLINA |
| CALIFORNIA           | LOUISIANA     | NEW JERSEY     | TENNESSEE      |
| COLORADO             | MAINE         | NEW MEXICO     | TEXAS          |
| CONNECTICUT          | MARYLAND      | NEW YORK       | UTAH           |
| DELAWARE             | MASSACHUSETTS | NORTH CAROLINA | VERMONT        |
| DISTRICT OF COLUMBIA | MICHIGAN      | OHIO           | VIRGINIA       |
| FLORIDA              | MINNESOTA     | OKLAHOMA       | WASHINGTON     |
| GEORGIA              | MISSISSIPPI   | OREGON         | WEST VIRGINIA  |
| ILLINOIS             | MISSOURI      | PENNSYLVANIA   | WISCONSIN      |
| INDIANA              | NEBRASKA      |                |                |

WS has a **staff S.E.** for the state of Illinois, and has secured an **S.E. affiliation for the state of Washington**. With the significant amount of work we do in Seattle and the surrounding areas, we knew that this would be an asset to our existing clients and potential clients as well. WS will now be able to provide **S.E. Review and Seal of structural calculations and shop drawings** in the state of **Washington** as well.

The Department of Planning and Development for the city of Seattle, WA officially accepts the Washington State Professional Engineering seal and signature of John Wheaton, P.E., LEED AP, on designs for curtain wall systems in the City of Seattle.

Wheaton Sprague also has a Canadian partner that can provide P. Eng services.



## STRUCTURAL ENGINEERING SERVICES

### STRUCTURAL ENGINEERING

- Design Criteria
- Windloads / Snowloads
- Seismic Load

### CURTAINWALL

- Vertical Mullions
- Horizontal Mullions
- Anchors
- Embeds / Inserts
- Specialty Components

### PANELS

- Panel Analysis
- Panel Connections
- Panel Support Structure

### STONE FACADE

- Stone Analysis
- Stone Attachments
- Backup Structure
- Terra Cotta

### SKYLIGHT

- Rafters
- Purlins
- Anchors

### SPECIALTY

- Guard & Handrail
- Secondary Steel Structure
- Strut Systems
- Glass Canopy
- Point Supported Glass
- Sunshades
- Solar Panels



## SPECIAL SERVICES OR INDIVIDUAL ENGINEERING APPLICATIONS

- Windload Analysis
- Seismic Analysis
- Code Consultation
- Development of System Capacity Charts and Graphs
- Curtainwall Systems Investigation and Selection
- Development of Computer-based Applications for Curtainwall Structures
- Review of Client Structural Calculations
- Review of Client Shop Drawings
- Preliminary Review – Value Engineering
- Review of Stone Strength and Stone Selection
- Field Troubleshooting

*Additional services available upon request*



**WHEATON & SPRAGUE  
ENGINEERING, INC.**

**System design from concept to reality for curtain wall systems  
System and application design for panel and stone**

### System Design:

- New & Custom Systems
- Proposal Drawings
- Product Development
- Profile Drawings

### Deliverable:

*Complete shop drawing production from proposals to as-builts*

- Proposal Drawings
- Profile Drawings
- Die Drawings
- Mock-Up Drawings
- 3D Modeling
- BIM (Building Information Modeling)
- Shop Drawings
- As-Built Drawings
- Embed Drawings

3D modeling will allow us to more completely visualize and follow seal lines, accurately determine proper joinery for complex intersections, visualize aesthetic problems before assembly of parts, and provide early detection of interference problems to our clients.

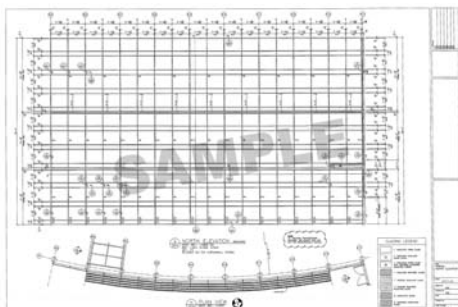
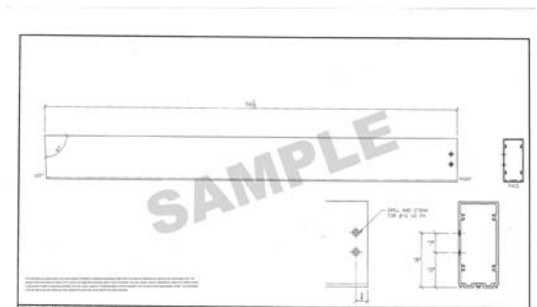
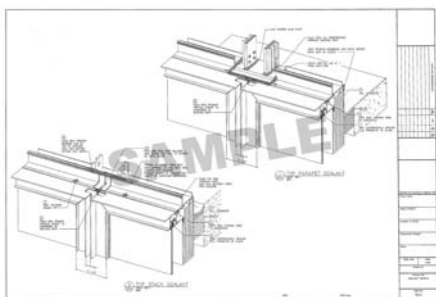
### Shop Drawings:

- Pre-sale and Post Sale Services
- New & Custom Services
- Product Development
- Research & Development

### Fabrication / Production Drawings:

*Complete fabrication and production drawings for curtainwall systems, panel systems and stone*

- Part Drawings
- Unit Assembly Drawings
- Unit Address Tags
- Anchor Layouts
- Panel Tickets
- Stone Tickets



*Additional services available upon request*



The goal of providing a model for the exterior cladding system is to have design issues and conflicts between facade building components worked out prior to the commencement of construction, in an effort to save time and money at all stages of the construction process. At the heart of the process is an authoritative building information model from which to extract the data to create a complete, accurate set of construction documents.

A **BIM model for a curtain wall**, or building's exterior cladding system, is a digital representation of the physical and functional characteristics of that system.

The model represents the definitive and authoritative guidelines from which the construction contractors and subcontractors will build with minimal deviation.

**Benefits of utilizing a building model prior to construction may include:**

- Safer worksite due to more pre-assembled items coming from offsite.
- Design issues resolved prior to construction
- Onsite trade construction at a minimum
- Instant changes perpetuate throughout the drawing package as one feature is revised
- Minimized down time due to conflicts

Using Revit Architecture software, Wheaton & Sprague has the capabilities to provide Building Information Modeling for the Building Envelope.

**Wheaton & Sprague features the following BIM Services:**

- 1) **Clash Detection Modeling** – to meet architect/GC requirements for coordination between trades.
- 2) **Sales and Marketing Modeling** – to showcase customer's product as a presentation tool to aid customer in winning projects.
- 3) **Construction Modeling and Shop Drawings** – detailed model according to customer's needs.
- 4) **Material Take-Offs** – for use in material orders

For BIM related services, please contact Richard Sprague at [rsprague@wheatonsprague.com](mailto:rsprague@wheatonsprague.com)



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STRUCTURE

Wheaton Sprague provides Thermal Analysis & Design of exterior cladding and wall systems, utilizing THERM 5.2, WINDOW 5.2 and OPTIC 5.0 finite element analysis programs.



**THERM** is a state-of-the-art, Microsoft Windows® based computer program developed at Lawrence Berkeley National Laboratory (LBNL) for use by building component manufacturers, engineers and others interested in heat transfer.

Using **THERM**, WS can model two-dimensional heat-transfer effects in building components such as windows, walls, foundation, roofs and doors; as well as other products where thermal bridges are of concern. **THERM's** heat-transfer analysis allows WS to evaluate a product's energy efficiency and local temperature patterns, which may relate directly to problems with condensation, moisture damage, and structural integrity.

Due to new standards for energy, efficiency and green building requirements, in addition to client demand, the firm made the implementation of Thermal Analysis & Design a part of its strategic plan for accomplishment in 2008.

Increasingly, architects are required to include thermal analysis in their submittal packages to comply with contract documents. WS will now be able to provide that submittal package for them. In addition, WS can now assist our clients in evaluating a new design for thermal efficiencies for all types of exterior cladding systems, before that design is finalized.

**Condition Simulated:** Fixed vision to operable vision vertical mullion with mill aluminum spacer on operable glass, mill aluminum spacer on fixed glass  
**Boundary Conditions:** Exterior Temperature: 10.0° F; Interior Temperature: +69.8° F, Relative Humidity: 35%; **Dew Point Temperature = 40.8° F**

## THERM 5.2

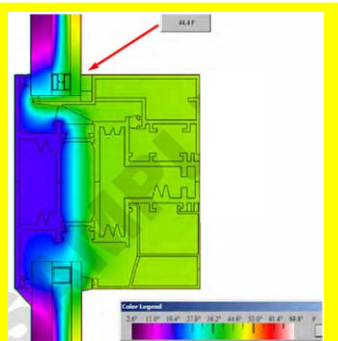
1. Frame & Edge of Glazing System Creation & Analysis
  - Provide results for items 2-4, and/or:
  - Export to **THERM 5.2** for Total Product Analysis
2. Provide Complex Composite Detail Analysis
  - Aluminum Curtain Wall Parapets/Soffits
  - Transition Details at Dissimilar Materials
3. Study Heat Transfer & Provide Heat Flux Analysis
4. Provide Dew Point Analysis

## OPTIC 5.0

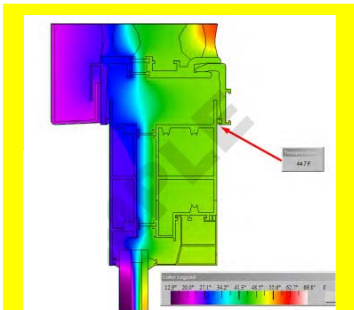
1. Configure Special Assemblies for input to **WINDOWS 5.2** program:
  - Laminate Glass with Two or More Plies
  - Glass Plies with Film
  - Insulated Panels
  - Various Exterior Wall Configurations

## WINDOW 5.2

1. Glazing System Creation & Analysis
  - Double or Triple IG Units
  - Monolithic
  - Site Built Products (Curtain Wall, Windows, Etc.)
  - Factory Built Products
2. Calculate Total Product U-Factor
  - Calculate Solar Heat Gain Coefficient (SHGC)
  - Simulate Condensation Resistance



**Condition Simulated:** Fixed vision head horizontal with mill aluminum IG spacer  
**Boundary Conditions:**  
 Exterior Temperature: 10.0° F  
 Interior Temperature: +69.8° F, Relative Humidity: 35%  
**Dew Point Temperature = 40.8° F**



**Condition Simulated:** Fixed vision head horizontal with mill aluminum IG spacer  
**Boundary Conditions:**  
 Exterior Temperature: 10.0° F  
 Interior Temperature: +69.8° F, Relative Humidity: 35%  
**Dew Point Temperature = 40.8° F**



**Condition Simulated:** Fixed vision sill horizontal with mill aluminum IG spacer  
**Boundary Conditions:**  
 Exterior Temperature: 10.0° F  
 Interior Temperature: +69.8° F, Relative Humidity: 35%  
**Dew Point Temperature = 40.8° F**

**Condition Simulated:** Fixed vision sill horizontal with mill aluminum IG spacer  
**Boundary Conditions:**  
 Exterior Temperature: 10.0° F  
 Interior Temperature: +69.8° F, Relative Humidity: 35%  
**Dew Point Temperature = 40.8° F**



*Coldest Interior Temperature is above Dew Point Temperature, condensation formation is not expected at design conditions.*



## Wheaton & Sprague Engineering, Inc. Blast Analysis & Design Capabilities:

- Analysis of glass lites utilizing Wingard Software. Can either determine if a particular glass lite meets the response criteria, or can determine the ultimate glazing capacity of the glass lite based on specified requirements.
- Understanding of balanced design philosophies and capable of designing systems based on that philosophy.
- Understanding with ISC Security Design Criteria, UFC 4-010-01, and ASTM F-1642-04
- Determination the acceptability of curtainwall and window framing systems in meeting specified requirements utilizing Single Degree of Freedom (SDOF) Dynamic Analysis. Capable of providing designs based on SDOF Dynamic Analysis in response to a specified threat.
- Analysis of connections of framing members based on specified requirements.
- Analysis of anchor conditions based on specified requirements.
- Experienced in the full scale testing of curtainwall and window units.
- Can provide complete calculation packages for glass analysis, vertical mullion design, horizontal mullion design, framing connection design, and anchor design for window systems and curtainwall systems.

## Blast Experience Highlights:

Byron Rogers Federal Office Building - Denver, CO

Cedar Rapids Courthouse - Cedar Rapids, IA

Cesar Chavez Federal Building – Denver, CO (In progress)

Elmendorf Air Force Base - Anchorage, Alaska

FBI Headquarters - Cincinnati, OH

Federal South - Seattle, WA (In progress)

Jackson Federal Building - Seattle, WA

US Post Office & Courthouse - Pierre, SD

VA Medical Center - Orlando, FL

Various DoD Armed Forces Recruiting Centers



## BUILDING ENVELOPE EXPERIENCE BY MARKET SEGMENT

### Custom Curtainwall Projects

Custom Curtainwall Projects		
<b>California</b>	<b>Maryland (Cont)</b>	<b>Utah</b>
Constitution Plaza	NIH Neuroscience	Internountain Medical Center Insert
Curtainwall Systems Detailing	UMBC Pubic Policy Bldg	
Disney Corp		<b>Virginia</b>
Electronic Arts	<b>Michigan</b>	4100 N. Fairfax
Hamden High	Compuware Curtain wall	Capital One
Hollywood & Highlands	HVG Standard System Details	Tyson's II - Bldg F
Mountainview Research Facility		
Natividad Medical Center	<b>Nevada</b>	<b>Washington</b>
Oracle 200	Fountainbleau Tower – Glass Analysis	8th and Olive
SBCMC Vestibule Canopy	Palms Place Railing System	505 Madison
	Panorama Condo	Amgen Bldg 8
<b>District of Columbia</b>	Washoe Medical Center	Bellevue City Hall
1909 K Curtainwall		City Center East Bldg
Federal Triangle	<b>New York</b>	Eddie Bauer
IRS Headquarters	150 Amsterdam Ave	Four Seasons Hotel
John A. Wilson Building	165 Charles Street	Fred Hutchinson Cancer Center
Lafayette Tower	246 Spring St	Goat Hill Office Tower
51 Louisiana	340 Madison Avenue	Harborview Medical Center
	Astor Place - Guardrail	Legacy-Salmon Creek Hospital
<b>Illinois</b>	Baruch Academic College	Lincoln Square
550 W Jackson	Charles St Apts	Museum of Glass
600 N Michigan	Clinton Mews-516 West 47th St	Ninth & Stewart Life Sci Bldg
Chicago Art Institute	One Prospect Park	Redmond City Hall
Chicago Place		Seattle Biomedical Research 307
Information Commons-Loyola U	<b>Ohio</b>	Seattle Central Library Storefront
Palmer House	Chagrin Highland	Sunset North Field Fix
	Cleveland Museum of Art	Tumwater Office Bldg
<b>Iowa</b>	Grange Insurance	U of WA Medicine: Lake Union
Iowa Events Center	OCLC	Washington Mutual Tower
Wells Fargo North Office Bldg	St John's West-Shore Hospital	West 8th Street - Seattle
	Success Tech Academy	Westlake Plaza
<b>Maryland</b>	Wesleyan University Link Bldg.	Wm H. Gates Law Library-U WA
AMC 14 - Columbia Mall		World Trade Center North
GM Allison Plant	<b>Oregon</b>	
Johns Hopkins Univ	OHSU BMRB	<b>West Virginia</b>
Legg Mason 4 Seasons	OHSU Patient Care Facility	WVA Univ Classroom Renovation

## STANDARD CURTAINWALL PROJECTS

<b>International</b>	<b>District of Columbia</b>	<b>Maryland (cont'd)</b>
Argus Insurance Bldg - Bermuda	14th Street Condos	500 E Pratt
Nat'l Museum of Marine Biology Taiwan	1010 Mass Ave	ASHA National Office
City Holdings Limited--Bermuda	1400 Church St	Charles River Laboratories
Abbott Lab - Puerto Rico	1425 K Street	Eastern Shore Hosp Center
131 Front Street - Bermuda	2020 'K' St.	JHU Curtainwall #25051
Ardenwood Bldgs 3, 5, 8	Dulles Midfield	Johns Hopkins Univ-Inserts
	Eisenhower Executive Office	M&T Bank
<b>California</b>	Georgetown Incinerator	Maple Lawn Offices
MCA/Universal Building	GWU Window Anchor System	Maplelawn Midtown Med Bldg
Orange County Courthouse	International Finance	Market Square One
People Soft	Investment Bldg Hist Windows	Soc Sec Admin Bldg
San Bernadino Cty. Med. Ctr.	NRC Curtainwall	Timonium II
UC Davis Health & Wellness	Station Place Bldg III	Tower II
	Union Station	US Census Bureau Hdqtrs
<b>Colorado</b>	Victor Bldg Window Updates	
Denver Museum Contemporary Art	Washington Tech Park	<b>Massachusetts</b>
Pepsi Center	Yale Steam Laundry Condo 1	28 State St.
Pepsi Corp		75 State St
Shea Center Office Building	<b>Florida</b>	Berklee College
	MGM Bldg	Brockton Trial Courthouse
<b>Connecticut</b>	Miami Airport - BESmoke Baffle	College of Holy Cross
100 Constitution Plaza-U of CT	Woodcrest Office Park	Community Boathouse
250/260 Constitution Plaza		Deerfield Academy
Aetna Insurance - Entrance	<b>Georgia</b>	EMC2 Corporation
Barnes & Noble - Yale Co-op	America's Mart	Globe Science Center
Berkley Skylight	Emory University	New England Business Center
Bradley Int'l Airport	Federal Reserve Bank Georgia	Reebok World Hdqtrs
Cutlers Corner	FRB Atlanta - windows	Sheraton Hotel
CWI Outriggers	GMS Proj Struc Eng Services	
Davenport College	GSU Science Park	<b>Michigan</b>
Fox S/Crittall Conservatory	Klaus Computing	Big Bear Grocery
History of Art Bldg (Yale)	Two Peachtree Point	Ford Motor Company
ICG-Inverness Business Park	Univ of W GA - Campus Center	General Motors Building
Linsly-Chittenden Hall (Yale)		Hastings Educational Bldg
Little Residence	<b>Iowa</b>	Huntington Bank
New Haven Bldg WL	Figgie Arts Center	Kalamazoo Elementary School
Operating Engineers	Wells Fargo Parking Ramp	Mecosta County Gen Hospital
Payne Witney (Yale)		MSU Housing Dev Authority
Quarry House (Yale)	<b>Illinois</b>	The Grand Hotel Tower & Expansion
Quinnipiac University	20 West Kinzie	Tubelight System Detail Update
Sheffield Sterling Strathcona	100 North Riverside-Boeing Bld	Van Andel Institute
Silliman College	353 N. Clark	WMU - Kohrman Hall
St John's RC Church	600 N Michigan	
The Yale Bookstore	Comer Children's Hosp--U of C	<b>Minnesota</b>
Trumbull College (YALE)	Northwestern University Molecular Bldg.	Univ of Minnesota
U Conn School of Business	Riverwoods II ESP	
Wesleyan University		<b>New Jersey</b>
Yale Afro-Am Cultural Center	<b>Indiana</b>	APG PW 2500 Series System
Yale Art Gallery Glass Wall	Ball Memorial Hospital	Atlantic City Int. Airport Exp.
Yale Branford	Indpls Air Traffic Cont Tower	Bally's Park Place
Yale Cross Campus Library	The Precedent	Crate & Barrel
Yale Law Library		K Hovnanian Core Bldg
Yale Music Library	<b>Kentucky</b>	Merck 800
Yale Park Street 55	Jefferson County Courthouse	Princeton U Friend Center
Yale - SSS	Lafayette Daily Advertiser	Roundhill Drive
Yale University AACC		Schering Plough
Yale University Library		Western world - Storefront
YUAG Kahn Bldg 1 of 2		

## STANDARD CURTAINWALL PROJECTS

<b>Nevada</b>	<b>Ohio (cont'd)</b>	<b>Pennsylvania (Cont)</b>
LeReve Area 3	Barnes & Noble	One South Broad
	Blegen Library-U of Cincinnati	Philadelphia Airport
<b>New York</b>	Canal Fulton Maintenance Bldg	Phillies Citizen's Bk Ballpark
10 E 87th St NY	CCF/ICH Intercontinental Hotel	PSU Dickinson School of Law
32 West 18th Street	Chagrin Highland	Villanova Law School Engineering
59-17 Junction Blvd	Clark State Comm College	WHYY
114 Morningside Drive	Cleveland Clinic Lorain Office Bldg	
829 Greenwich	Columbus College of Art & Design	<b>South Carolina</b>
Bronx Botanical Gardens Window	Country Mark Coop	Scana Sunshades
Canisius College Res Hall	Dawson-Bryant	
Darwin Martin House	Dayton Airport Control Tower	<b>Tennessee</b>
Dow Jones - Curtainwall	Del-Co Water	Caterpillar Financial Services
E 93rd St Office & Pkg Garage	Diebold	Meadow View Conf. Center
Erie Cty Public Safety Bldg	Eye Institute Cleveland Clinic	Three Corp
Giraldi/Greaney Residence	Fenn Tower - Cldv St Univ	Two Corp. Center
Gucci Building	Fred Martin Nissan Bldg	
Hauptman Woodward Skylight	Highland Elementary School	<b>Texas</b>
Hewitt School	Independence Office Building	Bush Int'l Airport
Hobart & William Smith College	Intercontinental Hotel	Hermann Memorial Hospital
Holley Residence	Jackson HS Addition	
Hudson River Museum	Kilgour Elementary School	<b>Virginia</b>
King's Highway Library	Licking Heights Elem School	Arlington Gateway Hotel
Queens Civil Courthouse	Mahoning County Technical Center	BDM Building
Seneca Hotel	MBNA Bridge	Capital One
South Street Seaport CW	Miami U Psychology Bldg	Dulles Int'l Airport-CD Ramp
Southern Blvd	MKA Estimating	FBI Headquarters
St Savior Chapel	New Millvale Elementary	Greens III @ Westfield
Stanhope Building	O'Neil's Slopewall	Harris Teeter - several locations
Sunshine Theatre	OSU - Mansfield Campus CW	Loudoun Hospital Center
SUNY Health Science Center	Progressive Insurance	Monument II
Telyas Residence	St Michael's Catholic School	NRTC Headquarters
Turnbull Residence	The Columbus Foundation	Orbital Building
US Court of Int'l Trade	United Glass	Park Crest Lofts
W-Squared		Plaza America
	<b>Oklahoma</b>	Roanoke Memorial Hosp
<b>North Carolina</b>	Broken Arrow Perf Arts Center	Sterling Park Tech Center CW
6000 Fairview		The Regent
Baptist Hospital Medical Center	<b>Oregon</b>	USPTO Interior CW
BHW Helipad	PDX Superwall	Virginia State Capital
Carolina Medical Center		VRE Woodbridge Station Expansion
Cisco System	<b>Pennsylvania</b>	
Forsyth Medical Center	August Wilson	<b>Washington</b>
French Science Center-Duke Uni	Beaver Falls Army Reserve	Corner at Bellevue Square
Mecklenburg County Courthouse	Childrens Hosp of Philadelphia	Fleet Mortgage Corp.
Perkins Library-Duke Univ	CHOP Interior Seg Glass Wall	Sunset North
Progress Energy Building	DL Lawrence Convention Center	
Sheraton Hotel	Exttech Glass Block Str System	<b>West Virginia</b>
The Arlington	Gwynedd Mercy College	Cabell-Huntington Hospitals
UNCC Atkins Library	Hamilton Square - Univ of PA	United Hospital
Wachovia Park	Keystone	W VA Air Nat'l Guard ATCT
	Lehigh Valley Hospital	WVU Biomedical Research Fac.
<b>Ohio</b>	Loews Hotel	WVU Brooks Hall Renovation
9th Avenue Parking Garage	Grant Street Greyhound Station	
ABB Environmental Systems	Marriot Hotel	
Anderson Center	Neshaminy Mall	
Aultman North		

**PANEL PROJECTS**

<b>PANEL PROJECTS</b>		
<b>Alabama</b>	<b>Maryland (Cont)</b>	<b>Ohio (Cont)</b>
Mobile Library	BWI Corporate Center	Flex Strut 9410
NACRMF The Shoals	Howard Community College	Holden Center
Premier Chevrolet	IRS Entrance Canopy	ICCH
	JHU--Applied Physics Laboratory	Lorain Community College
<b>California</b>	John Hopkins University Bookstore	LTV Garage
Benchmark Group	JHU San Martin Center Panels	Northfield Park
Crystal Cathedral Hosp Center	Maryland Metro Ceiling Panels	Tri-County Mall
Stanford University	Mount St Mary's	
UC Davis Medical Center	Tower II Canopy & Panels	<b>Pennsylvania</b>
	UMES SSEHS	1500 Spring Garden
<b>Connecticut</b>	Westin Hotel	Aloft at Philadelphia Airport
ECSU Science Building		Amtrak Int'l Gateway Ped. Brid
W CT State U Parking Center	<b>Massachusetts</b>	Arcwall 1500 Panel System
	Community Boathouse	August Wilson Center
<b>District of Columbia</b>	Deerfield 2 Corp - Allied	Bridgeside II
100 M Street	Deerfield 2 Corp - Mayden	Drexel University
2400 M Street	Logan Airport	Harrisburg Airport Panel Sys
American Airlines - JFK Airport	Lynn English High School	Heinz 57 Building
Georgetown Day School	MIT Custom	High Company #264
National Air & Space Museum		Hillman Cancer Center
Nat. Council of LaRaza Building	<b>North Carolina</b>	Magee Women's Hospital
Pepco	Carolinas Medical Center	Metal Sales Eng Consulting
	Carolina Neurosurgery	MSS Philadelphia Airport
<b>Delaware</b>	Central Piedmont CC	Philadelphia Int'l Airport
Delaware Trust Bldg	Grace Hospital	Plaza at PPL
New Castle Cty Courthouse	Int'l Home Furnishings	PSU Handrail
	Mitsubishi Dealership	Reading Hospital & Med Center
<b>Florida</b>	NC School of the Arts	Science Center
Dynetech Centre	Nortel	Smeal College - Penn St
Miami Airport - Concourse J	Raleigh Convention Center	The Gap Hdqtrs
Miami Airport - So Terminal B313A	Raleigh Neurology Bldg	Union League Parking Structure
Univ of Central FL	South Tryon Square Panels	
	Time Warner Cable Fayetteville	<b>South Carolina</b>
<b>Georgia</b>	Toyota TRD Chassis Engineering Bld.	Camping World
CDC - Atlanta	TRD Chassis Eng Building	Metro Waster Water Treatment
Georgia Convention Center	Umstead Hotel	World Reach HQ
	UNCP Belk Stadium	
<b>Illinois</b>	Valdese Hospital	<b>Tennessee</b>
Adler Planetarium	West Jefferson Chevrolet	Three Corp
Apple Computer Store		
Comer II Hdqtrs	<b>New Jersey</b>	<b>Texas</b>
River East Center	NJ Institute of Technology	Bush International Airport
U Chicago Comer Child Hospital		Methodist Hospital
	<b>Nevada</b>	
<b>Indiana</b>	Panorama I & II	<b>Virginia</b>
Simon Corp Hdqtrs		Advanced Technology Center
	<b>New York</b>	Alexandria Technology Center
<b>Kansas</b>	47 East 91st Street	Commonwealth 1
Blue Valley Library	125 W. 21st Street Apartments	Dulles Int'l Airport
	165 Charles St Apartments	Orthopedic Center-Central VA
<b>Kentucky</b>	Amer Museum Nat'l History	U of VA Clark Hall
Muhammad Ali Center	AOL Time Warner	Univ Commerce Center
Transportation Office Bldg	Dow Jones Panels	
	St. Patrick's Home	<b>Washington</b>
<b>Louisiana</b>	The Caroline	Local 17 IW Building
Brandt Nissan & Toyota		U WA Becker Panels
	<b>Ohio</b>	
<b>Maryland</b>	Case Western Reserve University	<b>West Virginia</b>
BWI Airport Door Analysis	Cleveland Clinic	United Hospital
	Cleveland Voc Guidance Services	WVU Learning Center

## STONE PROJECTS

<b>International</b>	<b>Massachusetts</b>	<b>Ohio</b>
Coliseo de Puerto Rico - Puerto Rico	Hope Lodge	Canton Vocational School
Dubai Stone Project		Int'l Bank of Commerce (IBC)
Puerto Rico Convention Center	<b>Michigan</b>	Landerhaven Business Park
US Embassy Panama	Detroit Institute of Arts	Lentine's Music
	Ford Motorland Services Corp	McNay Art Museum
<b>Arizona</b>	Ross School of Business	Radio Shack Hdqts-Int Stone
Sand City Sunshades	Weil Hall - Univ of MI	Robinson Memorial Hospital
Wachovia		Terrace VII Finish Out
	<b>North Carolina</b>	
<b>California</b>	South Park Mall	<b>Texas</b>
Hotel Valencia		Bayfront Convention Center
	<b>Nebraska</b>	Congress & Fourth
	LIED Learning Center, Boystown Nat'l Research Hospital	First America Plaza
<b>District of Columbia</b>	Omaha Performing Arts Center	Geo Allen Civil Courts Bldg
Dumont Canopy		Texas A & M Wehner Bldg
<b>Florida</b>	<b>New Hampshire</b>	
Gucci - Coral Gables	17 Lebanon St	<b>Utah</b>
Mercato	Bahre Residence	Westminster College Gore Cent
<b>Kentucky</b>	<b>New York</b>	
East Point	Lexington Ave Stone	

## STRUT / INSERT PROJECTS / SPECIALTY

<b>International</b>	<b>Kansas</b>	<b>Ohio (Cont)</b>
Aluvisa - Torre Mayor - Mexico	Halfen-Yates City Courthouse	McKinley Commercial Flagpole Foundation
		Ross Gunther Residence
<b>Alabama</b>	<b>Kentucky</b>	St. Vincent Charity Hospital X-Ray Room
Southern Progress III	Framingham State University	Trumbell Memorial
	University of Kentucky - Lintels	Unistruc Rack Struc-Nalco Chem
<b>Arizona</b>		Unistrut LPS Fall Protection
First Methodist Church	<b>Maryland</b>	
	Baltimore Co Detention Center	<b>Texas</b>
<b>California</b>	Maryland Tech Center MD	Halfen General Engineering
	National Association of Homebuilders Research Center	University of Houston
Coreslab Structures LA		
Renaissance - San Diego	<b>North Carolina</b>	<b>Virginia</b>
Video Products Bldg	Duke University	Dulles Int'l Airport Garage
Warham Development	New Hampshire	Griffith Water Treatment Plant
	John O. Morton Building	Halfen-105 W Main-Norfolk, VA
<b>Connecticut</b>		Marriott Hotel at Innsbrook
Homer Babb Bldg		Park Crest Lofts
Homer Babbidge	<b>New Jersey</b>	Richmond Federal Courthouse
Univ of CT Biology/Physics Bld	Boss Glass-Harborside Plaza	Roanoke Memorial Hospital
Royal Bank of Scotland		
	<b>Nevada</b>	
<b>Florida</b>	LeReve High-rise	<b>Washington</b>
Bass Museum of Art		1420 Terry Street
Park Place @ Brickell	<b>New York</b>	1441 N. 34th St. Office Project
	311 West Broadway	Bellevue Technology Tower
<b>Georgia</b>	Brooklyn Courthouse	Bremerton Naval Hosp Garage
CRC @ MC of Georgia		JD Fulwiler Insurance
	<b>Ohio</b>	Zymogenetics
<b>Illinois</b>	Akron Children Hosp Sunshade Inst	
345 East Ohio garage	Akron City Hospital	
New Prentice Women's Hospital	Cuyahoga County Airport	
River East Inserts	FlexStrut Engineering Services	
U of I Chiller Plant Louver	Hudson Community Chapel	

## SKYLIGHT / SLOPEWALL PROJECTS

<b>Colorado</b>	<b>Massachusetts</b>	<b>Pennsylvania</b>
River Walk Atrium	Domenikos Residence	Manor Care Health Services Old Mill Farms
<b>Connecticut</b>	<b>Michigan</b>	PA Academy of Music
Regional School District #7	Frank's Nursery & Crafts Frank's - E Windsor, NJ	Philadelphia-3 Seasons Shade Mountain Golf Course
<b>District of Columbia</b>	Herwig	Solar Innovations Gen Eng
Hattie Allen, Lorton branch	New Jersey Vernon Twp. High School	Z Purlins
<b>Florida</b>		<b>South Carolina</b>
Home Depot - East Palm Beach Home Depot - West Palm Beach	<b>North Carolina</b> Goldsboro City Hall	Home Depot Scana Office Building - Sunshades
<b>Georgia</b>	<b>Ohio</b>	<b>Texas</b>
Home Depot - McDonough, GA Home Depot - Pooler, GA	Artz Residence Goliat Hollet; Cincinnati, OH	Conservatek Consulting Conservatek Mock-Up One Victory Park
<b>Illinois</b>	Home Depot - Euclid	
McHenry College	Home Depot - Fairlawn Home Depot - Highland Hts Home Depot - Strongsville	<b>Utah</b> Ho Ho Gourmet
<b>Indiana</b>	Hyde Park Electronics Kenyon College Science Complex	<b>Virginia</b> Fairfax County-stamped plans
Home Depot - Ft. Wayne, IN	Landau	Frank's - Hampton, VA
<b>Kentucky</b>	Lowes Lowes - N Columbus	Lorten Dawning Lorton, VA, Stamped drawings \$520
Gallatin	Ludy - Miscellaneous Engineering Work	Wal-Mart - Sterling, VA
<b>Maryland</b>	Noble Correctional Institution Patio Enclosures - General	WMB Conservatory System
Dover AFB Shaner Residence Stancil Residence	Schwarzman Residence	<b>Washington</b> Wal-Mart - Marysville, WA

## RE-CLAD PROJECTS

<b>Connecticut</b>	<b>Michigan</b>	<b>Ohio</b>
100 Constitution Plaza, Univ. of CT Hartford Tower Reglaze Yale University	Ford Motor Plant Detroit Institute of Arts	400 Metro Fenn Tower, Cleveland State Univ. John Hay High School Northfield Park
<b>Hawaii</b>	<b>New York</b>	
Pacific Guardian Center	59-17 Junction Building 32 West 18th Street	<b>West Virginia</b> University of West Virginia
<b>Illinois</b>		
100 North Riverside Reglazing		



**WHEATON & SPRAGUE**  
ENGINEERING, INC.

Here's what some of our satisfied clients  
have to say about us:

**"The engineering staff at WSE are talented and hardworking. I would recommend WS to others."**

*– Hossein S., W&W*

**"Thanks for all the help – without WSE, I'd be in a very big world of hurt." "Hope for future projects!"** – Tom O, Enclos

**"Very Impressive"** – Robert C., Ecker Window Corp.

**"Very helpful and patient with my inexperience. Will use as needed in the future."**

*– Mike H., Lakeshore Glass & Metals*

**"Thanks for the quick turnaround."** – Dale G., Flexstrut

**"It's always a pleasure to work with Craig."** – Ray K., United Glass & Panel

**"With the work you did do, even though it was small, we were treated with the same level of importance and expedience as, I assume, a larger project would receive. Thank you for help on past projects, & hopeful future experiences."**

*– Emory C., D-M Products, Inc.*

**"Your firm does a wonderful job in attending to the needs of our company. We appreciate all you do! Thank you!"**

*– Charae M., Custom Glass*

**"Given the short time you have had with this job and the fact that this is the first work you have done for us I would have to rate this as very impressive. Thank you Sir for all your hard work."**

*- Billy F., Vistawall*

**"Marco just gave me a set of the Mockup drawings for Lafayette (WOW!), with only a quick glance, it is obvious we choose an outstanding company/team to work with, and do our drafting/engineering work on this (very difficult and complex) project! Thanks everyone..... incredible job.....keep up the good work!!!"**

*- Daryl F., Trainor Glass*

**"Excellent work!! Thanks so much! Just what I need, and on such short notice."** -Paul B., Huron Valley Glass

**"You guys have been one of the few that's been a pleasure to work with on this project!"** -Evan B., Enclos

**"Very responsive. Good work!"** - R. Sweeney, Boggs & Partners Architects

**"You are my 'go to' company for engineering."** – R. Fore, Protec

**"Thanks for the heads up. You just saved me from ordering a truckload of wrong metal."** – D. Dickson, ECP

**"I really enjoy working with you. You take the time to explain things well and you are always available to answer my questions. Your calc packages are the best I've seen; very professionally done."** – Ralph H., ASI Limited

**"This was a lot of work in a short time. I'm quite impressed how quick this pricing package was completed. Thanks!"**

*- J. Juba, Juba Aluminum*

## TESTIMONIES

BUILDING ENVELOPE



**“It has been a pleasure working with your group. The ease and comprehensive understanding by your team of this project’s engineering and timeline demands was of great assistance to Rinaldi in developing all the components for the interior stone veneer cladding systems. We were extremely impressed with WS’s immediate response to the structural steel framing and panel anchor testing elements which were added late in the engineering development. In an already compressed project time frame your team met the challenge on all levels. Again thanks and Rinaldi Inc. looks forward to working with Wheaton & Sprague on future projects.”**

*- Michael S., Rinaldi Inc*

**Very impressive portfolio of projects – Dan R. – Oldcastle Glass**

**“...your technical quality is top notch. With this project being my first as a PM, I’ve learned a lot and have more confidence in my decision making. I owe a great deal of that to WS. You have been great to work with.”**

*– Ben, PWS Int’l.*

**“Thank you Scott and WS, We appreciate your tremendous initiative greatly.” Thank you.**

*-Rob A., Oldcastle BuildingEnvelope™*

**“John, we are proud to have to as part of our team.” –Jim B., Pioneer Cladding and Glazing**