

Curtain Wall • Unitized Curtain Wall • Fixed Windows Sunshades • Light Shelves • Entrance Systems



FM Graham Enterprises • 715.536.4927 • Fax 715.539.2920 • www.fmgraham.com



Our products are manufactured to last a lifetime

FM Graham, a division of Graham Architectural Products, is a full-service exterior framing manufacturer. We provide architects and building owners with a complete package including application engineering assistance, calculations, shop drawings, fabrication, assembly and glazing. All of these services are provided at our 137,000 sq. ft. facility in Merrill, Wisconsin.

We offer a complete product line including custom framing systems, unitized curtain wall, curtain walls, entrances, window wall systems, custom sunshades, custom light shelves, blinded access panels, zero sightline vents and blast resistant fenestration.

What makes us special is our ability to provide custom solutions for all size projects. We work with our dealers to provide architecturally correct, installer friendly solutions to framing issues other manufacturers walk away from.

Our latest innovation is our GThurm composite curtain wall. Non-metallic GThurm provides a highly thermal resistant framing that is composed of 80% glass and 20% polyurethane, making it nearly homogenous with the glazing. As a result, GThurm boasts U values as low as 0.21 with CRF as high as 90, virtually eliminating condensation problems that exist with many metallic systems.

FM Graham is a premium quality producer offering competitive prices with turn key simplicity. We thrive on projects that require a high level of engineering and can provide solutions that simplify installation, resulting in better quality installation without compromise.

We have built our reputation on dependable and consistent quality, innovative and ex-



Church Mutual Insurance Company, Merrill, WI

pert design capability, and most importantly, on collaborative, long-term customer relationships. FM Graham has solutions for architects, building owners, and contractors. We stand ready to address your project needs and to help you develop a logical and comprehensive design, using our comprehensive range of products and services.

At FM Graham, we provide you with a wide variety of services to help ensure proper application and installation, including:

Project Design Assistance:

- Work with glazing contractor, architect, owner and or GC to provide specific project design assistance
- Proposal details
- Engineering
- Budgets
- Project specifications

Estimating:

- Quotes are provided from architectural drawings and specifications
- Project scope is discussed and verified with customer prior to bid
- Products quoted meet plan and specification requirements
- Product details furnished with quote upon request

Project Management:

- Each project will have a designated Project Manager
- One point of contact through the duration of a project
- PM's will work with customers on:
 - Project submission requirements
 - Lead times
 - Sequencing
 - Shipping requirements and schedules

Engineering:

- Additions and revisions to drawings
- Shop drawings incorporate all required building conditions to ensure proper attachment and sealing requirements
- Structural calculations with stamps in all 50 states
- Large projects can be engineered in phases to meet project schedules

- NFRC Thermal modeling is available
- Mock-up drawings
- Caulking details
- PE stamped shop drawings standard

Glazing:

• Glazing of customer supplied glass or glass supplied by FM Graham



- C & A Industries Omaha, NE
- Both dry and structural glazing options are available
- Documented quality control program for all structurally glazed projects

Shipping:

- Our products are shipped on dedicated carriers, typically tarp-covered flat bed trailers
- Finished goods are crated per customer agreed upon weight and sequencing
- Crates are matched with shop drawings
- Insured warehouse to hold finished goods

Products Offered By FM Graham

GThurm® Curtain Wall:

Our GThurm curtain wall provides unsurpassed thermal resistance in an engineered composite design using continuous strand glass reinforcement to match the strength of aluminum.



- U values as low as 0.21
- CRF (frame) up to 90
- Low embodied energy
- Installs using the same anchorage designs as our aluminum systems
- 10 Year limited warranty
- Fully captured or vertically butt glazed



Bayer MaterialScience, Pittsburgh, PA

- Split finish
- Exterior finish 2605 or anodized
- Interior finish 624
- Stainless steel fasteners
- Isolator gasket installed at factory
- GThurm pressure plates pre-punched for attachment screws and weeps to reduce field labor •
- EPDM glazing gaskets
- Factory fabricated and assembled frames. Sealed at horizontal/vertical joints
- Snap covers available in various depths and profiles

Pressure Wall Type Curtain Wall:

- System widths available in 2", 2 1/2", 3", or 4"
- Custom sizes available upon request or as required • by project
- Overall system depths available from 5 1/4" to 10 1/4'
- All systems utilize a split male/female stacking mullion to allow shop assembled framing



ICAR Tower, Clemson University • Greenville, SC

- Curtain wall back members have a minimum 1/8" wall thickness
- Systems incorporate a 3/8" minimum thermal isolator
- Pressure plates are pre-punched for attachment screws and weeps
- Covers and pressure plates are cut to size by FM Graham
- Exterior covers available in varying depths and profiles
- All systems have been tested to industry standards for air infiltration, water penetration, structural, and thermal performance
- Anodized or painted finishes are available

Unitized Curtain Wall

- Walls are designed on a project to project basis
- Systems are designed to meet project performance specifications
- Mock-up as required per specifications •
- Other FM Graham products can be incorporated, such as sunshades, lightshelves and doors, to provide a single source
- Systems available fully captured or structurally alazed
- Glass can be furnished by FM Graham or customer supplied
- Anodized or painted finishes are available

Sunshades and Light shelves:

- FM Graham offers a complete line of standard sunshade profiles and attachments
- Custom sunshade and lightshelf profiles and attachments are available
- Are constructed entirely of aluminum for light weight and finish match
- Fully assembled by FM Graham with stainless steel • fasteners
- Can be easily integrated into other products offered • by FM Graham
- Sunshades can also be mounted directly on to the building
- Structural calculations are provided on all sunshade products and can be provided as a stand-alone product
- Anodized or painted finishes are available •



University of Nebraska Research Center • Omaha, NE

450 T Fixed Windows:

- System has a 2" face width and depths of 4 1/2" • and 6"
- Can be used in a punched opening or strip window • application
- All framing is fabricated, assembled and sealed in the factory
- Vision glazing is from the interior, spandrel is from the exterior
- Glazing can be done in the field or by FM Graham •
- Custom anchoring is available depending on specific wall conditions
- System is fully tested and certified test reports are available
- Anodized or painted finishes are available

450 T Blinded Blast Series:

- System has a 2" face width and 4 3/4" deep
- Incorporates an exterior removable glazing bead at all sides, allowing for exterior glazing with structural silicone joints at the perimeter
- Poured and debridged thermal barrier •
- Blinded access panel improves thermal and acoustic performance while controlling light and privacy

Custom Fixed Windows:

- Custom fixed windows are designed for specific projects
- All systems are designed to meet project specifications
- Custom profiles are designed and provided on project basis
- Performance mock-up for all custom projects is • included
- Anodized or painted finishes are available

Doors and Storefront:

Doors can be standard 1 3/4" thick or monumental 2" thick



Wausau East High School • Wausau, WI

- Stile widths from 2 1/8" to 6"
- Rail widths from 3" to 12"
- All doors are engineered, fabricated and assembled in the factory
- Tie rod and welded optional construction on all doors
- Hardware is installed in the factory
- Hardware can be furnished by FM Graham or customer supplied
- Storefront is available in thermal or non-thermal framing
- Anodized or painted finishes are available

Zero Sightline Vent

- Designed to be installed in all our systems, including GThurm curtain wall
- We can pre-glaze in our factory or ship open
- High performance insulbar thermal break

Blast and Ballistic Mitigation Products:

- Custom designed blast and ballistic resistant products including, unitized curtain wall, pressure wall, fixed and operable windows, and doors
- Blast resistant designs to meet project specific criteria
- Performance mock-ups available for all systems
- All systems are currently calculated to UFC or GSA standards
- Easily integrated with other FM Graham products for a truly custom project
- Anodized or painted finishes are available

PRATT INSTITUTE MYRTLE HALL BROOKLYN, NY



PROJECT DESCRIPTION:

The Pratt Institute's Myrtle Hall is the first educational facility in Brooklyn to receive LEED certification. Pratt incorporated almost 33,000 square feet of FMG curtain wall along with nearly 6,000 feet of custom sunshades. The unique design helped Pratt achieve a LEED Gold certification. Myrtle Hall also won Masterworks award from the Municipal Art Society of New York.

PRODUCTS USED:

- 25,638 sf 2 1/2" X 8 1/4" unitized curtain wall
- 7,283 sf 2 ½" X 8 ¼" pressure wall
- 5,960 lineal feet 16" custom airfoil blade sunshades



BUILDING OWNER: Pratt Institute Brooklyn, NY

ARCHITECT: WASA Architects New York, NY

CUSTOMER: Crowne Architectural Systems Ridgewood, NJ



PROJECT NAME: Bayer MaterialScience Campus, Pittsburgh, PA



PROJECT DESCRIPTION:

After nearly a half century of service, Buildings 1, 2 and 3 on the Bayer campus in Pittsburgh, PA, were badly in need of renovation. The original single-pane, clear glass windows offered little insulation and operable vents had been sealed shut. This combination led to unacceptable indoor conditions for the occupants. Bayer facilities personnel needed to improve the human comfort factor while updating appearance of the buildings at the same time. IDC Architects created a design that made these older buildings look more like some of the newer buildings on campus, adding vision area to improve aesthetics, along with increased daylighting. They chose GThurm curtain wall from FM Graham to accomplish the high-level of energy efficiency desired with the fenestration.



Before Renovation

PRODUCTS USED:

- GThurm Curtain Wall
- Vertically captured and vertically butt glazed
- Two different depth face caps

After Renovation

BUILDING OWNER: Bayer MaterialScience Pittsburgh, PA

ARCHITECT: **IDC** Architects Pittsburgh, PA

CUSTOMER: The Redglaze Group Omaha, NE

MILVVAUKEE MEDICAL CENTER MILVVAUKEE, VVI

PROJECT NAME: Froederdt Hospital, Cancer Care Addition, Milwaukee, WI



PROJECT DESCRIPTION:

This project consisted of approximately 70,000 square feet of unitized curtain wall with painted shadow boxes, back pans and insulation in all floor slab locations. The floor slabs were 18'-0'' and the mullion spacing was 6'-0'', which resulted in some very large frames. Due to the unique shape of this building with the number of corners, setbacks and notches, in addition to having to design for +/-3/4'' live load deflection, this project had numerous challenges that FM Graham had to design for.

PRODUCTS USED:

- Custom Unitized Curtain Wall
- 2510 S Curtain Wall



BUILDING OWNER: Froederdt Hospital and Community Health, Inc. Milwaukee, WI

ARCHITECT: OWPP Chicago, IL

CUSTOMER: Simmons Building Products Wauwatosa, WI

C&A INDUSTRIES, INC. OMAHA, NE



PROJECT NAME: C & A Industries, Inc., Omaha, Nebraska



PROJECT DESCRIPTION:

This is an eight story office building incorporating 65,000 square feet of our 2506 C series curtain wall. The exterior face caps have varying depths of 1", 4" and 6". The project has a 2 coat Kynar paint finish with three colors, silver, gray and black. The challenge of this project was the delivery schedule. FM Graham had to ship assembled frames for installation to the job site within 12 weeks from contract award, also within that 12 weeks we had to provide submission drawings and calculations for approval. The contract was awarded in July 2006. The first delivery took place in October 2006 and completion was January 2007.

PRODUCTS USED: • 2506 C Curtain Wall









BUILDING OWNER: C&A Industries Omaha, NE

ARCHITECT: Holland Basham Architects Omaha, NE

CUSTOMER: The Redglaze Group Omaha, NE

THINK BANK



PROJECT NAME: Think Bank, Rochester, Minnesota



PROJECT DESCRIPTION:

This project consisted of approximately 30,000 square feet of curtain wall, over 300 vertical sunshades, and over 3,000 lineal feet of horizontal sunshades. This project had several challenges due to the shape of the building. One side was concave with a 6 degree inverted slope and the opposite side was convex. With all components having to be shop assembled, including the horizontal sunshades, the engineering and manufacturing precision was paramount. The vertical sunshades were over 7'-0" tall and made from 3/8" thick aluminum plate. These extended into the mullion of the curtain wall where the attachment was made with unexposed fasteners. The horizontal sunshades had a 2'-10" projection and were attached to the top of the vertical sunshades. Thermal expansion was a concern and the attachment of all components had to accommodate this. The project was installed with no rework required.

PRODUCTS USED:

- 2508 S Series Curtain Wall
- Custom Vertical Sunshades
- Custom Horizontal Sunshades
- Wide Stile Doors







BUILDING OWNER: Think Bank Rochester, MN

ARCHITECT: Hammel, Green & Abrahamson, Inc. Rochester, MN

CUSTOMER: W.L. Hall Co. Hopkins, MN

THE PAVILION AT PHILADELPHIA COMMUNITY COLLEGE PHILADELPHIA, PA



PROJECT DESCRIPTION:

The Pavilion at Philadelphia Community College includes three different FMG captured curtain wall profiles including 5 inch, 7 inch and 8 inch depths. The front fascia is a segmented radius wall with custom perforated sunshades designed to filter afternoon light to reduce heat gains and energy consumption.

PRODUCTS USED:

- 2505C Captured curtain wall
- 2507C Captured curtain wall
- 2508C Captured curtain wall • Custom sunshade with perforated
- plate





BUILDING OWNER: Philadelphia Community College

ARCHITECT: Burt Hill Philadelphia, PA

CUSTOMER: Colory metal & Glass Inc. Bensalem, PA

DISCOVERY WORLD MILWAUKEE, WI



PROJECT NAME: Discovery World, Milwaukee, Wisconsin



PROJECT DESCRIPTION:

This project consisted of approximately 25,000 square feet of curtain wall and 400 lineal feet of custom egg crate sunshades. All of the curtain wall framing and sunshades were assembled by FM Graham prior to shipping. The unique shape of this building created several challenges. The framing that encloses the top floor of the rotunda wraps all around the building and ground floor extends about 2/3 of the way with several areas that extend up through the second floor. Because the frames were fabricated by FM Graham, and the glass had to be ordered prior to the frames being built, FM Graham worked closely with the contractor and installer to make sure the frames fit the openings. The second challenge was supporting the sunshades with the curtain wall. These consisted of 10'-0" long assemblies weighing over 400 pounds apiece. The sheer weight of these units represented a significant structural challenge.

PRODUCTS USED:

- 2508 C and 2508 S Series Curtain Wall
- Custom Egg Crate Sunshades
- Medium Stile Doors and All Door Hardware







BUILDING OWNER: Discovery World, Ltd. Milwaukee, WI

ARCHITECT: Hammel, Green and Abrahamson, Inc. Milwaukee, WI

CUSTOMER: Simmons Building Products, Inc. Wauwatosa WI

COLUMBIA ST. MARY'S HOSPITAL MEQUON, WI



PROJECT NAME: St. Mary's Hospital Mequon, WI

PROJECT DESCRIPTION:

This project consisted of approximately 35,000 square feet of curtain wall. All of the curtain wall framing was assembled by FM Graham prior to shipping. This required accurate engineering and manufacturing. The challenge of this project was to meet the architect's design that

incorporated a wide metal sightline throughout the curtain wall that represented a "barn beam" look. This was accomplished by incorporating a 8 1/2" wide extruded profile panel throughout. All of the curtain wall framing had to be machined to allow this component to run through uninterrupted.



PRODUCTS USED:
2505 C and 2506 C Series Curtain Wall







BUILDING OWNER: Columbia St. Mary's Hospital Milwaukee, WI

ARCHITECT: HOK Chicago, IL

CUSTOMER: Simmons Building Products Wauwatosa, WI

CHEROKEE HEALTH SYSTEMS KNOXVILLE, TN

PROJECT NAME: Cherokee Health Systems, Knoxville, TN



PROJECT DESCRIPTION:

This project consisted of approximately 15,000 square feet of curtain wall and approximately 800 lineal feet of horizontal sunshades. All of the curtain wall framing and sunshades were assembled by FM Graham prior to shipping. This required accurate engineering and manufacturing. The sunshades were incorporated into the curtain wall. All attachments for the sunshades were pre-located and prepped by FM Graham, requiring the erector to install anchor bolts only. No field locating, anchors or frame drilling was required in the field.

PRODUCTS USED: • 2506 C and 2508 C Series Curtain

- Wall
- Custom Horizontal Sunshades









BUILDING OWNER: Cherokee Health Systems Knoxville, TN

ARCHITECT: Cockrill Design and Planning Knoxville, TN

CUSTOMER: **Clearview Glass** Knoxville, TN

CORPORATE COVE OFFICE BUILDING WAUSAU, WI



PROJECT NAME:

The Tower at Corporate Cove Wausau, Wisconsin



PROJECT DESCRIPTION:

This project consisted of approximately 12,000 square feet of curtain wall and 4,000 square feet of 450 T fixed windows. All of the curtain wall framing and windows were assembled by FM Graham, prior to shipping. The bottom six floors are office and retail space and floors seven and eight are apartments and condominiums. All anchorage into both the floor slabs and precast panels were accomplished with embeds furnished and located by FM Graham.

• 2506 Series Curtain Wall

• 450 T Series Windows





BUILDING OWNER: Ghidorzi Construction Wausau, WI

ARCHITECT: Structural Systems of Wausau Wausau, WI

CUSTOMER: Corcoran Glass and Paint Greenville, WI

UNIVERSITY OF MASSACHUSETTS AMHERST, MA



PROJECT NAME:



PROJECT DESCRIPTION:

The 175,000 sf Integrated Sciences Building at the University of Massachusetts features a unique curtain wall and terra-cotta sunscreen. Since the structural portion of the building is actually outside the curtain wall, the structural steel truss framing that supports both systems is behind them. Special knife edge anchors were designed to accomplish the installation. These anchors are strategically located to provide the support needed for the curtain wall and to reduce thermal transmission from the exterior steel truss. FMG worked closely with the Payette, Suntech and the structural steel truss manufacturer to design the attachments. The traditional brick facade with the high tech curtain wall was a departure from traditional design for the University. The large lobby/atrium behind the curtain wall is designed as a

meeting place for the students.

PRODUCTS USED:

• 2500 Series Curtain wall • Custom fixed framing at punched openings





BUILDING OWNER:

University of Massachusetts Amherst, MA

ARCHITECT: **Payette Architects** Boston, MA

CUSTOMER: Suntech of Connecticut. Branford, CT

UNIVERSITY OF NEBRASKA DURHAM RESEARCH CENTER II OMAHA, NE

The Tring Line

PROJECT NAME: University of Nebraska, Omaha, NE



PROJECT DESCRIPTION:

The Durham research center was named for Charles (Chuck) Durham, former CEO and chairman of HDR Architects and Omaha area philanthropist. The research center is the second such building to be named for Mr. Durham. The center, which includes some 50,000 square feet of FM Graham curtain wall, cost \$74 million, has 10 levels, 95 laboratories and 252,179 gross square feet.

PRODUCTS USED:

•2506 Captured & structurally glazed curtain wall

- •2507 Captured & structurally glazed curtain wall
- •2510 Captured & structurally glazed curtain wall
- •Blinded lift-out panels
- •Thermally broken storefront





BUILDING OWNER: University of Nebraska, Omaha, NE

ARCHITECT: HDR Architects, Inc. Omaha, NE

CUSTOMER: The Redglaze Group Omaha, NE

MEDGAR EVERS COLLEGE OF SCIENCE, HEALTH, AND TECHNOLOGY BROOKLYN, NY

PROJECT NAME: Medgar Evers College, Brooklyn, NY



PROJECT DESCRIPTION:

The building at Medgar Evers, housing the School of Science, Health and Technology, is the first new building of the College's master plan. The design includes nearly 27,000 square feet of FM Graham pressure wall and structurally glazed curtain wall. The building received awards from The Society for College and University Planning (SCUP) and the American Institute of Architects Committee on Architecture for Education (AIA-CAE) for Excellence in Architecture for a New Building. The SCUP Awards recognize excellence in comprehensive campus design and planning. The new building features light-filled corridors with curtain wall that provides views of the community while allowing the community outside to

view the activity within. The multifaceted curtain wall illuminates the neighborhood at night, contributing to the projects' goal of transparency within the community.

PRODUCTS USED:

- 2506 Captured & structurally glazed curtain wall
- 2507 Captured & structurally glazed curtain wall
- 2510 Captured & structurally glazed curtain wall
- Custom sunshades
- Thermally broken storefront





BUILDING OWNER: City University of New York

ARCHITECT: Ennead Architects New York, NY (Formerly Polshek Partnership Architects)

CUSTOMER: Whitestone Construction Woodside, NY

BLUE RIDGE PARKWAY DESTINATION CENTER ASHEVILLE, NC



PROJECT NAME:



PROJECT DESCRIPTION:

The Blue Ridge Parkway Destination Center is a very unique building. The buildings' design includes 13 passive solar Trombe walls on the south side. Lord, Aeck & Sargent said the Trombe walls represent the design team's most innovative strategy.

The designers worked with Pennsylvania State University's Applied Research Laboratory to create a fluid dynamics model to study air flow and heat transfer for the walls. The Trombe walls, which are named for French designer Felix Trombe, are designed to absorb solar heat and release it into the building. At the center, the sun heats the air space between the glass wall facing the exterior and an inner concrete wall. The heat is transferred into the building via vents. The walls help insulate and

warm the building in the winter and cool it in the summer. The Integration of the curtain wall with the exposed beam wood roof also created an interesting perimeter condition that had to be addressed.

LEED Gold Certified project.

PRODUCTS USED:

- 2500 Series Curtain wall
- Medium style aluminum entrance doors
- Aluminum vent windows



BUILDING OWNER: National Park Services

ARCHITECT: Lord, Aeck & Sargent Atlanta, GA

CUSTOMER: Blue Ridge Glass Waynesville, NC

PROJECT DESCRIPTION:

This project consisted of approximately 5,000 square feet of curtain wall, 1,000 square feet of 450 T fixed windows and 200 lineal feet of custom sunshades. All of the curtain wall framing, windows and sunshades were assembled by FM Graham prior to shipping. The large segmented curtain wall is a free standing wall with sunshades. The sunshades are attached to the curtain wall and supported with aircraft cables both above and below the sunshades. All sunshade connections were prepped by FM Graham prior to shipping which resulted in an accurate installation with minimal field labor.



PROJECT NAME:

Aspirus Weston Clinic, Weston, WI

ARCHITECT: Structural Systems of

Wausau Wausau, WI

CUSTOMER:

Corcoran Glass and Paint Greenville, WI

PRODUCTS USED:

•2580 C Series Curtain Wall
•450 T Series Windows
•Custom Sunshades

PROJECT DESCRIPTION:

The Engineers Battalion Headquarters at the White Sands Missile Range in New Mexico is out fitted with FM Graham's blast resistant curtain wall and door systems. Each of these projects are custom designed to meet the specific criteria required by the owner, providing both daylighting and ultimately, protection for the occupants.



PROJECT DESCRIPTION:

This project consisted of approximately 3,000 square feet of curtain wall, 1,000 square feet of fixed window storefront and 200 lineal feet of standard air foil blade sunshades. All of the curtain wall framing, windows and sunshades were assembled by FM Graham, prior to shipping.



PROJECT NAME: Marathon Cheese Headquarters Marathon, WI

ARCHITECT:

Structural Systems of Wausau Wausau, WI

CUSTOMER: Structural Systems of Wausau Wausau, WI

PRODUCTS USED:

- •2580C Series Curtain Wall •Standard Sunshades
- Storefront
- •Medium Stile Doors

PROJECT DESCRIPTION:

The ICAR Management Tower at Clemson University utilized approximately 10,000 square feet of FM Graham's 2500 Series curtain wall, along with custom sunshades and a custom aluminum canopy over the entrance way. The ICAR building is LEED Gold certified and won the South Carolina honor award for outstanding design.



PROJECT NAME:

Engineers Battalion Headquarters New Mexico

ARCHITECT:

Sillman Wright Architects San Diego,CA

CUSTOMER:

Division 8, Inc. El Cajon, CA

PRODUCTS USED:

•2507C blast resistant curtain wall •double and single blast resistant doors

PROJECT NAME:

Clemson University ICAR Management Tower Greenville, SC

ARCHITECT:

Neal Prince Architects Greenville, SC

CUSTOMER:

Binswanger Glass Charlotte, NC

PRODUCTS USED:

- •2500 Series Curtain wall
- •Custom Sunshades
- •Custom aluminum canopy
- over entrance door



FM Graham Enterprises, LLC

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