



Enclosure Systems

High Performance Insulated Wall Panels
Insulated Architectural Cladding
Architectural Cladding



MID-STATES
CONCRETE INDUSTRIES

carboncast®

Innovative precast wall systems that are lighter,
better insulating, sustainable and more resilient



*Irene and George Woodruff
Family Residence Center*



altusgroup®

carboncast®

C-GRID®
REINFORCED
C-GRID is a trademark of Chorherr, NA

CarbonCast Technology: one simple change, a multitude of benefits

High Performance Insulated Wall Panels

PAGES 4-5

- Full composite action for load-bearing performance
- Continuous insulation to meet ASHRAE 90.1 requirements
- Aesthetic versatility

Insulated Architectural Cladding

PAGES 6-7

- Continuous insulation to meet ASHRAE 90.1 requirements
- Up to 40% lighter; enables reduced superstructure and foundation
- Lower carbon footprint
- Aesthetic versatility

Architectural Cladding

PAGES 8-9

- Up to 50% lighter; enables reduced superstructure and foundation
- Integral insulation for improved R-value
- Virtually unlimited aesthetic options



Less concrete means less weight, less embodied energy and a reduced carbon footprint.

Depending on design, CarbonCast panels are priced competitively with other curtainwall systems such as brick-veneer, masonry, stud walls or concrete. And after factoring in reductions to superstructure requirements and potential HVAC system and operating savings, CarbonCast enclosure systems can help pay for themselves immediately.

carbon fiber “tow” or strand is comprised of thousands of ultra-fine fibers that are bundled together. These tows are assembled perpendicular to each other into a grid using a continuous rotary-forming process that chemically binds them with a tough, heat-cured epoxy resin.

Enabling superior performance.

Lightweight, non-corrosive C-GRID is the “enabling technology” that allows CarbonCast enclosure systems to be lighter, insulating, more durable and cost competitive. C-GRID has many of the same strength-weight benefits as high-performance aerospace carbon fiber, but at a significantly lower cost. The carbon fibers used to make C-GRID are over four times stronger in tensile strength than steel by weight. Each

It takes jet fighters to Mach 2.

Imagine what it does for precast.

The exceptional strength and durability of carbon fiber translate to several enhancements to the performance of precast concrete enclosure systems.

CarbonCast® Enclosure Systems use advanced technology to improve precast concrete by integrating ultra-strong, non-corrosive C-GRID® into the wall panels during fabrication. By taking the place of steel reinforcement, C-GRID provides a multitude of benefits that makes factory-made precast concrete an even more intelligent choice for commercial building envelopes.

CarbonCast Enclosure System Selector

Feature	High Performance Insulated Wall Panel	Insulated Architectural Cladding	Architectural Cladding
Length	Up to 60' (18.3m)	Up to 30' (9.15m)	Up to 30' (9.15m)
Width	Up to 13' (4m)	Up to 14' (4.27m)	Up to 14' (4.27m)
Thickness	6"-12" (152-305mm)	6"-9" (152-229mm)	7"-12" (178-305mm)
Weight PSF (KPa)	> 65 (3.1)	38-65 (1.82-3.1)	37-50 ¹ (1.8-2.4)
R-value	10-37	8-20	< 10
Continuous Insulation	Yes	Yes	No
Fire Rating	2 hrs	2 hrs	1-2 hrs ²
Load-bearing	Optional	Optional	No
Paintable Interior Face	Yes	Yes	No
Window/Door Recess	1-2" (25-51mm)	1-2" (25-51mm)	1-10" (25-254mm)

Applications

Low- and Mid-rise	■	■	■
High-rise	■	■	■
Poor Soil	■	■	■

¹ Weight can be reduced with lightweight backer mix. ² Assembly rating includes interior wall system of steel studs, batt insulation and 5/8" (16mm) type X gypsum board(s). Specifications vary by precaster.

Lighter Weight. Because carbon fiber resists corrosion, CarbonCast cladding with C-GRID in the face requires less protective concrete cover than conventional welded wire mesh. Less concrete means less weight, less embodied energy and a reduced carbon footprint. Lowering weight may also permit a reduction in steel or concrete superstructure, further reducing a building's carbon footprint. Energy costs for transportation to the job site may also be lessened. Panel weight can be reduced up to 50% or more versus conventional precast. Reducing CO2 footprint is an important strategy for reducing total energy in sustainable designs.

Enhanced Strength and Durability. Because it can be placed closer to the surface, C-GRID® offers outstanding crack control. And its high strength as a shear truss yields full composite action in CarbonCast® High Performance Insulated Wall Panels and Insulated Architectural Cladding. Because they can be thinner than typical non-composite designs, load-bearing CarbonCast walls can allow you to increase the amount of usable space inside a building without increasing its physical footprint.

Improved Thermal Performance. Carbon fiber epoxy grid has relatively low thermal conductivity. When used as a connector between concrete wythes, it eliminates hot and cold spots on interior walls, leading to more efficient heating and cooling, lower energy costs and improved occupant comfort. It permits continuous insulation (ci) to comply with ASHRAE requirements.

Aesthetic Versatility. You can enjoy the virtually limitless versatility of precast: design projections, reveals, bullnoses and other articulations, as well as finishes ranging from thin brick to terra cotta and dozens of other options. CarbonCast Enclosure Systems can help you realize almost any design vision.

Sustainable design? Consider the benefits of CarbonCast.

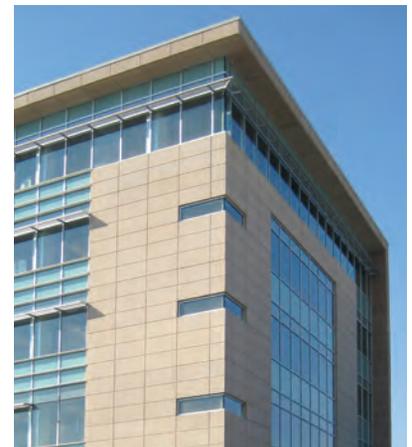
By using C-GRID as a reinforcing material, CarbonCast technology amplifies many of the qualities that enable precast to contribute to LEED® certification depending on the design.

Lighter Weight to Reduce Embodied Energy. CarbonCast products use less concrete than conventional precast products. That means

we use less fuel to produce, ship and erect, along with less Portland cement and its associated greenhouse gases. You may reduce superstructure and foundation requirements, resulting in less steel and/or concrete.

Stronger to Last Longer. C-GRID reinforcement in CarbonCast products is stronger and not susceptible to corrosion like conventional steel mesh reinforcement. CarbonCast products can reduce concrete cover requirements. Meanwhile, carbon fiber grid allows CarbonCast to maintain fire-resistive properties, deliver shear support for designs with reduced concrete mass and virtually eliminate thermal bridges in insulated designs.

Better Processes for Better Products. AltusGroup precasters have implemented sustainable manufacturing efforts such as reclaiming aggregates, slurry water and recycling formliners and molds. And all AltusGroup® members' plants are certified through the Precast/Prestressed Concrete Institute (PCI) third-party auditing program for quality control.



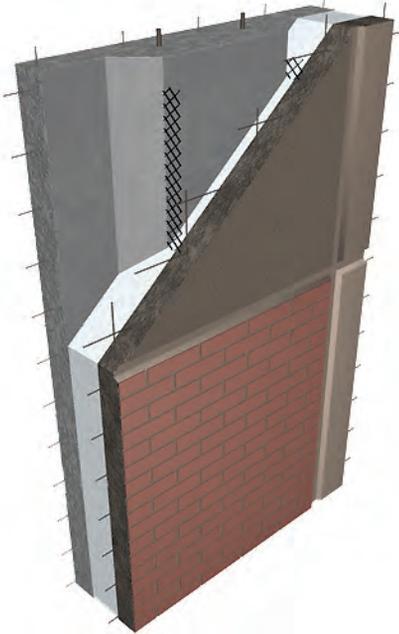
From ultra-modern to historically accurate designs, CarbonCast meets your objectives.



Top left/clockwise:
The Heights Residence Hall Montclair, N.J.
 Precaster: High Concrete Group LLC
Edward Jones Headquarters St. Louis, Mo.
 Precaster: High Concrete Group LLC
Cadbury Adams Science & Technology Center Whippany, N.J.
 Precaster: High Concrete Group LLC
The Heldrich New Brunswick, N.J.
 Precaster: High Concrete Group LLC

CarbonCast High Performance Insulated Wall Panels

- Full composite action for load-bearing performance
- Continuous insulation to meet ASHRAE 90.1 (2010) requirements
- Aesthetic versatility
- Fire rated



Setting a new standard for sandwich wall panels.

CarbonCast® High Performance Insulated Wall Panels deliver all the benefits of factory precasting with unprecedented thermal efficiency in a fully structurally composite panel.

CarbonCast High Performance Insulated Wall Panels are composed of two concrete wythes separated by continuous insulation (ci) and connected by C-GRID® shear trusses. With low thermal conductivity, high-strength C-GRID helps deliver a panel with insulation values up to R-37—and above ASHRAE 90.1 (2010) requirements—depending on the thickness and type of foam insulation.

Extensive research has unequivocally proven the outstanding load-bearing performance of CarbonCast High Performance

Insulated Wall Panels. The C-GRID shear trusses and patented pilasters render a panel with full structural composite action, but with improved durability. For example, an 8" (203mm) CarbonCast High Performance Insulated Wall Panel—4" (102mm) of insulation between two 2" (51mm) concrete wythes—behaves structurally as if it were an 8" (203mm) solid panel. For primary flexural reinforcement, prestressing strand or steel rebar is used in each wythe and in pilasters internal to the panel.

Structurally superior. Energy efficient. Dry and mold-free.

CarbonCast High Performance Insulated Wall Panels are:

Energy Efficient and Lighter in Weight. The exceptional bonding and strength of C-GRID trusses allow AltusGroup® precasters to use less concrete and more insulating foam to reduce energy use and lighten panels. They deliver superior insulation values for enhanced thermal efficiency and reduced energy expenditures.

Superior at Load Bearing. Vertical panels are available for both load-bearing and non-structural applications and can be manufactured in thicknesses of 6" (152mm) and up, with widths up to 15' (4.6m) and heights of 50' (15.24m) or more. They can eliminate the need for perimeter columns and add to usable floor space.

Dry, Mold-free and Non-combustible. Unlike brick and block insulated cavity walls or brick with steel studs, concrete does not allow water to penetrate, eliminating the need for a rain screen design. CarbonCast panels have no voids or cavities where air or water can

combine to support mold and mildew growth. When properly designed, they virtually eliminate the possibility for in-wall condensation. And the inherent fire resistance of concrete provides additional peace of mind. CarbonCast panels can meet NFPA 285 requirements.

Ideal for Occupant Comfort. CarbonCast High Performance Insulated Wall Panels provide an acoustic isolating environment. Very little sound is transmitted through the walls, which can provide an interior free of exterior noise. And the lack of cold spots provides a more comfortable environment.

Pre-finished on the Inside Wall. CarbonCast High Performance Insulated Wall Panels can have troweled interior wythes to eliminate the cost and time to install drywall or other surfaces. They are ready for paint or wallcovering and are ultra-durable.

COMMERCIAL AND INSTITUTIONAL USES

- Office Buildings
- Educational Facilities
- Healthcare Facilities
- Correctional Facilities
- Big Box Retail
- Multi-unit Residential
- Arenas, Theaters, Museums and Convention Centers

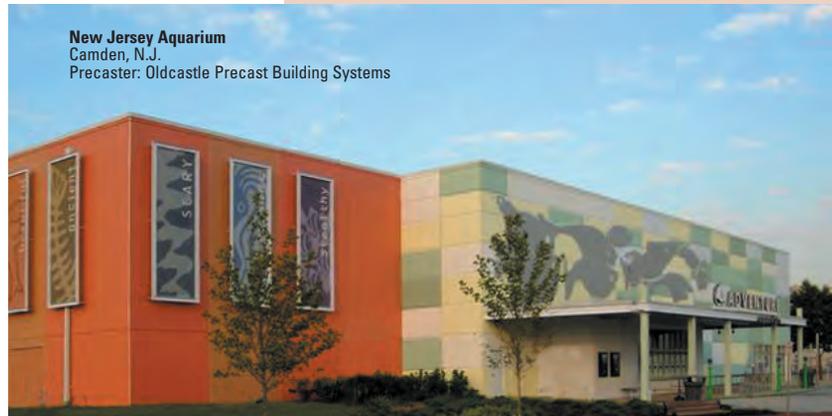
INDUSTRIAL USES

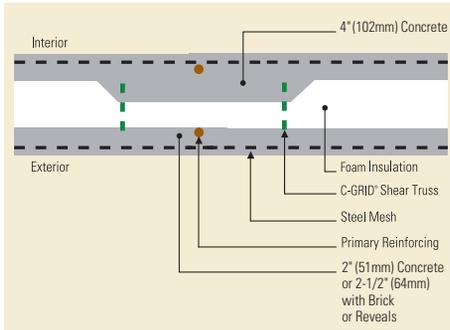
- Warehouses
- Refrigerated Storage
- Manufacturing Plants and Control Room Facilities
- Distribution Centers
- Data Centers

Gwinnett Police HQ and 911 Call Center
Gwinnett County, Ga.
Precaster: Metromont

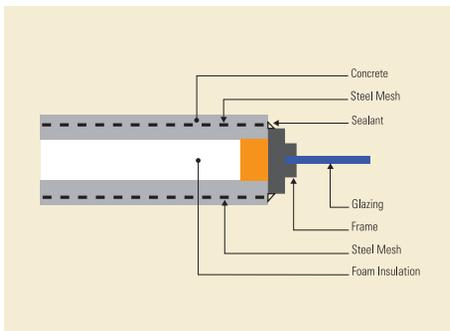


New Jersey Aquarium
Camden, N.J.
Precaster: Oldcastle Precast Building Systems



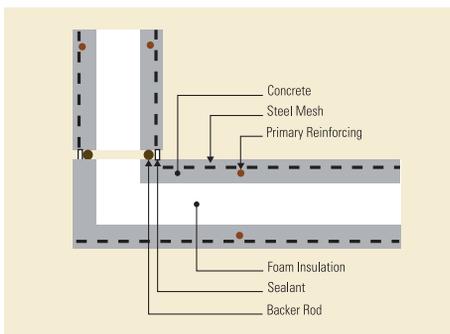


High Performance Insulated Wall Panel with Pilaster

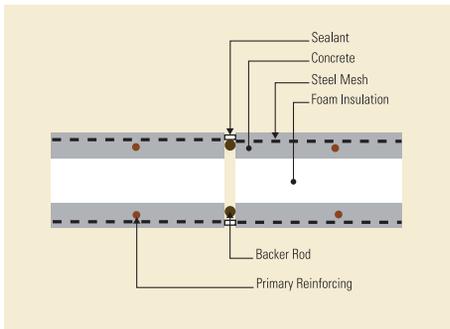


High Performance Insulated Wall Panel Window/Door Head and Sill Horizontal Section

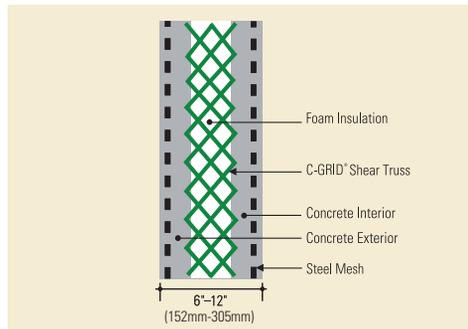
Photo: Josh Partee



High Performance Insulated Wall Panel Corner Detail



High Performance Insulated Wall Panel with Butt Joint



High Performance Insulated Wall Panel Vertical Section

- Top to bottom:
Cobb Energy Performing Arts Center Atlanta, Ga.
 Precaster: Metromont
Sandy High School Sandy, Ore.
 Precaster: Knife River
151 First Side Pittsburgh, Pa.
 Precaster: High Concrete Group LLC
Nordstrom Cincinnati, Ohio
 Precaster: High Concrete Group LLC

Additional technical information is available at altusprecast.com/products.

CarbonCast Insulated Architectural Cladding

- Continuous insulation to meet ASHRAE requirements
- Up to 40% lighter; enables reduced superstructure and foundation
- Lowers carbon footprint
- Aesthetic flexibility



The only thermally efficient architectural panel on the market, CarbonCast® Insulated Architectural Cladding offers weight reductions of about 40% compared to solid, 6" (152mm)-thick precast and is engineered to deliver insulation values of R-8 or more.

The design of this CarbonCast system is based on the extensively tested CarbonCast High Performance Insulated Wall Panel. CarbonCast Insulated Architectural Cladding is intended for horizontal and vertical placement as a non-load-bearing spandrel or column cover. The similarity in sandwich design means the CarbonCast Insulated Architectural Cladding panels are engineered to exhibit the exceptional strength and durability benefits of their brethren.

COMMERCIAL AND INSTITUTIONAL USES

- Mid- and High-rise Office Buildings
- Multi-unit Residential
- Mixed-use Commercial/Residential
- Healthcare Facilities
- Education
- Hotels/Dormitories

Highly insulated for lower energy consumption.

CarbonCast Insulated Architectural Cladding features edge-to-edge continuous insulation (ci). The resulting thermally efficient panel provides steady-state R-values of R-8 or more as additional insulation is incorporated between the panel's inner and outer wythes. AltusGroup® precasters can use either EPS, XPS or Poly Iso foam insulation depending on design requirements. All the insulation you need can be provided by the panel. Additionally, the physical properties of precast concrete provide a beneficial thermal lag effect that can further reduce HVAC demands.

Lightweight and strong coexist beautifully.

CarbonCast Insulated Architectural Cladding features inner and outer wythes 1¼" (45mm) thick and up (depending on reveal depth). The wythes sandwich a layer of insulation of usually 2" (51mm) or more depending on R-value demands. The thicker you specify the insulation layer, the higher the R-value can be.

C-GRID® shear trusses connect the inner and outer wythes of concrete. CarbonCast Insulated Architectural Cladding can also incorporate C-GRID into the exterior face in deep reveals, which would otherwise be limited with the use of steel mesh.

Reducing the amount of concrete lowers the panel weight. Inner and outer wythes of 1¼" (45mm) result in total concrete thickness of 3½" (89mm). That's 40% less concrete than a conventional 6" (152mm)-thick precast panel, which decreases embodied energy. The dramatic weight reduction delivers significant benefits.

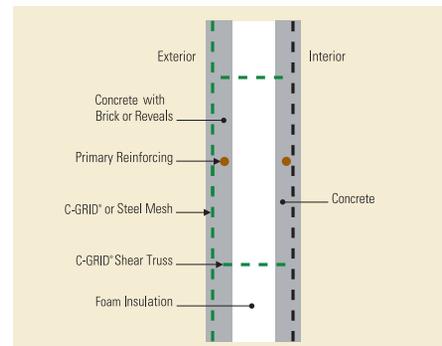
- Reduced load/superstructure: In most cases, lighter panels mean the building's superstructure and foundation can be engineered for less dead load, resulting in cost savings and a lower carbon footprint.
- Lower transportation costs: Precasters can ship more panels on each flatbed truck, lowering costly fuel consumption.
- Smaller cranes: Crane size and expense can be reduced with lower-weight panels.
- Seismic performance: Lighter panels are generally more desirable in high-seismic areas.

Architectural finishes abound.

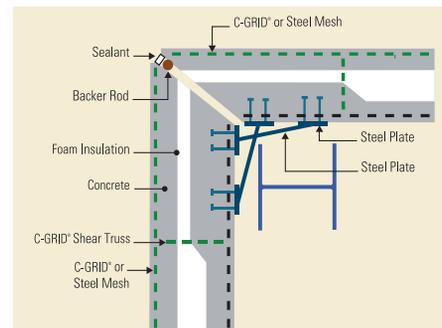
AltusGroup® precasters are able to incorporate a variety of architectural finishes into CarbonCast Insulated Architectural Cladding to create a distinct, expressive facade that will meet a wide variety of design needs. An assortment of architectural elements such as cornices, bullnoses and reveals can be cast into the concrete carefully and cost efficiently. Embedded finishes and veneers such as thin brick can also be used as well as simulated limestone or granite instead of extracted rock to further reduce raw material extraction. In addition, CarbonCast Insulated Architectural Cladding can be specified with a prefinished interior wythe. A steel-trowel treatment during manufacturing imparts a smooth, durable surface ready for paint or wallcovering and ideal for applications like dormitories and apartments.

See page 5 for Window/Door Head and Sill Detail.

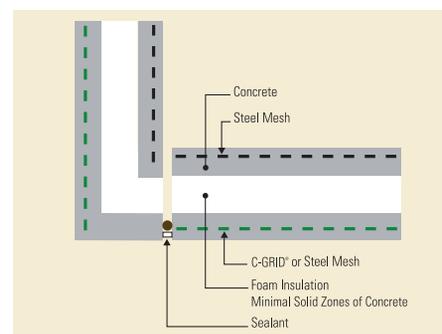
Additional technical information is available at altusprecast.com/products.



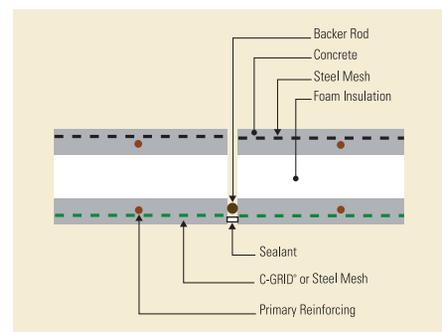
Insulated Architectural Cladding
Horizontal Section



Insulated Architectural Cladding
Thermally Efficient Miter Corner Connection Detail



Insulated Architectural Cladding
Thermally Efficient Butt Corner Detail



Insulated Architectural Cladding
Thermally Efficient Butt Joint

CarbonCast increases R-value, reduces HVAC costs by \$700K.

CarbonCast® Insulated Architectural Cladding panels on Georgia State University's 2,000-bed student housing complex in Atlanta delivered R-12 performance and an impressive facade for the school.

The typical panels comprised 4" (102mm) of expanded polystyrene sandwiched between two 2½" (64mm)-thick concrete wythes. C-GRID® shear trusses connected the inner and outer wythes. C-GRID, unlike steel, has low thermal conductivity, thereby preventing hot or cold spots.

Compared to comparable systems, the increased effective R-value could have enabled the university to specify a less substantial heating and cooling system, saving \$700,000, according to calculations. Compared to a simulation of the original envelope design, the thermally efficient CarbonCast design saved \$411,000 in energy costs in the first year of operation, a 33% reduction. Additionally, the CarbonCast panels reduce the risk of mold and mildew because concrete inhibits water penetration.



Georgia State University
University Commons
Atlanta, Ga.
Precaster: Metromont Corporation



Proximity Hotel
Greensboro, N.C.
Precaster: Metromont Corporation
LEED® Platinum

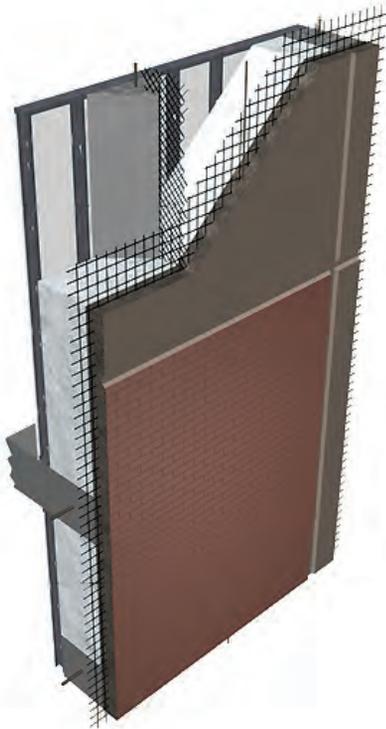


CarbonCast Enclosure Systems use either EPS (expanded polystyrene) or XPS (extruded polystyrene) rigid foam boards for insulation, depending on project-specific requirements such as end-use, location, R-value and budget. EPS foam generally costs less per point of R-value than XPS foam. XPS foam has a permeance rating of about 1.0. Poly-faced EPS foam has a permeance rating of 0.5. (A permeance rating of 1.0 or less is generally considered an effective vapor retarder.) EPS foam is available in different densities that result in R-values from R-3.1 to R-4.9 per inch, while XPS foam offers a uniform R-value of R-5. Your AltusGroup® precaster can help you determine the ideal insulation choice for your project.

CarbonCast Insulated Architectural Cladding Panels feature edge-to-edge continuous insulation (ci).

CarbonCast Architectural Cladding

- Up to 50% lighter; enables reduced superstructure and foundation
- Integral insulation for improved R-value
- Lower carbon footprint
- Extensive aesthetic options



Lightweight, insulating, back-ribbed CarbonCast® Architectural Cladding employs a steel-reinforced Vierendeel-like truss frame attached to a thin, C-GRID® reinforced diaphragm face. Insulating foam forms the ribs and displaces concrete to provide insulation. C-GRID carbon fiber shear trusses mechanically link the face and truss ribs to develop a rigid panel that will withstand fire, wind and rain.

CarbonCast Architectural Cladding incorporates patented V-Ribs designed to create a thermal break with the face of the panel. Solid zones at the panel's perimeter can be covered at the factory or in the field with rigid insulation to

COMMERCIAL AND INSTITUTIONAL USES

- Offices
- Multi-unit and High-rise Residential
- Healthcare
- Education
- Retail
- Cultural
- Mixed Use

create a highly insulating composite assembly. This design can increase net usable or rentable floor area by reducing the width needed for interior studding and other insulation. And you have a virtually limitless selection of architectural precast finishes and articulations including deep window recesses for a distinctive facade. Additionally, CarbonCast provides the ability to fabricate thick panels with minimal additional weight, allowing architects to impart a “massive” look without a weight penalty.

Less is more. Way more.

Conventional precast panels with reveals are typically 6" thick (152mm) and weigh about 75 pounds (3.6KPa) or more per square foot. Non-corrosive C-GRID reinforcement reduces the amount of concrete required to fabricate a panel. The section properties and reduced weight of CarbonCast wall components—which weigh as little as 37 pounds (1.8KPa) per square foot—translate to lower transportation and erection costs. They can reduce a building's superstructure and foundation and can shrink the structure's carbon footprint.

Several ways to save with one decision: CarbonCast.

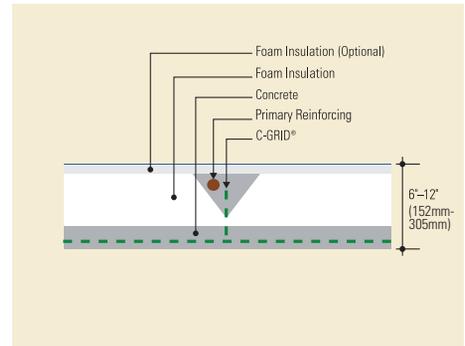
CarbonCast Architectural Cladding can speed installation compared with ordinary precast. Lightweight CarbonCast panels can be erected more efficiently because more panels can be staged at one time “under the hook” of the crane, reducing delays caused by jockeying panels into position for picking. In addition, larger panels can speed erection by reducing the number of picks, while lighter panels can permit the use of smaller, less expensive cranes.

Depending on design, CarbonCast panels are priced competitively with conventional precast or other curtainwall systems such as brick-veneer, masonry or stud walls. And after factoring in reductions to superstructure requirements, CarbonCast Architectural Cladding panels can help pay for themselves—especially in mid- and high-rise buildings.

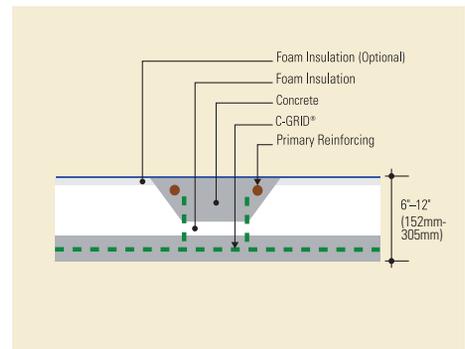
Factory insulation reduces HVAC demand.

The added R-value provided by the polystyrene foam—which can be a composite R-8 or more depending on panel configuration—can add insulation value leading to possible reduction in HVAC equipment.

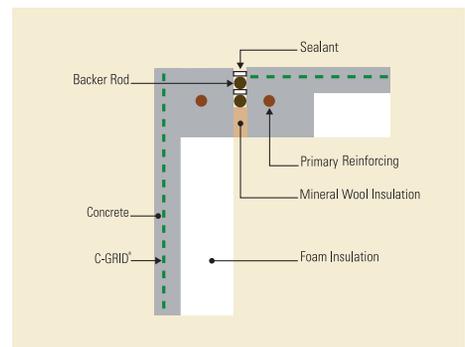
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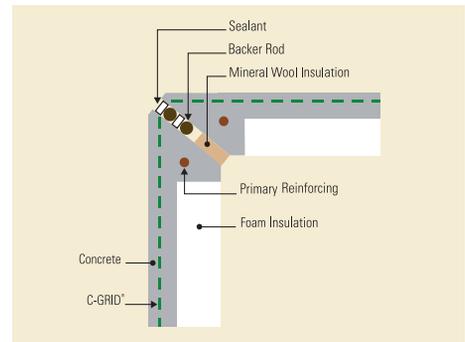
Architectural Panel
Secondary Vertical Rib



Architectural Panel
Primary Vertical Rib-A



Architectural Panel
Built Corner



Architectural Panel
Miter Corner

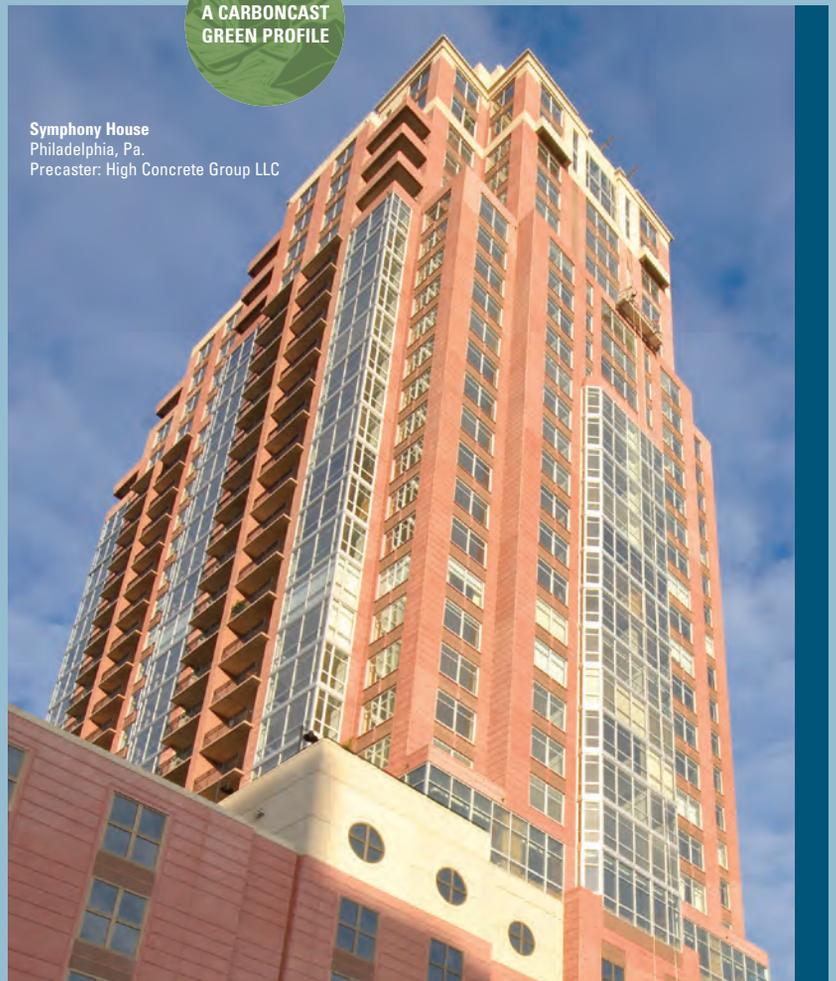
A CARBONCAST
GREEN PROFILE

Lightweight CarbonCast panels deliver command performance.

The developer of the 32-story Symphony House, a breathtaking \$125 million, 163-unit condominium in Philadelphia, promises residents “a provocative design that takes from the grandeur and romance of the 1920s and gives it a 21st-century transformation.” Coincidentally, the same could be said about the building’s exterior, the majority of which features next-generation CarbonCast Architectural Cladding that delivers a traditional aesthetic sensibility and a remarkable 33% weight reduction.

The weight reduction provided two benefits to the owner. First, the restrictive building site necessitated a tower crane to lift the 770 exterior panels into place. The CarbonCast panels, which weigh only 50 pounds (2.4KPa) per square foot, were easily accommodated by the crane—even at the more distant corners of the building.

In addition, the lower-weight panels reduced load on the floor slab where they are mounted and on the rest of the reinforced concrete structure, all the way down to the sizing of the foundation. An innovative slab attachment made possible by the light weight of the panels provided flexibility that made panelization of the structure easier by reducing the need to tie back directly to columns. Further, the thinness of the panels and the reduction of the structure delivered more interior floor space and better apartment layouts. And the panels were tested to withstand category 5 winds.



Symphony House
Philadelphia, Pa.
Precaster: High Concrete Group LLC

Million Air Airport Teterboro, N.J.
Precaster: High Concrete Group LLC



Edward Jones Headquarters
St. Louis, Mo.
Precaster:
High Concrete Group LLC



All the benefits of precast and even more sustainable

Versatility as infinite as your imagination.

Precast concrete gives architects and building owners a virtually unlimited array of design and finish options. CarbonCast® Enclosure Systems are no exception. They provide designers outstanding flexibility in terms of:

- **Form.** Articulations such as reveals, custom faces, cornices and other shapes. Deep window recesses can be included and will likely cost less than conventional precast.
- **Finish.** An almost limitless variety including colors, applied finishes and veneers such as thin brick, tile and stone.
- **Texture.** Custom surface texturing can range from delicate to bold, including polishing, etching and blasting, to yield the right unique appearance.

In addition to eliminating any potential for staining or spalling, C-GRID® reinforcement in the wall panel surface can provide superior crack control compared to steel mesh. Overall, CarbonCast delivers long-term peace of mind.

Improves the job site, not to mention the rest of the earth.

Delivered ready to erect, precast components avoid the costly scheduling, quality and safety issues associated with coordinating various trades, delays, scaffolding and site congestion caused by laborers and stored materials and equipment.

For decades, architects and engineers have depended on the strength, durability and design possibilities of precast concrete to achieve:

- Virtually unlimited aesthetic options
- Excellent design flexibility
- Peace of mind—Quality-oriented, consistent factory fabrication from PCI-certified plants enables greater quality control, superior consistency of finish and greater strength and impermeability.
- Thermal efficiency and weather tightness, which can reduce HVAC system requirements and energy consumption
- Fast-track construction—faster to erect, fewer uncontrollable delays, lower costs (up to five times faster than field fabrication)
- Low maintenance and life cycle costs—AltusGroup® precasters will provide extensive design and specification assistance, connection detailing, erection planning, erection and other services to ensure a hassle-free, high-quality installation.
- Outstanding durability, including fire and impact resistance

- Improved resistance to mold compared to most other systems
- Exceptional sound-isolating properties

CarbonCast builds on the LEED® advantages of precast.

- Lighter weight to reduce embodied energy by using less cement and concrete than conventional precast products
- Less fuel to produce, ship and erect
- Reduced crane requirements
- Reduced foundation superstructure and requirements
- Thermally efficient; reduces HVAC loads
- Reduced concrete cover requirements
- Eliminates sealers and corrosion inhibitors
- Maintains fire-resistive properties
- Shear support for designs that reduce concrete mass
- Eliminates thermal breaks in insulated designs

Current LEED information and available points for CarbonCast available at altusprecast.com/leed.

Top to bottom:

Academy of World Languages Cincinnati, Ohio

Precaster: High Concrete Group LLC

Gus Garcia Middle School Austin, TX

Precaster: Heldenfels, Inc.

Prologis Exit 8A Distribution Center South Brunswick, N.J.

Precaster: Oldcastle Precast—Building Systems Division

SCAD Museum of Art Savannah, Ga.

Precaster: Metromont



Ready to Pass the Toughest Test: Yours

Rigorous laboratory testing has affirmed a number of CarbonCast's performance characteristics. Below is a sampling of tests that demonstrate the suitability of CarbonCast Enclosure Systems for a variety of applications. Get more information at altusprecast.com/products or contact your AltusGroup precaster for details on tests.

C-GRID Material Properties

- Strand Tensile Strength and Cross-shear Strength
- Behavior Under Sustained Loads and Fatigue Behavior

C-GRID Reinforced Concrete Behavior

- Tension Tests and Pull-out Strength of Shear Grid
- Effect of Temperature on C-GRID used for Shear Transfer
- RILEM Moisture Absorption Test for 1" (25mm) Concrete Wythes

CarbonCast High Performance Insulated Wall Panel and Insulated Architectural Cladding

- Axial load and flexure performance plus full-scale load testing
- ASTM E119 three-hour fire test (2/4/2 [51/102/51mm] panel with interior pilasters)
- 50-year wind load fatigue test

CarbonCast Architectural Cladding

- Flexural Strength and Uniform Static Load
- Effects of Thermal Cycling
- Strand Bond Behavior in Panels Made with Nylon Fiber Reinforced SCC Concrete
- Missile Impact Test
- ASTM E119 Fire Test (2 hours)*

* CarbonCast is safe and fire-ratable when used with gypsum board wall assemblies. Floor-to-floor fire stops can also be cast into panels as required by fire codes.

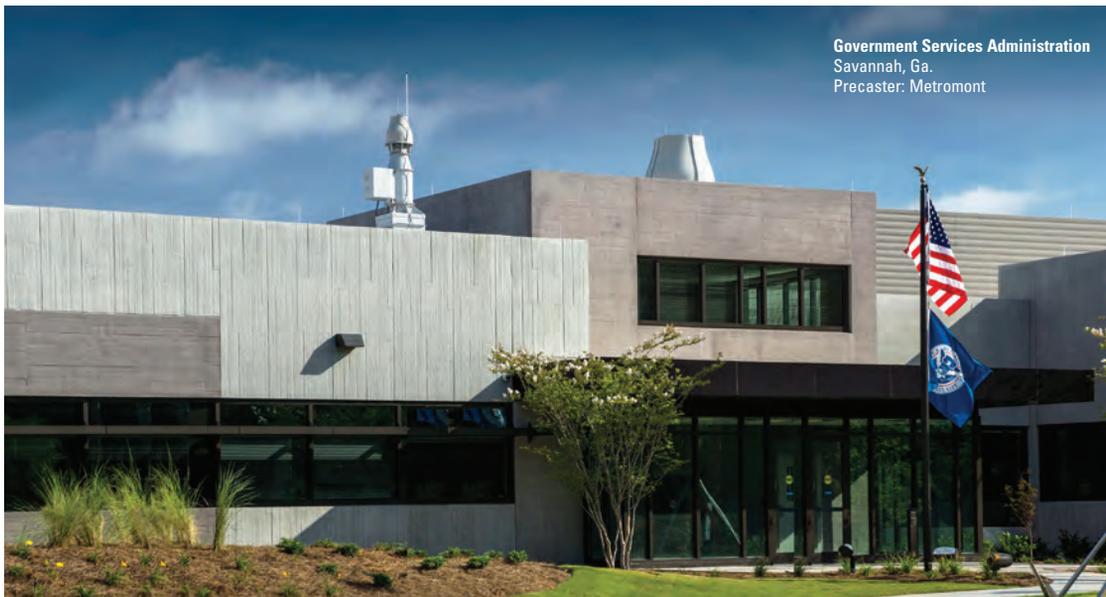
Revolutionary thinking from the leading minds in precast

AltusGroup, Inc., a company founded by some of the industry's largest precasters and C-GRID® manufacturer Chomarat North America LLC, was incorporated to make CarbonCast® technology—and future precast innovations—available throughout North America.

AltusGroup members collectively support more than two dozen manufacturing and sales locations in the United States and over 150 specification-oriented sales, marketing and engineering professionals and generate more than \$1 billion in annual revenue. With pooled research resources, knowledgeable manufacturing engineers and a national network of quality-conscious, PCI-certified plants (www.pci.org), sales support staff and university collaborators, AltusGroup can help you achieve your design, construction and budget objectives.

Innovative CarbonCast products are available across the United States and in Canada, with an unparalleled network of service and support, offering:

- Extensive testing and the backing of trusted industry leaders
- A central source for complete technical information, including CAD details, specifications and engineering design standards
- Local sales and technical representatives to help with design and construction challenges
- Uniform quality standards and details consistent with the IBC and local codes



Government Services Administration
Savannah, Ga.
Precaster: Metromont



Above:
Bloch School of Business
Kansas City, Mo.
Precaster: Enterprise Precast



Left:
Sanford Fieldhouse
Sioux Falls, S.D.
Precaster: Gage Brothers



Bottom, left to right:
Newton County High School
Covington, Ga.
Precaster: Metromont



Brothers Market
Parkersburg, Iowa
Precaster: Wells Concrete



AltusGroup® Producers:

Armtec

St. Jean Sur Richeleau, Que.;
Richmond, B.C.; Calgary, Alb.;
Brampton, Ont.;
armtec.com

Blakeslee Prestress Inc.

Branford, Conn.
blakesleeprestress.com

Central Pre-Mix Prestress

(an Oldcastle Company)
Spokane Valley, Wash.
cprestress.com

Enterprise Precast Concrete

Omaha, Neb.
enterpriseprecast.com

Gage Brothers Concrete Products

Sioux Falls, S.D.
gagebrothers.com

GPRM Prestress

Kapolei, Hawaii
gracepacificcorp.com

Heldenfels Enterprises Inc.

San Marcos, Tex.
heldenfels.com

High Concrete Group LLC

Denver, Pa.; Springboro, Ohio
highconcrete.com

Illini Precast

Marseilles, Ill.; Burlington, Wis.
illiniprecast.com

International Precast Solutions, LLC

River Rouge, Mich.
psi-hci.com

Knife River Corporation

Harrisburg, Ore.
kniferiverprestress.com

Metromont Corporation

Bartow, Fla.; Hiram, Ga.; Charlotte, N.C.;
Greenville, S.C.; Richmond, Va.
metromont.com

Mid-States Precast

South Beloit, Ill.
msprecast.com

Oldcastle Precast Building Systems

Edgewood, Md.; Selkirk, N.Y.
oldcastlesystems.com

Rocky Mountain Prestress

Denver, Colo.
rmprestress.com

Spancrete

Valders, Wis.
spancrete.com

Strescon Limited

Saint John, N.B.; Bedford, N.S.
oscoconstructiongroup.com/concrete.aspx

Stresscon

Colorado Springs, Colo.
stresscon.com

Wells Concrete

Albany, Minn.; Wells, Minn.
wellsconcrete.com

Chomarat North America LLC

(C-GRID® supplier)
Anderson, S.C.
carbongrid.com

International Affiliates:

Marxuach Precast Solutions

Puerto Rico

Verheyen Betoproducten

Belgium, North-central Europe

Prelco

Switzerland, Central Europe

Innovation Partners:

BASF Admixtures, Inc.

High Concrete Accessories

JVI

Meadow Burke Products



Other high-performance CarbonCast® products available from AltusGroup precasters include **CarbonCast Double Tees** for parking structures. They weigh up to 8% less than conventional precast double tees and eliminate the need for sealers and corrosion inhibitors, reducing a parking garage's carbon footprint.

For more information about AltusGroup, CarbonCast precast concrete components and the C-GRID technology, call 866-GO-ALTUS or visit www.altusprecast.com.

Details and drawings may vary slightly depending on precaster and region.

All information contained herein is believed to be accurate as of February 2015 and is subject to change without notice. No responsibility is assumed for its use by AltusGroup, or its members, and who reserve the right to make changes without notice, to product design, product components and product manufacturing methods. Please contact AltusGroup for more information.

C-GRID is a trademark of Chomarat North America LLC.

CarbonCast is a trademark of AltusGroup.

LEED is a registered trademark of the U.S. Green Building Council.

CarbonCast® precast products are protected under the following US patents: 6,898,908 B2; 7,100,336 B2, 8,677,720, patents pending.

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