



Blocks of veined marble blend with the snowy Vermont landscape; the marble will soon clad the DIA's Ford and Cavanaugh wings.

PHOTO COURTESY BOOMS STONE CO.

# A Masterpiece IN MARBLE

By Mary E. Kremposky, Associate Editor

**B**ooms Stone Co. is creating a masterpiece in marble for one of Michigan's most prominent public buildings – the Detroit Institute of Arts. Like delicate brushstrokes across a broad canvas, elegant black veining marks the new skin of white marble that will soon clad the exterior of the museum's north and south wings. The marble panels will hang on a steel substructure and custom anchoring system as intricate as the pattern of black minerals flowing through this ancient stone. Once completed in late 2005, this masterwork of a wall system will be "on exhibit" for at least a hundred years.

## A CHIP OFF THE OLD BLOCK

Formerly clad in dark brown granite, the wings will now match the white marble blanketing the main museum, constructed in 1927 and designed



PHOTO COURTESY BOOMS STONE CO.

The DIA marble was quarried at an underground mine in the heart of the Appalachians.

by architect Paul Philippe Cret. The new stone for the two wings – the south Eleanor and Edsel Ford wing built in 1961 and the north Jerome P. Cavanaugh wing in 1970 - was even taken from the same quarry near Danby, Vermont.

Companies have been extracting white marble from the Danby region of Vermont since the 1700s. The same vein of white marble runs through the heart of the Appalachian Mountains from Alabama to Labrador, ensuring an exact match for many a building renovation. "The vein clads just about any American building constructed with white marble since the mid 1800s," said Anthony C. Huhn, project manager for Redford-based Booms Stone Co.

Last February, Booms Stone Co. visited the Danby quarry with design architect Michael Graves Associates and SmithGroup Incorporated, braving a New England winter to help select the 50 blocks





PHOTO BY CHRIS COLLINS, CAM MAGAZINE



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**A crew member of Vulcan Iron Works labors on the steel grid; the scaffolding system awaits the crew of Booms Stone Co. who began work in mid-February.**

of Vermont Montclair Danby marble for the job. Measuring 150 to 250 cubic feet per block, the marble is a treasure taken from a mile below the Earth. Tapping into the North American continent's mother lode of marble, the Danby operation is an underground quarry that "covers an area of roughly 25 acres, runs a mile underground, and contains six different levels," said Huhn.

Technological improvements over the last 20 years have decreased the cost of the final stone product. Diamond-tipped boom saws with 10-foot blades pry massive 150- to 200-ton blocks of stone from their resting place, and a system of diamond-impregnated wire saws and pulleys cuts the block into smaller 40-ton blocks. The gang saw mill, a series of steel blades that operate like a giant bread slicer, then cuts the block into slabs with the help of a slurry of steel shot and water poured over the blades.

The warehouse of Booms Stone is filled with sumptuous marble and granite slabs in rich colors and markings from quarries across the globe that will be transformed into wall claddings, intricate floors, and stunning countertops. At publication time, the Danby quarry was in full production mode for the DIA's white marble panels. By mid-February, over

8,000 square feet of marble panels had been delivered to the DIA jobsite.

### PROTECTING REMBRANDT

The two wings will soon be cloaked in a skin of stunning white marble, but changes to the wall were more than skin deep. "There were about 12 to 15 steps that had to be executed on those walls prior to us even beginning to install the exterior cladding," said Huhn.

Water had infiltrated the granite cladding and deteriorated the block backup walls in some areas, leading Booms Stone to remove 66,000 square feet of granite over the course of three months, beginning in May 2004. As the mason, Dixon Inc. repaired the block backup walls, primarily performing patching work.

Sealing the walls to maintain proper indoor humidity levels was the next step needed to better protect the museum's invaluable collections, followed by installation of a vapor barrier by Western Waterproofing Co. and application of 3 inches of spray-on foam insulation. "There was no insulation in the walls when they were originally built and only a minimal vapor barrier," said Huhn. "The project was only part of a heating system upgrade to better control the internal environment."

Protecting the works of ancient and mod-

ern masters required creative problem solving in the selection of a panel support system. The canvas of white marble will be stretched across an intricate frame composed of a structural steel grid, a network of support steel, and rows of continuous aluminum anchors. "The old granite was anchored directly to the masonry backup walls, which were the old cinderblock type walls," said Huhn. Concerns about the inability of the block backup walls to handle the wind loading and stone weight led to the installation of this elaborate support grid.

Vulcan Iron Works will install a large steel grid of columns and beams; Booms Stone Co. will then anchor approximately 140 tons of support steel to the larger structural steel grid. "Our support system will actually carry the weight of the stone and the positive and negative wind loads," said Huhn. "...Vulcan's columns and horizontals are probably 10 to 11 feet on center. We will attach to the grid with smaller members that are 3.5 feet on center vertically."

Like the masterpieces adorning the walls within, the galvanized steel support system is created to stand the test of time. "It is very uncommon to have an entire substructure of galvanized steel," said Richard Booms, owner of Booms Stone Co. and president of the Marble Institute of America in 2003. "They don't want any corrosion. They want this to be a 100-year system." SmithGroup Incorporated is the managing architect on the project; Walbridge Aldinger Co. and Jenkins Construction, Inc. are joint venturing as construction managers.

The marble pieces and panels will directly hang on rows of custom aluminum anchors. Booms Stone Co. designed and is on the brink of installing the custom anchoring system composed of 36,000 lineal feet of continuous aluminum anchors fabricated by TriCity Extrusions of Bristol, Tennessee. "About 26 rows of stone will hook in a kerf (a saw-cut in wood, stone or other material, which is typically performed crosswise and usually not completely through the member) onto the aluminum anchors," added Huhn.

Every detail of this prominent project was scrutinized, analyzed, and sometimes revised to preserve a building designed to serve the community and preserve the works of the ages. "This is a very sophisticated project," said Booms. "You won't find many buildings that (the project team) has gone to this extent to waterproof, insulate, use galvanized steel – to do all of the extra steps that they have gone through to ensure the system is going to last a hundred years. They have gone to phenomenal lengths to do the best they can do."

Even the half-inch joints between the stone will be filled with a specialty caulk, a single-part, structural silicon sealant produced specifically for use on marble. "You can't even buy this long-lasting, high-adhesion caulk off the shelf; you have to special order it," said Booms.

#### PICTURE-PERFECT MARBLE

The same level of care was taken to ensure the quality of the marble panels. "The architect visited the quarry monthly inspecting production and approving every fabricated book-matched panel to ensure a quality final product," said Booms.

Elegant book-matched panels will cover large expanses of the main wall. In a book-matched panel, the vein pattern emanates from a center line, producing a symmetrical, mirror image of each side. Booms explained the production process at a recent stone seminar held at his company's offices: "During the slabbing of the blocks, the fabricator polishes the front face of one slab and the back face of the next cut slab. When you lay the two slabs down next to each other, the book-matched pattern of veins emanating from the center will emerge."

At the DIA, the book-matched panels are part of an assembly called picture framing, an arrangement of stone cut to form a frame around the main center panels. The panels forming the frame are flurry cut, while the center panels are vein-cut, book-matched pieces. The cuts are merely different ways of slicing a marble block to reveal different stone markings. "A vertical slice of a marble block produces vein-cut slabs with prominent veining," explains Booms. "A horizontal slice (flurry cut) slices across all the veining, creating pieces with cloud-like markings as opposed to pronounced veins."

Huhn unveils a sneak peak of the DIA walls: The stone is all flurry cut from ground level to a sill located about 14 foot above grade. Above the sill, 6-foot wide, flurry-cut faux columns or pilasters will be placed every 50 or 60 feet. The columns will separate the book-matched panels installed along the expanse of the main wall.

The vein-cut, book-matched panels are 5-foot-wide by four-feet high and weigh upwards of 500 to 600 pounds. "There is an extreme amount of wind loading on the panels, so the design dictated that they go to an 1¾-inch thick panel for the book-matched panels," said Huhn. The other stone pieces



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range in thickness from 1¼-inch to 2½-inch thick stone.

#### PROJECT LAUNCH

February 2005 marks the launch of the actual physical installation for Booms Stone. "We did the demo, stripped all the walls, and now we are finally in a position to start putting something back on the wall," said Huhn.

Booms began installation of the backup steel system in mid-February. After installation is complete by early March, Booms will begin hanging the pieces and panels of the Vermont

Montclair Danby marble that has journeyed from the heart of the Appalachian Mountains through a meticulous approval and fabrication process to the bustling jobsite in mid-town Detroit.

"Once we start installing the stone, we will be erecting about 1,500 to 2,000 square feet a week, which is one to two truckloads," estimates Huhn. The majority of the marble cladding will be completed by the end of 2005. The DIA undertaking is one of the largest projects to date for Booms Stone Co. The firm has contributed to another significant building crucial to Detroit's revitalization – the Compuware building in the heart of the city's central business district.

#### NATURAL WONDERS

Fittingly, Compuware's world headquarters is clad in stones from around the globe: Baltic Green Granite forms the 4-foot exterior base, followed by two floors of Baltic Brown – stones both quarried in Finland and fabricated in Italy; the interior wall cladding in the dramatic atrium is Impala Black

from South Africa; and the interior and exterior flooring is Cecelia granite imported from Brazil. The American heartland is not to be outdone; the 60,000 square feet of dolomitic limestone cladding the 10 floors of the exterior wall is Vetter Glacial Buff from the Vetter quarry in Wisconsin.

Booms Stone installed 6,000 to 8,000 square feet of exterior granite wall cladding with an average thickness of 1¼ inches, as well as stone on exterior paving, planters, and for the Kern Clock, said Bill Apostolopoulos, project manager. Granite exterior cladding covers the base course, two floors above the base course, and the executive floors at the top levels. The company also handled shop drawings and fabrication coordination for the 10 stories of Vetter Glacial Buff limestone. According to Booms, the 2-inch-thick limestone itself was shipped to National Precast, Inc., mechanically anchored with steel pins and cast monolithically into precast concrete panels at the firm's Roseville shop.

Booms Stone Co. installed some of the lavish granite throughout the Compuware interior, including the stunning main lobby and atrium and the furniture in the executive suites. Altogether, Booms installed 40,000 square feet of varied granite in both exterior and interior, traveling to the granite fabrication plant in Campolonghi Italia to review full-size, 25-feet by 15-feet-wide mockup panels





PHOTO BY CHRIS COLLINS, CAM MAGAZINE

**The distinctive granite work of Booms Stone blankets the Compuware façade. The company also handled shop drawings and fabrication coordination for the limestone sections, cast monolithically into precast concrete panels by National Precast, Inc.**

with Rossetti Architects and a Compuware representative. As a quality control measure, quarry visits are becoming a more common and accepted practice in the industry, particularly on prominent projects such as the Compuware building that require a vast quantity of stone.

Stone is a natural product with a range of variation in each stone type. The architect must specify an acceptable range of variation for each project, in many cases making a trip to the quarry a must. For example, Baltic Green and Baltic Brown both have a tendency to contain inclusions, or dark blotches, of a mineral called mica. "The architect was trying to manage the maximum size inclusion that they would accept," said Booms. "The rule on this job was that the inclusion could be no larger than a 50 cent piece."

The selected granites for Compuware were fairly consistent in pattern, but the team traveled to the quarry to review a mockup panel for uniformity of color and to ensure sufficient stone was available in the acceptable color range for the job. The team "went to the fabrication plant to make sure that the color range did not get out of hand and result in slabs delivered to the site that varied widely in color and that would produce an unwanted checkerboard pattern on the building façade," said Booms.

Whether one travels to Italy or stays in the office, Booms Stone Co. is adamant about providing samples representative of a stone's full range of variation. "For the granites, we usually obtain at least three 12-by-12-inch samples," said Apostolopoulos. "We obtained six to nine samples for the Compuware project."

At Compuware, the sampling and mockup review consumed months, but resulted in a satisfied owner. "Peter Karmanos, the owner of

Compuware, told the teams that they weren't going to settle for anything but first-rate quality," said Booms. One or two 4-by-4-inch stone samples often fail to reflect the natural variability of the stone, leaving the owner distraught and unsatisfied with the end product that may differ dramatically in color and pattern from the original design. As discussed at Booms Stone Co.'s recent seminar, Booms advocates obtaining a good number of sizeable samples and even suggests requesting digital photos of the full slab from the stone supplier.

Even after such a rigorous sampling and mockup review, either the supplier or the stone mason must number and arrange the pieces to achieve optimal blending. Proper blending eliminates an unwanted checkerboard pattern in a stone with wide variability in color, explained Booms. The attentive mason installs the stone pieces to achieve a gradual shift in tone from light to dark.

At Compuware, proper blending of color was crucial given the sizeable square footage of the façade, said Apostolopoulos. Proper blending leads to a quality job, a satisfied client, and a satisfied stone mason. "It is nice to drive through town and see your work, plus to see it on postcards and in Detroit magazines," said Apostolopoulos of his work on the Compuware building.

Booms Stone worked on the project for nearly two years; installation itself consumed nine to ten months. "Walbridge Aldinger, the general contractor, asked us to preorder all the material, to have it precut and bring it on the jobsite," said Booms. "We ended up with 20 containers of granite equaling 40,000 square feet in our warehouse. At a certain point in the job, we began taking truckloads of granite to the site every night and installing it during the day. We took enough for several days, since it was a just-in-time operation."

Mother Nature is the ultimate fabricator, her raw material molten magma and a mix of minerals, her tools heat and pressure and the forces of wind and water. Booms Stone Co. is an experienced stone fabricator and installer with the ability to bring the magic and beauty of Mother Nature's stone works into the spaces of our daily lives. Founded in 1986, Booms Stone Co. has been involved in some of the most intricate and ornate stone projects in Michigan, including the floor of the Blessed Sacrament Cathedral with its 14 different types of marble, the floor of the Hall of Justice building in Lansing and, most recently, the 40,000 square feet of granite pavers for the Riverfront promenade between the Renaissance Center and the Detroit River. ♡



PHOTO COURTESY BOOMS STONE CO.

**Booms Stone installed approximately 32,000 to 34,000 square feet of granite throughout the Compuware interior.**