PHOTO BY MARCI CHRISTIAN

A Fresh Angle on the Traditional City Hall

By Mary E. Kremposky, Associate Editor

The City of Farmington Hills' current City Hall revitalization offers a fresh angle on municipal buildings. A triangular spine slicing through a rectangle, both placed on opposing diagonals, creates a building of fresh and varied angles. A series of steeply sloping roofs add to the layered effect. Obviously, the building's irregular geometry is far more challenging to construct than your basic square box. Contracting Resources, Inc., Brighton, is more than equal to the task of turning the design of Lindhout Associates Architects, PC, also of Brighton, into a signature structure of steel, glass and brick.

David Richardson, LEED AP, Lindhout director, explains the firm's design concept: "The geometry creates a form which both opens the space up to the daylight and the city government up to the public. The addition is rotated in order to harvest more daylight; the existing part of the building will have new skylights and windows. As the building is like a plant reaching toward the sun, the ground source wells form the roots of the heat pump system, which both heats and cools the building.

"The angled spine houses an atrium, extending toward the intersection of 11 Mile and Orchard Lake Roads to form a stronger

connection with the community. At the prow of the atrium is a community display area that will feature work by local artists and students, and have a flat panel display showing what is happening in the auditorium."

Clearly, community and sustainability are pivotal in this City Hall revitalization that is breaking new ground as a municipal building going for LEED Gold. With a set of solar panels and a live roof over City Council chambers, the local government of Farmington Hills may be inspired to think "green" in all its decisions. Sustainable building systems will envelop residents and visitors from the moment of arrival in the parking lot to their entrance into municipal offices. Pulling into the north parking area, visitors will drive over a geothermal or geo-exchange heating and cooling system reaching 285 feet below grade and then park atop a pervious pavement system. Once inside, the view through expansive glass curtain walls will reveal pockets of large Oak and Beech trees carefully protected during construction. Exterior light shelves on clear glass curtain wall will deflect more natural light into the interior of the City Hall expansion.

PHOTO BY MARCI CHRISTIAN

B & A Steel Co., Inc., Chesterfield, erected the structural steel for this angular building's hybrid block and steel frame structure.

GOING FOR THE GOLD

The project is a study in the "green" technologies sprouting on jobsites across the country. The vertical geothermal system has 40 wells containing over 5.5 miles of 2-inch pipe that coil through the ground below the entire north parking lot. The system will supply all of the building's heating and cooling, erasing the facility's need for natural gas, said Bradley E. Barnard, superintendent for Contracting Resources. In an ideal world, a perfectly clean energy source would be a geothermal system combined with a renewable energy source to power the heat pumps.

A discounted electrical rate for heat pump operation and federal stimulus dollars for the ground source system made the geothermal system affordable. According to the website www.StimulusWatch.org, the American Recovery and Reinvestment Act (ARRA) released approximately $791,300 to the City of Farmington Hills in the form of an Energy Efficiency and Conservation Block Grant. "It was a great use of ARRA money that was put directly into the hands of local contractors," said Richardson.

Seeking alternative approaches to common systems is all part of a "search and rescue operation" for the globe. For water quality, a pervious pavement system blankets a swath of the city hall's new brick paver-blanketed parking lot. According to Barnard, stormwater penetrates porous gaps between the rows and percolates through three layers of different-sized aggregate placed in a four-feet deep cut. "In addition to the gaps between the bricks, a small diamond shape area near the corners creates more area to accept the stormwater," said Barnard. "The stormwater slowly trickles rather than gushes into the storm lines as a way to prevent flooding downstream." Plus, two rain gardens will slow the rush of stormwater and grace the site with more greenery.

The city hall revitalization will also feature a series of "green" roofs and will be wrapped in an efficient cloak of insulation. "Roof planters from LiveRoof LLC, Spring Lake, will cover most of the addition," said Richardson. "The product will help slow stormwater runoff, extend the life of the roof membrane, and minimize heat gain in the summer." DOW's Thermax wall system, a highly efficient insulation system that provides a continuous barrier across the metal studs, is the insulation of choice for this municipal expansion. As the exterior metal stud subcontractor, Brinker Team Construction, Detroit, "was very happy with this system's installation as well," added Richardson.

Exploring new systems is paired with conserving existing materials in this LEED-registered project. With its system of separate dumpsters, Contract Resources had diverted about 93 percent of materials from a landfill by late December 2009. "Site demolition generated a great deal of concrete debris that was shipped to a crushing plant in the initial phases of the job," said Barnard. "We also diverted masonry debris from the brick veneer installation."

As the job progresses, one recycling constraint is the region's undeveloped recycling infrastructure, said Barnard. Nearby recycling opportunities shrink as the debris stream switches to general waste, such as drywall. "There isn't any place close to take some of these items, such as the plastic irrigation piping we uncovered during demolition," said Barnard.

PHOTO BY MARCI CHRISTIAN

The 29,000-square-foot addition is an intricate puzzle of a building composed of six different sections marked by strong angles and varied heights.

Another constraint is the ingrained habit of simply tossing debris into a dumpster. "We make sure that debris is diverted properly and placed in the right dumpster," said Barnard. Beyond jobsite monitoring, LEED and its requirement for proper debris segregation is a contractual obligation for all subcontractors. "Obtaining LEED certification is a team effort," said Barnard. "Everyone's goal is to get the gold."

PHOTO BY RALPH SPENCER, AC, LEED, AP

Preserving a stand of mature trees added to the challenge of working on an already tight site, but will offer occupants a grand view and will symbolize the sustainable goals of this LEED-registered building going for LEED Gold.

AN EXERCISE IN ADVANCED GEOMETRY

The 29,000-square-foot addition is an intricate puzzle of a building composed of six different sections marked by strong angles and varied heights. Piecing together this ensemble of angular sections was an exercise in advanced geometry. "With so many angles, it is more challenging to visualize how a detail is actually going to come together, and it is more challenging to hold everything plumb," said Barnard. "Everything in the City Council chambers has an irregular angle. Fortunately, every angle is either 45 degrees or 22.5 degrees, which helps to somewhat simplify the process."

This layered structure steps down in a series of tiers, some capped by steeply sloping roofs in a building designed with three different roofing systems. The building's spine – the highest portion of the structure - will be capped by a standing seam metal roof and will be wrapped in translucent panels. The two main sections descend and stretch northeast and southwest of the spine. A rubber membrane roof will cover the northeast wing, while a live or "green" roof will blanket the larger southwest wing – the future home of the City Council chambers and various city offices. Soon to be clad in clear glass curtain wall, both wings cantilever on the north over the lowest building tier via four-post column piers, said Barnard. In the lower tier, small live roofs will sprout on a brick section, called the patio, as well as on the roof linking the addition to existing city offices.

As far as exterior cladding, "the majority of the building will be either translucent panels or a glass curtain wall system, he added. Brick will compose the remainder of the building skin, much of it clustered on the lower tier of the building. According to Richardson, "burnished block from Fendt Builder Supply, Inc., Farmington, forms the base of the hybrid block and steel frame structure, and at the same time is the finish for the new City Council chamber. They also provided the pervious pavers for the new parking spaces. Other Michigan-based products in the project include SunGuard Low E glass from Guardian. "It lets in visible daylight to help reduce electric light needs, while at the same time blocking out heat gain in the summer and heat loss in the winter," Richardson added.

Contracting Resources launched this complex project in early July 2009. The construction manager and its subcontracting team had poured spread footings, erected the hybrid block and steel-framed structure, laid brick veneer, and had curtain wall installation well underway by the beginning of January 2010 for this approximately $8 million dollar building. Subcontractors included masonry, D'Alosio Masonry & Construction, Inc., Farmington Hills; glass and glazing, Peterson Glass Co., Ferndale; exterior metal studs, Brinker Team Construction Co., Detroit; interior metal studs, SHS Incorporated, Novi; structural steel, B& A Steel Co., Inc.; electrical, MAS Electrical Services, Livonia; and roofing, Christen Detroit, Detroit.

WORKING ON A TIGHT SITE

Contracting Resources and its team grappled with the constraints of a tight site throughout the project. The small site is sandwiched between the existing City Hall, the small parking area for the police headquarters, the close proximity of 11 Mile Road, and a protected grove of trees surrounded by a snow fence. "We don't have much room between the building and the tree line to work," said Barnard. "We also have limited room for lay down of materials."

In early April, municipal workers will vacate the existing building and move into the new addition. Contracting Resources will begin completing gutting and renovating the interior of the existing City Hall. A new roof, complete with one set of solar panels, will be installed as well. In addition, the mansard roofing will be demolished, the old asbestos shingles will be abated, removed and safely disposed, and a new veneer of soldier course brick installed to match the addition's veneer.

The shift from the old asbestos shingles to a contemporary live roof clearly demonstrates how building materials and systems have evolved over the decades. The future is certain to hold the prospect of even more advances in building technology and more changes on the jobsite to promote sustainability. The efforts of the City of Farmington Hills, Lindhout Associates, and Contracting Resources, Inc. will soon bear fruit with the grand unveiling of this signature, sustainable project slated for the end of September 2010.