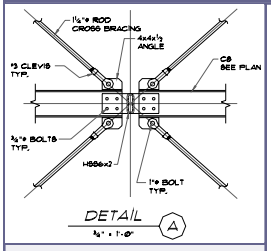
DM Berg Consultants, P.C.

Winter/Spring 2003



The Court Square Press Building
South Boston, Massachusetts

DM BERG CONSULTANTS, P.C. is a structural engineering firm providing services for both public and private-sector clientele. Our business focus is:

- Building designs for new construction
- Analyses, forensics, and report writing
- Rehabilitation and restoration for existing buildings and parking structures
- Envelope and weatherproofing designs for new and existing building roofing and cladding systems

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Guidelines to Control Cracking in Concrete Masonry Veneers

by Thomas G. Heger, P.E., President

With the economy of concrete masonry units (CMU) and the production of aesthetically pleasing textures and colors, more and more owners are opting to use this material as a veneer on their buildings in lieu of typical clay masonry brick units. In some cases, bands of clay masonry are used in combination with the CMU veneer. When specifying crack control details, such as, joint reinforcement and vertical control joint spacing for these veneers, the building designer must be aware of the differences between clay materials properties versus concrete materials properties.

As with all concrete products, the concrete masonry veneer will tend to shrink as the cement hydrates and the concrete cures. After production of the concrete masonry unit, the moisture content is at the highest. The clay brick, however, will come out of the production kiln with a very low moisture content. As the clay brick absorbs moisture from the air and weather, the brick will expand. The expansion of the clay brick band embedded in the concrete unit veneer will act as a restraint to the drying shrinkage of the concrete masonry units. The restraint will cause tension forces to develop in the concrete masonry units and may lead to cracking through the concrete masonry veneer.

Listed below are crack control recommendations for veneers constructed with concrete masonry units and with veneers where bands of clay masonry products are combined with concrete masonry units. The list is only a general guideline and is not intended to cover all veneer types and configurations.

Recommendations for using concrete masonry units as veneers:

· Vertical control joint spacing: Keep the veneer panel length to height ratio limited to a maximum of 1.5 with a maximum spacing of 20 feet. When possible, control joints should also be placed at all stress concentration points such as on each side of large window and door openings, outside corners and at changes in wall heights.

· Keep control joints clear of the ends of lintels. Lintels should not pass through control joints.

· Place horizontal joint reinforcement at 16 inches on center. Additionally, provide joint reinforcement at the first course above and below all window and door openings.

· Mortar: Type N is recommended and the mortar should be specified with a lower compressive strength than the block. The weaker mortar will coax the crack to occur within the mortar joint rather than the block.

· The block should not be laid up in an uncured ("green") state. The block should be stored on the site in a dry location and allowed to cure prior to installation.

· During block lay up, the unit should not be wetted.

· To limit the permeability of the block, an integral water repellent admixture should be specified in the block concrete mix. To complete the system, the mortar mix should also be specified with an integral water repellant admixture. Check the compatibility with other admixtures. Other concrete admixtures may reduce the effectiveness of the integral water repellents.

Additional recommendations are listed below when clay masonry bands are nested within the concrete masonry veneer:

· If horizontal clay bands are less than 10 feet apart then the maximum spacing of vertical control joints should be reduced to 16 feet.

· Control joints should be placed near both jambs of windows or doors greater than 6 feet wide since window openings of this size will reduce the cross sectional area of the veneer panel. Again, keep the control joint clear of the ends of lintels.

· To further control cracking, horizontal steel joint reinforcement should be placed above and below all bands of clay brick. If the bands of clay brick are less than 10 feet apart, then horizontal steel joint reinforcement is recommended at all courses.

For further information on crack control of concrete masonry units used as veneers visit the National Concrete Masonry Association (NCMA) web site at www.ncma.org or refer to the NCMA TEK manual articles.

Project Highlight . . . . . Staff Profile

THE COURT SQUARE PRESS BUILDING PHASE I
South Boston, Massachusetts

Rendering by Terry Cracknell

The Court Square Press Building Phase 1
S. Boston, Massachusetts

Architect:
John Cunningham Architects, Inc.

Architect for Interior Public Spaces:
Office dA

General Contractor:
A.J. Martini

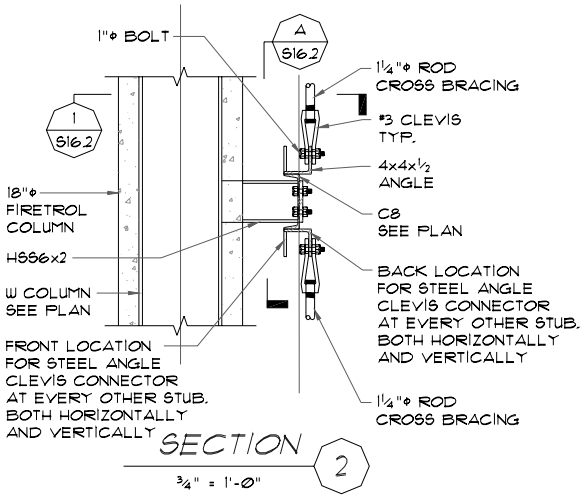
Total Estimated Cost:
$53,000,000

Total Square Footage:
210,000

Phase I consists of an extensive structural conversion of the existing historic 6-story 210,000 square foot commercial/industrial facility into luxury loft condominiums. The original building is of brick-and-wood beam mill type construction.

To achieve a level floor and provide sound deadening, reinforced concrete slabs were placed over the existing wood subflooring. These slabs were tied to the existing framing and masonry walls to provide restraint for the walls and to transfer diaphragm forces to the masonry shearwalls.

The open end of the existing C-shaped structure was enclosed by a new six-story steel, concrete, and glass structure with steel concentrically braced frames for lateral force resistance. ■



Check out our **"Corporate Profile"** in the April-May issue of *High-Profile Monthly* or go to their website at www.high-profile.com

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Congratulations to **Mike Peddie** and his wife on the birth of their daughter Aileen Theresa.

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Tom Queally made coffee on January 17, 2003!

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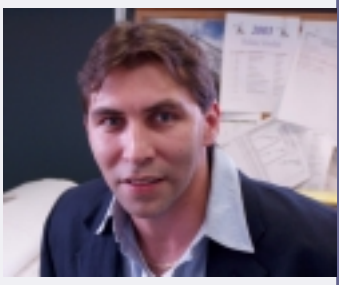
To read past articles, visit www.dmberg.com and click on **Company** subcategory **News**.

Thomas J. Queally
Senior Drafter



Since joining DMBC in 1995, Tom has been involved in a wide array of design projects, including rehabilitations, restorations, and design of new construction. Working directly with the engineering department and various disciplines involved, Tom enjoys being a part of an experienced CAD department.

With over 14 years of experience, Tom has broadened his understanding and knowledge in the detail and design of many types of structures and buildings while working at DMBC on a variety of projects. Tom has most recently been working as the lead drafter on Linden Ponds at Hingham, a retirement community in Hingham, with Steffian Bradley Architects. Linden Ponds is a sprawling campus of several mid-rise residential buildings in four neighborhoods, encompassing three community buildings. The campus is linked with climate-controlled bridges and walkways on a 108 acre site.

Tom attended Central New England College with studies focused on Civil Engineering and undertook class studies at The Wentworth Institute of Technology.

In his spare time, Tom enjoys spending time with his family; sports; music; and playing guitar.

Mr. Queally has also worked on the following projects:

- DoubleTree Hotel - Boston, MA
  Architect: Russell, Scott, Steedle & Capone
- Brookline Village Lofts - Brookline, MA
  Architect: CYMA2
- Multiplex Cinema - Holtsville, New York
  Architect: Beacon Architectural Associates, Inc.
- New England Homes for the Deaf - Danvers, M■

DMBC, P.C. strives to create a working atmosphere where, through mutual cooperation and respect amongst staff and clients, the process of designing structures can be carried out with efficiency for all concerned including owners, developers, other clients, and end users.