

# DM Berg Consultants, P.C.

Winter 2001

## Hello 2001, Goodbye 2000 *by Peter Banks, Senior Principal*



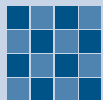
*Tufts University  
Parking Garage  
Medford, Massachusetts  
Architect: ADD, Inc.*

**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

### **Project Types**

Assembly	Industrial
Civic	Institutional
Commercial	Parking Garages
Educational	Residential
Healthcare	Retail
Hospitality	Specialty



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The year 2000 has passed very quickly and many things have happened.

One of the most exciting points was the introduction of DM Berg Consultants, P.C. We created DMBC to facilitate new and existing business ventures and establish new principals to carry on the David M. Berg tradition of service.

In the year 2000, we have successfully established new client relationships, thereby continuing our growth and business diversification. Along with this diversification we are continuing to establish professional registrations throughout the country with our project engineering staff. Our strong client base and projects provided many engineering challenges throughout the year, increasing the number of projects undertaken this year to over three hundred.

Our employees have become proactive, with our support, in furthering their education, involvement in community outreach programs, and participating in committee activities with a prominent focus on engineering and building code issues.

## **Do you know how you want your concrete to crack?**

*by Matthew H. Johnson, Project Engineer*

Concrete may be the most recognizable element in the built environment. However, concrete is often noticed for its rusted steel reinforcing spalls, delaminations, and cracks.

Concrete, in some form, has been around since 2000 B.C. Reinforced concrete was first used in 1850's. Prestressed concrete design began in the 1920's. All these concretes have common elements; they are enormously strong in compression, equally weak in tension, and will always crack. How you control these cracks will go a long way in determining the life cycle of the element you are designing and specifying.

Strength, the familiar 3,000, 4,000, or even 10,000 psi mixes, may be the easiest concrete character to control. An accurate mix design containing the correct water-to-cement ratio will almost always provide the required strength. But is strength your only concern? What other aspects of the mix design should you worry about? Just like the structural engineer who should not ignore a brick veneer, the architect or owner should not ignore the concrete specifications.

The year was full of commitment to the success of our new business structure. We continue to enjoy the efforts of our staff whose diligence and proactive approach to completing project tasks have provided client satisfaction with our services.

Working as a professional group, we have enjoyed both our work and company sponsored family events, including a ski weekend, golf outing, and an old fashioned New England clambake!

Because we offer competitive compensation and foster a challenging, productive, and rewarding work environment, our employees average term of service exceeds ten years.

We enter the new millennium with great anticipation. Soon we will complete the development of our new home web page. New clients, projects, and staff will enhance our success as we move forward in continuing the foundations that encompass the tradition of valued engineering services fostered by David M. Berg. ■

*Peter Banks*

Every element constructed of concrete is different and must be addressed as such. An interior slab on grade that will receive carpet is treated differently than an exterior concrete structural slab that is exposed to temperature variations, moving automobile live loads, deicing salts, and moisture. Additionally, because concrete is a flowable material in it's early stages, it can be formed or shaped into almost anything imaginable. The concrete finish can, therefore, be important to the overall design and specification.

Concrete cracks can occur from shrinkage during the curing process. The plastic mix undergoes the highest rate of water loss in its early stages. These cracks can not be stopped. However, cracks can be controlled (i.e., to specific, acceptable locations and widths) through saw cut control joints, addition of welded wire mesh, polymer microfibers, commercially available curing compounds, etc.

How the concrete is cured can also affect cracking. Wet curing concrete can help increase not only strength, but also the length of time at which water is present for hydration, reducing the amount of shrinkage cracks. (over)

**TUFTS UNIVERSITY PARKING GARAGE  
MEDFORD, MASSACHUSETTS**

*by Ali R. Borojerdi, P.E., Vice President*

**ALI R. BOROJERDI, P.E.  
VICE PRESIDENT**



Photo courtesy of Kay Companies

*Tufts University  
Parking Garage  
Medford, Massachusetts*

Architect:  
*ADD, Inc.*

General Contractor:  
*Kay Construction Corp.*

Cost: *\$12,000,000*

Parking Spaces: *530*

Garage: *210,000 sq.ft.*

Office: *30,000 sq.ft.*

**Matt Johnson** is representing DMBC on the **BASE** Committee, providing structural commentary to Ch. 34.

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We enjoyed our annual **Christmas Party** which was held at the Copley Marriott.

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Be on the lookout for our new and improved **Website** which will be up and running soon.



Scene from our **Summer Party**. We all enjoyed the clam bake and volleyball!

New construction of a 530-space parking garage on the Medford portion of the main campus provided both replacement and expanded parking.

Reinforced concrete Filigree beams and slabs were used in the six-story parking garage. Structural steel was used in the seventh floor office portion and the roof. Shear walls and braced frames provided lateral load resisting capacity in the long direction. Lateral resistance in the short direction was provided by moment frames which also carried the unbalanced lateral soil pressure.

A 150-foot long pedestrian bridge provided direct access from the campus to the seventh floor offices. The top chord of the bridge was designed as an elastically restrained member. A central pier supported the bridge. The bridge was separated from the seventh floor plaza by expansion joint. The plaza and bridge were equipped with a snow melting system embedded in the concrete slab to avoid snow and ice accumulation.

Tufts garage was completed in 2000 and won the *ABC Excellence in Construction Award*. ■

(article continued)

Long term cracking caused by rusted reinforcing steel can be a major problem. Rust on a reinforcing bar can increase the area of the original bar by more than four times. This will spall the concrete off the element, leaving the reinforcing further exposed to the elements. Increased concrete cover, reinforcing bar physical protection such as epoxy coatings, admixtures, sealers, and topping slabs, where applicable, can all help to reduce the incidence of rusting steel and prolong the life of the concrete element.

Equally important to the concrete is how the element is finished. Do you require a smooth, void free finish for painting? Is this surface going to be subject to exterior pedestrian traffic and require a textured broom finish? Will this be unexposed with the natural finish of the formwork acceptable?

While the structural design of the concrete element can not be ignored and is paramount to the strength and stability of the structure, of equal importance to the life and durability of an element is the way a concrete is specified to be mixed, transported, placed, cured, and finished. ■

Mr. Borojerdi became a principal of DMBC in January 2000 and previously served as an associate. Ali has varied design experience exceeding 23 years. His work experience includes structural analyses and designs; investigations and reporting; distress and failure investigations and analyses; and independent structural engineering reviews. He also has extensive experience in renovation and remedial work.



Mr. Borojerdi received his Master of Science Degree in Civil Engineering from the University of Minnesota before coming to Boston. He is currently registered in Massachusetts and is working towards becoming licensed in all of the New England States.

In addition to the Tufts project featured to the left, the following projects recently reached substantial completion under Mr. Borojerdi's supervision:

*Hingham High School - Hingham, MA*

Architect: The Design Partnership of Cambridge, Inc.

*Western CT State University Dormitory - Danbury, CT*

Architect: Herbert S. Newman & Partners

*Bayside Hotel - Boston, MA*

Architect: Arrowstreet, Inc.

*Regal Bostonian Hotel - Boston, MA*

Architect: Mintz Associates, Architects

In his spare time, Ali enjoys family, classical music, and good books! ■



**Double Tree Hotel and YMCA  
Don Bosco Technical High School  
Boston (Chinatown), Massachusetts**



Photo courtesy of Corcoran Jennison

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