

Market Square Plaza

LOCATION

Harrisburg, PA
(Strawberry & Market Streets)

OWNER

Phoenix Development Group
Harrisburg, PA

ARCHITECT

Murray Associates
1600 North 2nd, Harrisburg, PA

ENGINEER

Cagely and Associates
Gaithersburg, MD

GENERAL CONTRACTOR

R.T. Reynolds
3300 North 3rd, Harrisburg, PA

CONCRETE CONTRACTOR

Macri Concrete, Inc.
100 Old York Rd., Dillsburg, PA

READY MIX SUPPLIER

Pennsy Supply, Inc
1001 Paxton St., Harrisburg, PA

LIGHTWEIGHT AGGREGATE PRODUCER

Lelite Lightweight Aggregate
Lehigh Cement Company
675 Quaker Hill Road
Union Bridge, MD

PUMPER

Brundage-Bone
& Blanchet, LLC

TESTING LABORATORY

TSI Testing Services, Inc.
1884 Swatara Street
Harrisburg, PA

Use of Structural Lightweight Concrete Reduces Structural Member Size and Improves Fire Rating In 18-Story Office Building



Market Square Plaza under construction



Market Square Plaza completed

18-Story Market Square Plaza Uses Structural Lightweight Aggregate in Top 8 Floors

The \$32 million Market Square Plaza in Harrisburg, Pennsylvania, is scheduled for completion in early 2005. The building is bordered on three sides by buildings and fronts on the busiest street in downtown Harrisburg.

Lelite structural lightweight aggregate supplied by Lehigh Cement Company was used in the uppermost 8 stories (floors 11-18) of the building to address two particular issues:

- 1. The use of lightweight concrete on the decks of the offices allowed the designers to effectively reduce the size of the structural members.**
- 2. With the composite lightweight concrete deck construction, the designers were able to achieve an approved UL rating assembly for fire.**



Pennsy Supply delivers concrete for pumping



Pumping concrete for tower crane footer

Limited Staging Area Calls for Creative Coordination

R.T. Reynolds, Inc., the General Contractor, was limited to a staging area of approximately 20 x 100 feet in front of the building. No lay-down areas were available for any of the trades. The entire project was delivered and staged for construction from this area.

Reynolds planned and bid the project to work 24-hours a day until the project was under roof. This involved a lot of cooperation and coordination from the City of Harrisburg and the three major trades on the front end of the project. Stewart-Amos Steel was scheduled to work six 10-hour days per week until the pre-cast started. Once API pre-cast began, the ironworkers dropped to six eight-hour days.

Sequencing Trades Is Critical to Schedule

Poured-in-place concrete was scheduled to begin when the ironworkers turned over the eighth floor. Due to the large numbers of concrete trucks needed to deliver the concrete to the site, concrete was bid to be placed on the third shift during the off-peak traffic hours in the city. Pre-cast was scheduled to work second shift and was scheduled to begin when the poured-in-place concrete hit the 8th level.

Sequencing the trades in this fashion allowed the steel to top out one week ahead of the cast-in-place concrete. Pre-cast topped out 3 weeks after the cast-in-place concrete. This allowed time to achieve the desired concrete strengths for loading prior to placement of the pre-cast. It also allowed all trades access to the tower crane to stock the floors before the crane was removed.



Tower crane footer and installation



Pennsy Supply discharging concrete for lab testing

Pumping Concrete Facilitates Deck Construction

Time and space constraints were the major obstacles involved with this project. Poured-in-place concrete was the key to keeping the project on schedule. Ready mix supplier, Pennsy Supply and concrete contractor, Macri Concrete worked hand in hand to ensure that the concrete placement went smoothly. An 18-story standpipe system was installed in one of the elevator shafts to facilitate the pumping of concrete. A truck mounted pump was brought in every night. Normal weight concrete was pumped through the tenth floor and structural lightweight concrete was pumped from the eleventh through the eighteenth floors. Every pour went smoothly without any clogging or blowouts.



Shelley Sheetz, Lehigh representative, observing lightweight concrete placement for new second floor of Hilton Hotel ballroom



Pumping water out of saturation pond to prepare Lelite lightweight aggregate for lightweight concrete placement later the same night.

Saturation Pond Speeds Schedule

Lelite lightweight aggregate for structural lightweight concrete is normally sprinklered for 3 days to achieve the saturation levels needed for pumpability. To assure that lightweight aggregate was available to meet the aggressive construction schedule, Pennsy Supply, the ready-mix supplier, built an off-site saturation pond so that the lightweight aggregate could be appropriately saturated and delivered, and concrete could be placed on an around-the-clock basis.

and their suppliers worked hand in hand to deliver the services required to meet my aggressive schedule. The building went up on schedule and the quality of work is superb. The Reynolds construction staff, the city of Harrisburg and all the contractors involved did an excellent job of teaming together and the end result is apparent every time you drive down second street past City Hall.”

Barry Leonard, Senior Project Manager for R.T. Reynolds, summed up the project saying, “All trades

For Additional Information About Structural Lightweight Aggregate

Lehigh Cement Company

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www.lehighcement.com

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