

# Lightweight Concrete Wall Panel System Developed For Use With Metal Buildings

As an alternative to the traditional types of metal claddings used for pre-engineered metal building systems, Earl Composite Systems of Pasadena, CA, manufactures an easily attached concrete panel system called Metal Stud Crete (MSC).

MSC panelized wall units are comprised of 2"-thick slabs of concrete joined to light-gauge frames. They are engineered for both load-bearing shear wall and

## Panel Testing And More

MSC panels have been tested under laboratory conditions for composite action, shear flow and tensile pull-out. They have ICBO approval (Report No. ER5446), comply with the 1997 UBC, and meet stringent seismic requirements. Ballistic tests certify that MSC panels, when designed to bullet-resistant specifications, meet UL 752 Level IV standards.



curtain wall applications and can be cast on the job site if needed. They've been successfully used on a whole range of projects; everything from military barracks to convenience stores to single-family homes.

Earl Composite Systems is the exclusive licensee of the Metal Stud Crete system and has been marketing the panels to the pre-engineered metal building industry since 1999. Its parent company, Earl Corp. is a 70-year-old corporation with extensive concrete wall experience.

## Panel Fabrication

The connection between the concrete panel and the light-gauge steel framing members is accomplished by using a series of patented shear connectors. They are attached to the framing members prior to their layout and assembly per individual project specifications.

The fully assembled steel frames are then lowered far enough into a wet pour of concrete so that the MSC connectors are embedded. When the concrete reaches its proper strength (usually within 24 hours) the panels are ready for attachment. The manufacturing of panels can be carried out at the job site or performed at a precast plant.

## Features, Tech Support, Applications

The exterior face of an MSC panel needn't be standard concrete. The panels can be treated to achieve a variety of architectural finishes. Color pigmentation, exposed and retarded aggregates, texturing, sandblasting, and even brick inlays and stone veneers are among the options.

In addition to providing assistance with choosing the right look, Earl Composite Systems (ECS) can provide panel engineering, produce shop drawings and ensure compliance with the requirements of local building authorities. The steel studs and concrete used to manufacture the panels are off-the-shelf items that can be purchased virtually anywhere, while the patented composite shear connectors are provided by the company. To ensure the panels are manufactured and installed correctly, ECS can provide on-site training and technical assistance.

If enclosing a structure quickly is of paramount importance, or if site-casting is not practical, ECS can supply ready-to-install panels through its national association of pre-casters. Off-site production enables the panels to arrive ready for installation once the steel structure has been erected.

The panels can be cast at the site using procedures standard in the forming of tilt-up panels.



## Panel Installation

MSC panels can be attached to pre-engineered metal framing using angle clips and self-tapping screws. Installation begins by securing the panels to the floor slab and then the header beam at the top of the panel. When used as a shear wall, the panels are also attached to the adjacent vertical columns on either side of the bay. MSC panels typically weigh about 35 lbs. per sq. ft., requiring the use of a lightweight crane during installation.

The exterior walls are made watertight by using backer rod and caulking at the vertical and horizontal joints.



The accompanying construction progress photos show the OCON IV project. In the photo directly above, MSC panels are arranged face down on the building's concrete slab as they await installation. In the photo at the top and on page 41, the installation process has begun.

## Recent Case Study

Many contractors throughout the United States have begun recommending MSC panels as a way to enhance the aesthetics of otherwise-standard metal buildings. One of them is Associated Construction Concepts (ACC), a metal building general contractor headquartered in Longmont, CO. In addition to fabricating panels for its own pre-engineered metal building projects, the company had a pre-casting operation that allows it to manufacture and supply MSC wall panels to other area builders.

One of the firm's initial MSC projects was OCON IV. The metal building framing system was manufactured and supplied by Brytex Building Systems of Edmonton, Alberta, CAN. ACC is a Brytex builder. On the project, high-strength, 5000-psi concrete was used to expedite the installation of the site-formed panels.

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