Cinemark Melrose 10

OWNER: CINEMARK
LOCATION: MELROSE PARK, IL
ARCHITECT:
KIP E. DANIELS, ARCHITECT
MASON CONTRACTOR:
G. PORTER & CO

EXTERIOR MASONRY COST: $15.80 / ft² (1998)
INTERIOR MASONRY COST: $13.80 / ft²(1998)
TOTAL COST OF MASONRY: $1,007,000 (1998)
DURATION OF MASONRY WORK: 3 1/2 MONTHS

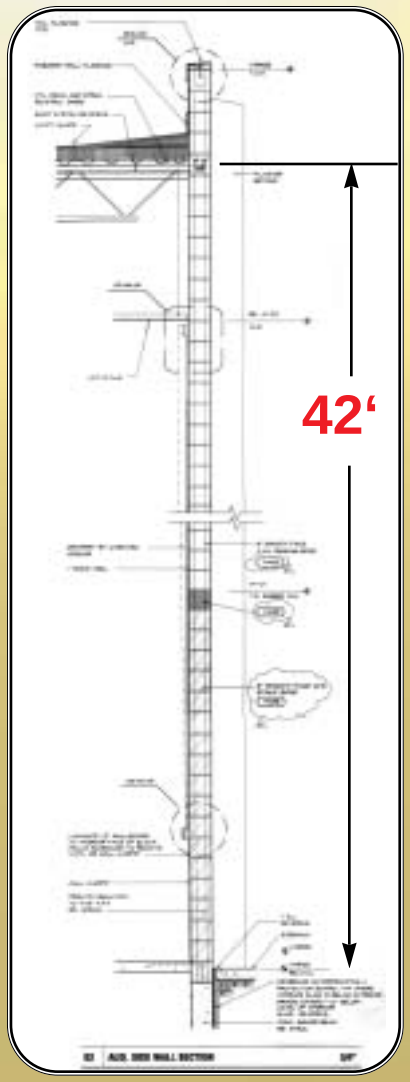
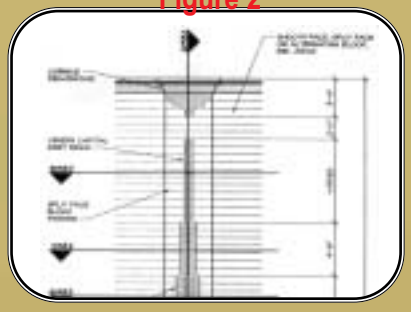


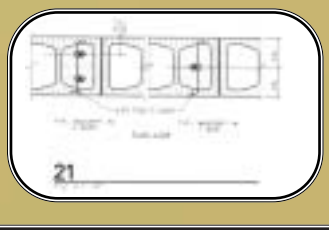
Figure 2



To create soaring slender walls, the architect used three different concrete masonry wall systems. The versatility of concrete masonry allowed the architect to satisfy all design, acoustic and structural requirements with one form of construction.

For the exterior perimeter walls, a very high slender wall was required. In a tall slender wall system such as this, wind loads usually control the structural design. Typically, these walls are designed to span vertically from the foundation to the roof diaphragm. The behavior of this type of wall under wind load is much like a vertical beam spanning from the ground all the way to the roof system (see Figure 1). The wall's thickness and rebar size/spacing are thus controlled by this flexural behavior. By using a pilaster system instead, the walls now span horizontally between pilasters.(Figure 1) The pilasters used in this design are shown in Figure 2 (bottom left). They are 20 inches deep and are built with three 12 x 8 x 16 cmu units coursed in with the 8 inch wall. Each core of the pilaster is reinforced with a #6 rebar and is fully grouted. The pilasters are typically spaced at approximately 20 feet on center. In this case, the reinforced 8" walls span around 20 feet horizontally between pilasters, resulting in a more efficient wall design.

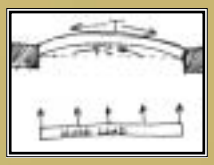
FIGURE 3



"The reason the project proceeded as smoothly as it did was due to the forward thinking, experience and planning of G. Porter's foreman, Jim Reitmayer. He not only foresaw problems, but he helped solve them before they became major problems"

-Terry Rodgers,
Paul H. Schwendener, Inc.

NON-PILASTER SYSTEM



PILASTER SYSTEM

FIGURE 1

The remaining walls are tall reinforced interior walls spanning vertically, some fully grouted (for acoustic reasons) and some partially grouted. Remember that interior walls are not subject to wind loads, allowing them to be more slender and thus more economical. These walls contain vertical rebar to resist the aforementioned flexural stress. Figure 3 shows how the use of two reinforcing bars in the same grouted cmu cell increases the strength of the wall . The double rebar detail increases the effective depth of the internal moment resisting arm which is limited to half the thickness of the unit when using one rebar per core. Two rebars have to be used so that the wall is capable of resisting the higher lateral loads in either perpendicular direction.

The flexiblity of Concrete Masonry is shown in Figure 4 below. The architect used three different wall types to satisfy all of the wall designs. By adjusting the rebar size and spacing, and/or adding pilasters, this one construction system adapts to the situation flawlessy.

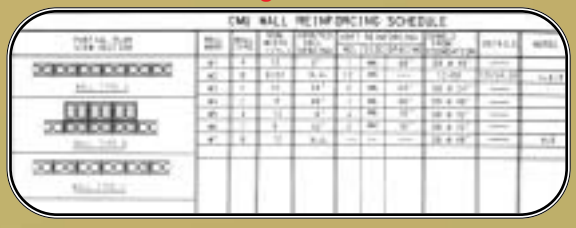



Figure 4