

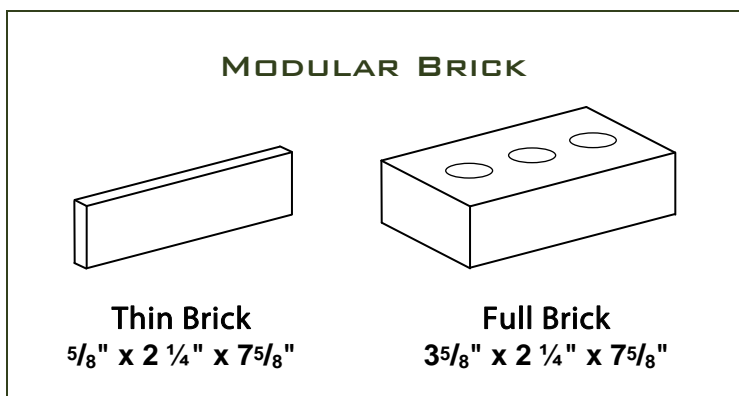
INNOVATION IN DESIGN: USE OF THIN BRICK VS FULL BRICK REDUCING HARVESTED MATERIALS AND ENERGY CONSUMPTION

Precast concrete, along with cast-in thin brick, has increasingly become today's building system of choice. It gives architects the flexibility to integrate traditional brick features with the buildings structural precast frame. The integration of thin brick can greatly reduce the amount of harvested materials and the associated embodied energy to extract, fire, transport and install the brick.

When a total precast concrete building shell is designed, the architect can integrate thin brick into the columns, beams, spandrels and wall panels as required. In addition, a thermal efficient precast concrete mass wall system can be designed with continuous insulation to meet or exceed the ASHRAE 90.1-2007 energy standard for the building envelope.

ANALYSIS OF THIN BRICK VS FULL BRICK

- Project Size: 100,000 sq. ft. of exterior face
- Determine raw material consumption
- Determine fuel required to extract materials, transport to the precaster or brick distributor and deliver to the jobsite



REDUCING HARVESTED MATERIALS AND ENERGY CONSUMPTION

ANALYSIS OF THIN BRICK VS FULL BRICK

From Harvest to Brick Plant	Thin Brick	Full Brick
Raw Material	288 tons	1,440 tons
Distance to Plant (roundtrip)	24 miles	24 miles
Fuel	39 gallons	192 gallons
Trips	13 loads	64 loads
Energy Cost	\$109	\$538

Firing Cost at Brick Plant	Thin Brick	Full Brick
Natural Gas	710 MMBtu	3,500 MMBtu
Natural Gas Cost per MMBtu	\$6	\$6
Energy Cost	\$4,260	\$21,000

Shipping from Brick Plant	Thin Brick	Full Brick
Distance to precast plant/jobsite	980 miles	
Distance to brick distributor/jobsite		150 miles
Number of Truck Loads	12 loads	100 loads
Fuel	1,470 gal.	1,875 gal.
Energy Cost	\$4,116	\$5,250

Total Energy Cost	\$8,485	\$26,788
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PROJECTED SAVINGS WITH THIN BRICK AND PRECAST

- 1,152 tons of raw material
- 558 gallons of diesel fuel
- 2,790 MMBtu of natural gas
- \$18,303 dollars

ASSUMPTIONS

- Truck Capacity: 45,000 pounds
- Fuel Cost: \$2.80 per gallon
- Mileage: 8.0 mpg
- 10% organic loss on ignition (kiln firing)

